SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO. N40085-16-R-2803	2. TYPE OF SOLICITATION [ ] SEALED BID (IFB) [X] NEGOTIATED (RFP)	3. DATE ISSUED 21-May-2016	PAGE OF PAGES 1 OF 66

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.

7. ISSUED BY CODE N40085	8. ADDRESS OFFER TO (If Other Than Item 7) CODE
NAVFAC MID ATLANTIC PWD CRANE FEAD 300 HIGHWAY 361 NSA BLDG 2516 CRANE IN 47522 TEL: FAX:	**See Item 7** TEL: FAX:

9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
	DEBRA S. DILLS	812-854-3234

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

ROOF REPAIRS & REPLACEMENT AT NSA, CRANE, INDIANA and GLENDRODA TEST FACILITY SULLIVAN INDIANA
This project consists of roof repairs and replacements at the Naval Support Activity, Crane Indiana and the Glendora Test Facility at Sullivan, Indiana. The work includes the potential for multiple task order for roof repairs and replacement. Provide all labor, equipment, tools, supplies, transportation, supervision, quality control, and management necessary to perform roof repairs and replacements. This include but is not limited to locating and isolating leakage points of entry, removal, repair and replacement of PVC, E.P.D.M. roofing systems, asphalt shingles, metal roofing standing seam, transite roof panels, asbestos containing roofing materials rolled roofing, felt, insulation, plywood decking, roof accessories to include flashing, gravel stops, drip edges, and gutters and downspouts; the application of liquid applied roof coatings; the repair of joints and re-caulking. Remove, repair and install new EFIS siding and metal siding and incidental related work. New roofing construction is not included.

11. The Contractor shall begin performance within 15 calendar days and complete it within 365 calendar days after receiving [X] award, [ ] notice to proceed. This performance period is [X] mandatory, [ ] negotiable. *(See* FAR 52.211-10 *.)*

12 A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? *(If "YES," indicate within how many calendar days after award in Item 12B.)* [X] YES [ ] NO	12B. CALENDAR DAYS 15

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 3 copies to perform the work required are due at the place specified in Item 8 by 02:00 PM *(hour)* local time 21 Jun 2016 *(date).* If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee [X] is, [ ] is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 90 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

SOLICITATION, OFFER, AND AWARD (Continued)

(Construction, Alteration, or Repair)

OFFER ***(Must be fully completed by offeror)***

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*		15. TELEPHONE NO. *(Include area code)*
		16. REMITTANCE ADDRESS *(Include only if different than Item 14)* **See Item 14**
CODE	FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. *(Insert any number equal to or greater than the minimum requirements stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS	SEE SCHEDULE OF PRICES

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation -- give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*	20B. SIGNATURE	20C. OFFER DATE

AWARD ***(To be completed by Government)***

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)*	**ITEM**	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C. 2304(c) ☐ 41 U.S.C. 253(c)
26. ADMINISTERED BY CODE		27. PAYMENT WILL BE MADE BY: CODE

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT *(Contractor is required to sign this document and return _ _ copies to issuing office.)* Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications or incorporated by reference in or attached to this contract.

☐ 29. AWARD *(Contractor is not required to sign this document.)* Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN *(Type or print)*		31A. NAME OF CONTRACTING OFFICER *(Type or print)* TEL: EMAIL:
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA BY
		31C. AWARD DATE

Section 00010 - Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001			Each		

Roof Repairs and Replacement
FFP
The contractor shall provide all labor, supplies, materials, equipment, transportation, supervision and management required for all work specified for roof repairs and replacements at NSA Crane, IN and Glendora Test Facility, Sullivan, IN. All work shall be in accordance with the Statement of Work and ELINS. Exhibits A, B, C, D, & E contain pre-priced line items that will be utilized when issuing task orders under this CLIN for the Base Year and each option year that is exercised. The contract is a a base year plus 4 option years, and the maximum for this contract is 60 months or $15,000,000.00 which ever comes first.
BASE PERIOD $_____
OPTION ONE $_____
OPTION TWO $_____
OPTION THREE $_____
OPTION FOUR $_____
TOTAL OF BASE PERIOD, OPTION ONE, OPTION TWO, OPTION THREE & OPTION FOUR $_____
FOB: Destination

NET AMT

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	N/A	N/A	N/A	Government

Solicitation #N40085-16-R-2803

Exhibit A

Roof Repairs and Replacement at NSA Crane, Indiana

BASE PERIOD

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	BASE YEAR EXTENDED AMOUNT
A001	Install Elastomeric Sheet Roof System (E.P.D.M.) - White 0.090 Thick Totally Adhered System *(See Paragraph 1.1)*	100	SQ	$ -	$ -
A002	Install Polyvinyl Chloride (PVC) - 0.080 Mechanically Attached Roof System (See Paragraph 1.2)	600	SQ	$ -	$ -
A003	Install Polyvinyl Chloride (PVC) 0.080 Fully Adhered Roof System *(See Paragraph 1.3)*	600	SQ	$ -	$ -
A004	Install Metal Sheet Roof Standard 26 ga Interlocking Ribs *(See Paragraph 1.4)*	25,000	SF	$ -	$ -
A005	Install Standing Seam, Steel Roof Panels 24 gauge, a 1-3/4" minimum Standing Seam.	500	SF	$ -	$ -
A006	Install 4.2" corrugated metal roof Roof panels shall be 24 ga.(See Paragraph 1.6)	1,000	SF	$ -	$ -
A007	B type metal decking. *(See Paragraph 1.7)*	1,000	SF	$ -	$ -
A008	Install Insulation Core metal Roof Panels *(See Paragraph 1.8)*	12,000	SF	$ -	$ -
A009	Install class "A" Mineral granule-surfaced asphalt shingles 290 lb. per Square *(See Paragraph 1.9)*	100	SQ	$ -	$ -
A010	Install 30 lb. Felt *(See Paragraph 1.10)*	100	SQ	$ -	$ -
A011	Install ½" fiberglass mat faced gypsum cover board *(See Paragraph 1.11)*	30,000	SF	$ -	$ -
A012	Aluminum foil faced closed cell Polyethylene foam insulation moisture barrier 1/2" thick - use under metal roof(See Paragraph 1.12)	20,000	SF	$ -	$ -
A013	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Mechanically Attached** *(See Paragraph 1.13)*	10,000	SF	$ -	$ -
A014	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Fully Adhered** *(See Paragraph 1.14)*	20,000	SF	$ -	$ -
A015	Install Rigid Polyisocyanurate Insulation 2" Thick : Mechanically Attached with Min. "R" Factor of 12.0 **Mechanically Attached** *(See Paragraph 1.15)*	200,000	SF	$ -	$ -

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	BASE YEAR EXTENDED AMOUNT
A016	Install Rigid Polyisocyanurate Insulation 2" Thick : Fully Adhered with Min. "R" Factor of 12.0 **Fully Adhered** *(See Paragraph 1.16)*	100,000	SF	$ -	$ -
A017	Install Rigid Polyisocyanurate Insulation - tapered min 1/4" per ft. *(See Paragraph 1.17)*	2,000	BF	$ -	$ -
A018	Install Flashing EPDM 0.060 inch Thick *(See Paragraph 1.18)*	1,000	SF	$ -	$ -
A019	Install Flashing PVC 0.060 inch Thick *(See Paragraph 1.19)*	2,000	SF	$ -	$ -
A020	Walk Pad PVC .090 inch thick & 30 inch wide (See Paragraph 1.20)	500	LF	$ -	$ -
A021	Install Vent Stack Flashing *(See Paragraph 1.21)*	100	EA	$ -	$ -
A022	Install Counter Flashing (.032 Thk. Alum.) *(See Paragraph 1.22)*	500	SF	$ -	$ -
A023	Install 6" Alum Gravel Stops with Drip Edges *(See Paragraph 1.23)*	2,000	LF	$ -	$ -
A024	Install 10" Alum Gravel Stops with Drip Edges *(See Paragraph 1.24)*	500	LF	$ -	$ -
A025	Install new 6" seamless gutters with all accessories *(See Paragraph 1.25)*	2,000	LF	$ -	$ -
A026	Install 6" box Gutters Complete with Accessories *(See Paragraph 1.26)*	200	LF	$ -	$ -
A027	Install 8" box gutter – galvanized steel w/Kynar finish with Accessories 22 ga. Galvanized *(See Paragraph 1.27)*	500	LF	$ -	$ -
A028	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" x 4" Rectangular (See Paragraph 1.28)	1,500	LF	$ -	$ -
A029	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" Round (See Paragraph 1.29)	100	LF	$ -	$ -
A030	Install Downspouts Complete w/Accessories (.032 Aluminum) 4" Round (See Paragraph 1.30)	100	LF	$ -	$ -

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	BASE YEAR EXTENDED AMOUNT
A031	Install 6 inch square downspouts *(See Paragraph 1.31)*	400	LF	$ -	$ -
A032	Install Starter Strip for Eaves and Edges 9” wide strip of mineral-surfaced roll roofing (*See Paragraph 1.32)*	500	LF	$ -	$ -
A033	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x4" *(See Paragraph 1.33)*	3,000	LF	$ -	$ -
A034	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x6" *(See Paragraph 1.34)*	3,000	LF	$ -	$ -
A035	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x10" *(See Paragraph 1.35)*	3,000	LF	$ -	$ -
A036	Install Decking, 3/4" CDX Plywood *(See Paragraph 1.36)*	200	SF	$ -	$ -
A037	Install Decking New 1/2" CDX Plywood *(See Paragraph 1.37)*	500	SF	$ -	$ -
A038	Install “Z” or “C” purlins 4" *(See Paragraph 1.38)*	500	LF	$ -	$ -
A039	Install “Z” or “C” purlins 8" *(See Paragraph 1.39)*	500	LF	$ -	$ -
A040	Installation of metal drip edge for shingle roofing *(See Paragraph 1.40)*	400	LF	$ -	$ -
A041	Install Metal Termination Bar *(See Paragraph 1.41)*	2,000	LF	$ -	$ -
A042	Install Roofing Scupper *(See Paragraph 1.42)*	30	EA	$ -	$ -
A043	Install Pitch Pocket within Roof *(See Paragraph 1.43)*	20	EA	$ -	$ -
A044	Install 6" Aluminum Fascia *(See Paragraph 1.44)*	2800	LF	$ -	$ -
A045	Install 12" Aluminum Fascia *(See Paragraph 1.45)*	2800	LF	$ -	$ -
A046	Install Turbine Vent up to 10" dia *(See Paragraph 1.46)*	10	EA	$ -	$ -

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	EXTENDED AMOUNT (BASE YEAR)
A047	Install Turbine Vent - 11" up to 26" dia. *(See Paragraph 1.47)*	15	EA	$ -	$ -
A048	Install Ridge Vent for shingle or metal roof *(See Paragraph 1.48)*	1000	LF	$ -	$ -
A049	Fluid applied roofing. This shall be 5 layers *(See Paragraph 1.49)*	1,000	SF	$ -	$ -
A050	Infrared Roof Moisture Surveys the minimum area ordered per task order will be 1000 SF *(See Paragraph 1.50)*	1000	SF	$ -	$ -
A051	Wall cap (See Paragraph 1.51)	3,000	SF	$ -	$ -
A052	Expansion joint (See Paragraph 1.52)	3,000	LF	$ -	$ -
A053	Conductor head - 22 ga. galvanized steel w/Kynar finish *(See Paragraph 1.53)*	30	EA	$ -	$ -
A054	Install 3”x5” Snow Blocks (More than 100) *(See Paragraph 1.54)*	1500	EA	$ -	$ -
A055	Install Bar type snow guards for R type and corrugated roof panels *(See Paragraph 1.55)*	400	LF	$ -	$ -
A056	Install Bar type snow guards for standing seam roof panels *(See Paragraph 1.56)*	200	LF	$ -	$ -
A057	Repair Joints and Holes in Metal roofs *(See Paragraph 1.57)*	500	SF	$ -	$ -
A058	Apply Aluminum Fiber or Black Asphalt Fiber Roof Coating *(See Paragraph 1.58)*	500	SF	$ -	$ -
A059	EXTERIOR INSULATION AND FINISH SYSTEMS - EFIS *(See Paragraph 1.59)*	3,000	SF	$ -	$ -
A060	Install soffits on the underside of eaves *(See Paragraph 1.60)*	500	SF	$ -	$ -
A061	Remove Existing Roofing Elastomeric Sheet (E.P.D.M.) *(See Paragraph 161)*	50,000	SF	$ -	$ -

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	BASE YEAR EXTENDED AMOUNT
A062	Remove single ply Polyvinyl Chloride (PVC) membrane *(See Paragraph 1.62)*	3,000	SF	$ -	$ -
A063	Remove Modified bituminous roof membrane up to 5-Ply *(See Paragraph 1.63)*	10,000	SF	$ -	$ -
A064	Remove Build up roofing including aggregate up to 5-Ply *(See Paragraph 1.64)*	1,000	SF	$ -	$ -
A065	Remove Existing Asphalt/Fiberglass Shingles *(See Paragraph 1.65)*	10,000	SF	$ -	$ -
A066	Remove Rigid Insulation *(See Paragraph 1.66)*	250,000	SF	$ -	$ -
A067	Remove stone ballast only (See Paragraph 1.67)	5,000	SF	$ -	$ -
A068	Remove CDX Plywood Decking (See Paragraph 1.68)	10,000	SF	$ -	$ -
A069	Remove Metal Roof System *(See Paragraph 1.70)*	1,000	SF	$ -	$ -
A070	Remove Flashing (See Paragraph 1.70)	5,000	SF	$ -	$ -
A071	Remove Vent Stack Flashing *(See Paragraph 1.71)*	200	EA	$ -	$ -
A072	Remove Counter Flashing and Misc. Accessories *(See Paragraph 1.72)*	1,000	SF	$ -	$ -
A073	Remove Gravel Stop and Drip Edges *(See Paragraph 1.73)*	4,200	LF	$ -	$ -
A074	Remove Guttering *(See Paragraph 1.74)*	5,000	LF	$ -	$ -
A075	Remove Downspouts *(See Paragraph 1.75)*	1000	LF	$ -	$ -
A076	Remove Pressure - Treated Wood Nailers, Crickets Saddles and Fascia Boards *(See Paragraph 1.76)*	5,000	LF	$ -	$ -
A077	Remove 2”X4” wood purlins attached on top of transite roof panels *(See Paragraph 1.77)*	6000	LF	$ -	$ -
A078	Removal of gypsum board under roofing systems. *(See Paragraph 1.78)*	2,000	SF	$ -	$ -
A079	Remove Transite (Asbestos) Roof or ceiling Panels	20,200	SF	$ -	$ -

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	BASE YEAR EXTENDED AMOUNT
	(See Paragraph 1.79)				
A080	Removal of Asbestos Containing Roof Material *(See Paragraph 1.80)*	5,000	SF	$ -	$ -
A081	Removal of asbestos contaminated insulation below transite roof panel (See Paragraph 1.81)	10,000	SF	$ -	$ -
A082	Private Qualified Person (PQP) *(See Paragraph 1.82)*	20	DAY	$ -	$ -
A083	Asbestos Hazard Abatement Plan (See Paragraph 1.83)	4	EA	$ -	$ -
A084	Locate & Identify Roof Leak *(See Paragraph 1.84)*	130	EA	$ -	$ -
A085	Respond to Emergency Service Calls (See Paragraph 1.85)	10	EA	$ -	$ -
A086	Clean gutters (See Paragraph 1.86)	16,500	LF	$ -	$ -
A087	Community Infestation Control in Conjunction inert Roof Repair/Replacement *(See Paragraph 1.87)*	20,000	SF	$ -	$ -
A088	Labor for Installation of Material in Conjunction with Roof Repair/Replacement *(See Paragraph 1.88)*	750	LH	$ -	$ -
A089	Material and Equipment in Conjunction with Roof Repairs/Replacement *(See Paragraph 1.89)* For proposal purposes only, assume the amount of material and equipment is $20,000.00	20000	%	0.0%	$ 20,000.00
	To calculate the amount for ELIN A089 multiply $20,000.00 by the percent mark-up + 100% For example if the fixed burden rate is 10% then $20,000.00 x 1.10 = $22,000.00 which is entered in ELIN A089				
A090	Work Outside Normal Working Hours *(See paragraph 1.90)* For proposal purposes only, assume the total of all applicable ELINS A001 to A089 to be performed outside of normal working hours is $5,000.00 To calculate the amount for ELIN A090 multiply $5,000.00 by the percent mark-up + 100% For example if the percent mark up is 10% then $5,000.00 x 1.10 = $5,500.00 which is entered in ELIN A090 Thus, the Work Outside Normal Working Hours premium is an additional charge of $500.00 for those tasks on a particular task order that will be performed outside of normal working hours	5000	%	0.0%	$ 5,000.00
A091	Bond Cost for Payment and Performance Bonds *(See Paragraph 1.91)* To calculate the amount for ELIN A091 multiply the subtotal of ELINS A001 - A090 by the bond premimum.	$ 25,000.00	%	0.0%	$ -

ESTIMATED TOTAL PRICE: $ 25,000.00
BASE YEAR
(Line Items A001 -- A091)
(CLIN 0001)

Solicitation #N40085-16-R-2803

Exhibit B

Roof Repairs and Replacement at NSA Crane, IN

OPTION 1

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

OPTION PERIOD #1

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	EXTENDED AMOUNT
B001	Install Elastomeric Sheet Roof System (E.P.D.M.) - White 0.090 Thick Totally Adhered System *(See Paragraph 1.1)*	100	SQ	$ -	$ -
B002	Install Polyvinyl Chloride (PVC) - 0.080 Mechanically Attached Roof System (See Paragraph 1.2)	600	SQ	$ -	$ -
B003	Install Polyvinyl Chloride (PVC) 0.080 Fully Adhered Roof System *(See Paragraph 1.3)*	600	SQ	$ -	$ -
B004	Install Metal Sheet Roof Standard 26 ga Interlocking Ribs *(See Paragraph 1.4)*	25,000	SF	$ -	$ -
B005	Install Standing Seam, Steel Roof Panels 24 gauge. (See Paragraph 1.5)	500	SF	$ -	$ -
B006	Install 4.2" corrugated metal roof Roof panels shall be 24 ga.(See Paragraph 1.6)	1,000	SF	$ -	$ -
B007	B type metal decking. *(See Paragraph 1.7)*	1,000	SF	$ -	$ -
B008	Install Insulation Core metal Roof Panels *(See Paragraph 1.8)*	12,000	SF	$ -	$ -
B009	Install class "A" Mineral granule-surfaced asphalt shingles 290 lb. per Square *(See Paragraph 1.9)*	100	SQ	$ -	$ -
B010	Install 30 lb. Felt *(See Paragraph 1.10)*	100	SQ	$ -	$ -
B011	Install ½" fiberglass mat faced gypsum cover board *(See Paragraph 1.11)*	30,000	SF	$ -	$ -
B012	Aluminum foil faced closed cell Polyethylene foam insulation moisture barrier 1/2" thick - use under metal roof(See Paragraph 1.12)	20,000	SF	$ -	$ -
B013	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Mechanically Attached** *(See Paragraph 1.13)*	10,000	SF	$ -	$ -
B014	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Fully Adhered** *(See Paragraph 1.14)*	20,000	SF	$ -	$ -
B015	Install Rigid Polyisocyanurate Insulation 2" Thick : Mechanically Attached with Min. "R" Factor of 12.0 **Mechanically Attached** *(See Paragraph 1.15)*	200,000	SF	$ -	$ -

B016	Install Rigid Polyisocyanurate Insulation 2" Thick : Fully Adhered with Min. "R" Factor of 12.0 **Fully Adhered** *(See Paragraph 1.16)*	100,000	SF	$ -	$ -
B017	Install Rigid Polyisocyanurate Insulation - tapered min 1/4" per ft. *(See Paragraph 1.17)*	2,000	BF	$ -	$ -
B018	Install Flashing EPDM 0.060 inch Thick *(See Paragraph 1.18)*	1,000	SF	$ -	$ -
B019	Install Flashing PVC 0.060 inch Thick *(See Paragraph 1.19)*	2,000	SF	$ -	$ -
B020	Walk Pad PVC .090 inch thick & 30 inch wide (See Paragraph 1.20)	500	LF	$ -	$ -
B021	Install Vent Stack Flashing *(See Paragraph 1.21)*	100	EA	$ -	$ -
B022	Install Counter Flashing (.032 Thk. Alum.) *(See Paragraph 1.22)*	500	SF	$ -	$ -
B023	Install 6" Alum Gravel Stops with Drip Edges *(See Paragraph 1.23)*	2,000	LF	$ -	$ -
B024	Install 10" Alum Gravel Stops with Drip Edges *(See Paragraph 1.24)*	600	LF	$ -	$ -
B025	Install new 6" seamless gutters with all accessories *(See Paragraph 1.25)*	2,000	LF	$ -	$ -
B026	Install 6" box Gutters Complete with Accessories *(See Paragraph 1.26)*	200	LF	$ -	$ -
B027	Install 8" box gutter – galvanized steel w/Kynar finish with Accessories 22 ga. Galvanized *(See Paragraph 1.27)*	500	LF	$ -	$ -
B028	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" x 4" Rectangular (See Paragraph 1.28)	1,500	LF	$ -	$ -
B029	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" Round (See Paragraph 1.29)	250	LF	$ -	$ -
B030	Install Downspouts Complete w/Accessories (.032 Aluminum) 4" Round (See Paragraph 1.30)	100	LF	$ -	$ -
B031	Install 6 inch square downspouts *(See Paragraph 1.31)*	400	LF	$ -	$ -
B032	Install Starter Strip for Eaves and Edges 9" wide strip of mineral-surfaced roll roofing (*See Paragraph 1.32)*	500	LF	$ -	$ -

B033	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x4" *(See Paragraph 1.33)*	3,000	LF	$ -	$ -
B034	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x6" *(See Paragraph 1.34)*	3,000	LF	$ -	$ -
B035	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x10" *(See Paragraph 1.35)*	3,000	LF	$ -	$ -
B036	Install Decking, 3/4" CDX Plywood *(See Paragraph 1.36)*	200	SF	$ -	$ -
B037	Install Decking New 1/2" CDX Plywood *(See Paragraph 1.37)*	500	SF	$ -	$ -
B038	Install “Z” or “C” purlins 4" *(See Paragraph 1.38)*	500	LF	$ -	$ -
B039	Install “Z” or “C” purlins 8" *(See Paragraph 1.39)*	500	LF	$ -	$ -
B040	Installation of metal drip edge for shingle roofing *(See Paragraph 1.40)*	400	LF	$ -	$ -
B041	Install Metal Termination Bar *(See Paragraph 1.41)*	500	LF	$ -	$ -
B042	Install Roofing Scupper *(See Paragraph 1.42)*	15	EA	$ -	$ -
B043	Install Pitch Pocket within Roof *(See Paragraph 1.43)*	20	EA	$ -	$ -
B044	Install 6" Aluminum Fascia *(See Paragraph 1.44)*	2800	LF	$ -	$ -
B045	Install 12" Aluminum Fascia *(See Paragraph 1.45)*	2800	LF	$ -	$ -
B046	Install Turbine Vent up to 10" dia *(See Paragraph 1.46)*	10	EA	$ -	$ -
B047	Install Turbine Vent - 11" up to 26" dia. *(See Paragraph 1.47)*	10	EA	$ -	$ -
B048	Install Ridge Vent for shingle or metal roof *(See Paragraph 1.48)*	1000	LF	$ -	$ -
B049	Fluid applied roofing. This shall be 5 layers *(See Paragraph 1.49)*	1,000	SF	$ -	$ -

B050	Infrared Roof Moisture Surveys the minimum area ordered per task order will be 1000 SF *(See Paragraph 1.50)*	1000	SF	$ -	$ -
B051	Wall cap (See Paragraph 1.51)	3,000	SF	$ -	$ -
B052	Expansion joint (See Paragraph 1.52)	3,000	LF	$ -	$ -
B053	Conductor head - 22 ga. galvanized steel w/Kynar finish *(See Paragraph 1.53)*	30	EA	$ -	$ -
B054	Install 3”x5” Snow Blocks (More than 100) *(See Paragraph 1.54)*	1500	EA	$ -	$ -
B055	Install Bar type snow guards for R type and corrugated roof panels *(See Paragraph 1.55)*	400	LF	$ -	$ -
B056	Install Bar type snow guards for standing seam roof panels *(See Paragraph 1.56)*	200	LF	$ -	$ -
B057	Repair Joints and Holes in Metal roofs *(See Paragraph 1.57)*	500	SF	$ -	$ -
B058	Apply Aluminum Fiber or Black Asphalt Fiber Roof Coating *(See Paragraph 1.58)*	500	SF	$ -	$ -
B059	EXTERIOR INSULATION AND FINISH SYSTEMS - EFIS *(See Paragraph 1.59)*	1,000	SF	$ -	$ -
B060	Install soffits on the underside of eaves *(See Paragraph 1.60)*	500	SF	$ -	$ -
B061	Remove Existing Roofing Elastomeric Sheet (E.P.D.M.) *(See Paragraph 161)*	50,000	SF	$ -	$ -
B062	Remove single ply Polyvinyl Chloride (PVC) membrane *(See Paragraph 1.62)*	3,000	SF	$ -	$ -
B063	Remove Modified bituminous roof membrane up to 5-Ply *(See Paragraph 1.63)*	10,000	SF	$ -	$ -
B064	Remove Build up roofing including aggregate up to 5-Ply *(See Paragraph 1.64)*	1,000	SF	$ -	$ -
B065	Remove Existing Asphalt/Fiberglass Shingles *(See Paragraph 1.65)*	10,000	SF	$ -	$ -
B066	Remove Rigid Insulation *(See Paragraph 1.66)*	250,000	SF	$ -	$ -
B067	Remove stone ballast only (See Paragraph 1.67)	10,000	SF	$ -	$ -

B068	Remove CDX Plywood Decking (See Paragraph 1.68)	10,000	SF	$ -	$ -
B069	Remove Metal Roof System *(See Paragraph 1.70)*	1,000	SF	$ -	$ -
B070	Remove Flashing (See Paragraph 1.70)	5,000	SF	$ -	$ -
B071	Remove Vent Stack Flashing *(See Paragraph 1.71)*	200	EA	$ -	$ -
B072	Remove Counter Flashing and Misc. Accessories *(See Paragraph 1.72)*	1,000	SF	$ -	$ -
B073	Remove Gravel Stop and Drip Edges *(See Paragraph 1.73)*	4,200	LF	$ -	$ -
B074	Remove Guttering *(See Paragraph 1.74)*	5,000	LF	$ -	$ -
B075	Remove Downspouts *(See Paragraph 1.75)*	1000	LF	$ -	$ -
B076	Remove Pressure - Treated Wood Nailers, Crickets Saddles and Fascia Boards *(See Paragraph 1.76)*	5,000	LF	$ -	$ -
B077	Remove 2”X4” wood purlins attached on top of transite roof panels *(See Paragraph 1.77)*	6000	LF	$ -	$ -
B078	Removal of gypsum board under roofing systems. *(See Paragraph 1.78)*	2,000	SF	$ -	$ -
B079	Remove Transite (Asbestos) Roof or ceiling Panels *(See Paragraph 1.79)*	20,200	SF	$ -	$ -
B080	Removal of Asbestos Containing Roof Material *(See Paragraph 1.80)*	5,000	SF	$ -	$ -
B081	Removal of asbestos contaminated insulation below transite roof panel (See Paragraph 1.81)	10,000	SF	$ -	$ -
B082	Private Qualified Person (PQP) *(See Paragraph 1.82)*	20	DAY	$ -	$ -
B083	Asbestos Hazard Abatement Plan (See Paragraph 1.83)	4	EA	$ -	$ -
B084	Locate & Identify Roof Leak *(See Paragraph 1.84)*	125	EA	$ -	$ -
B085	Respond to Emergency Service Calls (See Paragraph 1.85)	5	EA	$ -	$ -
B086	Clean gutters (See Paragraph 1.86)	16,500	LF	$ -	$ -
B087	Community Infestation Control in Conjunction inert Roof Repair/Replacement *(See Paragraph 1.87)*	20,000	SF	$ -	$ -

B088	Labor for Installation of Material in Conjunction with Roof Repair/Replacement *(See Paragraph 1.88)*	750	LH	$ -	$ -
B089	Material and Equipment in Conjunction with Roof Repairs/Replacement *(See Paragraph 1.89)* For proposal purposes only, assume the amount of material and equipment is $20,000.00 To calculate the amount for ELIN B089 multiply $20,000.00 by the percent mark-up + 100% For example if the fixed burden rate is 10% then $20,000.00 x 1.10 = $22,000.00 which is entered in ELIN B089	20000	%	0.0%	$ 20,000.00
B090	Work Outside Normal Working Hours *(See paragraph 1.90)* For proposal purposes only, assume the total of all applicable ELINS B001 to B089 to be performed outside of normal working hours is $5,000.00 To calculate the amount for ELIN B090 multiply $5,000.00 by the percent mark-up + 100% For example if the percent mark up is 10% then $5,000.00 x 1.10 = $5,500.00 which is entered in ELIN B090 Thus, the Work Outside Normal Working Hours premium is an additional charge of $500.00 for those tasks on a. particular task order that will be performed outside of normal working hours	5000	%	0.0%	$ 5,000.00
B091	Bond Cost for Payment and Performance Bonds (See Paragraph 1.91) To calculate the amount for ELIN B091 multiply the subtotal of ELINS B001 - B090 by the bond premimum.	$ 25,000.00	%	0.0%	$ -

ESTIMATED TOTAL PRICE: **$ 25,000.00**
OPTION PERIOD #1
(Line Items B001 -- B091)
(CLIN 0001)

Solicitation #N40085-16-R-2803

Exhibit C

Roof Repairs and Replacement at NSA Crane, IN

OPTION 2

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

OPTION PERIOD #2

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	EXTENDED AMOUNT
C001	Install Elastomeric Sheet Roof System (E.P.D.M.) - White 0.090 Thick Totally Adhered System *(See Paragraph 1.1)*	100	SQ	$ -	$ -
C002	Install Polyvinyl Chloride (PVC) - 0.080 Mechanically Attached Roof System (See Paragraph 1.2)	600	SQ	$ -	$ -
C003	Install Polyvinyl Chloride (PVC) 0.080 Fully Adhered Roof System *(See Paragraph 1.3)*	600	SQ	$ -	$ -
C004	Install Metal Sheet Roof Standard 26 ga Interlocking Ribs *(See Paragraph 1.4)*	25,000	SF	$ -	$ -
C005	Install Standing Seam, Steel Roof Panels 24 gauge. (See Paragraph 1.5)	500	SF	$ -	$ -
C006	Install 4.2" corrugated metal roof Roof panels shall be 24 ga.(See Paragraph 1.6)	1,000	SF	$ -	$ -
C007	B type metal decking. *(See Paragraph 1.7)*	1,000	SF	$ -	$ -
C008	Install Insulation Core metal Roof Panels *(See Paragraph 1.8)*	12,000	SF	$ -	$ -
C009	Install class "A" Mineral granule-surfaced asphalt shingles 290 lb. per Square *(See Paragraph 1.9)*	100	SQ	$ -	$ -
C010	Install 30 lb. Felt *(See Paragraph 1.10)*	100	SQ	$ -	$ -
C011	Install ½" fiberglass mat faced gypsum cover board *(See Paragraph 1.11)*	30,000	SF	$ -	$ -
C012	Aluminum foil faced closed cell Polyethylene foam insulation moisture barrier 1/2" thick - use under metal roof(See Paragraph 1.12)	20,000	SF	$ -	$ -
C013	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Mechanically Attached** *(See Paragraph 1.13)*	10,000	SF	$ -	$ -
C014	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Fully Adhered** *(See Paragraph 1.14)*	20,000	SF	$ -	$ -
C015	Install Rigid Polyisocyanurate Insulation 2" Thick : Mechanically Attached with Min. "R" Factor of 12.0 **Mechanically Attached** *(See Paragraph 1.15)*	200,000	SF	$ -	$ -

C016	Install Rigid Polyisocyanurate Insulation 2" Thick : Fully Adhered with Min. "R" Factor of 12.0 **Fully Adhered** *(See Paragraph 1.16)*	100,000	SF	$ -	$ -
C017	Install Rigid Polyisocyanurate Insulation - tapered min 1/4" per ft. *(See Paragraph 1.17)*	2,000	BF	$ -	$ -
C018	Install Flashing EPDM 0.060 inch Thick *(See Paragraph 1.18)*	1,000	SF	$ -	$ -
C019	Install Flashing PVC 0.060 inch Thick *(See Paragraph 1.19)*	2,000	SF	$ -	$ -
C020	Walk Pad PVC .090 inch thick & 30 inch wide (See Paragraph 1.20)	500	LF	$ -	$ -
C021	Install Vent Stack Flashing *(See Paragraph 1.21)*	100	EA	$ -	$ -
C022	Install Counter Flashing (.032 Thk. Alum.) *(See Paragraph 1.22)*	500	SF	$ -	$ -
C023	Install 6" Alum Gravel Stops with Drip Edges *(See Paragraph 1.23)*	2,000	LF	$ -	$ -
C024	Install 10" Alum Gravel Stops with Drip Edges *(See Paragraph 1.24)*	600	LF	$ -	$ -
C025	Install new 6" seamless gutters with all accessories *(See Paragraph 1.25)*	2,000	LF	$ -	$ -
C026	Install 6" box Gutters Complete with Accessories *(See Paragraph 1.26)*	200	LF	$ -	$ -
C027	Install 8" box gutter – galvanized steel w/Kynar finish with Accessories 22 ga. Galvanized *(See Paragraph 1.27)*	500	LF	$ -	$ -
C028	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" x 4" Rectangular (See Paragraph 1.28)	1,500	LF	$ -	$ -
C029	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" Round (See Paragraph 1.29)	250	LF	$ -	$ -
C030	Install Downspouts Complete w/Accessories (.032 Aluminum) 4" Round (See Paragraph 1.30)	100	LF	$ -	$ -
C031	Install 6 inch square downspouts *(See Paragraph 1.31)*	400	LF	$ -	$ -
C032	Install Starter Strip for Eaves and Edges 9" wide strip of mineral-surfaced roll roofing (*See Paragraph 1.32)*	500	LF	$ -	$ -

C033	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x4" *(See Paragraph 1.33)*	3,000	LF	$ -	$ -
C034	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x6" *(See Paragraph 1.34)*	3,000	LF	$ -	$ -
C035	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x10" *(See Paragraph 1.35)*	3,000	LF	$ -	$ -
C036	Install Decking, 3/4" CDX Plywood *(See Paragraph 1.36)*	200	SF	$ -	$ -
C037	Install Decking New 1/2" CDX Plywood *(See Paragraph 1.37)*	500	SF	$ -	$ -
C038	Install “Z” or “C” purlins 4" *(See Paragraph 1.38)*	500	LF	$ -	$ -
C039	Install “Z” or “C” purlins 8" *(See Paragraph 1.39)*	500	LF	$ -	$ -
C040	Installation of metal drip edge for shingle roofing *(See Paragraph 1.40)*	400	LF	$ -	$ -
C041	Install Metal Termination Bar *(See Paragraph 1.41)*	500	LF	$ -	$ -
C042	Install Roofing Scupper *(See Paragraph 1.42)*	15	EA	$ -	$ -
C043	Install Pitch Pocket within Roof *(See Paragraph 1.43)*	20	EA	$ -	$ -
C044	Install 6" Aluminum Fascia *(See Paragraph 1.44)*	2800	LF	$ -	$ -
C045	Install 12" Aluminum Fascia *(See Paragraph 1.45)*	2800	LF	$ -	$ -
C046	Install Turbine Vent up to 10" dia *(See Paragraph 1.46)*	10	EA	$ -	$ -
C047	Install Turbine Vent - 11" up to 26" dia. *(See Paragraph 1.47)*	10	EA	$ -	$ -
C048	Install Ridge Vent for shingle or metal roof *(See Paragraph 1.48)*	1000	LF	$ -	$ -
C049	Fluid applied roofing. This shall be 5 layers *(See Paragraph 1.49)*	1,000	SF	$ -	$ -

C050	Infrared Roof Moisture Surveys the minimum area ordered per task order will be 1000 SF *(See Paragraph 1.50)*	1000	SF	$ -	$ -
C051	Wall cap (See Paragraph 1.51)	3,000	SF	$ -	$ -
C052	Expansion joint (See Paragraph 1.52)	3,000	LF	$ -	$ -
C053	Conductor head - 22 ga. galvanized steel w/Kynar finish *(See Paragraph 1.53)*	30	EA	$ -	$ -
C054	Install 3”x5” Snow Blocks (More than 100) *(See Paragraph 1.54)*	1500	EA	$ -	$ -
C055	Install Bar type snow guards for R type and corrugated roof panels *(See Paragraph 1.55)*	400	LF	$ -	$ -
C056	Install Bar type snow guards for standing seam roof panels *(See Paragraph 1.56)*	200	LF	$ -	$ -
C057	Repair Joints and Holes in Metal roofs *(See Paragraph 1.57)*	500	SF	$ -	$ -
C058	Apply Aluminum Fiber or Black Asphalt Fiber Roof Coating *(See Paragraph 1.58)*	500	SF	$ -	$ -
C059	EXTERIOR INSULATION AND FINISH SYSTEMS - EFIS *(See Paragraph 1.59)*	1,000	SF	$ -	$ -
C060	Install soffits on the underside of eaves *(See Paragraph 1.60)*	500	SF	$ -	$ -
C061	Remove Existing Roofing Elastomeric Sheet (E.P.D.M.) *(See Paragraph 161)*	50,000	SF	$ -	$ -
C062	Remove single ply Polyvinyl Chloride (PVC) membrane *(See Paragraph 1.62)*	3,000	SF	$ -	$ -
C063	Remove Modified bituminous roof membrane up to 5-Ply *(See Paragraph 1.63)*	10,000	SF	$ -	$ -
C064	Remove Build up roofing including aggregate up to 5-Ply *(See Paragraph 1.64)*	1,000	SF	$ -	$ -
C065	Remove Existing Asphalt/Fiberglass Shingles *(See Paragraph 1.65)*	10,000	SF	$ -	$ -
C066	Remove Rigid Insulation *(See Paragraph 1.66)*	250,000	SF	$ -	$ -
C067	Remove stone ballast only (See Paragraph 1.67)	10,000	SF	$ -	$ -

C068	Remove CDX Plywood Decking (See Paragraph 1.68)	10,000	SF	$ -	$ -
C069	Remove Metal Roof System *(See Paragraph 1.70)*	1,000	SF	$ -	$ -
C070	Remove Flashing (See Paragraph 1.70)	5,000	SF	$ -	$ -
C071	Remove Vent Stack Flashing *(See Paragraph 1.71)*	200	EA	$ -	$ -
C072	Remove Counter Flashing and Misc. Accessories *(See Paragraph 1.72)*	1,000	SF	$ -	$ -
C073	Remove Gravel Stop and Drip Edges *(See Paragraph 1.73)*	4,200	LF	$ -	$ -
C074	Remove Guttering *(See Paragraph 1.74)*	5,000	LF	$ -	$ -
C075	Remove Downspouts *(See Paragraph 1.75)*	1000	LF	$ -	$ -
C076	Remove Pressure - Treated Wood Nailers, Crickets Saddles and Fascia Boards *(See Paragraph 1.76)*	5,000	LF	$ -	$ -
C077	Remove 2”X4” wood purlins attached on top of transite roof panels *(See Paragraph 1.77)*	6000	LF	$ -	$ -
C078	Removal of gypsum board under roofing systems. *(See Paragraph 1.78)*	2,000	SF	$ -	$ -
C079	Remove Transite (Asbestos) Roof or ceiling Panels *(See Paragraph 1.79)*	20,200	SF	$ -	$ -
C080	Removal of Asbestos Containing Roof Material *(See Paragraph 1.80)*	5,000	SF	$ -	$ -
C081	Removal of asbestos contaminated insulation below transite roof panel (See Paragraph 1.81)	10,000	SF	$ -	$ -
C082	Private Qualified Person (PQP) *(See Paragraph 1.82)*	20	DAY	$ -	$ -
C083	Asbestos Hazard Abatement Plan (See Paragraph 1.83)	4	EA	$ -	$ -
C084	Locate & Identify Roof Leak *(See Paragraph 1.84)*	125	EA	$ -	$ -
C085	Respond to Emergency Service Calls (See Paragraph 1.85)	5	EA	$ -	$ -
C086	Clean gutters (See Paragraph 1.86)	16,500	LF	$ -	$ -
C087	Community Infestation Control in Conjunction inert Roof Repair/Replacement *(See Paragraph 1.87)*	20,000	SF	$ -	$ -

C088	Labor for Installation of Material in Conjunction with Roof Repair/Replacement *(See Paragraph 1.88)*	750	LH	$ -	$ -
C089	Material and Equipment in Conjunction with Roof Repairs/Replacement *(See Paragraph 1.89)* For proposal purposes only, assume the amount of material and equipment is $20,000.00 To calculate the amount for ELIN C089 multiply $20,000.00 by the percent mark-up + 100% For example if the fixed burden rate is 10% then $20,000.00 x 1.10 = $22,000.00 which is entered in ELIN C089	20000	%	0.0%	$ 20,000.00
C090	Work Outside Normal Working Hours *(See paragraph 1.90)* For proposal purposes only, assume the total of all applicable ELINS C001 to C089 to be performed outside of normal working hours is $5,000.00 To calculate the amount for ELIN C090 multiply $5,000.00 by the percent mark-up + 100% For example if the percent mark up is 10% then $5,000.00 x 1.10 = $5,500.00 which is entered in ELIN C090 Thus, the Work Outside Normal Working Hours premium is an additional charge of $500.00 for those tasks on a. particular task order that will be performed outside of normal working hours	5000	%	0.0%	$ 5,000.00
C091	Bond Cost for Payment and Performance Bonds (See Paragraph 1.91) To calculate the amount for ELIN B091 multiply the subtotal of ELINS C001 - C090 by the bond premimum.	$ 25,000.00	%	0.0%	$ -

ESTIMATED TOTAL PRICE: **$ 25,000.00**
OPTION PERIOD #2
(Line Items C001 -- C091)
(CLIN 0001)

Solicitation #N40085-16-R-2803

Exhibit D

Roof Repairs and Replacement at NSA Crane, IN

OPTION 3

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

OPTION PERIOD #3

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	EXTENDED AMOUNT
D001	Install Elastomeric Sheet Roof System (E.P.D.M.) - White 0.090 Thick Totally Adhered System *(See Paragraph 1.1)*	100	SQ	$ -	$ -
D002	Install Polyvinyl Chloride (PVC) - 0.080 Mechanically Attached Roof System (See Paragraph 1.2)	600	SQ	$ -	$ -
D003	Install Polyvinyl Chloride (PVC) 0.080 Fully Adhered Roof System *(See Paragraph 1.3)*	600	SQ	$ -	$ -
D004	Install Metal Sheet Roof Standard 26 ga Interlocking Ribs *(See Paragraph 1.4)*	25,000	SF	$ -	$ -
D005	Install Standing Seam, Steel Roof Panels 24 gauge. (See Paragraph 1.5)	500	SF	$ -	$ -
D006	Install 4.2" corrugated metal roof Roof panels shall be 24 ga.(See Paragraph 1.6)	1,000	SF	$ -	$ -
D007	B type metal decking. *(See Paragraph 1.7)*	1,000	SF	$ -	$ -
D008	Install Insulation Core metal Roof Panels *(See Paragraph 1.8)*	12,000	SF	$ -	$ -
D009	Install class "A" Mineral granule-surfaced asphalt shingles 290 lb. per Square *(See Paragraph 1.9)*	100	SQ	$ -	$ -
D010	Install 30 lb. Felt *(See Paragraph 1.10)*	100	SQ	$ -	$ -
D011	Install ½" fiberglass mat faced gypsum cover board *(See Paragraph 1.11)*	30,000	SF	$ -	$ -
D012	Aluminum foil faced closed cell Polyethylene foam insulation moisture barrier 1/2" thick - use under metal roof(See Paragraph 1.12)	20,000	SF	$ -	$ -
D013	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Mechanically Attached** *(See Paragraph 1.13)*	10,000	SF	$ -	$ -
D014	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Fully Adhered** *(See Paragraph 1.14)*	20,000	SF	$ -	$ -
D015	Install Rigid Polyisocyanurate Insulation 2" Thick : Mechanically Attached with Min. "R" Factor of 12.0 **Mechanically Attached** *(See Paragraph 1.15)*	200,000	SF	$ -	$ -

D016	Install Rigid Polyisocyanurate Insulation 2" Thick : Fully Adhered with Min. "R" Factor of 12.0 **Fully Adhered** *(See Paragraph 1.16)*	100,000	SF	$ -	$ -
D017	Install Rigid Polyisocyanurate Insulation - tapered min 1/4" per ft. *(See Paragraph 1.17)*	2,000	BF	$ -	$ -
D018	Install Flashing EPDM 0.060 inch Thick *(See Paragraph 1.18)*	1,000	SF	$ -	$ -
D019	Install Flashing PVC 0.060 inch Thick *(See Paragraph 1.19)*	2,000	SF	$ -	$ -
D020	Walk Pad PVC .090 inch thick & 30 inch wide (See Paragraph 1.20)	500	LF	$ -	$ -
D021	Install Vent Stack Flashing *(See Paragraph 1.21)*	100	EA	$ -	$ -
D022	Install Counter Flashing (.032 Thk. Alum.) *(See Paragraph 1.22)*	500	SF	$ -	$ -
D023	Install 6" Alum Gravel Stops with Drip Edges *(See Paragraph 1.23)*	2,000	LF	$ -	$ -
D024	Install 10" Alum Gravel Stops with Drip Edges *(See Paragraph 1.24)*	600	LF	$ -	$ -
D025	Install new 6" seamless gutters with all accessories *(See Paragraph 1.25)*	2,000	LF	$ -	$ -
D026	Install 6" box Gutters Complete with Accessories *(See Paragraph 1.26)*	200	LF	$ -	$ -
D027	Install 8" box gutter – galvanized steel w/Kynar finish with Accessories 22 ga. Galvanized *(See Paragraph 1.27)*	500	LF	$ -	$ -
D028	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" x 4" Rectangular (See Paragraph 1.28)	1,500	LF	$ -	$ -
D029	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" Round (See Paragraph 1.29)	250	LF	$ -	$ -
D030	Install Downspouts Complete w/Accessories (.032 Aluminum) 4" Round (See Paragraph 1.30)	100	LF	$ -	$ -
D031	Install 6 inch square downspouts *(See Paragraph 1.31)*	400	LF	$ -	$ -
D032	Install Starter Strip for Eaves and Edges 9” wide strip of mineral-surfaced roll roofing (*See Paragraph 1.32)*	500	LF	$ -	$ -

D033	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x4" *(See Paragraph 1.33)*	3,000	LF	$ -	$ -
D034	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x6" *(See Paragraph 1.34)*	3,000	LF	$ -	$ -
D035	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x10" *(See Paragraph 1.35)*	3,000	LF	$ -	$ -
D036	Install Decking, 3/4" CDX Plywood *(See Paragraph 1.36)*	200	SF	$ -	$ -
D037	Install Decking New 1/2" CDX Plywood *(See Paragraph 1.37)*	500	SF	$ -	$ -
D038	Install “Z” or “C” purlins 4" *(See Paragraph 1.38)*	500	LF	$ -	$ -
D039	Install “Z” or “C” purlins 8" *(See Paragraph 1.39)*	500	LF	$ -	$ -
D040	Installation of metal drip edge for shingle roofing *(See Paragraph 1.40)*	400	LF	$ -	$ -
D041	Install Metal Termination Bar *(See Paragraph 1.41)*	500	LF	$ -	$ -
D042	Install Roofing Scupper *(See Paragraph 1.42)*	15	EA	$ -	$ -
D043	Install Pitch Pocket within Roof *(See Paragraph 1.43)*	20	EA	$ -	$ -
D044	Install 6" Aluminum Fascia *(See Paragraph 1.44)*	2800	LF	$ -	$ -
D045	Install 12" Aluminum Fascia *(See Paragraph 1.45)*	2800	LF	$ -	$ -
D046	Install Turbine Vent up to 10" dia *(See Paragraph 1.46)*	10	EA	$ -	$ -
D047	Install Turbine Vent - 11" up to 26" dia. *(See Paragraph 1.47)*	10	EA	$ -	$ -
D048	Install Ridge Vent for shingle or metal roof *(See Paragraph 1.48)*	1000	LF	$ -	$ -
D049	Fluid applied roofing. This shall be 5 layers *(See Paragraph 1.49)*	1,000	SF	$ -	$ -

D050	Infrared Roof Moisture Surveys the minimum area ordered per task order will be 1000 SF *(See Paragraph 1.50)*	1000	SF	$ -	$ -
D051	Wall cap (See Paragraph 1.51)	3,000	SF	$ -	$ -
D052	Expansion joint (See Paragraph 1.52)	3,000	LF	$ -	$ -
D053	Conductor head - 22 ga. galvanized steel w/Kynar finish *(See Paragraph 1.53)*	30	EA	$ -	$ -
D054	Install 3”x5” Snow Blocks (More than 100) *(See Paragraph 1.54)*	1500	EA	$ -	$ -
D055	Install Bar type snow guards for R type and corrugated roof panels *(See Paragraph 1.55)*	400	LF	$ -	$ -
D056	Install Bar type snow guards for standing seam roof panels *(See Paragraph 1.56)*	200	LF	$ -	$ -
D057	Repair Joints and Holes in Metal roofs *(See Paragraph 1.57)*	500	SF	$ -	$ -
D058	Apply Aluminum Fiber or Black Asphalt Fiber Roof Coating *(See Paragraph 1.58)*	500	SF	$ -	$ -
D059	EXTERIOR INSULATION AND FINISH SYSTEMS - EFIS *(See Paragraph 1.59)*	1,000	SF	$ -	$ -
D060	Install soffits on the underside of eaves *(See Paragraph 1.60)*	500	SF	$ -	$ -
D061	Remove Existing Roofing Elastomeric Sheet (E.P.D.M.) *(See Paragraph 161)*	50,000	SF	$ -	$ -
D062	Remove single ply Polyvinyl Chloride (PVC) membrane *(See Paragraph 1.62)*	3,000	SF	$ -	$ -
D063	Remove Modified bituminous roof membrane up to 5-Ply *(See Paragraph 1.63)*	10,000	SF	$ -	$ -
D064	Remove Build up roofing including aggregate up to 5-Ply *(See Paragraph 1.64)*	1,000	SF	$ -	$ -
D065	Remove Existing Asphalt/Fiberglass Shingles *(See Paragraph 1.65)*	10,000	SF	$ -	$ -
D066	Remove Rigid Insulation *(See Paragraph 1.66)*	250,000	SF	$ -	$ -
D067	Remove stone ballast only (See Paragraph 1.67)	10,000	SF	$ -	$ -

D068	Remove CDX Plywood Decking (See Paragraph 1.68)	10,000	SF	$ -	$ -
D069	Remove Metal Roof System *(See Paragraph 1.70)*	1,000	SF	$ -	$ -
D070	Remove Flashing (See Paragraph 1.70)	5,000	SF	$ -	$ -
D071	Remove Vent Stack Flashing *(See Paragraph 1.71)*	200	EA	$ -	$ -
D072	Remove Counter Flashing and Misc. Accessories *(See Paragraph 1.72)*	1,000	SF	$ -	$ -
D073	Remove Gravel Stop and Drip Edges *(See Paragraph 1.73)*	4,200	LF	$ -	$ -
D074	Remove Guttering *(See Paragraph 1.74)*	5,000	LF	$ -	$ -
D075	Remove Downspouts *(See Paragraph 1.75)*	1000	LF	$ -	$ -
D076	Remove Pressure - Treated Wood Nailers, Crickets Saddles and Fascia Boards *(See Paragraph 1.76)*	5,000	LF	$ -	$ -
D077	Remove 2”X4” wood purlins attached on top of transite roof panels *(See Paragraph 1.77)*	6000	LF	$ -	$ -
D078	Removal of gypsum board under roofing systems. *(See Paragraph 1.78)*	2,000	SF	$ -	$ -
D079	Remove Transite (Asbestos) Roof or ceiling Panels *(See Paragraph 1.79)*	20,200	SF	$ -	$ -
D080	Removal of Asbestos Containing Roof Material *(See Paragraph 1.80)*	5,000	SF	$ -	$ -
D081	Removal of asbestos contaminated insulation below transite roof panel (See Paragraph 1.81)	10,000	SF	$ -	$ -
D082	Private Qualified Person (PQP) *(See Paragraph 1.82)*	20	DAY	$ -	$ -
D083	Asbestos Hazard Abatement Plan (See Paragraph 1.83)	4	EA	$ -	$ -
D084	Locate & Identify Roof Leak *(See Paragraph 1.84)*	125	EA	$ -	$ -
D085	Respond to Emergency Service Calls (See Paragraph 1.85)	5	EA	$ -	$ -
D086	Clean gutters (See Paragraph 1.86)	16,500	LF	$ -	$ -
D087	Community Infestation Control	20,000	SF	$ -	$ -

	in Conjunction inert Roof Repair/Replacement *(See Paragraph 1.87)*				
D088	Labor for Installation of Material in Conjunction with Roof Repair/Replacement *(See Paragraph 1.88)*	750	LH	$ -	$ -
D089	Material and Equipment in Conjunction with Roof Repairs/Replacement *(See Paragraph 1.89)* For proposal purposes only, assume the amount of material and equipment is $20,000.00 To calculate the amount for ELIN D089 multiply $20,000.00 by the percent mark-up + 100% For example if the fixed burden rate is 10% then $20,000.00 x 1.10 = $22,000.00 which is entered in ELIN D089	20000	%	0.0%	$ 20,000.00
D090	Work Outside Normal Working Hours *(See paragraph 1.90)* For proposal purposes only, assume the total of all applicable ELINS D001 to D089 to be performed outside of normal working hours is $5,000.00 To calculate the amount for ELIN D090 multiply $5,000.00 by the percent mark-up + 100% For example if the percent mark up is 10% then $5,000.00 x 1.10 = $5,500.00 which is entered in ELIN D090 Thus, the Work Outside Normal Working Hours premium is an additional charge of $500.00 for those tasks on a. particular task order that will be performed outside of normal working hours	5000	%	0.0%	$ 5,000.00
D091	Bond Cost for Payment and Performance Bonds (See Paragraph 1.91) To calculate the amount for ELIN D091 multiply the subtotal of ELINS D001 - D090 by the bond premimum.	$ 25,000.00	%	0.0%	$ -

ESTIMATED TOTAL PRICE: **$ 25,000.00**
OPTION PERIOD #3
(Line Items D001 -- D091)
(CLIN 0001)

Solicitation #N40085-16-R-2803

Exhibit E

Roof Repairs and Replacement at NSA Crane, IN

OPTION 4

SOLICITATION #N40085-16-R-2803, ROOF REPAIRS AND REPLACEMENT AT THE NAVAL SUPPORT ACTIVITY CRANE, INDIANA & GLENDORA TEST FACILITY SULLIVAN, INDIANA

OPTION PERIOD #4

EXHIBIT LINE ITEM NUMBER	LINE ITEM DESCRIPTION	QUANTITY	UNIT OF ISSUE	UNIT PRICE	EXTENDED AMOUNT
E001	Install Elastomeric Sheet Roof System (E.P.D.M.) - White 0.090 Thick Totally Adhered System *(See Paragraph 1.1)*	100	SQ	$ -	$ -
E002	Install Polyvinyl Chloride (PVC) - 0.080 Mechanically Attached Roof System (See Paragraph 1.2)	600	SQ	$ -	$ -
E003	Install Polyvinyl Chloride (PVC) 0.080 Fully Adhered Roof System *(See Paragraph 1.3)*	600	SQ	$ -	$ -
E004	Install Metal Sheet Roof Standard 26 ga Interlocking Ribs *(See Paragraph 1.4)*	25,000	SF	$ -	$ -
E005	Install Standing Seam, Steel Roof Panels 24 gauge. (See Paragraph 1.5)	500	SF	$ -	$ -
E006	Install 4.2" corrugated metal roof Roof panels shall be 24 ga.(See Paragraph 1.6)	1,000	SF	$ -	$ -
E007	B type metal decking. *(See Paragraph 1.7)*	1,000	SF	$ -	$ -
E008	Install Insulation Core metal Roof Panels *(See Paragraph 1.8)*	12,000	SF	$ -	$ -
E009	Install class "A" Mineral granule-surfaced asphalt shingles 290 lb. per Square *(See Paragraph 1.9)*	100	SQ	$ -	$ -
E010	Install 30 lb. Felt *(See Paragraph 1.10)*	100	SQ	$ -	$ -
E011	Install ½" fiberglass mat faced gypsum cover board *(See Paragraph 1.11)*	30,000	SF	$ -	$ -
E012	Aluminum foil faced closed cell Polyethylene foam insulation moisture barrier 1/2" thick - use under metal roof(See Paragraph 1.12)	20,000	SF	$ -	$ -
E013	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Mechanically Attached** *(See Paragraph 1.13)*	10,000	SF	$ -	$ -
E014	Install Rigid Polyisocyanurate Insulation 1½" Thick with Min. "R" Factor of 9.0 **Fully Adhered** *(See Paragraph 1.14)*	20,000	SF	$ -	$ -
E015	Install Rigid Polyisocyanurate Insulation 2" Thick : Mechanically Attached with Min. "R" Factor of 12.0 **Mechanically Attached** *(See Paragraph 1.15)*	200,000	SF	$ -	$ -

E016	Install Rigid Polyisocyanurate Insulation 2" Thick : Fully Adhered with Min. "R" Factor of 12.0 **Fully Adhered** *(See Paragraph 1.16)*	100,000	SF	$ -	$ -
E017	Install Rigid Polyisocyanurate Insulation - tapered min 1/4" per ft. *(See Paragraph 1.17)*	2,000	BF	$ -	$ -
E018	Install Flashing EPDM 0.060 inch Thick *(See Paragraph 1.18)*	1,000	SF	$ -	$ -
E019	Install Flashing PVC 0.060 inch Thick *(See Paragraph 1.19)*	2,000	SF	$ -	$ -
E020	Walk Pad PVC .090 inch thick & 30 inch wide (See Paragraph 1.20)	500	LF	$ -	$ -
E021	Install Vent Stack Flashing *(See Paragraph 1.21)*	100	EA	$ -	$ -
E022	Install Counter Flashing (.032 Thk. Alum.) *(See Paragraph 1.22)*	500	SF	$ -	$ -
E023	Install 6" Alum Gravel Stops with Drip Edges *(See Paragraph 1.23)*	2,000	LF	$ -	$ -
E024	Install 10" Alum Gravel Stops with Drip Edges *(See Paragraph 1.24)*	600	LF	$ -	$ -
E025	Install new 6" seamless gutters with all accessories *(See Paragraph 1.25)*	2,000	LF	$ -	$ -
E026	Install 6" box Gutters Complete with Accessories *(See Paragraph 1.26)*	200	LF	$ -	$ -
E027	Install 8" box gutter – galvanized steel w/Kynar finish with Accessories 22 ga. Galvanized *(See Paragraph 1.27)*	500	LF	$ -	$ -
E028	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" x 4" Rectangular (See Paragraph 1.28)	1,500	LF	$ -	$ -
E029	Install Downspouts Complete w/Accessories (.032 Aluminum) 3" Round (See Paragraph 1.29)	250	LF	$ -	$ -
E030	Install Downspouts Complete w/Accessories (.032 Aluminum) 4" Round (See Paragraph 1.30)	100	LF	$ -	$ -
E031	Install 6 inch square downspouts *(See Paragraph 1.31)*	400	LF	$ -	$ -
E032	Install Starter Strip for Eaves and Edges 9" wide strip of mineral-surfaced roll roofing (*See Paragraph 1.32)*	500	LF	$ -	$ -

E033	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x4" *(See Paragraph 1.33)*	3,000	LF	$ -	$ -
E034	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x6" *(See Paragraph 1.34)*	3,000	LF	$ -	$ -
E035	Install Pressure -Treated Wood Fascia, nailers or purlins 2"x10" *(See Paragraph 1.35)*	3,000	LF	$ -	$ -
E036	Install Decking, 3/4" CDX Plywood *(See Paragraph 1.36)*	200	SF	$ -	$ -
E037	Install Decking New 1/2" CDX Plywood *(See Paragraph 1.37)*	500	SF	$ -	$ -
E038	Install “Z” or “C” purlins 4" *(See Paragraph 1.38)*	500	LF	$ -	$ -
E039	Install “Z” or “C” purlins 8" *(See Paragraph 1.39)*	500	LF	$ -	$ -
E040	Installation of metal drip edge for shingle roofing *(See Paragraph 1.40)*	400	LF	$ -	$ -
E041	Install Metal Termination Bar *(See Paragraph 1.41)*	500	LF	$ -	$ -
E042	Install Roofing Scupper *(See Paragraph 1.42)*	15	EA	$ -	$ -
E043	Install Pitch Pocket within Roof *(See Paragraph 1.43)*	20	EA	$ -	$ -
E044	Install 6" Aluminum Fascia *(See Paragraph 1.44)*	2800	LF	$ -	$ -
E045	Install 12" Aluminum Fascia *(See Paragraph 1.45)*	2800	LF	$ -	$ -
E046	Install Turbine Vent up to 10" dia *(See Paragraph 1.46)*	10	EA	$ -	$ -
E047	Install Turbine Vent - 11" up to 26" dia. *(See Paragraph 1.47)*	10	EA	$ -	$ -
E048	Install Ridge Vent for shingle or metal roof *(See Paragraph 1.48)*	1000	LF	$ -	$ -
E049	Fluid applied roofing. This shall be 5 layers *(See Paragraph 1.49)*	1,000	SF	$ -	$ -

E050	Infrared Roof Moisture Surveys the minimum area ordered per task order will be 1000 SF *(See Paragraph 1.50)*	1000	SF	$ -	$ -
E051	Wall cap (See Paragraph 1.51)	3,000	SF	$ -	$ -
E052	Expansion joint (See Paragraph 1.52)	3,000	LF	$ -	$ -
E053	Conductor head - 22 ga. galvanized steel w/Kynar finish *(See Paragraph 1.53)*	30	EA	$ -	$ -
E054	Install 3”x5” Snow Blocks (More than 100) *(See Paragraph 1.54)*	1500	EA	$ -	$ -
E055	Install Bar type snow guards for R type and corrugated roof panels *(See Paragraph 1.55)*	400	LF	$ -	$ -
E056	Install Bar type snow guards for standing seam roof panels *(See Paragraph 1.56)*	200	LF	$ -	$ -
E057	Repair Joints and Holes in Metal roofs *(See Paragraph 1.57)*	500	SF	$ -	$ -
E058	Apply Aluminum Fiber or Black Asphalt Fiber Roof Coating *(See Paragraph 1.58)*	500	SF	$ -	$ -
E059	EXTERIOR INSULATION AND FINISH SYSTEMS - EFIS *(See Paragraph 1.59)*	1,000	SF	$ -	$ -
E060	Install soffits on the underside of eaves *(See Paragraph 1.60)*	500	SF	$ -	$ -
E061	Remove Existing Roofing Elastomeric Sheet (E.P.D.M.) *(See Paragraph 161)*	50,000	SF	$ -	$ -
E062	Remove single ply Polyvinyl Chloride (PVC) membrane *(See Paragraph 1.62)*	3,000	SF	$ -	$ -
E063	Remove Modified bituminous roof membrane up to 5-Ply *(See Paragraph 1.63)*	10,000	SF	$ -	$ -
E064	Remove Build up roofing including aggregate up to 5-Ply *(See Paragraph 1.64)*	1,000	SF	$ -	$ -
E065	Remove Existing Asphalt/Fiberglass Shingles *(See Paragraph 1.65)*	10,000	SF	$ -	$ -
E066	Remove Rigid Insulation *(See Paragraph 1.66)*	250,000	SF	$ -	$ -
E067	Remove stone ballast only (See Paragraph 1.67)	10,000	SF	$ -	$ -

E068	Remove CDX Plywood Decking (See Paragraph 1.68)	10,000	SF	$ -	$ -
E069	Remove Metal Roof System *(See Paragraph 1.70)*	1,000	SF	$ -	$ -
E070	Remove Flashing (See Paragraph 1.70)	5,000	SF	$ -	$ -
E071	Remove Vent Stack Flashing *(See Paragraph 1.71)*	200	EA	$ -	$ -
E072	Remove Counter Flashing and Misc. Accessories *(See Paragraph 1.72)*	1,000	SF	$ -	$ -
E073	Remove Gravel Stop and Drip Edges *(See Paragraph 1.73)*	4,200	LF	$ -	$ -
E074	Remove Guttering *(See Paragraph 1.74)*	5,000	LF	$ -	$ -
E075	Remove Downspouts *(See Paragraph 1.75)*	1000	LF	$ -	$ -
E076	Remove Pressure - Treated Wood Nailers, Crickets Saddles and Fascia Boards *(See Paragraph 1.76)*	5,000	LF	$ -	$ -
E077	Remove 2”X4” wood purlins attached on top of transite roof panels *(See Paragraph 1.77)*	6000	LF	$ -	$ -
E078	Removal of gypsum board under roofing systems. *(See Paragraph 1.78)*	2,000	SF	$ -	$ -
E079	Remove Transite (Asbestos) Roof or ceiling Panels *(See Paragraph 1.79)*	20,200	SF	$ -	$ -
E080	Removal of Asbestos Containing Roof Material *(See Paragraph 1.80)*	5,000	SF	$ -	$ -
E081	Removal of asbestos contaminated insulation below transite roof panel (See Paragraph 1.81)	10,000	SF	$ -	$ -
E082	Private Qualified Person (PQP) *(See Paragraph 1.82)*	20	DAY	$ -	$ -
E083	Asbestos Hazard Abatement Plan (See Paragraph 1.83)	4	EA	$ -	$ -
E084	Locate & Identify Roof Leak *(See Paragraph 1.84)*	125	EA	$ -	$ -
E085	Respond to Emergency Service Calls (See Paragraph 1.85)	5	EA	$ -	$ -
E086	Clean gutters (See Paragraph 1.86)	16,500	LF	$ -	$ -
E087	Community Infestation Control in Conjunction inert Roof Repair/Replacement *(See Paragraph 1.87)*	20,000	SF	$ -	$ -

E088	Labor for Installation of Material in Conjunction with Roof Repair/Replacement *(See Paragraph 1.88)*	750	LH	$ -	$ -
E089	Material and Equipment in Conjunction with Roof Repairs/Replacement *(See Paragraph 1.89)* For proposal purposes only, assume the amount of material and equipment is $20,000.00 To calculate the amount for ELIN E089 multiply $20,000.00 by the percent mark-up + 100% For example if the fixed burden rate is 10% then $20,000.00 x 1.10 = $22,000.00 which is entered in ELIN E089	20000	%	0.0%	$ 20,000.00
E090	Work Outside Normal Working Hours *(See paragraph 1.90)* For proposal purposes only, assume the total of all applicable ELINS E001 to E089 to be performed outside of normal working hours is $5,000.00 To calculate the amount for ELIN E090 multiply $5,000.00 by the percent mark-up + 100% For example if the percent mark up is 10% then $5,000.00 x 1.10 = $5,500.00 which is entered in ELIN E090 Thus, the Work Outside Normal Working Hours premium is an additional charge of $500.00 for those tasks on a. particular task order that will be performed outside of normal working hours	5000	%	0.0%	$ 5,000.00
E091	Bond Cost for Payment and Performance Bonds (See Paragraph 1.91) To calculate the amount for ELIN E091 multiply the subtotal of ELINS E001 - E090 by the bond premimum.	$ 25,000.00	%	0.0%	$ -

ESTIMATED TOTAL PRICE: **$ 25,000.00**
OPTION PERIOD #4
(Line Items E001 -- E091)
(CLIN 0001)

Section 00100 - Bidding Schedule/Instructions to Bidders

DIVISION 00 PRICING INFORMATION

2016 ROOF CONTRACT

DIVISION 00 PRICING INFORMATION

SECTION 00101 - BID SCHEDULE -- BASIS OF PRICES

1. BASIS OF AWARD

1.1 Offerors shall submit a completed Schedule of Estimated Work as part of the price proposal. Upon award, the approved Schedule of Estimated Work shall be a part of the contract and provide the basis for fixed unit prices. Pricing for the Schedule of Estimated Work shall be obtained by entering the proposed unit price for each Exhibit Line Item (ELIN) listed, multiplying it by the estimated quantity, and entering the mathematical extension in the subtotal column. Unbalancing or failure to enter a unit price for each Exhibit Line Item listed in the Schedule of Estimated Work may be cause for rejection of the proposal.

In the event there is a difference between a unit price and the extended total amount, the unit price will be held to be the intended proposal and the total recomputed accordingly. If the offeror provides a total amount for a contract item but fails to enter the unit price, the amount divided by the specified quantity will be held to be the intended unit price.

1.2 For the purpose of uniformity in proposals, offers shall consider the detailed requirements of Technical Sections, and the conditions listed below in the computation of their unit prices for all tasks listed in the Schedule of Work.

1.3 For Estimated Quantities the Contractor shall reference clauses 252.216-7006 - Ordering; 52.216-19 - Delivery-Order Limitations; 52.216-21 – Requirements.

1.4 This contract is for repair and replacement of existing roofs center wide. This work will be accomplished via a requirements contract. This contract contains provisions for a 12-month base period, plus four 12-month option periods to be exercised at the Government's discretion. Under no circumstances shall the term of the contract exceed 60 months. Under the terms of this type of contact, the Government does not guarantee a minimum amount of services to be ordered. However, the Government is obligated to order from the Contractor, and no other source, all supplies or services of the type described in the contract which are contracted for during the contract term. Exceptions are total renovations which include roof replacement, work which will be accomplished by Government forces, work included as part of new mil-con or other new or major renovation building projects, and work under the Government Purchase Card threshold which is currently $2,000.00. If the contractor does not accept an order, the Government reserves the right to procure the services from other sources. Each roof warranty shall be supplied to the contracting officer within 35 days after the roof has been completed, 10% of the roof project awarded funds will be with held until the warranty is received by the government.

BASIS OF UNIT PRICES:

1. For the purpose of uniformity, offerors shall consider the detailed requirements of the Technical Sections and the conditions listed below in subparagraphs 1.1 through 1.91.

Unit Price for all line items listed under A001 through A091, B001 through B091, C001 through C091, D001 through D091 and E001 through E091 in the Exhibit Line Items shall include all costs including but not limited to labor, transportation, material, equipment, management, and supervision as required to accomplish the Exhibit Line Item in the unit price unless specifically identified in the line item description (subparagraphs 1.1 through 1.91) as not being a part of the unit price. Contractor is responsible for disposal of all material removed during each project. Maintenance, repair, and installation shall be in accordance with manufacturer's specifications, instructions, recommendation and all sections of this contract. Contractor shall provide maximum warranty for each roof type as specified in Division 07.

The price of each task order will be obtained by using the appropriate exhibit line items with the finished product quantities. Additional quantities deemed necessary by the contractor or manufacturer for waste and/or overlaps should not be included in line item quantities. For each project, the Government and the contractor will perform a joint scoping site visit and agree on the line items and finished project quantities. The agreed upon line items and quantities will result in a firm fixed-priced task order with a specified delivery date. In the event there is no line item for the required work, the Government and the contractor will agree on a breakdown of labor, material and equipment costs based on RS Means.

Accessories and associated work to Exhibit Line Items: All materials and labor necessary to accomplish the Exhibit Line Item shall be a part of the unit price bid unless specifically identified as not being part of the unit price. When material is identified as “not being part of the unit price” that material may be purchased under another EXHIBIT Line Item or may be Government-furnished, at the Government’s discretion.

The contractor shall submit pre-priced line items for the base year and 4 option periods (Exhibits A, B, C, D & E). These pre-priced line items shall include all increases for labor, material, equipment, and other costs. The current Construction Wage Rate Requirements Wage Determination will be incorporated at the time the option is exercised. The pre-priced line items for each option period shall include any and all increases for labor costs at the time the option is exercised. The Government will not negotiate a change to the pre-priced option period line items proposed by the Contractor as a result of changes to the Construction Wage Rate Requirements Wage Determination. The Contractor shall include any anticipated changes in wages in the pre-priced line items for the option periods.

1.1 Unit price for exhibit line items A001, B001, C001, D001, & E001 shall be for material and installation of a **single ply 0.090 inch, Ethylene Propylene Diene Monomer** (E.P.D.M.) roofing system WHITE with **fully adhered** sheets. This line item shall meet the requirements of section 07 53 23 ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING in this contract. Adhesives are a part of unit price. Unit price is completed square.

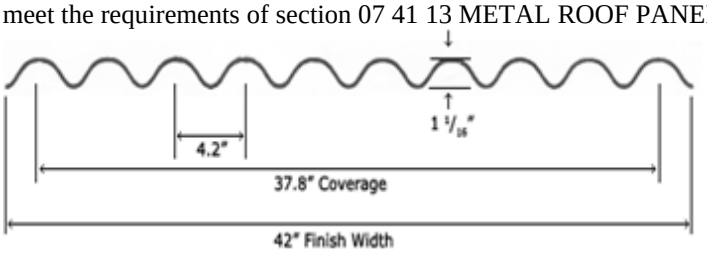
1.2 Unit price for exhibit line items A002, B002, C002, D002, & E002 shall be for material and installation of a **single ply 0.080 inch polyvinyl chloride** (PVC) and PVC blend thermoplastic sheet roofing, with associated thermoplastic flashing for installations with insulation below the membrane. Application method shall be **mechanically attached**. Metal fasteners are a part of unit price. Unit price is completed square. Roof system shall be installed in accordance with manufacturers printed instructions. This line item shall meet the requirements of section 07 54 19 POLYVINYL-CHLORIDE (PVC) ROOFING of this contract.

1.3 Unit price for exhibit line items A003, B003, C003, D003, & E003 shall be for material and installation of a **single ply 0.080 inch polyvinyl chloride** (PVC) and PVC blend thermoplastic sheet roofing, with associated thermoplastic flashing for installations with insulation below the membrane. Application method shall be **fully adhered** system. Adhesives are a part of unit price. Unit price is completed square. Roof system shall be installed in accordance with manufacturers printed instructions. This line item shall meet the requirements of section 07 54 19 POLYVINYL-CHLORIDE (PVC) ROOFING of this contract.

1.4 Unit price for exhibit line items A004, B004, C004, D004, & E004 shall be for material and installation of **metal roof R type**. Roof panels shall be standard 26 gauge steel and have a factory color finish meeting the specified requirements. Roof panels shall have interlocking ribs for securing adjacent sheets. Metal fasteners are a part of unit price. Fastening system shall be with exposed penetrating fastener type. Roof system shall be installed in accordance with manufacturers printed instructions. This line item shall meet the requirements of section 07 41 13 METAL ROOF PANELS of this contract. Unit price is completed square.

1.5 Unit price for exhibit line items A005, B005, C005, D005, & E005 shall be for material and installation of **steel standing seam metal roof system**. Roof panels shall be standard 24 gauge flat profile with a 1-3/4 inch minimum standing seam with concealed clip fastening system and to be mechanically field crimped. Roof system shall be installed in accordance with manufacturers printed instructions. This line item shall include all system installation accessories and meet the requirements of section 07 61 14. 00 20 STEEL STANDING SEAM ROOFING of this contract. Unit price is completed square foot.

1.6 Unit price for exhibit line items A006, B006, C006, D006, & E006 shall be for material and installation of **4.2" corrugated metal** roof system that has the same profile as our existing transite roof panels. Roof panels shall be standard 24 ga. steel and have a factory color finish meeting the specified requirements. Fastening system shall be with exposed penetrating fastener type. Roof system shall be installed in accordance with manufacturers printed instructions. Unit price is completed square foot. This line item shall include all system installation accessories and meet the requirements of section 07 41 13 METAL ROOF PANELS of this contract 4.2″ Corrugated Metal Panels



1.7 Unit price for exhibit line items A007, B007, C007, D007, & E007 shall be for material and installation of **B type metal decking**. Roof panels shall be standard 24 ga. steel and have a factory color finish meeting the specified requirements. Fastening system shall be with exposed penetrating fastener type. Roof system shall be installed in accordance with manufacturers printed instructions. This line item shall include all system installation accessories and meet the requirements of section 07 41 13 METAL ROOF PANELS of this contract. Unit price is completed square foot.

1.8 Unit price for exhibit line items A008, B008, C008, D008, & E008 shall be for material and installation of factory-formed **insulated aluminum or steel roof panels** with a minimum R-value of 20. Assemblies shall be fabricated from two sheets of metal with modified polyisocyanurate or polyurethane foam insulation core foamed-in-place or board during fabrication with joints between panels designed to form weather-tight seals. Include accessories required for weather-tight installation. Unit price is completed square foot. The panels shall be room fire rated and roof covering fire rated. This line item shall conform to Division 07, Thermal and moisture protection of this contract.

1.9 Unit price for exhibit line items A009, B009, C009, D009, & E009 shall be for material and installation of Mineral granule-surfaced **asphalt shingles**, self-sealing, square tab, strip , fungus-resistant impact resistant shingles conforming to UL 2218, Class 4. ASTM D3018/D3018M, Type I, and ASTM D3462/D3462M , **architectural shingles** weighing not less than 290 pounds per 100 square feet. Metal fasteners are a part of unit price. Unit price is completed square. Shingles shall meet the fire resistance requirements of UL 790 for Class A and the wind resistance requirements of ASTM D3161/D3161M, Class F. Color shall be as selected from the manufacturer's standard color charts. This line item shall meet the requirements of section 07 31 13 ASPHALT SHINGLES of this contract.

1.10 Unit price for exhibit line items A010, B010, C010, D010, & E010 shall be for material and installation of **Asphalt-saturated felt** conforming to ASTM D4869/D4869M or ASTM D226/D226M, Type II, number 30#, without perforations or other material specified by the shingle manufacturer for use as underlayment conforming to Division 07, Thermal and moisture protection of this contract. Metal fasteners are a part of unit price. Unit price is completed square.

1.11 Unit price for exhibit line items A011, B011, C011, D011, & E011 shall be for material and installation of **1/2 inch fiberglass mat faced gypsum** cover board fully adhered or with flat metal discs not less than 1-3/8 inch diameter and nailed 16 times per 8 ft X 4 ft sheet as indicated and per manufacturer's recommendation. Metal fasteners and adhesives are a part of unit price. Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 22 00 ROOF AND DECK INSULATION of this contract.

1.12 Unit price for exhibit line items A012, B012, C012, D012, & E012 shall be for material and installation of **1/2 inch closed cell Polyethylene** foam insulation; **aluminum foil faced both sides** with a class a rating installed as per manufacturer's recommendation. Fasteners and seam tapes are included in unit price. Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 22 00 ROOF AND DECK INSULATION of this contract.

1.13 Unit price for exhibit line items A013, B013, C013, D013, & E013 shall be for material and installation of **1½ inch** Polyisocyanurate Board: ASTM C1289 Type II, fibrous felt or glass mat membrane both sides, except minimum compressive strength shall be 20 pounds per square inch (psi). Insulation shall be **mechanically fastened** as per manufacturer's recommendation to with stand a wind speed of 90 MPH. Metal fasteners are a part of unit price. Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 22 00 ROOF AND DECK INSULATION of this contract.

1.14 Unit price for exhibit line items A014, B014, C014, D014, & E014 shall be for material and installation of **1½ inch** Polyisocyanurate Board: ASTM C1289 Type II, fibrous felt or glass mat membrane both sides, except minimum compressive strength shall be 20 pounds per square inch (psi). **Insulation** shall be **fully adhered** to with stand a wind speed of 90 mile per hour. Adhesives are a part of unit price. Unit price is completed square foot . This line item shall meet the requirements of SECTION 07 22 00 ROOF AND DECK INSULATION of this contract.

1.15 Unit price for exhibit line items A015, B015, C015, D015, & E015 shall be for material and installation of **2 inch** Polyisocyanurate Board: ASTM C1289 Type II, fibrous felt or glass mat membrane both sides, except minimum compressive strength shall be 20 pounds per square inch (psi). **Insulation** shall be **mechanically fastened** sheet as per manufacturer's recommendation to with stand a wind speed of 90 MPH. Metal fasteners are a part of unit price. Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 22 00 ROOF AND DECK INSULATION of this contract.

1.16 Unit price for exhibit line items A016, B016, C016, D016, & E016 shall be for material and installation of **2 inch** Polyisocyanurate Board: ASTM C1289 Type II, fibrous felt or glass mat membrane both sides, except minimum compressive strength shall be 20 pounds per square inch (psi). **Insulation** shall be **fully adhered** to withstand a wind speed of 90 mile per hour. Adhesives are a part of unit price. Unit price is completed square foot . This line item shall meet the requirements of SECTION 07 22 00 ROOF AND DECK INSULATION of this contract.

1.17 Unit price for exhibit line items A017, B017, C017, D017, & E017 shall be per board foot of material and installation **Tapered Roof Insulation** assembly shall be factory tapered to a slope of not less than 1/4 inch per foot in 4'X4' ft sheets and **fully adhered or mechanically fastened**, the insulation shall withstand a 90MPH wind and as per manufacturer's recommendation. Metal fasteners and adhesives are a part of unit price. Unit price is completed board foot.

1.18 Unit prices for exhibit line items A018, B018, C018, D018, & E018 shall be for material and installation of 0.060 inch Thick **EPDM flashing** and accessories including base flashing, perimeter flashing and penetration flashings. The height of the flashing above the finished roof shall be as directed by the OIC or his authorized

representative but in no case less than 8". Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

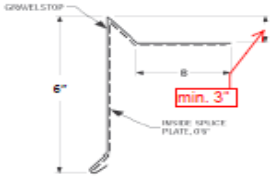
1.19 Unit prices for exhibit line items A019, B019, C019, D019, & E019 shall be for material and installation of 0.060 inch Thick **PVC flashing** and accessories including base flashing, perimeter flashing and penetration flashings. The height of the flashing above the finished roof shall be as directed by the OIC or his authorized representative but in no case less than 8". Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.20 Unit prices for exhibit line items A020, B020, C020, D020, & E020 shall be for material and installation of 0.090 inch Thick and 30 inch wide **PVC walk pad** and accessories. Walk pad shall not cover seams in the membrane. Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 54 19 POLYVINYL-CHLORIDE (PVC) ROOFING of this contract.

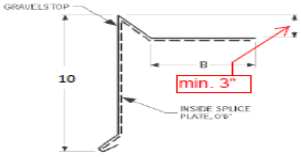
1.21 Unit price for exhibit line items A021, B021, C021, D021, & E021 shall be for material and installation of **vent and stack flashing** up to 8" in diameter. Prepare flashing and sheet metal as required for the type of roofing. This shall include slip flashing collar and flange. Provide proper caulking to all vents and stack flashings. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.22 Unit price for exhibit line items A022, B022, C022, D022, & E022 shall be for material and installation of .032 thick aluminum **counters flashing**. The installation of counter flashing inserted in reglets shall have the concealed edge of the flashing turned back to form a wedge shape. Lead wedges shall be installed 18 inch on centers. The flashing in reglets shall be filled with non-shrink caulking. Flashing installed in areas without reglets shall be installed on ¼ in. X 1-1/8 in. aluminum batten strips fastened 18 inch on centers with 3/8" X 1-1/2" masonry fasteners. The flashing shall be folded away at the top and filled with non-shrink caulking. The aluminum batten strip is included in this sub-bid item, the masonry fasteners are a part of the unit price. Unit price is completed square foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.23 Unit prices for exhibit line items A023, B023, C023, D023, & E023 shall be for material and installation of 6 inch 0.070 thick aluminum **gravel stops** and drip edges with prefabricated mitered corner pieces. Fasteners are a part of the unit price. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.



1.24 Unit prices for exhibit line items A024, B024, C024, D024, & E024 shall be for material and installation of 10 inch 0.070 thick aluminum **gravel stops** and drip edges with prefabricated mitered corner pieces. Fasteners are a part of the unit price. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.



1.25 Unit prices for exhibit line items A025, B025, C025, D025, & E025 shall be for material and installation of seamless **6 inch commercial type** gutters of shape indicated and supported by brackets that permit free thermal movement of the gutter. Provide gutters in sizes indicated complete with mitered corners, end caps, outlets,

brackets, and other accessories necessary for installation. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.26 Unit price for exhibit line items A026, B026, C026, D026, & E026 shall be for material and installation of **6 inch box type gutters** shaped as specified. The gutter shall be supported on the underside with brackets that permit thermal movement of gutter. The gutter system shall include mitered corners, joint connectors and miscellaneous fittings as may be required for a complete installation. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.27 Unit price for exhibit line items A027, B027, C027, D027, & E027 shall be for material and installation of **8 inch box type gutters** shaped as specified. The gutter shall be 22 gauge galvanized steel and supported on the underside with brackets that permit thermal movement of the gutter. The gutter system shall include mitered corners, joint connectors and miscellaneous fittings required for complete installation. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.28 Unit price for exhibit line items A028, B028, C028, D028, & E028 shall be for material and installation **3"x 4" downspouts** joined by rivets or screws. The spout shall be secured to the wall with racks and keys. All fittings required for a complete system are included in this sub-bid item. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.29 Unit price for exhibit line items A029, B029, C029, D029, & E029 shall be for material and installation of **3 inch round** downspouts joined by rivets or screws. The spout shall be secured to the wall with racks and keys. All fittings required for a complete system are included in this sub-bid item. Unit price is complete linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.30 Unit price for exhibit line items A030, B030, C030, D030, & E030 shall be for material and installation of **4 inch round** downspouts joined by rivets or screws. The spout shall be secured to the wall with racks and keys. All fittings required for a complete system are included in this sub-bid item. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract.

1.31 Unit price for exhibit line items A031, B031, C031, D031, & E031 shall be for material and installation of **6 inch square** downspouts joined by rivets or screws. The spout shall be secured to the wall with racks and keys. All fittings required for a complete system are included in this sub-bid item. Unit price is completed linear foot. This line item shall meet the requirements of SECTION 07 60 00 FLASHING AND SHEET METAL of this contract

1.32 Unit price for exhibit line items A032, B032, C032, D032, & E032 shall be for material and installation of starter strip in conjunction with eaves, valleys, and roof edges. Contractor shall apply starter strip at eaves, using **9" wide strip** of mineral-surfaced roll roofing of a color to match shingles. Contractor shall install starter strip overlapping the metal drip edge at eaves and rake edges 3/8" to 3/4". Place nails so top of nail is exposed to cutouts of first course of shingles. Fasteners are a part of the unit price. Unit price is completed linear foot. This line item shall meet the requirements of section 07 31 13 ASPHALT SHINGLES of this contract

1.33 Unit price for exhibit line items A033, B033, C033, D033, & E033 shall be for material and installation of pressure-treated **2"x 4"** wood Nailers, fascia boards or purlins. This line item shall include painting. The installation shall be anchored securely to continuous construction with approved fasteners space 24 inch on centers. Fasteners are a part of unit price. Unit price is completed linear foot. All wood exposed after work completion shall be painted to match existing color at no additional cost to the Government. This line item shall conform to SECTION 06 10 00 ROUGH CARPENTRY Division 07, Thermal and moisture protection of this contract

1.34 Unit price for exhibit line items A034, B034, C034, D034, & E034 shall be for material and installation of pressure-treated **2"x 6"** wood Nailers, fascia boards or purlins. This line item shall include painting. The installation shall be anchored securely to continuous construction with approved fasteners space 24 inch on centers.

Fasteners are a part of unit price. Unit price is completed linear foot. All wood exposed after work completion shall be painted to match existing color at no additional cost to the Government. This line item shall conform to SECTION 06 10 00 ROUGH CARPENTRY Division 07, Thermal and moisture protection of this contract

1.35 Unit price for exhibit line items A035, B035, C035, D035, & E035 shall be for material and installation of pressure-treated **2"x 10"** wood Nailers, fascia boards or purlins. This line item shall include painting. The installation shall be anchored securely to continuous construction with approved fasteners space 24 inch on centers. Fasteners are a part of unit price. Unit price is completed linear foot. All wood exposed after work completion shall be painted to match existing color at no additional cost to the Government. This line item shall conform to SECTION 06 10 00 ROUGH CARPENTRY Division 07, Thermal and moisture protection of this contract

1.36 Unit price for exhibit line items A036, B036, C036, D036, & E036 shall be for material and installation of new **¾ inch thick type CDX plywood** decking. Fasteners are a part of unit price. Unit price is completed square foot. All decking shall be installed in accordance with SECTION 06 10 00 ROUGH CARPENTRY of this contract.

1.37 Unit price for exhibit line items A037, B037, C037, D037, & E037 shall be for material and installation of new **½ inch thick type CDX plywood** decking. Fasteners are a part of unit price. Unit price is complete square foot. All decking shall be installed in accordance with SECTION 06 10 00 ROUGH CARPENTRY of this contract.

1.38 Unit price for exhibit line items A038, B038, C038, D038, & E038 shall be for material and installation of **"Z" or "C" purlins** and shall include all fasteners. Unit price is completed linear foot. Steel purlins shall be **4" tall** and 16-gauge steel. Steel purlins shall be hot rolled steel strip with a minimum yield of 55,000 psi and shall conform to the physical characteristics of ASTM A607. This line item will be used in certain roof projects and shall be order by the linear foot (LF) and conforming to Division 5 Metals and Division 07, Thermal and moisture protection of this contract

1.39 Unit price for exhibit line items A039, B039, C039, D039, & E039 shall be for material and installation of **"Z" or "C" purlins** and shall include all fasteners. Unit price is completed linear foot. Steel purlins shall be **8" tall** and 16-gauge steel. Steel purlins shall be hot rolled steel strip with a minimum yield of 55,000 psi and shall conform to the physical characteristics of ASTM A607. This line item will be used in certain roof projects and shall be order by the linear foot (LF) and conforming to Division 5 Metals and Division 07, Thermal and moisture protection of this contract

1.40 Unit price for exhibit line items A040, B040, C040, D040, & E040 shall be for material and installation of 0.016 inch thick **metal drip edge**. The line item shall include all fasteners. Unit price is completed linear foot. Contractor shall provide metal drip edge directly on the wood deck at the eaves and over the underlayment at rakes. Extend metal drip edge at eaves and rake edges 3/8" to 3/4" and back from edge of deck a maximum of 3 ½ inches and secure with nails spaced a maximum of 10 inches on center along inner edge and conform to Division 07, Thermal and moisture protection of this contract.

1.41 Unit priced under exhibit line items A041, B041, C041, D041, & E041 shall be for material and installation of **metal termination bar** to be used at the end of the roofing where the roof membrane is extended up and secured to a horizontal wall surface. The line item shall include all fasteners and required caulking. Unit price is completed linear foot. This termination bar shall be screwed to the wall holding the roofing in place and providing a water-tight seal between the roofing and the wall and conform to Division 07, Thermal and moisture protection of this contract.

1.42 Unit price for exhibit line items A042, B042, C042, D042, & E042 shall be for material and installation of roof **scuppers** around the perimeter of the roof line to channel water away from the roof to the down spouts. The scuppers shall be installed as recommended by manufacture and shall conform to Division 07, Thermal and moisture protection of this contract.

1.43 Unit price for exhibit line items A043, B043, C043, D043, & E043 shall be for material and installation of a **pitch pocket** within the roof. This pitch pocket is used where an un-regular support surface extends through the

roof line to support an intersecting roof line and or platforms to support pieces of equipment upon the roof surface. This pitch pocket is used to seal around the support to stop water from entering inside the building. This line item includes all accessories and shall conform to Division 07, Thermal and moisture protection of this contract

1.44 Unit price for exhibit line items A044, B044, C044, D044, & E044 shall be for material and installation of **Aluminum fascia 6" wide** applied in 8 to 10 foot lengths except at corners and must have a baked-on, factory-applied color coating applied after metal substrates have been cleaned and pretreated. The line item shall include all fasteners. Unit price is completed linear foot. Provide finish coating dry-film and match the existing color or as indicated. This line item shall conform to Division 07, Thermal and moisture protection of this contract.

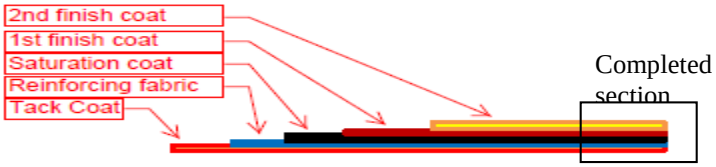
1.45 Unit price for exhibit line items A045, B045, C045, D045, & E045 shall be for material and installation of **Aluminum fascia 12" wide** applied in 8 to 10 foot lengths except at corners and must, have a baked-on, factory-applied color coating applied after metal substrates have been cleaned and pretreated. The line item shall include all fasteners. Unit price is completed linear foot. Provide finish coating dry-film thickness of 0.8 to 1.3 mils, and match the existing color. This line item shall conform to Division 07, Thermal and moisture protection of this contract.

1.46 Unit price for exhibit line items A046, B046, C046, D046, & E046 shall be for removal of existing and replace with new aluminum **turbine type vents up to 10 inches** in dia. All materials and labor for removal as well as installation shall be included. Turbine vents shall be constructed of prefinished aluminum. Vents shall be designed to prevent infiltration of insects, bats, birds, rain, and snow. Turbine vents shall be provided where shown. Turbine vents shall be installed in accordance with the manufacturer's printed instructions. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.47 Unit price for exhibit line items A047, B047, C047, D047, & E047 shall be for removal of existing and replace with new **turbine type vents from 11 to 26 inches** in dia. All materials and labor for removal as well as installation shall be included. Turbine vents shall be constructed of prefinished aluminum or galvanized. Vents shall be designed to prevent infiltration of insects, bats, birds, rain, and snow. Turbine vents shall be provided where shown. Turbine vents shall be installed in accordance with the manufacturer's printed instructions. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.48 Unit price for exhibit line items A048, B048, C048, D048, & E048 shall be for material and installation of **ridge vents** for metal or shingle roof. Vents shall be designed to prevent infiltration of insects, rain, and snow. Ridge vents shall be provided along the ridge line where shown. Ridge vents shall be installed in accordance with the manufacturer's printed instructions. Unit price is completed linear foot. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.49 Unit priced for exhibit line items A049, B049, C049, D049, & E049 shall be for material and installation of **Fluid applied roofing**. This shall be 5 layers as specified below with a total thickness of not less than 60 mils. This price shall be for 1 sq. ft. of completed roof. This line item shall include all preparation of the existing roof that will be coated. This line item shall conform to section 07 14 00 FLUID-APPLIED WATERPROOFING of this contract.



1.50 Unit priced for exhibit line items A050, B050, C050, D050, & E050 shall be for roof moisture **survey using infrared** technology. Wet areas found shall be marked with paint. This line item price shall be for 1 square foot based on a minimum order of 1000 square feet per task order.

1.51 Unit price for exhibit line items A051, B051, C051, D051, & E051 shall be for SF of material and installation of new **wall cap** shall be 22 gauge aluminum or galvanized steel with Kynar finish. Unit price is completed linear

foot. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.52 Unit price for exhibit line items A052, B052, C052, D052, & E052 shall be for LF of material and installation of new **expansion joint coping**. Coping shall be 22 gauge aluminum or galvanized steel with Kynar finish. Unit price is completed linear foot. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.53 Unit price for exhibit line items A053, B053, C053, D053, & E053 shall be for material and installation of conductor heads. **Conductor heads** shall be 22 gauge aluminum galvanized steel with Kynar finish. Where conductor heads are used in conjunction with scuppers set the conductor a minimum of 2 inches wider than the scupper. Attach the conductor heads to the wall with masonry fasteners and loose-lock. Provide conductor heads with screens of the same material. Securely fasten screens to the heads. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.54 Unit price for exhibit line items A054, B054, C054, D054, & E054 shall be for material and installation of more than 100 - **3"x5" snow blocks**. The snow blocks shall be installed in accordance with the manufactures specifications. The snow blocks shall be fastened with adhesive that covers the complete mounting surface and be designed for a snow load rating of 20 lb per sq ft. Peel and stick type are not allowed. This line item includes all adhesives and shall conform to Division 07, Thermal and moisture protection of this contract.

1.55 Unit price for exhibit line items A055, B055, C055, D055, & E055 shall be for material and installation of **bar type snow and ice retention system for R** type and corrugated metal roofs. The bar shall be attached at every other rib or 24" maximum. This system shall be designed for the roof slope and a snow load of 20 lb. per. Sq. ft. retention load of 1200 lbs. Unit price is completed linear foot. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.56 Unit price for exhibit line items A056, B056, C056, D056, & E056shall be for material and installation of **bar type snow and ice retention system for standing seam metal roofs**. The bar shall be attached at every other joint / seam or 36" maximum. This system shall be designed for the roof slope and a snow load of 20 lb. per. Sq. ft. retention load of 1200 lbs. Unit price is completed linear foot. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.57 Unit price for exhibit line items A057, B057, C057, D057, & E057shall be for the preparation and **repairs to joints, seams, and holes in metal roofing**. The work area shall be cleaned of all foreign materials down to the base metal to a distance of 6" in all directions from the work area. Repairs shall be made with impregnated glass cloth and approved plastic cement. Unit price is completed square foot. This line item shall conform to Division 07, Thermal and moisture protection of this contract.

1.58 Unit price for exhibit line items A058, B058, C058, D058, & E058 shall include the preparation and cleaning of the area to be coated so that the roof is free of all oil, grease, rust, loose paint and foreign matter. A liberal **coat of aluminum fiber or asphalt fiber** roof coating shall be applied until a uniform coating free from pin holes and voids is secured. Roof may be either bitumen or metal. This line item shall conform to Division 07, Thermal and moisture protection and Division 9 Paints and coatings of this contract.

1.59 Unit priced for exhibit line items A059, B059, C059, D059, & E059 shall be for material and **installation of EFIS** consisting of sheathing, insulation board 1½" thick, reinforcing fabric, base coat, and finish coat, adhesive and mechanical fasteners as applicable. This price shall be for 1 sq. ft. completed. This line item shall include all preparation of the existing walls that will be coated. This line item shall conform to section 07 24 00 EXTERIOR INSULATION AND FINISH SYSTEMS of this contract.

1.60 Unit price for exhibit line items A060, B060, C060, D060, & E060 shall be for material and **installation of Soffits** (The surface on the underside of eaves) complete. Unit price is completed linear foot. This line item includes all fasteners and shall conform to Division 07, Thermal and moisture protection of this contract.

1.61 Unit price for exhibit line items A061, B061, C061, D061, & E061 shall be for the **removal of ethylene propylene diene terpolymer membrane (E.P.D.M.)** roofing. Unit price is completed square foot. The insulation will be removed on a separate line item.

1.62 Unit price for exhibit line items A062, B062, C062, D062, & E062 shall be for the **removal of Polyvinyl Chloride (PVC) membrane** roofing. Unit price is square foot removed. The insulation will be removed on a separate line item.

1.63 Unit price for exhibit line items A063, B063, C063, D063, & E063 shall be for the **Removal of Modified bituminous** roof membrane up to 5-Ply. Unit price is square foot removed. The insulation will be removed on a separate line item.

1.64 Unit price for exhibit line items A064, B064, C064, D064, & E064 shall be for the **removal of up to 5-ply built up** roofing systems including insulation down to the existing roof deck. Unit price is square foot removed.

1.65 Unit price for exhibit line items A065, B065, C065, D065, & E065 shall be for the **removal of asphalt/fiberglass shingles with existing felt paper**. Unit price is square foot removed.

1.66 Unit price for exhibit line items A066, B066, C066, D066, & E066 shall be for the **removal of rigid insulation** and fasteners. Unit price is square foot removed.

1.67 Unit price for exhibit line items A067, B067, C067, D067, & E067 shall be for the **removal stone of ballast**. Unit price is square foot removed.

1.68 Unit price for exhibit line items A068, B068, C068, D068, & E068 shall be for the **removal of CDX plywood**. Unit price is square foot removed.

1.69 Unit price for exhibit line items A069, B069, C069, D069, & E069 shall be for **the removal Metal Roof** System including moisture barrier. Unit price is square foot removed.

1. 70 Unit price for exhibit line items A070, B070, C070, D070, & E070 shall be for the **removal of flashing** and accessories including base flashing, perimeter flashing and penetration flashings. Unit price is square foot removed.

1.71 Unit price for exhibit line items A071, B071, C071, D071, & E071 shall be for the **removal of vent stacks flashing** on 10 inch and smaller.

1.72 Unit price for exhibit line items A072, B072, C072, D072, & E072 shall be for the **removal of counter flashing**, the removal of counter flashing inserted in reglets, the removal of aluminum batten strips, masonry fasteners and removal of caulking. Unit price is square foot removed.

1.73 Unit price for exhibit line items A073, B073, C073, D073, & E073 shall be for the **removal of gravel stops and drip edges**. Unit price is linear foot removed.

1.74 Unit price for exhibit line items A074, B074, C074, D074, & E074 shall be for the **removal gutters**, brackets and accessories.Unit price is linear foot removed.

1.75 Unit price for exhibit line items A075, B075, C075, D075, & E075 shall be for the **removal of downspouts** and fasteners. Unit price is linear foot removed.

1.76 Unit price for exhibit line items A076, B076, C076, D076, & E076 shall be for the removal **of wood nailer**, **purlins and fascia boards**. Unit price is linear foot removed.

1.77 Unit price for exhibit line items A077, B077, C077, D077, & E077 shall be for the removal of **2"X4" wood purlins** that are attached on top of transite roof panels and under shingled roofs. Unit price is linear foot removed.

1.78 Unit price for exhibit line items A078, B078, C078, D078, & E078 shall be for the **removal of gypsum board under roofing** systems. Unit price is square foot removed.

1. 79 Unit price for exhibit line items A079, B079, C079, D079, & E079 shall be for the **removal of asbestos transite roof or ceiling panels**. Unit price is square foot removed. Removal of asbestos transite panels shall be in accordance with Indiana rule 326 Indiana administration code (IAC) and shall be licensed in the state of Indiana. Contractor shall remove and dispose of transite panels in accordance with Federal, State and local regulations and laws. Contractor shall remove each roof panel in sections taking care not to crumble, pulverize, or reduce to powder. Each panel shall be wrapped with (6) mil thick polyethylene plastic sheeting which shall be properly labeled prior to disposal, including name or waste generator and location at which the waste was generated. Contractor shall coordinate and submit a detailed job plan to the NAVFAC MW Crane, Asbestos Program Manager via the Contracting Officer for approval prier to demolition. And also meet the requirements of SECTION 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS of this contract.

1.80 Unit price for exhibit line items A080, B080, C080, D080, & E080 shall be for **asbestos abatement** such as **shingles, adhesives, flashing, gutters, etc** other than roof transite panels. Unit price is square foot removed and shall be in accordance with Indiana rule 326 Indiana administration code (IAC) and shall be licensed in the state of Indiana. Contractor shall remove and dispose of asbestos containing materials in accordance with Federal, State and local regulations and laws. Contractor shall coordinate and submit a detailed job plan to the NAVFAC MW Crane, Asbestos Program Manager via the Contracting Officer for approval prier to demolition. This line item shall also meet the requirements of SECTION 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS of this contract.

1.82 Unit price for exhibit line items A081, B081, C081, D081, & E081 shall be for removal of asbestos contaminated insulation below transite panel roofs. Unit price is square foot removed. This line shall be used only during the complete removal of the transite panel roof. And shall be in accordance with Indiana rule 326 Indiana administration code (IAC) and shall be licensed in the state of Indiana. Contractor shall remove and dispose of asbestos containing materials in accordance with Federal, State and local regulations and laws. Contractor shall coordinate and submit a detailed job plan to the NAVFAC MW Crane, Asbestos Program Manager via the Contracting Officer for approval prier to demolition. **This line item will require a full negative pressure enclosure**. This line item shall also meet the requirements of SECTION 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS of this contract.

1.82 Unit price for exhibit line items A082, B082, C082, D082, & E082 shall be for a Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The PQP shall be appropriately licensed in the State of Indiana. The PQP and the asbestos contractor shall not have an employee/employer relationship or financial relationship which could constitute a conflict of interest. The PQP shall be a first tier subcontractor**. This line item shall be priced per day. -** SECTION 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS

1.83 Unit price for exhibit line items A083, B083, C083, D083, & E083 shall be for 1 **Asbestos Hazard Abatement Plan** as described in SECTION 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS. The contractor shall provide an Asbestos Hazard Abatement Plan for each task order as they are issued. This line item is for 1 Asbestos Hazard Abatement Plan. Past Asbestos Hazard Abatement Plans have been approximately 100 pages.

1.84 Unit price for exhibit line items A084, B084, C084, D084, & E084 shall be for a site visit to locate and identify roof leaks. The price shall be all costs associated with locating leakage point of entry, and reporting the following information to the Contract Representative:

a. Detailed description of work to be accomplished.
b. Estimated number of hours to accomplish it.
c. List of materials required and estimated cost.
d. Expected delivery date.
e. Identification of other costs involved.

The contractor shall utilize line items in this contract when preparing a cost proposal to complete repairs of the leaks. If items required as not specifically identified in the exhibit line items, then exhibit line items A088 and A089, B088 and B089 C088 and C089, D088 and D089 or E088 and E089 as appropriate, shall be used.

The Contractor shall not proceed with work prior to receipt of an authorized task order.

1.85 **Emergency Service**
All unit priced tasks under exhibit line items A085, B085, C085, D085, & E085 which are designated as **Emergency Service** are to be priced with the understanding that commencement of work shall be not later than three (3) hours after the issuance of an oral order. Service calls shall not exceed $300.00 in material cost to the contractor to complete and (8) man hours, not including travel time. The Contractor shall respond to the emergency area and contain the leakage problem by means of temporary repairs. After temporary repairs are completed, the contractor shall submit a proposal utilizing the line items in this contract for permanent repairs. Oral orders arising as a result of emergency situations will be confirmed by issuance of a written Task Order within five (5) working days.

Only designated Government Representatives may issue oral orders in emergency circumstances. Emergency work requirements arise when it is determined by OIC that a situation of danger to personnel and/or damage to critical material, equipment, or a breach of security exists. Emergency situations necessitate pursuing measures necessary to divert water from the emergency area. This line item may consist of covering material, equipment, etc. with water-proofing material such as plastic and diverting water away from area of concern.

1.86 Gutter cleaning
Unit price under exhibit line items A086, B086, C086, D086, & E086 shall be for cleaning gutters. The contractor shall clean all sand, dirt, leaves and debris from the gutter and clean out side down spouts that empty on to the ground. This line price shall be price by the linear foot of gutter only.

1.87 Community Infestation Control
Unit price under exhibit line items A087, B087, C087, D087, & E087 shall be for the labor and material to performing removal of and prevention of community infestation, prevent and control bats, birds or rodents from entering or gathering in or around inert buildings or structures during roof replacement as designated by the KO. Includes observation, clean up, removal of dead animals and sealing of building to include, but not limited to; roof, vents, doors, windows and walls. One year warranty with quarterly inspection to include clean up of any new infestations and if necessary repeat of control measures. This line item shall be priced for 1 SF and the average inert building is 10,000 SF.

1.88 Labor for items not covered it the exhibit line items
Unit price under exhibit line items A088, B088, C088, D088, & E088 shall be for the labor in conjunction with roof repairs that are not covered in the Exhibit Line Items. The Contractor shall provide labor as necessary for the maintenance, repair, and replacement for items not specifically listed within the other exhibit line items. This labor shall be identified by the Contractor in the estimate that is provided to the Government, which identifies the repairs to be made, the material and equipment required, and the amount of labor necessary to perform the work. The Labor Hour Unit Price shall include all direct and indirect costs to perform an hour of labor except material. Cost such as profit, field and office overhead, job estimating, job preparation, licenses, permits, insurance, furnishing submittals, and all other direct and indirect cost associated with performance are all included as part of labor hour

unit prices. Labor hour quantities proposed by the Contractor that accomplish repair jobs are subject to approval by the Contracting Officer or his/her designated representative. No work under this bid item shall be performed until proper authorization from the Government has been received**.**

1.89 Exhibit line items A089, B089, C089, D089, & E089 are for material and equipment that is not specifically listed within other exhibit line items. The amount listed in the exhibit is for proposal evaluation purposes only and does not necessarily indicate any quantity of material/equipment required by the Government. The Contractor shall provide such materials and/or equipment for repairs and maintenance as required by the Government for the roof maintenance and repair or replacement. The Contractor's cost for material and equipment procured under this ELIN will be reimbursed at the invoice cost, plus a "Fixed Burden Rate". "Fixed Burden Rate" is defined as additional cost, expressed as a percentage of the invoice cost for the Contractor's handling and Overhead. The invoice cost is the supplier's actual invoice for materials and equipment purchased for incorporation in the contract-related repair. The contractor shall provide a copy of the supplier's invoices for material and equipment procured under this ELIN. Note: The amount listed in the exhibit line items is for proposal valuation purposes only and does not necessarily indicate any quantity of material/equipment required by the Government. Material and equipment proposed by the Contractor that accomplishes repair jobs is subject to approval by the Contracting Officer or his/her designated representative. No work under this bid item shall be performed until proper authorization from the Government has been received**.**

1.90 Unit price for ELINS A090, B090, C090, D090, & E090 shall be the premium to perform **Work Outside Normal Working Hours**. A task order may require that all or some tasks be performed outside of normal working hours. The task order request for proposal will specify which work, if any, shall be performed outside of normal working hours. The contractor shall provide a percentage markup that will be added to each ELIN when work performance is required outside of normal working hours. The term "outside of normal working hours" means Saturday, Sunday, Holiday, or after hours call back work that is required by the government. Any non-holiday Friday is considered a normal work day, regardless of the contractor's work schedule.

a. Only those tasks or portions of the task that are actually performed and completed outside of normal working hours shall qualify for the premium
b. This requirement does not relieve the Contractor of any Fair Labor Standards Act or negotiated wage contract requirement. Also, this is not construed to represent an overtime requirement.

1.91 Unit prices for ELINS A091, B091, C091, D091, & E091 shall be for **Bond Cost** for Payment and Performance Bonds. Both performance and payment bonds will be required for each task order regardless of the total task order price. Bond Cost shall be the premium (percentage cost) to provide both payment and performance bonds on each task order. This bond premium will be used to calculate the bond cost on each task order. The bond cost for each task order will be computed by multiplying the bond premium times the total of the applicable exhibit lines items 001 through 090. The bond cost will then be added to the applicable exhibit line item total to obtain the final task order amount.

NOTICE TO OFFERORS

DIVISION 0
DIVISION O. PRICING AND TECHNICAL PROPOSAL INFORMATION

Section 00100 - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

1.0 GENERAL INFORMAITON

NAICS Code: 238610 Roofing Contractors - Size Standard: $15.0 million)
FSC Code: Z2JZ

This procurement is issued as a Women-Owned Small Business Set Aside.

Proposals are due no later than 2:00 p.m (EDT). on Tuesday, June 21, 2016

2.0. REQUIRED DATA SUBMISSIONS

a. All offerors are required to register in the System for Award Management (SAM) database in accordance with FAR 52.204-7. *LACK OF REGISTRATION IN SAM DATABASE WILL MAKE THE OFFEROR INELIGIBLE FOR AWARD*. The website address for SAM database is www.sam.gov. Registration in SAM is free.

b. In addition, all offerors are required to complete Annual Representations and Certifications via SAM in accordance with FAR 52.204-8. The website address for SAM is www.sam.gov

c. All offerors are required to complete and submit VETS-4212 Federal Contractor Report on Veterans' Employment in accordance with Public Law 107-288 and FAR 52.222-37. The website address is: http://www.dol.gov/vets/vets4212.htm

3.0 PRE-PROPOSAL CONFERENCE/SITE VISIT
A PRE-proposal conference/site visit will not be held.

4.0 QUESTIONS

ALL QUESTIONS MUST BE SUBMITTED IN WRITING. The offeror may submit written questions via e-mail or fax to the address below specifying the section and paragraph of the RFP for which clarification is desired. Inquiries should be addressed to:

NAVFAC Mid-Atlantic PWD Crane – Acquisition Department
Attn: Debbie Dills (Code PRX22)
N40085-16-R-2803
300 Highway 361
Building 2516, NSA
Crane, IN 47522-5082
Phone: (812) 854-3234
Facsimile: (812) 854-3800
E-Mail: debbie.dills@navy.mil

5.0 PROPOSALS

Offerors are required to submit both technical and price proposals. The Government will award a contract resulting from this solicitation to the responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, price and other factors considered. For this solicitation, the combinations of the technical submittals are equal in value to the price.

The technical proposal and the price proposal shall be submitted in separate volumes. The technical proposal shall not contain any cost/pricing information except for salary information provide on resumes.

Proposals are due no later than 2:00 p.m. (EDT) on Tuesday, June 21, 2016. Proposals shall be submitted in hard copy the following address:

NAVFAC Mid-Atlantic PWD Crane – Acquisition Department
Attn: Debbie Dills (Code PRX22)
NSA, Bldg 2516
300 Hwy 361
Crane, IN 47522-5082

Proposals will not be accepted via e-mail or via fax.

The Government will award this solicitation to the single offeror whose proposal conforming to the solicitation will be the most advantageous to the Government, price and other factors considered:

TECHNICAL PROPOSAL: *Offerors shall submit an original and three (3) copies of the Technical Proposal*. Pages must be singled sided 8 ½ " x 11" and may be formatted in landscape or portrait format. Pages may be single-spaced in any font size legible to the naked eye. Pages of print are defined as text, diagrams, pictures, charts, tables, maps, appendices to proposal or forms. Tabs are required for all sections of the technical proposal.

In addition, the offeror may submit catalogue cuts, brochures or other pre-printed material as long as the exact item to be incorporated is identified.

To facilitate the evaluation, the technical proposal should be sufficiently detailed and complete to clearly and fully demonstrate that the offeror has a thorough understanding of the requirements.

Extraneous information in the technical proposal may be construed as indicative of the offeror's ignorance of the subject or a casual approach to the RFP. Statements that the prospective offeror understands and can or will comply with all specifications, statements paraphrasing the statement of work or parts thereof, and phrases such as "standard procedures will be employed" or "well known techniques will be used", etc. will be considered insufficient.

Elaborate brochures, binding, detailed artwork are unnecessary. The technical proposal shall be clear, concise and shall include sufficient detail for effective evaluation and for substantiating the validity of stated claims. The proposal should not simply rephrase or restate the Government's requirements, but rather shall provide convincing rationale to address how the offeror intends to meet requirements. Offerors shall assume that the Government has no prior knowledge of their experience, and will base its evaluation on the information presented in the offeror's proposal.

Proposals unrealistic in terms of technical or schedule commitments or unrealistically low in price will be considered lacking technical competence or comprehension of the complexity and risks of the contract requirements and may be rated as technically unacceptable.

Price and Technical Evaluation Factors to be addressed in this solicitation are identified below:

Factor 1 – Experience

Factor 2 – Safety

Factor 3 – Management Ability

Factor 4 – Past Performance

The distinction between experience and past performance is experience pertains to the types of work and volume of work completed by a contractor that are comparable to the types of work covered by this requirement, in terms of size, scope, and complexity. Past performance pertains to both the relevance of recent efforts and how well a contractor has performed on the contracts.

1. Basis of Evaluation and Submittal Requirements for Each Factor.

(a) Price:

(1) Solicitation Submittal Requirements: Offerors shall submit an original only of the price proposal. In addition, the offerors shall submit a completed electronic copy of the exhibit line items for the base period and both option periods. The basis of price proposal shall be the exhibit line items (ELINS) for each of the contract periods.

- Offerors shall complete and submit the SF1442, SFl442 Continuation Page, and Exhibit Line Items for the entire project. (Exhibits A, B, C, D and E)
- Offerors shall indicate on the proposal that prices are valid for not less than ninety (90) days.

(2) Basis of Evaluation: The Government will evaluate price based on the total price. Total price consists of the basic requirements and all option items (the total price of Exhibits A, B, C, D and E). The Government intends to evaluate all options and has included the provision FAR 52.217-5, Evaluation of Options (JUL 1990) in 00100 of the solicitation. In accordance with FAR 52.217-5, evaluation of options will not obligate the Government to exercise the option(s). Analysis will be performed by one or more of the following techniques to ensure a fair and reasonable price:

(i) Comparison of proposed prices received in response to the RFP.
(ii) Comparison of proposed prices with the IGCE.
(iii) Comparison of proposed prices with available historical information.
(iv) Comparison of market survey results.

The following responsibility determination items shall be submitted with the price proposal:

- The offeror shall provide a Bid Guarantee, as required by NFAS 5252.228-9302.

- In order to show the offeror's ability to obtain adequate financial resources to support this project, the offeror shall submit a letter from a bank or other financial institution stating their available line of credit as well as the available balance on the line of credit and that their accounts are in good standing.

- The offeror shall demonstrate the capability to bond individual projects valued up to $750,000.00 as well as the capability to bond up to $3,000,000.00 of projects within a 12-month time period. The offeror shall provide a letter from their bonding company that describes the contractors bonding capability.

- Representations and certifications shall be completed on-line in accordance with FAR 52.204-8.

- Provide proof that the required VETS-4212 Federal Contractor Veterans' Employment Report has been submitted for the preceding fiscal year in accordance with FAR 52.222-37 or provide an explanation of why this requirement does not apply to your firm.

(b) Technical Factors:

(1) **Factor 1, Experience:**

(i) Solicitation Submittal Requirements: Submit a minimum of three (3) and a maximum of five (5) relevant projects for the Offeror that best demonstrates your experience on relevant projects that are similar in size, scope, and complexity to the RFP. For purposes of this evaluation, a relevant project is further defined as follows:

Size: Roofing portion of the project has a cost of at least $150,000.

Scope/Complexity: Removal, repair and replacement of one of the following type of roofing systems: (1) PVC, (2) E.P.D.M roofing systems, (3) asphalt shingles, (4) standing seam metal roofing, or (5) transite roof panels. An offeror shall demonstrate experience with a minimum of three (3) of the five (5) roofing system types.

The Offeror may utilize experience of a subcontractor that will perform major or critical aspects of the requirement to demonstrate construction experience under this evaluation factor. The Offer must provide a letter of commitment and an explanation of the meaningful involvement that the subcontractor will have in performance of this contract. However, a minimum of one project shall be performed by the Offeror.

Projects submitted for the Offeror shall be completed within the past five (5) years of the date of issuance of this RFP

A project is defined as a construction project performed under a single task order or contract. For multiple award and indefinite delivery/indefinite quantity type contracts, the contract as a whole should not be submitted as a project; rather offerors should submit the work performed under a task order as a project.

The following data shall be provided for each submitted project: name and location of the project, date the project was awarded, award amount, final price, date the project was completed, indicate if the offeror performed work as a prime contractor, subcontractor, or joint venture, and a description of the project.

For all submitted projects, the description of the project shall clearly describe the scope of work performed and the relevancy to the project requirements of this RFP (i.e.: unique features, square footage, construction methods

If the Offeror is a Joint Venture (JV), relevant project experience should be submitted for projects completed by the Joint Venture entity. If the Joint Venture does not have shared experience, projects shall be submitted for each Joint Venture partner. If no shared project experience is demonstrated, proposals that fail to submit projects for <u>each</u> partner may be rated lower. Offerors are still limited to a total of five (5) projects combined.

If an Offeror is utilizing experience information of affiliates/subsidiaries/parent/LLC/LTD/ member companies (name is not exactly as stated on the SF1442), the proposal shall clearly demonstrate that the affiliate/subsidiary/parent firm will have meaningful involvement in the performance of the contract.

(ii) Basis of Evaluation: The basis of evaluation will include the Offeror's demonstrated experience and depth of experience in performing relevant projects as defined in the solicitation submittal requirements. The assessment of the Offeror's relevant experience will be used as a means of evaluating the capability of the Offeror to successfully meet the requirements of RFP. The Government will only review five projects. Any projects submitted in excess of the five (5) will be not be considered

(2) **Factor 2, Safety**

(i) Solicitation Submittal Requirements: The Offeror shall submit the following information: (For a partnership or joint venture, the following submittal requirements are required for each contractor who is part of the partnership or joint venture; however, only one safety narrative is required. EMR and DART Rates shall not be submitted for subcontractors.)

(1) Experience Modification Rate (EMR): For the ***three*** previous complete calendar years [2013, 2014, and 2015, submit your EMR (which compares your company's annual losses in insurance claims against its policy premiums over a ***three*** year period). EMRs shall be submitted on insurance company letterhead. If you have no EMR, affirmatively state so, and explain why. Any extenuating circumstances that affected the EMR and upward or downward trends should be addressed as part of this element. Lower EMRs will be given greater weight in the evaluation.

(2) OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate: For the ***three*** previous complete calendar years [2013, 2014, and 2015], submit your OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate, as defined by the U.S. Department of Labor, Occupational Safety and Health Administration. If you cannot submit an OSHA DART Rate, affirmatively state so, and explain why. Any extenuating circumstances that affected the OSHA DART Rate data and upward or downward trends should be addressed as part of this element. Lower OSHA DART Rates will be given greater weight in the evaluation.

(3) Technical Approach for Safety: Describe the plan that the Offeror will implement to evaluate safety performance of potential subcontractors, as a part of the selection process for all levels of subcontractors. Also, describe any innovative methods that the Offeror will employ to ensure and monitor safe work practices at all subcontractor levels. The Safety Narrative shall be limited to two pages.

(ii) Basis of Evaluation: The Government is seeking to determine that the Offeror has consistently demonstrated a commitment to safety and that the Offeror plans to properly manage and implement safety procedures for itself and its subcontractors. The Government will evaluate the Offeror's overall safety record, the Offeror's plan to select and monitor subcontractors, any and innovative safety methods that the Offeror plans to implement for this procurement. The Government's sources of information for evaluating safety may include, but are not limited to, OSHA, NAVFAC's ESAMS database, and other related databases. While the Government may elect to consider data from other sources, the burden of providing detailed, current, accurate and complete safety information regarding these submittal requirements rests with the Offeror. The evaluation will collectively consider the following:

- Experience Modification Rate (EMR)
- OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate
- Offeror Technical Approach to Safety
- Other sources of information available to the Government

(1) Experience Modification Rate (EMR): The Government will evaluate the EMR to determine if the Offeror has demonstrated a history of safe work practices taking into account any upward or downward trends and extenuating circumstances that impact the rating. Lower EMRs will be given greater weight in the evaluation.

(2) OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate: The Government will evaluate the OSHA DART Rate to determine if the Offeror has demonstrated a history of safe work practices taking into account any upward or downward trends and extenuating circumstances that impact the rates. Lower OSHA DART Rates will be given greater weight in the evaluation.

(3) Technical Approach to Safety: The Government will evaluate the narrative to determine the degree to which subcontractor safety performance will be considered in the selection of all levels of subcontractors on the upcoming project. The Government will also evaluate the narrative to determine the degree to

which innovations are being proposed that may enhance safety on this procurement. Those Offerors whose plan demonstrates a commitment to hire subcontractors with a culture of safety and who propose innovative methods to enhance a safe working environment may be given greater weight in the evaluation.

(3) **Factor 3, Management Ability:**

(i) Solicitation Submittal Requirements: The offeror shall submit a narrative demonstrating an in-depth understanding of the contract requirements. Evaluation will focus on the contractor's work plan and their ability in managing and executing a project of similar size and scope with in a similar work environment. The narrative shall address the following:

- Ability to coordinate and supervise work requirements as well as subcontractors at a single location and at multiple locations simultaneously.
- Quality control organization and quality control procedures that adequately assure high quality performance.
- Ability to respond to unknown/unforeseen conditions.
- Ability to complete the project within an acceptable schedule.
- Scheduling approach takes into account all foreseeable factors that will affect the completion of the project including but not limited to identification and monitoring of submittals, equipment/material purchases/delivery and the actual work activities.
- Scheduling approach takes into account flexibility in meeting the customer's fluctuating schedule and providing a detailed contingency work plan. For example: the restrictions associated with Government and storage operations and working in restricted areas.
- Ability to perform asbestos abatement and lead abatement in accordance with state and federal regulations. The offeror should provide the qualifications/certifications and identity of the organization performing the abatement.
- Ability to manage warranty issues. The offeror shall provide a list of manufacturer’s for whom the contractor is authorized to perform warranty work. The offeror should demonstrate their ability to manage warranty issues.

(ii) Basis of Evaluation: Evaluation will focus on the offeror’s ability to accomplish the work including management of subcontractors and work at multiple sites simultaneously. The offeror’s quality control organization and procedures are more than adequate to assure high quality performance. The proposal clearly details a plan responding to unforeseen/unknown conditions. Scheduling approach and the factors considered in scheduling include identifying and monitoring submittals, equipment/material purchases/delivery and the actual work activities as well as the ability to complete the project within an acceptable schedule. The offeror’s scheduling program is flexible to meet the customer's fluctuating schedule and includes a detailed contingency work plan. The offeror has the ability to perform asbestos and lead abatement as required in accordance with all applicable laws and regulations. The proposal clearly details a plan for managing and responding to warranty issues on a variety of roofing systems.

(4) **Factor 4, Past Performance:**

(i) Solicitation Submittal Requirements: IF A COMPLETED CPARS EVALUATION IS AVAILABLE, IT SHALL BE SUBMITTED WITH THE PROPOSAL. IF THERE IS NOT A COMPLETED CPARS EVALUATION, the Past Performance Questionnaire (PPQ) included in the solicitation is provided for the offeror or its team members to submit to the client for each project the offeror includes in its proposal for Factor 1, Experience. AN OFFEROR SHALL NOT SUBMIT A PPQ WHEN A COMPLETED CPARS IS AVAILABLE.

IF A CPARS EVALUATION IS NOT AVAILABLE, ensure correct phone numbers and email addresses are provided for the client point of contact. Completed PPQs should be submitted with your proposal. If the offeror is unable to obtain a completed PPQ from a client for a project(s) before proposal closing date, the offeror should complete and submit with the proposal the first page of the PPQ which will provide contract and client information

for the respective project(s). Offerors should follow-up with clients/references to ensure timely submittal of questionnaires. If the client requests, questionnaires may be submitted directly to the Government's point of contact, Debbie Dills, via email at debbie.dills@navy.mil prior to proposal closing date. Offerors shall not incorporate by reference into their proposal PPQs or CPARS previously submitted for other RFPs. However, this does not preclude the Government from utilizing previously submitted PPQ information in the past performance evaluation.

Also include performance recognition documents received within the last five years such as awards, award fee determinations, customer letters of commendation, and any other forms of performance recognition.
In addition to the above, the Government may review any other sources of information for evaluating past performance. Other sources may include, but are not limited to, past performance information retrieved through the Past Performance Information Retrieval System (PPIRS) using all CAGE/DUNS numbers of team members (partnership, joint venture, teaming arrangement, or parent company/subsidiary/affiliate) identified in the offeror's proposal, inquiries of owner representative(s), and any other known sources not provided by the offeror.

While the Government may elect to consider data from other sources, the burden of providing detailed, current, accurate and complete past performance information rests with the Offeror.

A copy of the blank Past Performance Questionnaire to be used for requesting client references is included.

(ii) Basis of Evaluation: The degree to which past performance evaluations and all other past performance information reviewed by the Government (e.g., PPIRS, Federal Awardee Performance and Integrity Information System (FAPIIS), Electronic Subcontract Reporting System (eSRS), performance recognition documents, and information obtained from any other source) reflect a trend of satisfactory performance considering:

- A pattern of successful completion of tasks;
- A pattern of deliverables that are timely and of good quality;
- A pattern of cooperativeness and teamwork with the Government at all levels (task managers, contracting officers, auditors, etc.);
- Recency of tasks performed that are identical to, similar to, or related to the task at hand; and
- A respect for stewardship of Government fund

6.0 **EVALUATION AND BASIS FOR AWARD**

The Government reserves the right to eliminate from consideration for award any or all offers at any time prior to award of the contract; to negotiate with offerors in the competitive range; and to award the contract to the offeror submitting the lowest priced, technically acceptable offer. As stated in the solicitation, the Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. In addition, if the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

The LPTA process is selected as appropriate for this acquisition because the best value is expected to result from selection of the technically acceptable proposal with the lowest evaluated price.

An overall non-price factors rating must be at least "ACCEPTABLE" in order to be eligible for award. An "UNACCEPTABLE" rating in any factor results in the overall non-price factors

proposal being rated “UNACCEPTABLE” unless corrected through discussions. An overall non-price factors rating of “UNACCEPTABLE” makes a proposal ineligible for award.

In order to permit efficient competition, the Navy will utilize the following methodology: Proposals will initially be screened for price and placed in order (lowest to highest). The Navy will then evaluate the technical factors of the three lowest priced proposals. The Navy will make award to the lowest priced technically acceptable proposal from among the three lowest priced proposals. However, the Navy, at its sole discretion, reserves the right to increase the number of proposals it will review under this methodology. Accordingly, under this methodology, the technical factors of some proposals may not be evaluated by the Navy. If discussions are deemed necessary by the Contracting Office, all proposals will be evaluated (both technical and price) for the purpose of establishing a competitive range.

7.0 **DISPOSITION OF PROPOSALS**

After award, any excess copies of the proposal will not be returned to the offeror, but shall be destroyed by the Contracting Officer. No certificate of destruction will be issued.

PAST PERFORMANCE QUESTIONNAIRE

1. The NAVFAC Form PPQ shall be utilized for all evaluations that require a Past Performance Questionnaire (PPQ).

2. Solicitation Submittal Requirements: IF A COMPLETED CPARS EVALUATION IS AVAILABLE, IT SHALL BE SUBMITTED WITH THE PROPOSAL. IF THERE IS NOT A COMPLETED CPARS EVALUATION, the Past Performance Questionnaire (PPQ) included in the solicitation is provided for the offeror or its team members to submit to the client for each project the offeror includes in its proposal for Factor 1, Experience. AN OFFEROR SHALL NOT SUBMIT A PPQ WHEN A COMPLETED CPARS IS AVAILABLE.

IF A CPARS EVALUATION IS NOT AVAILABLE, ensure correct phone numbers and email addresses are provided for the client point of contact. Completed PPQs should be submitted with your proposal. If the offeror is unable to obtain a completed PPQ from a client for a project(s) before proposal closing date, the offeror should complete and submit with the proposal the first page of the PPQ (Attachment C), which will provide contract and client information for the respective project(s). Offerors should follow-up with clients/references to ensure timely submittal of questionnaires. If the client requests, questionnaires may be submitted directly to the Government's point of contact, Debbie Dills, via email at debbie.dills@navy.mil prior to proposal closing date. Offerors shall not incorporate by reference into their proposal PPQs or CPARS previously submitted for other RFPs. However, this does not preclude the Government from utilizing previously submitted PPQ information in the past performance evaluation."

NAVFAC/USACE PAST PERFORMANCE QUESTIONNAIRE (Form PPQ-0)

CONTRACT INFORMATION (Contractor to complete Blocks 1-4)

1. Contractor Information
Firm Name: CAGE Code:
Address: DUNs Number:
Phone Number:
Email Address:
Point of Contact: Contact Phone Number:

2. Work Performed as: ☐ Prime Contractor ☐ Sub Contractor ☐ Joint Venture ☐ Other (Explain)
Percent of project work performed:
If subcontractor, who was the prime (Name/Phone #):

3. Contract Information
Contract Number:
Delivery/Task Order Number (if applicable):
Contract Type: ☐ Firm Fixed Price ☐ Cost Reimbursement ☐ Other (Please specify):
Contract Title:
Contract Location:

Award Date (mm/dd/yy):
Contract Completion Date (mm/dd/yy):
Actual Completion Date (mm/dd/yy):
Explain Differences:

Original Contract Price (Award Amount):
Final Contract Price (*to include all modifications, if applicable*):
Explain Differences:

4. Project Description:
Complexity of Work ☐ High ☐ Med ☐ Routine
How is this project relevant to project of submission? (*Please provide details such as similar equipment, requirements, conditions, etc.*)

CLIENT INFORMATION (Client to complete Blocks 5-8)

5. Client Information
Name:
Title:
Phone Number:
Email Address:

6. Describe the client's role in the project:

7. Date Questionnaire was completed (mm/dd/yy)**:**

8. Client's Signature:

NOTE: NAVFAC REQUESTS THAT THE CLIENT COMPLETES THIS QUESTIONNAIRE AND SUBMITS DIRECTLY BACK TO THE OFFEROR. THE OFFEROR WILL SUBMIT THE COMPLETED QUESTIONNAIRE TO NAVFAC WITH THEIR PROPOSAL, AND MAY DUPLICATE THIS QUESTIONNAIRE FOR FUTURE SUBMISSION ON NAVFAC SOLICITATIONS. CLIENTS ARE HIGHLY ENCOURAGED TO SUBMIT QUESTIONNAIRES DIRECTLY TO THE OFFEROR. HOWEVER, QUESTIONNAIRES MAY BE SUBMITTED DIRECTLY TO NAVFAC. PLEASE CONTACT THE OFFEROR FOR NAVFAC POC INFORMATION. THE GOVERNMENT RESERVES THE RIGHT TO VERIFY ANY AND ALL INFORMATION ON THIS FORM.

ADJECTIVE RATINGS AND DEFINITIONS TO BE USED TO BEST REFLECT YOUR EVALUATION OF THE CONTRACTOR'S PERFORMANCE

RATING	DEFINITION	NOTE
(E) Exceptional	Performance meets contractual requirements and exceeds many to the Government/Owner's benefit. The contractual performance of the element or sub-element being assessed was accomplished with few minor problems for which corrective actions taken by the contractor was highly effective.	An Exceptional rating is appropriate when the Contractor successfully performed multiple significant events that were of benefit to the Government/Owner. A singular benefit, however, could be of such magnitude that it alone constitutes an Exceptional rating. Also, there should have been NO significant weaknesses identified.
(VG) Very Good	Performance meets contractual requirements and exceeds some to the Government's/Owner's benefit. The contractual performance of the element or sub-element being assessed was accomplished with some minor problems for which corrective actions taken by the contractor were effective.	A Very Good rating is appropriate when the Contractor successfully performed a significant event that was a benefit to the Government/Owner. There should have been no significant weaknesses identified.
(S) Satisfactory	Performance meets minimum contractual requirements. The contractual performance of the element or sub-element contains some minor problems for which corrective actions taken by the contractor appear or were satisfactory.	A Satisfactory rating is appropriate when there were only minor problems, or major problems that the contractor recovered from without impact to the contract. There should have been NO significant weaknesses identified. Per DOD policy, a fundamental principle of assigning ratings is that contractors will not be assessed a rating lower than Satisfactory solely for not performing beyond the requirements of the contract.
(M) Marginal	Performance does not meet some contractual requirements. The contractual performance of the element or sub-element being assessed reflects a serious problem for which the contractor has not yet identified corrective actions. The contractor's proposed actions appear only marginally effective or were not fully implemented.	A Marginal is appropriate when a significant event occurred that the contractor had trouble overcoming which impacted the Government/Owner.
(U) Unsatisfactory	Performance does not meet most contractual requirements and recovery is not likely in a timely manner. The contractual performance of the element or sub-element contains serious problem(s) for which the contractor's corrective actions appear or were ineffective.	An Unsatisfactory rating is appropriate when multiple significant events occurred that the contractor had trouble overcoming and which impacted the Government/Owner. A singular problem, however, could be of such serious magnitude that it alone constitutes an unsatisfactory rating.
(N) Not Applicable	No information or did not apply to your contract	Rating will be neither positive nor negative.

Contractor Information (Firm Name): _____
Client Information (Name): _____

TO BE COMPLETED BY CLIENT

PLEASE CIRCLE THE ADJECTIVE RATING WHICH BEST REFLECTS YOUR EVALUATION OF THE CONTRACTOR'S PERFORMANCE.

1. QUALITY:						
a) Quality of technical data/report preparation efforts	E	VG	S	M	U	N
b) Ability to meet quality standards specified for technical performance	E	VG	S	M	U	N
c) Timeliness/effectiveness of contract problem resolution without extensive customer guidance	E	VG	S	M	U	N
d) Adequacy/effectiveness of quality control program and adherence to contract quality assurance requirements (without adverse effect on performance)	E	VG	S	M	U	N
2. SCHEDULE/TIMELINESS OF PERFORMANCE:						
a) Compliance with contract delivery/completion schedules including any significant intermediate milestones. *(If liquidated damages were assessed or the schedule was not met, please address below)*	E	VG	S	M	U	N
b) Rate the contractor's use of available resources to accomplish tasks identified in the contract	E	VG	S	M	U	N
3. CUSTOMER SATISFACTION:						
a) To what extent were the end users satisfied with the project?	E	VG	S	M	U	N
b) Contractor was reasonable and cooperative in dealing with your staff (including the ability to successfully resolve disagreements/disputes; responsiveness to administrative reports, businesslike and communication)	E	VG	S	M	U	N
c) To what extent was the contractor cooperative, businesslike, and concerned with the interests of the customer?	E	VG	S	M	U	N
d) Overall customer satisfaction	E	VG	S	M	U	N
4. MANAGEMENT/ PERSONNEL/LABOR						
a) Effectiveness of on-site management, including management of subcontractors, suppliers, materials, and/or labor force?	E	VG	S	M	U	N
b) Ability to hire, apply, and retain a qualified workforce to this effort	E	VG	S	M	U	N
c) Government Property Control	E	VG	S	M	U	N
d) Knowledge/expertise demonstrated by contractor personnel	E	VG	S	M	U	N
e) Utilization of Small Business concerns	E	VG	S	M	U	N
f) Ability to simultaneously manage multiple projects with multiple disciplines	E	VG	S	M	U	N
g) Ability to assimilate and incorporate changes in requirements and/or priority, including planning, execution and response to Government changes	E	VG	S	M	U	N
h) Effectiveness of overall management (including ability to effectively lead, manage and control the program)	E	VG	S	M	U	N
5. COST/FINANCIAL MANAGEMENT						
a) Ability to meet the terms and conditions within the contractually agreed price(s)?	E	VG	S	M	U	N

Contractor Information (Firm Name): _____
Client Information (Name): _____

b) Contractor proposed innovative alternative methods/processes that reduced cost, improved maintainability or other factors that benefited the client	E	VG	S	M	U	N
c) If this is/was a Government cost type contract, please rate the Contractor's timeliness and accuracy in submitting monthly invoices with appropriate back-up documentation, monthly status reports/budget variance reports, compliance with established budgets and avoidance of significant and/or unexplained variances (under runs or overruns)	E	VG	S	M	U	N
d) Is the Contractor's accounting system adequate for management and tracking of costs? *If no, please explain in Remarks section.*		Yes			No	
e) If this is/was a Government contract, has/was this contract been partially or completely terminated for default or convenience or are there any pending terminations? *Indicate if show cause or cure notices were issued, or any default action in comment section below.*		Yes			No	
f) Have there been any indications that the contractor has had any financial problems? *If yes, please explain below.*		Yes			No	
6. SAFETY/SECURITY						
a) To what extent was the contractor able to maintain an environment of safety, adhere to its approved safety plan, and respond to safety issues? (Includes: following the users rules, regulations, and requirements regarding housekeeping, safety, correction of noted deficiencies, etc.)	E	VG	S	M	U	N
b) Contractor complied with all security requirements for the project and personnel security requirements.	E	VG	S	M	U	N
7. GENERAL						
a) Ability to successfully respond to emergency and/or surge situations (including notifying COR, PM or Contracting Officer in a timely manner regarding urgent contractual issues).	E	VG	S	M	U	N
b) Compliance with contractual terms/provisions *(explain if specific issues)*	E	VG	S	M	U	N
c) Would you hire or work with this firm again? *(If no, please explain below)*		Yes			No	
d) In summary, provide an overall rating for the work performed by this contractor.	E	VG	S	M	U	N

Please provide responses to the questions above (*if applicable*) and/or additional remarks. Furthermore, please provide a brief narrative addressing specific strengths, weaknesses, deficiencies, or other comments which may assist our office in evaluating performance risk *(please attach additional pages if necessary)***:**

CLAUSES INCORPORATED BY REFERENCE

52.217-5	Evaluation Of Options	JUL 1990
52.228-1	Bid Guarantee	SEP 1996

CLAUSES INCORPORATED BY FULL TEXT

52.211-2 AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DATA ITEM DESCRIPTIONS LISTED IN THE ACQUISITION STREAMLINING AND STANDARDIZATION INFORMATION SYSTEM (ASSIST) (APR 2014)

(a) Most unclassified Defense specifications and standards may be downloaded from the following ASSIST websites:

(1) ASSIST (https://assist.dla.mil/online/start/);

(2) Quick Search (http://quicksearch.dla.mil/);

(3) ASSISTdocs.com (http://assistdocs.com).

(b) Documents not available from ASSIST may be ordered from the Department of Defense Single Stock Point (DoDSSP) by--

(1) Using the ASSIST Shopping Wizard (https://assist.dla.mil/wizard/index.cfm);

(2) Phoning the DoDSSP Customer Service Desk (215) 697-2179, Mon-Fri, 0730 to 1600 EST; or

(3) Ordering from DoDSSP, Building 4, Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Telephone (215) 697-2667/2179, Facsimile (215) 697-1462.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.215-1 INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (JAN 2004)

(a) Definitions. As used in this provision--

“Discussions” are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

“In writing or written” means any worded or numbered expression which can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

“Proposal modification” is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

“Proposal revision” is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

“Time”, if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) Amendments to solicitations. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) Submission, modification, revision, and withdrawal of proposals. (1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, or revision, of proposals.

(i) Offerors are responsible for submitting proposals, and any modifications, or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is “late” and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall--

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) If a post-award debriefing is given to requesting offerors, the Government shall disclose the following information, if applicable:

(i) The agency's evaluation of the significant weak or deficient factors in the debriefed offeror's offer.

(ii) The overall evaluated cost or price and technical rating of the successful and the debriefed offeror and past performance information on the debriefed offeror.

(iii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection.

(iv) A summary of the rationale for award.

(v) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(vi) Reasonable responses to relevant questions posed by the debriefed offeror as to whether source-selection procedures set forth in the solicitation, applicable regulations, and other applicable authorities were followed by the agency.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a requirements indefinite delivery/indefinite quantity_contract resulting from this solicitation.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
9.7%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Town of Crane, Martin County, State of Indiana

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.233-2 SERVICE OF PROTEST (SEP 2006)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from

Contracting Officer
NAVFAC MID-Atlantic PWD Crane
300 Highway 361, B#2516
Crane, IN 47522

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) Site visits may be arranged during normal duty hours by contacting:

Name: Debbie Dills
Address: 300 HWY 361, B#2516, Crane, IN 47522
Telephone: 812 854 3234

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.236-28 PREPARATION OF PROPOSALS--CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including--

(1) Lump sum price;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words “no proposal” in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/vffara.htm

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

252.204-7004 ALTERNATE A, SYSTEM FOR AWARD MANAGEMENT (FEB 2014)

(a) *Definitions*. As used in this provision—

"System for Award Management (SAM) database" means the primary Government repository for contractor information required for the conduct of business with the Government.

"Commercial and Government Entity (CAGE) code" means—

(1) A code assigned by the Defense Logistics Information Service (DLIS) to identify a commercial or Government entity; or

(2) A code assigned by a member of the North Atlantic Treaty Organization that DLIS records and maintains in the CAGE master file. This type of code is known as an "NCAGE code."

"Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

"Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional SAM records for identifying alternative Electronic Funds Transfer (EFT) accounts (see FAR 32.11) for the same parent concern.

"Registered in the System for Award Management (SAM) database" means that—

(1) The contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, and Contractor and Government Entity (CAGE) code into the SAM database; and

(2) The contractor has completed the Core Data, Assertions, Representations and Certifications, and Points of Contact sections of the registration in the SAM database;

(3) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS). The Contractor will be required to provide consent for TIN validation to the Government as part of the SAM registration process; and

(4) The Government has marked the record "Active."

(b) (1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the SAM database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" or "DUNS+4" followed by the DUNS or DUNS+4 number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number will be used by the Contracting Officer to verify that the offeror is registered in the SAM database.

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number—

(i) Via the internet at http://fedgov.dnb.com/webform or if the offeror does not have internet access, it may call Dun and Bradstreet at 1-866-705-5711 if located within the United States; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office. The offeror should indicate that it is an offeror for a U.S. Government contract when contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business name.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company physical street address, city, state and Zip Code.

(iv) Company mailing address, city, state and Zip Code (if separate from physical).

(v) Company telephone number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

(d) If the Offeror does not become registered in the SAM database in the time prescribed by the Contracting Officer, the Contracting Officer will proceed to award to the next otherwise successful registered Offeror.

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

(f) Offerors may obtain information on registration at https://www.acquisition.gov.

(End of Provision)

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5252.228-9302 BID GUARANTEE (OCT 2004) (ALT II)

To assure the execution of the contract and the performance and payment bonds, each bidder/offeror shall submit with its bid/offer a guarantee bond (SF 24) executed by a surety company holding a certificate of authority from the

Secretary of the Treasury as an acceptable surety, or other security provided in FAR Clause 52.228-1, “Bid Guarantee”. Security shall be in a penal sum equal to at least 20 percent of the price payable for the estiamted quantity under the bid submitted, but in no case to exceed $3,000,000. A copy of the agent’s authority to sign bonds for the surety company shall accompany the bid guarantee bond. (End of provision)

Section 00600 - Representations & Certifications

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52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (FEB 2016)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is **238160** Roofing Contractors.

(2) The small business size standard is **$15.0 Million.**

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the provision at 52.204-7, System for Award Management, is included in this solicitation, paragraph (d) of this provision applies.

(2) If the provision at 52.204-7 is not included in this solicitation, and the offeror is currently registered in System for Award Management (SAM), and has completed the Representations and Certifications section of SAM electronically, the offeror may choose to use paragraph (d) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

( ) Paragraph (d) applies.

( ) Paragraph (d) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) (1) The following representations or certifications in SAM are applicable to this solicitation as indicated:

(i) 52.203-2, Certificate of Independent Price Determination. This provision applies to solicitations when a firm-fixed-price contract or fixed-price contract with economic price adjustment is contemplated, unless—

(A) The acquisition is to be made under the simplified acquisition procedures in Part 13;

(B) The solicitation is a request for technical proposals under two-step sealed bidding procedures; or

(C) The solicitation is for utility services for which rates are set by law or regulation.

(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed $150,000.

(iii) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include the provision at 52.204-7, System for Award Management.

(iv) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that—

(A) Are not set aside for small business concerns;

(B) Exceed the simplified acquisition threshold; and

(C) Are for contracts that will be performed in the United States or its outlying areas.

(v) 52.209-2; Prohibition on Contracting with Inverted Domestic Corporations--Representation.

(vi) 52.209-5; Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.

(vii) 52.209-11, Representation by Corporations Regarding elinquent Tax Liability or a Felony Conviction under any Federal Law. This provision applies to all solicitations.

(viii) 52.214-14, Place of Performance--Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.

(ix) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.

(x) 52.219-1, Small Business Program Representations (Basic & Alternate I). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.

(A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.

(B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.

(xi) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United States or its outlying areas.

(xii) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.

(xiii) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.

(xiv) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial items.

(xv) 52.223-1, Biobased Product Certification. This provision applies to solicitations that require the delivery or specify the use of USDA-designated items; or include the clause at 52.223-2, Affirmative Procurement of Biobased Products Under Service and Construction Contracts.

(xvi) 52.223-4, Recovered Material Certification. This provision applies to solicitations that are for, or specify the use of, EPA- designated items.

(xvii) 52.225-2, Buy American Certificate. This provision applies to solicitations containing the clause at 52.225-1.

(xviii) 52.225-4, Buy American--Free Trade Agreements--Israeli Trade Act Certificate. (Basic, Alternates I, II, and III.) This provision applies to solicitations containing the clause at 52.225- 3.

(A) If the acquisition value is less than $25,000, the basic provision applies.

(B) If the acquisition value is $25,000 or more but is less than $50,000, the provision with its Alternate I applies.

(C) If the acquisition value is $50,000 or more but is less than $77,533, the provision with its Alternate II applies.

(D) If the acquisition value is $77,533 or more but is less than $100,000, the provision with its Alternate III applies.

(xix) 52.225-6, Trade Agreements Certificate. This provision applies to solicitations containing the clause at 52.225-5.

(xx) 52.225-20, Prohibition on Conducting Restricted Business Operations in Sudan--Certification. This provision applies to all solicitations.

(xxi) 52.225-25, Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran—Representation and Certification. This provision applies to all solicitations.

(xxii) 52.226-2, Historically Black College or University and Minority Institution Representation. This provision applies to solicitations for research, studies, supplies, or services of the type normally acquired from higher educational institutions.

(2) The following representations or certifications are applicable as indicated by the Contracting Officer:

[Contracting Officer check as appropriate.]

X (i) 52.204-17, Ownership or Control of Offeror.

(ii) 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products.

(iii) 52.222-48, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Certification.

(iv) 52.222-52 Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Certification.

(v) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Alternate I only).

(vi) 52.227-6, Royalty Information.

(A) Basic.

(B) Alternate I.

(vii) 52.227-15, Representation of Limited Rights Data and Restricted Computer Software.

(d) The offeror has completed the annual representations and certifications electronically via the SAM website accessed through https://www.acquisition.gov. After reviewing the SAM database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically that apply to this solicitation as indicated in paragraph (c) of this provision have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to

the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause	Title	Date	Change

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on SAM.

(End of provision)

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52.204-19 INCORPORATION BY REFERENCE OF REPRESENTATIONS AND CERTIFICATIONS (DEC 2014)

The Contractor's representations and certifications, including those completed electronically via the System for Award Management (SAM), are incorporated by reference into the contract.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.209-7 INFORMATION REGARDING RESPONSIBILITY MATTERS (JULY 2013)

(a) Definitions. As used in this provision--

Administrative proceeding means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative Proceedings, Civilian Board of Contract Appeals Proceedings, and Armed Services Board of Contract Appeals Proceedings). This includes administrative proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include agency actions such as contract audits, site visits, corrective plans, or inspection of deliverables.

Federal contracts and grants with total value greater than $10,000,000 means--

(1) The total value of all current, active contracts and grants, including all priced options; and

(2) The total value of all current, active orders including all priced options under indefinite-delivery, indefinite-quantity, 8(a), or requirements contracts (including task and delivery and multiple-award Schedules).

Principal means an officer, director, owner, partner, or a person having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a division or business segment; and similar positions).

(b) The offeror ( ) has ( ) does not have current active Federal contracts and grants with total value greater than $10,000,000.

(c) If the offeror checked “has” in paragraph (b) of this provision, the offeror represents, by submission of this offer, that the information it has entered in the Federal Awardee Performance and Integrity Information System (FAPIIS) is current, accurate, and complete as of the date of submission of this offer with regard to the following information:

(1) Whether the offeror, and/or any of its principals, has or has not, within the last five years, in connection with the award to or performance by the offeror of a Federal contract or grant, been the subject of a proceeding, at the Federal or State level that resulted in any of the following dispositions:

(i) In a criminal proceeding, a conviction.

(ii) In a civil proceeding, a finding of fault and liability that results in the payment of a monetary fine, penalty, reimbursement, restitution, or damages of $5,000 or more.

(iii) In an administrative proceeding, a finding of fault and liability that results in--

(A) The payment of a monetary fine or penalty of $5,000 or more; or

(B) The payment of a reimbursement, restitution, or damages in excess of $100,000.

(iv) In a criminal, civil, or administrative proceeding, a disposition of the matter by consent or compromise with an acknowledgment of fault by the Contractor if the proceeding could have led to any of the outcomes specified in paragraphs (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this provision.

(2) If the offeror has been involved in the last five years in any of the occurrences listed in (c)(1) of this provision, whether the offeror has provided the requested information with regard to each occurrence.

(d) The offeror shall post the information in paragraphs (c)(1)(i) through (c)(1)(iv) of this provision in FAPIIS as required through maintaining an active registration in the System for Award Management database via https://www.acquisition.gov (see 52.204-7).

(End of provision)

252.203-7005 REPRESENTATION RELATING TO COMPENSATION OF FORMER DOD OFFICIALS (NOV 2011)

(a) Definition. Covered DoD official is defined in the clause at 252.203-7000, Requirements Relating to Compensation of Former DoD Officials.

(b) By submission of this offer, the offeror represents, to the best of its knowledge and belief, that all covered DoD officials employed by or otherwise receiving compensation from the offeror, and who are expected to undertake activities on behalf of the offeror for any resulting contract, are presently in compliance with all post-employment restrictions covered by 18 U.S.C. 207, 41 U.S.C. 2101-2107, and 5 CFR parts 2637 and 2641, including Federal

Acquisition Regulation 3.104-2.

(End of provision)

252.209-7991 REPRESENTATION BY CORPORATIONS REGARDING AN UNPAID DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER ANY FEDERAL LAW—FISCAL YEAR 2016 APPROPRIATIONS (DEVIATION 2016-O0002) (OCT 2015)

(a) In accordance with section 101(a) of the Continuing Appropriations Act, 2016 (Pub. L. 114-53) and any subsequent FY 2016 appropriations act that extends to FY 2016 funds the same restrictions as are contained in sections 744 and 745 of division E, title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235), none of the funds made available by this or any other Act may be used to enter into a contract with any corporation that—
(1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government; or

(2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless the agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government.

(b) The Offeror represents that—

(1) It is [____] is not [____] a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability,

(2) It is [____] is not [____] a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

(End of provision)

Section 00700 - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	NOV 2013
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	MAY 2014
52.203-6	Restrictions On Subcontractor Sales To The Government	SEP 2006
52.203-7	Anti-Kickback Procedures	MAY 2014
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	MAY 2014
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	MAY 2014
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	OCT 2010
52.203-17	Contractor Employee Whistleblower Rights and Requirement To Inform Employees of Whistleblower Rights	APR 2014
52.204-2 Alt II	Security Requirements (Aug 1996) - Alternate II	APR 1984
52.204-4	Printed or Copied Double-Sided on Postconsumer Fiber Content Paper	MAY 2011
52.204-7	System for Award Management	JUL 2013
52.204-9	Personal Identity Verification of Contractor Personnel	JAN 2011
52.204-10	Reporting Executive Compensation and First-Tier Subcontract Awards	OCT 2015
52.204-13	System for Award Management Maintenance	JUL 2013
52.204-15	Service Contract Reporting Requirements for Indefinite-Delivery Contracts	JAN 2014
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	OCT 2015
52.209-9	Updates of Publicly Available Information Regarding Responsibility Matters	JUL 2013
52.209-10	Prohibition on Contracting With Inverted Domestic Corporations	NOV 2015
52.211-13	Time Extensions	SEP 2000
52.211-15	Defense Priority And Allocation Requirements	APR 2008
52.215-2	Audit and Records--Negotiation	OCT 2010
52.219-8	Utilization of Small Business Concerns	OCT 2014
52.219-14	Limitations On Subcontracting	NOV 2011
52.219-28	Post-Award Small Business Program Rerepresentation	JUL 2013
52.222-1	Notice To The Government Of Labor Disputes	FEB 1997
52.222-3	Convict Labor	JUN 2003
52.222-4	Contract Work Hours and Safety Standards- Overtime Compensation	MAY 2014
52.222-6	Construction Wage Rate Requirements	MAY 2014
52.222-7	Withholding of Funds	MAY 2014
52.222-8	Payrolls and Basic Records	MAY 2014
52.222-9	Apprentices and Trainees	JUL 2005
52.222-10	Compliance with Copeland Act Requirements	FEB 1988
52.222-11	Subcontracts (Labor Standards)	MAY 2014
52.222-12	Contract Termination-Debarment	MAY 2014
52.222-13	Compliance With Construction Wage Rate Requirements and Related Regulations	MAY 2014
52.222-14	Disputes Concerning Labor Standards	FEB 1988

52.222-26	Equal Opportunity	APR 2015
52.222-27	Affirmative Action Compliance Requirements for Construction	APR 2015
52.222-30	Construction Wage Rate Requirements--Price Adjustment (None or Separately Specified Method)	MAY 2014
52.222-35	Equal Opportunity for Veterans	OCT 2015
52.222-36	Equal Opportunity for Workers with Disabilities	JUL 2014
52.222-37	Employment Reports on Veterans	FEB 2016
52.222-40	Notification of Employee Rights Under the National Labor Relations Act	DEC 2010
52.222-50	Combating Trafficking in Persons	MAR 2015
52.222-54	Employment Eligibility Verification	OCT 2015
52.222-55	Minimum Wages Under Executive Order 13658	DEC 2015
52.223-2	Affirmative Procurement of Biobased Products Under Service and Construction Contracts	SEP 2013
52.223-3	Hazardous Material Identification And Material Safety Data	JAN 1997
52.223-5	Pollution Prevention and Right-to-Know Information	MAY 2011
52.223-6	Drug-Free Workplace	MAY 2001
52.223-17	Affirmative Procurement of EPA-Designated Items in Service and Construction Contracts	MAY 2008
52.223-18	Encouraging Contractor Policies To Ban Text Messaging While Driving	AUG 2011
52.224-1	Privacy Act Notification	APR 1984
52.224-2	Privacy Act	APR 1984
52.225-13	Restrictions on Certain Foreign Purchases	JUN 2008
52.227-1	Authorization and Consent	DEC 2007
52.227-2	Notice And Assistance Regarding Patent And Copyright Infringement	DEC 2007
52.227-4	Patent Indemnity-Construction Contracts	DEC 2007
52.228-2	Additional Bond Security	OCT 1997
52.228-5	Insurance - Work On A Government Installation	JAN 1997
52.228-11	Pledges Of Assets	JAN 2012
52.228-12	Prospective Subcontractor Requests for Bonds	MAY 2014
52.228-14	Irrevocable Letter of Credit	NOV 2014
52.228-15	Performance and Payment Bonds--Construction	OCT 2010
52.229-3	Federal, State And Local Taxes	FEB 2013
52.232-5	Payments under Fixed-Price Construction Contracts	MAY 2014
52.232-17	Interest	MAY 2014
52.232-18	Availability Of Funds	APR 1984
52.232-23 Alt I	Assignment of Claims (May 2014) - Alternate I	APR 1984
52.232-27	Prompt Payment for Construction Contracts	MAY 2014
52.232-33	Payment by Electronic Funds Transfer--System for Award Management	JUL 2013
52.232-39	Unenforceability of Unauthorized Obligations	JUN 2013
52.232-40	Providing Accelerated Payments to Small Business Subcontractors	DEC 2013
52.233-1 Alt I	Disputes (May 2014) - Alternate I	DEC 1991
52.233-3	Protest After Award	AUG 1996
52.233-4	Applicable Law for Breach of Contract Claim	OCT 2004
52.236-1	Performance of Work by the Contractor	APR 1984
52.236-2	Differing Site Conditions	APR 1984
52.236-4	Physical Data	APR 1984
52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984

52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984
52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-12	Cleaning Up	APR 1984
52.236-13	Accident Prevention	NOV 1991
52.236-14	Availability and Use of Utility Services	APR 1984
52.236-15	Schedules for Construction Contracts	APR 1984
52.236-17	Layout of Work	APR 1984
52.236-21	Specifications and Drawings for Construction	FEB 1997
52.236-26	Preconstruction Conference	FEB 1995
52.242-13	Bankruptcy	JUL 1995
52.242-14	Suspension of Work	APR 1984
52.243-4	Changes	JUN 2007
52.244-6	Subcontracts for Commercial Items	FEB 2016
52.246-12	Inspection of Construction	AUG 1996
52.246-13	Inspection--Dismantling, Demolition, or Removal of Improvements	AUG 1996
52.246-21	Warranty of Construction	MAR 1994
52.248-3	Value Engineering-Construction	OCT 2015
52.249-2 Alt I	Termination for Convenience of the Government (Fixed-Price) (Apr 2012) - Alternate I	SEP 1996
52.249-10	Default (Fixed-Price Construction)	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.201-7000	Contracting Officer's Representative	DEC 1991
252.203-7000	Requirements Relating to Compensation of Former DoD Officials	SEP 2011
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	DEC 2008
252.203-7002	Requirement to Inform Employees of Whistleblower Rights	SEP 2013
252.203-7998 (Dev)	Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements - Representation. (DEVIATION 2015-O0010)	FEB 2015
252.203-7999 (Dev)	Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements. (DEVIATION 2015-O0010)	FEB 2015
252.204-7000	Disclosure Of Information	AUG 2013
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7005	Oral Attestation of Security Responsibilities	NOV 2001
252.204-7012	Safeguarding Covered Defense Information and Cyber Incident Reporting.	DEC 2015
252.204-7015	Disclosure of Information to Litigation Support Contractors	FEB 2014
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Country that is a State Sponsor of Terrorism	OCT 2015
252.215-7008	Only One Offer	OCT 2013
252.222-7006	Restrictions on the Use of Mandatory Arbitration Agreements	DEC 2010
252.223-7001	Hazard Warning Labels	DEC 1991
252.223-7004	Drug Free Work Force	SEP 1988
252.223-7006	Prohibition On Storage, Treatment, and Disposal of Toxic or Hazardous Materials	SEP 2014

252.225-7012	Preference For Certain Domestic Commodities	FEB 2013
252.225-7016	Restriction On Acquisition Of Ball and Roller Bearings	JUN 2011
252.225-7030	Restriction On Acquisition Of Carbon, Alloy, And Armor Steel Plate	DEC 2006
252.225-7031	Secondary Arab Boycott Of Israel	JUN 2005
252.225-7048	Export-Controlled Items	JUN 2013
252.227-7000	Non-estoppel	OCT 1966
252.227-7033	Rights in Shop Drawings	APR 1966
252.232-7003	Electronic Submission of Payment Requests and Receiving Reports	JUN 2012
252.232-7007	Limitation Of Government's Obligation	APR 2014
252.232-7010	Levies on Contract Payments	DEC 2006
252.236-7000	Modification Proposals-Price Breakdown	DEC 1991
252.243-7001	Pricing Of Contract Modifications	DEC 1991
252.243-7002	Requests for Equitable Adjustment	DEC 2012
252.244-7000	Subcontracts for Commercial Items	JUN 2013
252.247-7023	Transportation of Supplies by Sea	APR 2014
252.247-7024	Notification Of Transportation Of Supplies By Sea	MAR 2000

CLAUSES INCORPORATED BY FULL TEXT

52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within **15** calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 365 calendar days after award/noitceto proceed. * The time stated for completion shall include final cleanup of the premises.

***Completion times for individual task orders will be stated on each task order.**

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government **in the amount shown on the task order** for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.211-14 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE, EMERGENCY PREPAREDNESS, AND ENERGY PROGRAM USE (APR 2008)

Any contract awarded as a result of this solicitation **will be DO-C2** rated order certified for national defense, emergency preparedness, and energy program use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.
(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.216-19 ORDER LIMITATIONS. (OCT 1995)

(a) Minimum order. When the Government requires supplies or services covered by this contract in an amount of less than **$2,000.00,** the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) Maximum order. The Contractor is not obligated to honor:

(1) Any order for a single item in excess of **$1,000,000.00** ;

(2) Any order for a combination of items in excess of **$3,000,000.00**; or

(3) A series of orders from the same ordering office within **30** days that together call for quantities exceeding the limitation in subparagraph (1) or (2) above.

(c) If this is a requirements contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR)), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) above.

(d) Notwithstanding paragraphs (b) and (c) above, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order (or orders) is returned to the ordering office within **2** days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.216-21 REQUIREMENTS (OCT 1995)

(a) This is a requirements contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies or services specified in the Schedule are estimates only and are not purchased by this contract. Except as this contract may otherwise provide, if the Government's requirements do not result in orders in the quantities described as "estimated" or "maximum" in the Schedule, that fact shall not constitute the

basis for an equitable price adjustment.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. Subject to any limitations in the Order Limitations clause or elsewhere in this contract, the Contractor shall furnish to the Government all supplies or services specified in the Schedule and called for by orders issued in accordance with the Ordering clause. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(c) Except as this contract otherwise provides, the Government shall order from the Contractor all the supplies or services specified in the Schedule that are required to be purchased by the Government activity or activities specified in the Schedule.

(d) The Government is not required to purchase from the Contractor requirements in excess of any limit on total orders under this contract.

(e) If the Government urgently requires delivery of any quantity of an item before the earliest date that delivery may be specified under this contract, and if the Contractor will not accept an order providing for the accelerated delivery, the Government may acquire the urgently required goods or services from another source.

(f) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after **task order completion date.**

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor within 365 days from award of the basic contract, provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least **30 calendar** days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed **60 months.** (End of clause)

52.219-30 NOTICE OF SET-ASIDE FOR, OR SOLE SOURCE AWARD TO, WOMEN-OWNED SMALL BUSINESS CONCERNS ELIGIBLE UNDER THE WOMEN-OWNED SMALL BUSINESS PROGRAM (DEC 2015)

(a) *Definitions.* “Women-owned small business (WOSB) concern eligible under the WOSB Program” (in accordance with 13 CFR 127), means a small business concern that is at least 51 percent directly and

unconditionally owned by, and the management and daily business operations of which are controlled by, one or more women who are citizens of the United States.

“WOSB Program Repository” means a secure, Web-based application that collects, stores, and disseminates documents to the contracting community and SBA, which verify the eligibility of a business concern for a contract to be awarded under the WOSB Program.

(b) *Applicability*. This clause applies only to—

(1) Contracts that have been set aside or reserved for, or awarded on a sole source basis to, WOSB concerns eligible under the WOSB Program;

(2) Part or parts of a multiple-award contract that have been set aside for WOSB concerns eligible under the WOSB Program; and

(3) Orders set aside for WOSB concerns eligible under the WOSB Program, under multiple-award contracts as described in8.405-5 and 16.505(b)(2)(i)(F).

(c) General.

(1) Offers are solicited only from WOSB concerns eligible under the WOSB Program. Offers received from concerns that are not WOSB concerns eligible under the WOSB program shall not be considered.

(2) Any award resulting from this solicitation will be made to a WOSB concern eligible under the WOSB Program.

(3) The Contracting Officer will ensure that the apparent successful offeror has provided the required documents to the WOSB Program Repository. The contract shall not be awarded until all required documents are received.

(d) *Agreement*. A WOSB concern eligible under the WOSB Program agrees that in the performance of the contract for—

(1) Services (except construction), the concern will perform at least 50 percent of the cost of the contract incurred for personnel with its own employees;

(2) Supplies or products (other than procurement from a non-manufacturer in such supplies or products), the concern will perform at least 50 percent of the cost of manufacturing the supplies or products (not including the costs of materials);

(3) General construction, the concern will perform at least 15 percent of the cost of the contract with its own employees (not including the costs of materials); and

(4) Construction by special trade contractors, the concern will perform at least 25 percent of the cost of the contract with its own employees (not including cost of materials).

(e) *Joint Venture*. A joint venture may be considered a WOSB concern eligible under the WOSB Program if—

(1) It meets the applicable size standard corresponding to the NAICS code assigned to the contract, unless an exception to affiliation applies pursuant to 13 CFR 121.103(h)(3);

(2) The WOSB participant of the joint venture is designated in the System for Award Management database and the System for Award Management as a WOSB concern;

(3) The parties to the joint venture have entered into a written joint venture agreement that contains provisions-

(i) Setting forth the purpose of the joint venture;

(ii) Designating a WOSB concern eligible under the WOSB Program as the managing venturer of the joint venture, and an employee of the managing venturer as the project manager responsible for the performance of the contract;

(iii) Stating that not less than 51 percent of the net profits earned by the joint venture will be distributed to the WOSB;

(iv) Specifying the responsibilities of the parties with regard to contract performance, sources of labor, and negotiation of the WOSB contract; and

(v) Requiring the final original records be retained by the managing venturer upon completion of the WOSB contract performed by the joint venture.

(4) The joint venture must perform the applicable percentage of work required in accordance with paragraph (d) above; and

(5) The procuring activity executes the contract in the name of the WOSB concern eligible under the WOSB Program or joint venture.

(f) *Nonmanufacturer*. A WOSB concern eligible under the WOSB Program that is a non-manufacturer, as defined in 13 CFR 121.406(b) or 19.102(f), may submit an offer on a WOSB requirement with a NAICS code for supplies, if it meets the requirements under the non-manufacturer rule set forth in those regulations.

(End of clause)

52.222-5 CONSTRUCTION WAGE RATE REQUIREMENTS--SECONDARY SITE OF THE WORK (MAY 2014)

(a)(1) The offeror shall notify the Government if the offeror intends to perform work at any secondary site of the work, as defined in paragraph (a)(1)(ii) of the FAR clause at 52.222-6, Construction Wage Rate Requirements, of this solicitation.

(2) If the offeror is unsure if a planned work site satisfies the criteria for a secondary site of the work, the offeror shall request a determination from the Contracting Officer.

(b)(1) If the wage determination provided by the Government for work at the primary site of the work is not applicable to the secondary site of the work, the offeror shall request a wage determination from the Contracting Officer.

(2) The due date for receipt of offers will not be extended as a result of an offeror's request for a wage determination for a secondary site of the work.

(End of provision)

52.222-15 CERTIFICATION OF ELIGIBILITY (MAY 2014)

(a) By entering into this contract, the Contractor certifies that neither it nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b)(2) or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b)(2) or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(End of clause)

52.222-21 PROHIBITION OF SEGREGATED FACILITIES (APR 2015)

(a) Definitions. As used in this clause--

Gender identity has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

Segregated facilities means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

Sexual orientation has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, andis found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

52.225-11 BUY AMERICAN--CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2016)

(a) Definitions. As used in this clause--

Caribbean Basin country construction material means a construction material that--

(1) Is wholly the growth, product, or manufacture of a Caribbean Basin country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a Caribbean Basin country into a new and different construction material distinct from the materials from which it was transformed.

Commercially available off-the-shelf (COTS) item—

(1) Means any item of supply (including construction material) that is--

(i) A commercial item (as defined in paragraph (1) of the definition at FAR 2.101);

(ii) Sold in substantial quantities in the commercial marketplace; and

(iii) Offered to the Government, under a contract or subcontract at any tier, without modification, in the same form in which it is sold in the commercial marketplace; and

(2) Does not include bulk cargo, as defined in 46 U.S.C. 40102(4) such as agricultural products and petroleum products.

Component means an article, material, or supply incorporated directly into a construction material.

Construction material means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

Cost of components means--

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the construction material.

Designated country means any of the following countries:

(1) A World Trade Organization Government Procurement Agreement (WTO GPA) country (Armenia, Aruba, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea (Republic of), Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan or United Kingdom);

(2) A Free Trade Agreement (FTA) country (Australia, Bahrain, Canada, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Korea (Republic of), Mexico, Morocco, Nicaragua, Oman, Panama, Peru, or Singapore);

(3) A least developed country (Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Laos, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, South Sudan, Tanzania, Timor-Leste, Togo, Tuvalu, Uganda, Vanuatu, Yemen, or Zambia); or

(4) A Caribbean Basin country (Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bonaire, British Virgin Islands, Curacao, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saba, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sint Eustatius, Sint Maarten, or Trinidad and Tobago).

Designated country construction material means a construction material that is a WTO GPA country construction material, an FTA country construction material, a least developed country construction material, or a Caribbean Basin country construction material.

Domestic construction material means--

(1) An unmanufactured construction material mined or produced in the United States;

(2) A construction material manufactured in the United States, if--

(i) The cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic; or

(ii) The construction material is a COTS item.

Foreign construction material means a construction material other than a domestic construction material.

Least developed country construction material means a construction material that--

(1) Is wholly the growth, product, or manufacture of a least developed country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a least developed country into a new and different construction material distinct from the materials from which it was transformed.

“Free Trade Agreement country construction material” means a construction material that—

(1) Is wholly the growth, product, or manufacture of a Free Trade Agreement (FTA) country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a FTA country into a new and different construction material distinct from the materials from which it was transformed.

“Least developed country construction material” means a construction material that—

(1) Is wholly the growth, product, or manufacture of a least developed country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a least developed country into a new and different construction material distinct from the materials from which it was transformed.

United States means the 50 States, the District of Columbia, and outlying areas.

WTO GPA country construction material means a construction material that--

(1) Is wholly the growth, product, or manufacture of a WTO GPA country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a WTO GPA country into a new and different construction material distinct from the materials from which it was transformed.

(b) Construction materials.

(1) This clause implements 41 U.S.C. chapter 83, Buy American, by providing a preference for domestic construction material. In accordance with 41 U.S.C. 1907, the component test of the Buy American statute is waived for construction material that is a COTS item. (See FAR 12.505(a)(2)). In addition, the Contracting Officer has determined that the WTO GPA and Free Trade Agreements (FTAs) apply to this acquisition. Therefore, the Buy American restrictions are waived for designated country construction materials.

(2) The Contractor shall use only domestic or designated country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to information technology that is a commercial item or to the construction materials or components listed by the Government as follows:

None

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that--

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American statute is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American statute to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American statute.

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including--

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American statute applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American statute applies, use of foreign construction material is noncompliant with the Buy American statute.

(d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison

Construction material description	Unit of measure	Quantity	Price (dollars) \1\
Item 1:			
Foreign construction material....	.....	.....	.....
Domestic construction material...	.....	.....	.....
Item 2:			

Foreign construction material.... ....
Domestic construction material... ....

\1\ Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).
List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.
Include other applicable supporting information.

(End of clause)

52.225-12 NOTICE OF BUY AMERICAN REQUIREMENT-- CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2014)

(a) Definitions. “Commercially available off-the-shelf (COTS) item,” “construction material,” “designated country construction material,” “domestic construction material,” and “foreign construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American -- Construction Materials Under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) Requests for determination of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American statute should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American statute before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American statute, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) Alternate offers. (1) When an offer includes foreign construction material, other than designated country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic or designated country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic or designated country construction material, and the offeror shall be required to furnish such domestic or designated country construction material. An offer based on use of the foreign construction material for which an exception was requested-- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/vffara.htm

(End of clause)

52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of anyDefense Federal Acquisition Regulation Supplement (48 CFR **Chapter 1**) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

252.203-7004 DISPLAY OF HOTLINE POSTERS (OCT 2015)

(a) Definition. United States, as used in this clause, means the 50 States, the District of Columbia, and outlying areas.

(b) Display of fraud hotline poster(s). (1) The Contractor shall display prominently the DoD fraud hotline poster, prepared by the DoD Office of the Inspector General, in common work areas within business segments performing work in the United States under Department of Defense (DoD) contracts.

(2) If the contract is funded, in whole or in part, by Department of Homeland Security (DHS) disaster relief funds, the DHS fraud hotline poster shall be displayed in addition to the DoD fraud hotline poster. If a display of a DHS fraud hotline poster is required, the Contractor may obtain such poster from:
https://www.oig.dhs.gov/assets/Hotline/DHS_OIG_Hotline-optimized.jpg

(c) Display of combating trafficking in persons and whistleblower protection hotline posters. The Contractor shall display prominently the DoD Combating Trafficking in Persons and Whistleblower Protection hotline posters, prepared by the DoD Office of the Inspector General, in common work areas within business segments performing work under DoD contracts.

(d)(1) These DoD hotline posters may be obtained from: Defense Hotline, The Pentagon, Washington, DC 20301-1900, or are also available via the internet at http://www.dodig.mil/hotline/hotline_posters.htm.

(2) If a significant portion of the employee workforce does not speak English, then the posters are to be displayed in the foreign languages that a significant portion of the employees speak. Contact the DoD Inspector General at the address provided in paragraph (d)(1) of this clause if there is a requirement for employees to be notified of this clause and assistance with translation is required.

(3) Additionally, if the Contractor maintains a company Web site as a method of providing information to employees, the Contractor shall display an electronic version of these required posters at the Web site.

(e) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (e), in all subcontracts that exceed $5.5 million except when the subcontract is for the acquisition of a commercial item.

(End of clause)

252.216-7006 ORDERING (MAY 2011)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the contract schedule. Such orders may be issued from contract award date through contract completion date.

(b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.

(c)(1) If issued electronically, the order is considered ``issued'' when a copy has been posted to the Electronic Document Access system, and notice has been sent to the Contractor.

(2) If mailed or transmitted by facsimile, a delivery order or task order is considered ``issued'' when the Government deposits the order in the mail or transmits by facsimile. Mailing includes transmittal by U.S. mail or private delivery services.

(3) Orders may be issued orally only if authorized in the schedule.

(End of Clause)

252.232-7006 WIDE AREA WORKFLOW PAYMENT INSTRUCTIONS (MAY 2013)

(a) Definitions. As used in this clause--

Department of Defense Activity Address Code (DoDAAC) is a six position code that uniquely identifies a unit, activity, or organization.

Document type means the type of payment request or receiving report available for creation in Wide Area WorkFlow (WAWF).

Local processing office (LPO) is the office responsible for payment certification when payment certification is done external to the entitlement system.

(b) Electronic invoicing. The WAWF system is the method to electronically process vendor payment requests and receiving reports, as authorized by DFARS 252.232-7003, Electronic Submission of Payment Requests and Receiving Reports.

(c) WAWF access. To access WAWF, the Contractor shall--

(1) Have a designated electronic business point of contact in the System for Award Management at https://www.acquisition.gov; and

(2) Be registered to use WAWF at https://wawf.eb.mil/ following the step-by-step procedures for self-registration available at this Web site.

(d) WAWF training. The Contractor should follow the training instructions of the WAWF Web-Based Training Course and use the Practice Training Site before submitting payment requests through WAWF. Both can be accessed by selecting the “Web Based Training” link on the WAWF home page at https://wawf.eb.mil/.

(e) WAWF methods of document submission. Document submissions may be via Web entry, Electronic Data Interchange, or File Transfer Protocol.

(f) WAWF payment instructions. The Contractor must use the following information when submitting payment requests and receiving reports in WAWF for this contract/order:

(1) Document type. The Contractor shall use the following document type(s).

Navy Construction/Facilities Management Invoice

(Contracting Officer: Insert applicable document type(s). Note: If a “Combo” document type is identified but not supportable by the Contractor's business systems, an “Invoice” (stand-alone) and “Receiving Report” (stand-alone) document type may be used instead.)

(2) Inspection/acceptance location. The Contractor shall select the following inspection/acceptance location(s) in WAWF, as specified by the contracting officer.

N61154

(3) Document routing. The Contractor shall use the information in the Routing Data Table below only to fill in applicable fields in WAWF when creating payment requests and receiving reports in the system.

Routing Data Table*

Field Name in WAWF	Data to be entered in WAWF
Pay Official DoDAAC	**N68732**
Issue By DoDAAC	**N40085**
Admin DoDAAC	**N40085**
Inspect By DoDAAC	**N61154**
Ship To Code	**N61154**
Ship From Code	____
Mark For Code	____
Service Approver (DoDAAC)	**N61154**
Service Acceptor (DoDAAC)	**N61154**
Accept at Other DoDAAC	____
LPO DoDAAC	**N61154**
DCAA Auditor DoDAAC	____
Other DoDAAC(s)	____

(4) Payment request and supporting documentation. The Contractor shall ensure a payment request includes appropriate contract line item and subline item descriptions of the work performed or supplies delivered, unit price/cost per unit, fee (if applicable), and all relevant back-up documentation, as defined in DFARS Appendix F, (e.g. timesheets) in support of each payment request.

(5) WAWF email notifications. The Contractor shall enter the email address identified below in the “Send Additional Email Notifications” field of WAWF once a document is submitted in the system.

Steve Allen at steven.allen@navy.mil
Terry Mahoney at terry.mahoney@navy.mil

(g) WAWF point of contact. (1) The Contractor may obtain clarification regarding invoicing in WAWF from the following contracting activity's WAWF point of contact.

Debbie Dills, phone 812 854 3234 or email: debbie.dills@navy.mil

(2) For technical WAWF help, contact the WAWF helpdesk at 866-618-5988.

(End of clause)

252.236-7001 CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall--

(1) Check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

Title File Drawing No.
Drawings may be provided with each task order statement of work.

(End of clause)

5252.201-9300 CONTRACTING OFFICER AUTHORITY (JUN 1994)

In no event shall any understanding or agreement between the Contractor and any Government employee other than the Contracting Officer on any contract, modification, change order, letter or verbal direction to the Contractor be effective or binding upon the Government. All such actions must be formalized by a proper contractual document executed by an appointed Contracting Officer. The Contractor is hereby put on notice that in the event a Government employee other than the Contracting Officer directs a change in the work to be performed, it is the Contractor's responsibility to make inquiry of the Contracting Officer before making the deviation. Payments will not be made without being authorized by an appointed Contracting Officer with the legal authority to bind the Government.

5252.209-9300 ORGANIZATIONAL CONFLICTS OF INTEREST (JUN 1994)

The restrictions described herein shall apply to the Contractor and its affiliates, consultants and subcontracts under this contract. If the Contractor under this contract prepares or assists in preparing a statement of work, specifications and plans, the Contractor and its affiliates shall be ineligible to bid or participate, in any capacity, in any contractual effort which is based on such statement of work or specifications and plans as a prime contractor, subcontractor, consultant or in any similar capacity. The Contractor shall not incorporate its products or services in such statement of work or specification unless so directed in writing by the Contracting Officer, in which case the restriction shall not apply. This contract shall include this clause in its subcontractor's or consultants' agreements concerning the performance of this contract.

5252.216-9306, PROCEDURES FOR ISSUING ORDERS (NOV 2009)

(a) Services to be furnished under this contract shall be furnished at such times as ordered by the issuance of task orders by the Ordering Officer designated by the Contracting Officer. All orders issued hereunder are subject to the terms and conditions of this contract. This contract shall control in the event of conflict with any order. A task order will be considered "issued" for the purpose of this contract at the time the Government deposits the order in the mail or, if transmitted by other means, when physically delivered to the Contractor.
(b) Except in emergency situations, only a Contracting Officer may modify task/delivery orders. An Ordering Officer, when authorized by the designation official (Contracting Officer), may issue modifications to task/delivery orders only during an emergency. Modifications to task/delivery orders will be issued on a Standard Form (SF 30).
Task orders may be modified orally by the Ordering Officer in emergency circumstances. Oral modifications will be confirmed in writing by issuance of a SF 30 within two (2) working days from the time the oral direction is issued.

(End of clause)

5252.223-9300 INSPECTION BY REGULATORY AGENCIES (JUN 1994)

Work performed under this contract is subject to inspection by State and Federal Government Regulatory agencies including those described below.

Permission has been granted by the Navy permitting Federal and State occupational health and safety officials to enter Navy shore installations, without delay and at reasonable times, to conduct routine safety and health investigations. Permission also extends to safety and health investigations based on reports of unsafe conditions. Occupational Health and Safety Administration (OSHA) officials may also investigate accidents or illnesses involving the Contractor's employees. Inspections may also be carried out by the Department of Labor to inspect for compliance with labor laws.

The Contractor shall cooperate with regulatory agencies and shall provide personnel to accompany the agency inspection or review teams. Contractor personnel shall be knowledgeable concerning the work being inspected, and participate in responding to all requests for information, inspection or review findings by regulatory agencies.

5252.228-9300 INDIVIDUAL SURETY/SURETIES (JUN 1994)

As prescribed in FAR 28.203(a), individual sureties will be permitted. In order for the Contracting Officer to make a determination as to the acceptability of individuals proposed as sureties, as prescribed in FAR 28.203(b), all proposers who submit bonds which are executed by individual sureties are requested to furnish additional information in support of SF-28, Affidavit of Individual Surety, with the bonds. Pursuant to Instruction 3(b) of Standard Form 24, the Bond, Standard Form 25A, the Payment Bond, the Contracting Officer requests the following information:

(a) Equity Securities (Stock):

(1) State the place(s) of incorporation and address of the principal place of business for each issuing corporation listed.

(2) State whether the security issued was issued by public or private offering and give the place of registration of the security.

(3) State whether the security is presently, actively traded.

(b) Debt Securities (Bonds) and Certificates of Deposit:

(1) List the type of bonds held and their maturity dates.

(2) State the name, address and telephone number of the issuing agency, firm or individual.

(3) State the complete address(es) where the bonds are held.

(4) State whether the bonds have been pledged as security or otherwise been encumbered.

(c) Real Property Interests:

(1) Provide complete recording data for the conveyance of each parcel or interest listed to the individual proposed surety.

(2) State whether the values listed are based upon personal evaluation or evaluation of an experienced real estate appraiser. If available, provide copies of written appraisals.

(3) State the method(s) of valuation upon which appraisal is based.

(4) Provide the assessed value of each property interest listed utilized by the appropriate tax assessor for purposes of property taxation.

(5) Provide the telephone number, including area code, for the tax assessor who performed the most recent tax assessment.

(6) State whether each real property interest listed is currently under lien or in any way encumbered and the dollar amount of each such lien or encumbrance.

(d) Persons Proposed as Individual Sureties:

(1) A current list of all other bonds (bid, performance and payment) on which the individual is a surety and bonds for which the individual is requesting to be a surety.

(2) A statement as to the percent of completion of projects for which the individual is bound on a performance bond.

This information is necessary to enable the Contracting Officer to evaluate the sufficiency of the surety's net worth in a timely manner.

5252.228-9305 NOTICE OF BONDING REQUIREMENTS (DEC 2000) (ALT II)

(a) Within 15 days of receipt of a task order award, the bidder/offeror to whom the award is made shall furnish the following bond(s) each with satisfactory security for each subsequent task order award:

X A Performance Bond (Standard Form 25). The performance bond shall be in a penal sum equal to 100% percent of the task order price.

X A Payment Bond (Standard Form 25A). The payment bond shall be in a penal sum equal to 100% of the task order price.

(b) Any surety company holding a certificate of authority from the Secretary of Treasury as an acceptable Surety on Federal bonds will be accepted. Individual sureties will be permitted as prescribed in FAR 28.203 and FAC 5252.228-9300. Alternative types of security in lieu of furnishing sureties on performance and/or payment bonds will be permitted as prescribed in FAR 28.204, and will be held for at least one year after the completion of the contract. Additional bond security may be required as prescribed in FAR 52.228-2. Bonds shall be accompanied by a document authenticating the agent's authority to sign bonds for the surety company.

(c) The contract time for purposes of fixing the completion date, default and liquidated damages shall begin to run 15 days from the date of award, regardless of when performance and payment bonds or deposits in lieu of surety are executed.

5252.236-9301 SPECIAL WORKING CONDITIONS AND ENTRY TO WORK AREA (OCT 2004)

The Government under certain circumstances may require denial of entry to the work areas under this contract where the Contractor's work or presence would constitute a safety or security hazard to ordance storage or handling operations. Restrictions covering entry to and availability of the work areas are as follows:

(a) Entry. Entry to work areas located within the special Security Limited areas, defined as those work areas located within the existing security fence, can be granted subject to special personnel requirements as specified herein and to other normal security and safety requirements. Complete denial of entry to the Limited Area may be required during brief periods of one to two hours (normally) and on rare occasions of two to four hours. For bidding purposes, the Contractor shall assume denial of entry to the work areas in the Limited Area of six 2-hour denials and one 4-hour denial per month.

(b) Vehicle Delay. The Contractor shall also assume for bidding purposes that, in addition to site denial, each vehicle and/or unit of construction equipment will be delayed during each movement through the security gate, both entering and leaving the limited area. Delays will average 30 minutes.

(b) Operational Considerations. To reduce delay time while preserving required security, the following points should be considered in operational planning:

(1) Vehicle Search. Security regulations required that all vehicles, when authorized to enter the Limited Area be thoroughly searched by guard force personnel. Such a search will be required for all vehicle/ construction equipment. Accordingly, once a vehicle or unit of construction equipment has been cleared, it may be left in the Limited Area after initial entry has been made. For the period of time authorized the vehicle/equipment left in the Limited Area will be assigned parking areas by the Contracting Officer. The vehicle/equipment must be secured as specified in paragraph entitled "SECURITY REQUIREMENTS." The intent is to reduce the Contractor loss of time at the security gate. No private vehicles will be allowed to enter the Limited Area.

(2) Delivery Vehicles. Guard force personnel will inspect vehicles delivering construction materials while the driver is being processed for entry into the Limited Area.. A Security Escort will then escort the driver and vehicle in the Limited Area. To provide this service, delivery schedules should be promulgated in advance and vendors made aware that a reasonable delay can be expected if delivery is other than the time specified. Deliveries after 1600 hours will not be allowed entry into the Limited Area without prior approval of the Physical Security Officer.

5252.236-9303 ACCIDENT PREVENTION (NOV 1998)

(a) The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, all accidents resulting in death, traumatic injury, occupational disease, and damage to property, materials, supplies and equipment incident to work performed under this contract.

(b) Compliance with the provisions of this article by subcontractors will be the responsibility of the Contractor.

(c) Prior to commencement of the work, the Contractor may be required to:

(1) submit in writing his proposals for effectuating provision for accident prevention;

(2) meet in conference with representatives of the Contracting Officer to discuss and develop mutual understandings relative to administration of the overall safety program.

5252.236-9305 AVAILABILITY OF UTILITIES (JUN 1994)

When available, the government will furnish reasonable amounts of the following utilities for the work to be performed under this contract at no cost to the Contractor. Information concerning the location of existing outlets may be secured from the OIC. The Contractor shall provide and maintain, at his expense, the necessary service lines from existing Government outlets to the site of work.

Electric - Water - Compressed Air

Contractor Furnished Utilities: In the event that the Government is unable to provide the required types of utilities, the Contractor shall, at his expense, arrange for the required utilities.

Contractor Energy Conservation: The Contractor shall be directly responsible for instructing employees in utilities conservation practices. The Contractor shall be responsible for operating under conditions which preclude the waste of utilities, which shall include:

a. Lights shall be used only in areas where and at the time when work is actually performed.

b. Mechanical equipment controls for heating, ventilation and air conditioning systems will not be adjusted by the workers.

c. Water faucets or valves shall be turned off after the required usage has been accomplished.

Telephone Lines. Telephone lines for the sole use of the Contractor will not be available. Government telephones shall not be used for personal reasons.

Contractor Availability. The Contractor shall maintain a telephone at which he or his representative may be reached 24 hours daily. The telephone shall be listed in the contractor's name. If the Contractor does not have a local telephone, he shall maintain a toll free emergency telephone (or accept collect calls from authorized Government personnel) at which he or his representative may be reached at night, weekends and holidays. It is mandatory that the Contractor or his representative be available to a toll-free telephone 24 hours per day, seven days per week, including holidays. He shall notify the OIC in writing of the mailing address and telephone number within three days after award of this contract and immediately thereafter in the event of change.

5252.236-9310 RECORD DRAWINGS (Oct 2004)

The Contractor shall maintain at the job site two sets of full-size prints of the contract drawings, accurately marked in red with adequate dimensions, to show all variations between the construction actually provided and that indicated or specified in the contract documents, including buried or concealed construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the final government-accepted drawings. Existing utility lines and features revealed during the course of construction, shall also be accurately located and dimensioned. Variations in the interior utility systems shall be clearly defined and dimensioned; and coordinated with exterior utility connections at the building five-foot line, where applicable. Existing topographic features which differ from those shown on the contract drawings shall also be accurately located and recorded. Where a choice of materials or methods is permitted herein, or where variations in scope or character of methods is permitted herein, or where variations in scope or character of work from that of the original contract are authorized, the drawings shall be marked to define the construction actually provided. The representations of such changes shall conform to standard drafting practice and shall include such supplementary notes, legends and details as necessary to clearly portray the as-built construction. These drawings shall be available for review by the Contracting Officer at all times. Upon completion of the work, both sets of the marked up prints shall be certified as correct, signed by the Contractor, and delivered to the Contracting Officer for his approval before acceptance. Requests for partial payments will not be approved if the marked prints are not kept current, and request for final payment will not be approved until the market prints are delivered to the Contracting Officer.

5252.242-9300 GOVERNMENT REPRESENTATIVES (OCT 1996)

a. The contract will be administered by an authorized representative of the Contracting Officer. In no event, however, will any understanding or agreement, modification, change order, or other matter deviating from the terms of the contract between the contractor and any person other than the Contracting Officer be effective or binding upon the Government, unless formalized by proper contractual documents executed by the Contracting Officer prior to completion of this contract. The authorized representative as indicated hereinafter:

X_1. The Contracting Officer's Representative (COR) will be designated by the Contracting Officer as the authorized representative of the Contracting Officer. The COR is responsible for monitoring performance and the technical management of the effort required hereunder, and should be contacted regarding questions or problems of a technical nature.

X_2. The designated Contract Specialist will be the Administrative Contracting Officer's representative on all other contract administrative matters. The Contract Specialist should be contacted regarding all matters pertaining to the contract or delivery orders.

_3. The designated Property Administrator is the Administrative contracting Officer's representative on property matters. The Property Administrator should be contacted regarding all matters pertaining to property administration.

Section 00800 - Special Contract Requirements

DOL WAGES MARTIN & SULLIVAN

GENERAL WAGE DECISION NUMBER: IN160003 MODIFICATION 7 DTD 5/20/16
SULLIVAN COUNTY

GENERAL WAGE DECISION NUMBER IN160008 MODIFICATION 3 DTD 4/15/16
MARTIN COUNTY

WAGES ARE ATTACHED

General Decision Number: IN160003 05/20/2016 IN3

Superseded General Decision Number: IN20150003

State: Indiana

Construction Type: Building

Counties: Clay, Gibson, Greene, Owen, Parke, Posey, Putnam, Sullivan, Vanderburgh, Vermillion, Vigo and Warrick Counties in Indiana.

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016
1	01/22/2016
2	02/26/2016
3	03/04/2016
4	04/01/2016
5	04/08/2016
6	04/15/2016
7	05/20/2016

ASBE0018-003 06/01/2015

CLAY, GREENE, OWEN, PARKE, PUTNAM, VERMILLION AND VIGO COUNTIES

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (includes application of all insulating materials protective coverings, coatings and finishes to all types of mechancial systems)	$ 31.23	17.88
HAZARDOUS MATERIAL HANDLER (includes preparation, wettings stripping, removal, scrapping, vacuuming, bagging & disposing of all insulation		

materials, whether they
contain asbestos or not, from
mechanical systems).....$ 19.49 10.95

ASBE0037-002 04/01/2014

GIBSON, POSEY, SULLIVAN, VANDERBURGH AND WARRICK COUNTIES

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (includes application of all insulating materials protective coverings, coatings an finishes to all types of mechanical systems. Also the application of firestopping material openings and penetrations in walls, floors, ceilings, curtain walls and all lead abatement).....	$ 29.99	16.32

BOIL0374-002 01/01/2013

	Rates	Fringes
BOILERMAKER.....	$ 33.78	25.19

BRIN0001-001 06/01/2015

EVANSVILLE
POSEY, VANDERBURGH and WARRICK COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	$ 29.32	13.70
Marble, Tile & Terrazzo Finisher.....	$ 19.37	11.56
Marble, Tile & Terrazzo Workers.....	$ 25.81	11.49

BRIN0004-012 06/01/2015

BLOOMINGTON
OWEN COUNTY

	Rates	Fringes
Bricklayer, Stonemason.....	$ 27.50	9.67
TERRAZZO FINISHER.....	$ 19.07	7.07
TERRAZZO WORKER/SETTER.....	$ 29.57	10.96
Tile & Marble Finisher.....	$ 19.96	7.07
Tile, Marble Setter.....	$ 29.98	10.85

BRIN0005-001 03/28/2016

TERRE HAUTE CLAY, GIBSON, REENE, PARKE, SULLIVAN, VERMILLION
and VIGO COUNTIES

	Rates	Fringes
BRICKLAYER		
BRICKLAYER, STONE MASON and POINTER/CLEANER/CAULKER	$ 30.13	11.65
CEMENT MASON (GREENE and SULLIVAN COUNTIES)	$ 27.78	11.02
CEMENT MASON (REMAINING COUNTIES)	$ 27.93	11.02
TERRAZZO FINISHER	$ 19.07	7.05
TERRAZZO	$ 29.87	11.00
TILE and MARBLE FINISHER	$ 19.83	6.32
TILE, MARBLE, MOSAIC	$ 29.28	10.90

CARP0088-001 01/01/2016

CLAY, OWEN, PARKE, PUTNAM, VERMILLION AND VIGO COUNTIES

	Rates	Fringes
Carpenters:		
Carpenters, Drywall Installers, Piledrivers	$ 27.61	17.34
Millwright	$ 26.94	19.52
Soft Floor Layers	$ 26.50	15.92

CARP0103-001 04/01/2015

POSEY, VANDERBURGH AND WARRICK COUNTIES

	Rates	Fringes
CARPENTER		
Carpenter	$ 25.20	18.73
Piledriver	$ 26.20	18.73

CARP0103-002 04/01/2015

GREENE, GIBSON and SULLIVAN COUNTIES

	Rates	Fringes
CARPENTER		
Carpenter	$ 25.20	18.68
Piledriver	$ 26.20	18.68

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* CARP1080-002 05/01/2016

	Rates	Fringes
MILLWRIGHT		
GIBSON, GREENE AND SULLIVAN COUNTIES	$ 26.20	22.19
POSEY, VANDERBURGH and WARRICK COUNTIES	$ 26.95	21.78

ELEC0016-004 04/01/2016

GIBSON, POSEY, VANDERBURGH AND WARRICK COUNTIES

	Rates	Fringes
ELECTRICIAN.....	$ 35.85	16.21

ELEC0481-001 06/01/2015

PUTNAM COUNTY

	Rates	Fringes
ELECTRICIAN.....	$ 34.15	18.21

ELEC0538-002 01/01/2016

VERMILLION COUNTY

	Rates	Fringes
ELECTRICIAN.....	$ 32.30	19.12

ELEC0725-003 01/01/2016

CLAY, GREENE, OWEN, PARKE, SULLIVAN AND VIGO COUNTIES

	Rates	Fringes
ELECTRICIAN.....	$ 35.58	17.55

ELEC0725-007 01/01/2016

CLAY, GREENE, OWEN, PARKE, SULLIVAN AND VIGO COUNTIES

	Rates	Fringes
Communication Technician.....	$ 27.35	12.08

Includes the installation, operation, inspection, maintenance, repair and service of radio, television, recording, voice sound and vision production and reproduction apparatus, equipment and appliances used for domestic, commercial, education, entertainment and private telephone systems.

ELEV0003-007 01/01/2015

GIBSON, POSEY, SULLIVAN, VANDERBURGH, and WARRICK COUNTIES

	Rates	Fringes
ELEVATOR MECHANIC.....	$ 45.09	28.39+a+b

FOOTNOTES:

a) Employer contributes as a vacation pay credit 8% basic hourly rate for more than 5 years of service and 6% basic hourly rate for less than 5 years of service.

b) Eight Paid Holidays: Thanksgiving Day; New Year's Day; Memorial Day; Independence Day; Labor Day; Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day and Christmas Day.

ELEV0034-001 01/01/2016

CLAY, GREENE, OWEN, PARKE, PUTNAM, VERMILLION, AND VIGO COUNTIES

	Rates	Fringes
ELEVATOR MECHANIC.....	$ 44.13	29.985+a+b

a) PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Vetern's Day, Thanksgiving Day, the Friday after Thanksgiving, and Christmas Day.

b) Employer contributes 8% of regular hourly rate to vacation pay credit for employee with more than 5 years of service; 6% for less than 5 years' service.

ENGI0181-013 04/01/2015

GIBSON, POSEY, VANDERBURGH, and WARRICK COUNTIES

	Rates	Fringes
Power equipment operators:		
GROUP A.....	$ 31.88	14.40
GROUP B.....	$ 23.75	14.40

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP A: A-Frame Winch Truck, Articulating dump, autograde (CMI), auto patrol, ballast regulator (RR), batcher plant (electrical control concrete), bending machine (pipe), bituminous plant (engineer), bituminous plant, bituminous mixer travel plant, bituminous paver, bituminous roller, boring machine, buck hoist, bull dozer, cable way, Chicago boom, chimney hoist, clamshell, concrete mixer (21 cu. ft. or over), concrete paver, concrete pump (crete), construction elevator (Allmac or similar) crane, craneman, crawler backhoe, crawler high-lift, crusher plant, derrick, derrick boat, dinkey, directional/boring machine, dope pots (pipeline), double drum tugger (electric or air), dragline, dredge operator, dredge engineer, drill operator, elevating grader, extendable boom forklift, formless paver, gantry crane, gator (or similar type tiller), gradeall, grader, grademan, greaser (on grease facility servicing heavy equipment), G.P.S System (on equipment with the classifications), grout pump, head greaser, helicopter crew, Hetherington paver, hoist (motorized, gas or diesel), hydraulic crane, hydro blaster, Industrial type forklift (over 9,000 lbs), laser concrete screed, laser or remote contrlled equipment (within the classifications), locomotive crane, locomotive, mechanic, mobile mixer, motor crane, mucking machine, multiple tamping machine (RR) overhead crane, pile driver, pulls, push dozer, push boats,

roller (sheep foot), rough terrain crane, R.T. backhoe, R.T. endloader, Ross carrier, scoop, shovel, side boom, skidstter loader (obcat or similar type), swing crane, tail boom, tar machine (pipeline), tower crane, trench machine, welder (heavey duty), truck mounted concrete pump, truck-mounted drill, vacuum truck, well point whirleys.

GROUP B: Air Compressor (1 or more, 600 cfm and over), air compressor with throttle valve, bituminous distrubtor, brakeman, bullfloat, cement gun, concrete mixer, concrete mixer, concrete saw, concrete spreader or puddlers, conveyor, deck hand oiler, deck engine, drill helper, earth roller, electric vibrator compactor (earth or rock), elevator (in-plant, automatic), finishing machine, fireman, form grader, generator, guard-rail driver, heater, oiler, Industrial type forklift (9,000 lbs and under), material pump, motor boats, paving joint machine, post hole digger, power broom, power traffic signals, rock roller, rock spreader, Roller (earth or rock), spike machine (RR), steam jenny, sub grader, tamping machine, truck crane oiler, truck mounted drill oiler, Tugger (one-drum, air or electric) vibrator, vibro-piling hammer-hydraulic hammer or auger, water pump, widener (apsco or similar type) welding machine, JLG lifts and scissor lifts or similar machine.

ENGI0841-001 04/01/2015

REMAINING COUNTIES

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 38.60	18.35
GROUP 2	$ 24.75	18.35

GROUP 1: Power Cranes, Draglines, Derricks, Shovels, Gradalls, Mechanics, Tractor Highlift, Tournadozer, Concrete Mixers with Skip, Tournamixer, Two-Drum Machine, One-Drum Hoist with Tower or Boom, Cableways, Tower Machines, Motor Patrol, Boom Tractor, Boom or Winch Truck, Winch or Hydraulic Boom Truck, Truck Crane, Tournapull, Tractor Operating Scoops, Bulldozer, Push Tractor, Asphalt Planer, Finishing Machine on Asphalt, Large Rollers on Earth, Rollers on Asphalt Mix, Ross Carrier or Similar Machine, Gravel Processing Machine, Asphalt Plant Engineer, Paver Operator, Farm Tractor with Half Yard Bucket and/or Backhoe Attachments, Dredge Engineer, or Dredge Operator, Central Mix Plant Engineer, CMI or Similar Type Machine, Truck or Skid Mounted Concrete Pump, Tower Crane, Engine or Rock Crusher Plant, Concrete Plant Engineer, Ditching Machine with Dual Attachment, Tractor Mounted Loaders, Cherry Picker, Hydro Crane, Standard or Dinkey Locomotives, Scoopmobiles, Euclid Loader, Soil Cement Machine, Back Filler, Elevating Machine, Power Blade, Drilling Machines Including Well Testing, Caissons, Shaft or Any Similar Type Drilling Machines, Motor Driven Paint Machine, Pipe Cleaning Machine, Pipe Wrapping Machine, Pipe Bending Machine, Apsco Paver, Boring Machine, (Equipment Greased), Barber-Greene Loaders, Formless Paver, (Well Point System),

Concrete Spreader, Hydra Ax, Span Saw and Similar Types, Marine Scoops, Brush Mulcher, Brush Burner, Mesh Placer, Tree Mover, Helicopter Crew (3), Piledriver - Skid or Crawler, Stump Remover, Root Rake, Tug Boat Operator, Refrigerating Machine, Freezing Operator, Chair Cart-Self Propelled, Hydra Seeder, Straw Blower Power Sub Grader, Bull Float, Finishing Machine, Self-Propelled Pavement Breaker (Backhoe Attached), Lull (or Similar Type Machine), Two Air Compressors, Compressors Hooked in Maifold, Overhead Crane, Chip Spreader, Mud Cat, Sull-Air Fork Lifts (Except When Used For Landscaping Work), Soil Stabilazer (Seaman Tiller, Bo Mag, Rago Gator and Similar Types or Equipment), Tube Float, Spray Machine, Curing Machine, Concrete or Asphalt Milling Machine, Snooper Truck Operator.

GROUP 2: Concrete Mixers Without Skips, Rock Crusher, Ditching Machine Under 6', Curbing Machine, One Drum Machines without Tower or Boom, Air Tugger, Self-Propelled Concrete Saw, Machine-Mounted Post Hole Digger, Two to Four Generators, Water Pumps, or Welding Machines within 400 ft., Air Compressor 600 cu. ft. and Under, Rollers on Aggregate and Seal Coat Surfaces, Fork Lifts (When Used For Landscaping Work, Concrete and Blacktop Curb Machine, Farm Tractor with less than Half Yard Bucket, One Water Pump, Iolers, Air Valves or Steam Valves, One Welding Machine, Truck Jack, Mud Jack, Gunnite Machine, House Elevators when used for Hoisting Material, Engine Tenders, Wagon Drill, Flex Plane, Conveyor, Siphons and Pulsometer, Switchman, Fireman on Paint Pots, Fireman on Asphalt Plants, Distributor Operators on Trucks, Tampers, Self-Propelled Power Broom, Striping Machine (Motor Driven), Form Tamper, Bulk Cement Plan Equipment Greaser, Deck Hands, Truck Crane Oiler Driver, Cement Blimps, Form Grader, Temporary Heat, Throttle Valve, Farm Tractor, Super Sucker (And Similar Type of Equipment).

FOOTNOTE: Employees operating booms from 149 ft. to 199 ft. including jib, shall receive an additional seventy five cents (.75) per hour above the rate. Employees operating booms over 199 ft. including jib, shall receive an additional one dollar and twenty five cents ($1.25) per hour above the regular rate.

IRON0022-003 06/01/2015

CLAY, DAVIESS, GREENE, KNOX, LAWRENCE, MARTIN, MONROE, MONTGOMERY, OWEN, PARKE, PUTNAM, SULLIVAN, VERMILLION AND VIGO COUNTIES

	Rates	Fringes
IRONWORKER.....	$ 30.39	19.75

The following holidays shall be observed: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after Thanksgiving and Christmas Day. Any holiday which occurs on a Sunday shall be observed the following Monday, unless the legal observance of these

holidays is changed by law.

IRON0103-003 08/01/2015

GIBSON, POSEY, VANDERBURGH AND WARRICK COUNTIES

	Rates	Fringes
IRONWORKER	$ 28.14	18.68

LABO0204-002 06/01/2015

CLAY, GREENE, OWEN, PARKE, PUTNAM, SULLIVAN, VERMILLION, and VIGO COUNTIES

	Rates	Fringes
Laborers:		
Caisson and Tunnel Work in Compressed and Free Air		
GROUP 1	$ 21.17	13.36
GROUP 2	$ 21.37	13.36
GROUP 3	$ 21.45	13.36
GROUP 4	$ 22.17	13.36
LABORERS		
GROUP 1	$ 21.17	13.36
GROUP 2	$ 21.92	13.36
GROUP 3	$ 22.17	13.36

LABORER CLASSIFICATIONS

GROUP1: Building and construction laborers; Scaffold builders (other than for masons or plasterers); Mechanic tenders; Flag & signal person; Window washers & cleaners; Waterboys & toolhousemen; Railroad workers; Masonry wall washers (interior & exterior); Curing compound; All portable water pumps with discharge up to 3 inches; Waterproofing; Handling of creosote lumber or like treated material (excluding railroad material); Asphalt rakers & lutemen; Kettlemen; Air tool operators and all pneumatic tool operators; Air & electric vibrators & chipping hammer operators: Earth compactors; Jackmen & sheet men working ditches deeper than 6 ft. in depth; Laborers working ditches 6 ft. in depth or deeper; Assembly of unicrete pump; Tile layers (sewer or field) & sewer pipe layer (metallic or non-metallic); Motor-driven wheelbarrows & concrete buggies; Hyster operators; Pumpcrete assemblers; Core drill operator; Cement, lime or silia clay handlers (bulk or bag); Handling of toxic materials damaging to clothing; Pneumatic spikers; Deck engine & winch operators: Water main & cable ducking (metallic/non-metallic); Screed man or screw operator on asphalt paver; Chain saw and demolition saw operators; Concrete conveyor assemblers; Asbestos removal; Hazardous waste removal.

GROUP 2: Plasterers' tenders; Mason tenders; Mortar mixers; Welders (acetylene or electric); Cutting torch or burner; Cement nozzle laborers; Cement gun operators; Scaffold

builders when working for plasterers and for masons; Water blast machine operators.

GROUP 3: Dynamite men; Drillers-air track or wagon drilling for explosives

LABORERS CLASSIFICATIONS For CAISSON And TUNNEL WORK In COMPRESSED And FREE AIR

GROUP 1: Cage Tenders, Dump Men, Flagman, Signalman, Top Laborers, Rod Men

GROUP 2: Concrete Repairmen, Lock Tenders (pressure side), Motor men, Muckers, Grout Machine, Track Layers, Air Hoist, Key Board, Agitator Car, Car Pushers, Concrete Laborers, Grout Laborers, Lock Tenders (free air side), Steel Setters, Tuggers, Tuggers, Switchmen.

GROUP 3: Mucking Machine, Laser Beam, Liner Plate & Ring Setter, Shield Drivers, Power Knife, Welders Burners, Pipe Jacking Machine, Skinners, Maintenance Technician, Miner, Bricklayer Tenders, Concrete Blowers, Drillers, Erectors, Form Men, Jackhammermen, Mining Machine.

GROUP 4: Dynamite Men, Drillers air track or wagon drilling for explosives.

LABO0561-005 04/01/2016

GIBSON, POSEY, VANDERBURGH and WARRICK COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1	$ 24.12	13.55
GROUP 2	$ 24.62	13.55
GROUP 3	$ 24.62	13.55
GROUP 4	$ 25.37	13.55

LABORER CLASSIFICATIONS

GROUP 1: Building & Construction Laborers; Scaffold Builders (other than for Masons or Plasterers); Ironworker Tender; Mechanic Tender; Civil Engineer Tender; Rodmen and Chainmen; Signalmen and Flagman, Window Washer & Cleaner; Waterboy and Toolhouseman; Roofer Tender; Railroad Worker; Masonry Wall Washer (Interior & Exterior); Cement Finisher Tender; Carpenter Tender; All Other Tenders not listed; Portable Water Pump with discharge up to 3"; Wiremesh; Fire Prevention; Fire Watch; Fire Stop Tender

GROUP 2: Waterproofing; Handling of creosote Lumber or like treated material (Excluding Railroad Material); Asphalt Raker & Luteman; Kettleman; handling and removal Hazardous materials damaging to clothing; Air Tool Operator; Vibrator; Chipping Hammer Operator and all pneumatic tool operator and earth compactor; Jack Man & Sheeting Man Working in Ditches 6 Feet in depth or deeper; Laborers

working ditches six (6) feet in depth or deeper; Assembly of Unicrete Pump; Chain Saw Operator; Water line layers, five (5) feet outside the building foundation; Tile layers (Sewer or Field); Sewer Pipe Layer (Metallic and Non-metallic) five (5) feet outside the building; Motor Driven Wheelbarrow & Concrete Buggy; Hyster Operator; Grout pump operator; Pump crete Assembler; Conveyor Assembler; Core Drill Operator; Cement/Lime/Silica Clay Handler (Bulk or Bar); Pneumatic Spiker; Deck/Engine/Winch Operator; Water Main & Cable Decking (Metallic or Non-metallic); Remote Controlled Compactor

GROUP 3: Plasterer Tender; Mason Tender; Mortar Mixer; Welder (Acetylene or Electric); Cutting Torch or Burner; Cement Gun Operator; Scaffold Builder (When working for Plasterer or Mason)

GROUP 4: Dynamite Man

PAIN0156-002 04/01/2016

GIBSON, POSEY, VANDERBURGH AND WARRICK COUNTIES

	Rates	Fringes
Painters:		
BRUSH & ROLLER	$ 26.45	13.05
DRYWALL FINISHERS	$ 26.70	13.05
SPRAY, SANDBLAST, POWER TOOLS, WATERBLAST & STEAM CLEANING	$ 27.45	13.05

PAIN0197-002 06/01/2013

CLAY, GREENE, OWEN, PARKE, PUTNAM, SULLIVAN, VERMILLION AND VIGO COUNTIES:

	Rates	Fringes
Painters:		
Brush & Roller	$ 24.95	11.51
Drywall & Paper hangers (with tools)	$ 25.95	11.51
Sandblasting	$ 26.95	11.51
Spray & Pot Man	$ 24.45	11.51

PAIN1165-007 07/01/2015

GIBSON, POSEY, VANDERBURGH, WARRICK COUNTIES

	Rates	Fringes
GLAZIER	$ 27.23	13.67

PAIN1165-012 07/01/2015

CLAY; GREENE; OWEN; PARKE; PUTNAM; SULLIVAN; VERMILLION and VIGO COUNTIES

	Rates	Fringes
GLAZIER	$ 26.26	14.52

PLAS0075-001 06/01/2014

CLAY, OWEN, PARKE, PUTNAM, VERMILLION AND VIGO COUNTIES:

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 25.25	11.75

PLAS0566-001 04/01/2013

GIBSON, POSEY, VANDERBURGH AND WARRICK COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 25.00	14.71

PLAS0692-001 06/01/2014

AREA #46

CLAY, GIBSON, GREENE, OWEN, PARKE, POSEY, PUTNAM, SULLIVAN, VANDERBURGH, VERMILLION, VIGO and WARRICK COUNTIES

	Rates	Fringes
PLASTERER	$ 25.04	12.98

PLUM0136-002 04/01/2016

REMAINING COUNTIES

	Rates	Fringes
Plumbers and Pipefitters	$ 35.65	16.43

PLUM0157-001 01/01/2016

CLAY, GREENE, PARKE, PUTNAM (Part), SULLIVAN, VERMILLION and VIGO COUNTIES

	Rates	Fringes
Plumbers and Pipefitters	$ 37.03	14.48

PLUM0440-001 06/01/2015

PUTNAM COUNTY (EAST OF ROAD 43 EXCEPT TERRITORY ON A EAST MILE RADIUS FROM THE COURT HOUSE)

	Rates	Fringes

Plumbers and Pipefitters.....$ 35.72 15.34

ROOF0106-001 04/01/2015

REMAINING COUNTIES:

	Rates	Fringes
Roofers:		
COMPOSITION.....	$ 28.80	14.11
SLATE & TILE.....	$ 28.80	14.11

ROOF0119-001 09/01/2013

PUTNAM COUNTY

	Rates	Fringes
Roofers:.....	$ 24.03	10.25

ROOF0150-002 07/01/2012

CLAY, GREENE, OWEN, PARKE, SULLIVAN, VERMILLION AND VIGO COUNTIES

	Rates	Fringes
ROOFER.....	$ 26.50	10.07

SFIN0669-002 04/01/2014

	Rates	Fringes
SPRINKLER FITTER.....	$ 35.41	18.53

SHEE0020-018 07/02/2015

CLAY, GREENE, OWEN, PARKE, PUTNAM, SULLIVAN, VERMILLION, and VIGO COUNTIES

	Rates	Fringes
Sheet metal worker.....	$ 32.40	19.92
HVAC Duct Work		

SHEE0020-019 07/01/2015

GIBSON, POSEY, VANDERBURGH, and WARRICK COUNTIES

	Rates	Fringes
Sheet metal worker.....	$ 29.52	21.30
HVAC Duct Work		

TEAM0135-006 04/01/2013

CLAY, GREENE OWEN, PARKE, PUTNAM, SULLIVAN, VERMILLION, and VIGO COUNTIES

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 26.75	344.80/WK+A
GROUP 2	$ 27.25	344.80/WK+A
GROUP 3	$ 27.45	344.80/WK+A
GROUP 4	$ 27.60	344.80/WK+A
GROUP 5	$ 28.75	344.80/WK+A

A: $27.70 PER DAY.

TRUCK DRIVER CLASSIFICATIONS:

GROUP 1: Single Axle Trucks seven (7) cu.yds. or less than ten and 0ne-half (10 1/2) tons, dumpsters, scoop-mobiles five (5) cu. yds. and under or less than seven and one-half (7 1/2) tons, mixer trucks three (3) cu.yds. and under, air compressors and welding machines, including those pulled by separate units, batch trucks-wet or dry-2"34-E batches or less, truck driver helpers, warehousemen, mechanic's helpers, greasers and tiremen, all pick-up trucks and other vehicles. Drivers on dumpsters or similar dumpsters, mounted on four
(4) wheel truck rated two (2) cu.yds. or less, and small pallet type fork-lift operator and drivers on pallet jacks or similar type equipment.

GROUP 2: Drivers on tandem axle eighteen (18) cu.yds.or twenty- four (24) tons gross, six (6) wheel trucks, Koehring or similar dumpsters, tract trucks, Euclids, hug bottom dumps, tournapulls, tournatrailers, tournarockers, or similar equipment when used for transportation purposes under nine (9) cu.yds. or less than thirteen and one-half (13 1/2)
tons, tandems and semi-trailer service trucks, mixer trucks over three (3) cu. yds. and including six and one-half (6 1/2) cu.yds., fork lift, four (4) wheel A frame trucks when used for transportation purposes, four (4) wheel winch trucks, pavement breakers, batch trucks - wet or dry - over 2 up to and including 4-"34-E" batches two (2) men oil distributors, fork-lift under four (4) ton and vacuum trucks.

GROUP 3: Koehring or similar dumpsters, tract trucks, semi-trailer water trucks, Euclids, hug bottom dumps, tournapulls, tournatrailers, tournarockers, tractor trailers, tandems Q frame winch trucks, hydrolift trucks or similar equipment when used for transportation purposes, mixer trucks over six and one-half (6 1/2) cu.yds. batch trucks wet or dry over 4-"34-E" batches single axle low boy trailers, and Contractor's mechanics when working on equipment operated by employees within this Bargaining Unit. Six (6) wheel pole trailers and one (1) man oil distributors, fork- lift over four (4) ton and mobile mixers.

GROUP 4: Drivers on heavy equipment over sixteen (16) cu.yds. or twenty-four ton, such as Koehring or similar

dumpsters, tract trucks, Euclids, hug bottom dumps, tournapulls, tournarockers or similar equipment wen used for transportation purposes, pole trailers over six (6) wheels, water pulls, low-boy trailers tandem axles, quad axle or more no-weight limitation, diseal and/or heavy equipment mechanics when working on equipment operated by employees with this Bargaining Unit.

GROUP 5: Mechanic furnishing his own tools.

TEAM0215-005 04/01/2015

GIBSON, POSEY, VANDERBURGH AND WARRICK COUNTIES:

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 22.28	15.55
GROUP 2	$ 22.74	15.55
GROUP 3	$ 22.96	15.55

GROUP 1 - Pickup Trucks, Winch Trucks, Warehouseman, Mechanic, Street sweepers, Single axle trucks

GROUP 2 - Tandem Trucks or Dump Trucks; Farm Tractor Pulling trailer; Bituminous Distributors, Pavement Breakers

GROUP 3 - Mixer Trucks, all types; Lowboys, all types; Semi-trucks, all types; All Tri-axle Dump Trucks; Articulated End Dumps; End Dumps; Heavy Equipment Type Water Wagons; Hazardous Waste Warehouseman; Hazardous Waste Driver; and Drivers on equipment when not self-loaded or pusher loaded, such as Koehring or similar dumpsters, track trucks, Euclid bottom dump and hug bottom dump, Tournatrailers, Tournarockers or similar equipment.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local),

a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

General Decision Number: IN160008 04/15/2016 IN8

Superseded General Decision Number: IN20150008

State: Indiana

Construction Type: Building

Counties: Daviess and Martin Counties in Indiana.

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016
1	02/26/2016
2	04/01/2016
3	04/15/2016

BRIN0005-002 06/01/2014

	Rates	Fringes
BRICKLAYER		
BRICKLAYER; STONE MASON & POINTER, CAULKER, CLEANER	$ 30.13	11.02
CEMENT MASON	$ 27.93	11.02
MARBLE and TILE SETTER	$ 27.57	7.32
TERRAZZO FINISHER	$ 19.07	7.05
TERRAZZO and MOSAIC WORKER	$ 28.11	7.42
TILE and MARBLE FINISHER	$ 19.03	4.35

CARP0103-008 04/01/2015

	Rates	Fringes
CARPENTER (Including Drywall)	$ 25.20	18.68

ELEC0016-001 04/01/2016

	Rates	Fringes
ELECTRICIAN (Including Alarm Installation and HVAC Control		

Wiring).....$ 35.85 16.21

ENGI0181-025 04/01/2015

MARTIN COUNTY

	Rates	Fringes
Power equipment operators:		
Backhoe.....	$ 31.88	14.40

LABO0561-004 04/01/2016

DAVIESS COUNTY

	Rates	Fringes
LABORER (Unskilled).....	$ 24.12	13.55

LABO0741-005 06/01/2015

MARTIN COUNTY

	Rates	Fringes
LABORER (Unskilled).....	$ 21.18	13.30

PAIN0047-004 06/01/2014

	Rates	Fringes
PAINTER (Including Drywall Finisher).....	$ 24.43	12.35

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* PAIN0156-005 04/01/2016

DAVIESS COUNTY

	Rates	Fringes
PAINTER.....	$ 26.45	13.05

PLAS0692-026 04/01/2013

AREA #566

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	$ 24.75	14.41

PLUM0136-005 04/01/2016

	Rates	Fringes
PLUMBER (Including HVAC Work)....	$ 35.65	16.43
PIPEFITTERS.....	$ 35.65	16.43

ROOF0106-003 04/01/2015

	Rates	Fringes

ROOFER.....$ 28.80 14.11

SHEE0020-021 07/01/2015

	Rates	Fringes
Sheet metal worker (Including HVAC Duct Work).....	$ 29.52	21.30

SUIN1996-003 04/22/1996

	Rates	Fringes
Elevator Constructor.....	$ 19.90	5.57

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

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Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

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A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

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With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

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Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

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U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

SECTION 01 11 00

SUMMARY OF WORK
08/15

PART 1 GENERAL

1.1 General Requirements

It is the intention of this solicitation to Provide all labor, equipment, tools, supplies, transportation, supervision, quality control, and management necessary to perform Center wide Roof Repair and Replacement by means of a requirements type contract awarded on a unit priced basis. Work will be performed at the Naval Support Activity Crane, Indiana and the Glendora Test Facility, Sullivan, Indiana. Projects may range in size from approximately $2,000 to $2,000,000.

a. The work includes provision of necessary labor, transportation, materials, supplies, equipment, and supervision for locating and isolating leakage points of entry, removal, repair and replacement of built-up, PVC, E.P.D.M. roofing systems, asphalt shingles, standing seam, transite roof panels, asbestos contained roofing materials rolled roofing, felt, insulation, plywood decking, roof accessories to include flashing, gravel stops, drip edges, and gutters and downspouts; the application of roof coatings; the repair of joints, re-caulking; and incidental related work The actual amount of work to be performed and the time and place of such performance will be determined by the Contracting Officer or his properly authorized representative, who will issue written Task Orders to the Contractor(s). Each roof warranty shall be supplied to the contracting officer within 35 days after the roof has been completed, 10% of the roof project awarded funds will be withheld until the warranty is received by the government.

b. No oral statement of any person other than the Contracting Officer or designated representative, as provided in the clause in this contract titled "Changes," shall in any manner or degree modify or otherwise affect the terms of this contract.

1.2 Definitions

As used throughout this contract, the following terms shall have the meaning set forth below. Additional definitions are in the "DEFINITIONS" clause in Section I.

Where "as directed," "as required," "as permitted," "approval," "acceptance" or words of similar import are used, it shall be understood that direction, requirement, permission, approval or acceptance by the Contracting Officer is intended unless stated otherwise. Where "as shown," "as indicated," "as detailed" or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.

1.2.1 Administrative Contracting Officer (ACO)

The individual designated by the Contracting Officer to administer the contract. Throughout this contract, the term ACO will be used to refer to the individual designated to administer the contract or his/her designated representative.

1.2.2 Center

Naval Support Activity Crane, Indiana
Glendora Test Facility, Sullivan, Indiana

1.2.3 Construction Representative (CR)

Government personnel assigned as Contracting Officer's Representatives to perform Quality Assurance evaluation, coordinate construction, and to record and document their findings.

1.2.4 Contract Discrepancy Reports (CDRs)

Contract Discrepancy Reports (CDRs) may be issued by the ACO to identify and document cases of poor Contractor performance. The CDR requires the Contractor to explain in writing why performance is unsatisfactory, how performance will be returned to satisfactory levels, and how recurrence of the problem will be prevented in the future.

1.2.5 Contracting Officer(KO)

"Contracting Officer" means a person with the authority to enter into, administer, and/or terminate contracts and make related determination and findings.

1.2.6 Contracting Officer's Representative (KOR)

Person(s) designated by the Contracting Officer to be his/her authorized representative, such as the Contract Specialist, TOC Project Manager, or Construction Representative. As Contracting Officer's representatives, their authority is limited to specific actions.

1.2.7 Contractor

The term contractor as used herein refers to both the prime contractor and any subcontractors. The prime contractor will be responsible for insuring that his subcontractors comply with the provisions of this contract. The

term Contractor may be used to mean the single contractor that a Task Order is issued to.

1.2.8 Contractor Representative

The Contractor Representative is a foreman, superintendent, manager, or subcontractor who has authority to act for the prime contractor.

1.2.9 Contract Specialist

The individual assigned by the Contracting Officer to conduct negotiations with the Contractor.

1.2.10 Customer

The customer is the functional element at a Government activity which benefits from the services provided by the Contractor. A customer may be any of the divisions within the Public Works Center or another component at the activity. Customer responsibilities include establishing requirements and assisting specification development prior to the task order being issued. The customer has no authority to direct the contractor. If the contractor takes direction from the customer, the contractor does so at his own risk with full knowledge that the Government is under no obligation to pay for work so directed.

1.2.11 Government-Furnished Property (GFP)

Government Furnished Property includes all property in the possession of, or directly acquired by the Government and subsequently made available to the Contractor.

1.2.12 Government Representative

The person(s) whom the ACO will designate by name and/or position title to conduct liaison between the Contractor and the ACO on matters pertinent to this contract and be his/her authorized representative.

1.2.13 Quality Assurance (QA)

A program undertaken by the Government to evaluate certain attributes of products and services it procures (based on the application of pre-specified standards to pre-identified performance indicators), to record such evaluations, and to recommend or effect remedial contract administrative action.

1.2.14 Quality Control (QC)

A method used by the Contractor to control quality of goods and/or services provided.

1.2.15 RFP

Request for Proposal issued by the Government to the Contractor under this contract.

1.2.16 Task Order

A task order is a document (DD Form 1155) prepared by the Contracting Officer that is issued to the contractor and unilaterally orders work to be

performed. Task orders will be issued as necessary and may be modified on DD Form SF 30.

1.2.17 Contract Construction Compliance Notice

Contract Construction Compliance Notice Reports (CCCNR's) may be issued by the Construction Representative to identify and document deficiencies in workmanship, material, quality control, and supervision that result in poor contractor performance. The (CCCNR) requires the Contractor to explain in writing what corrective actions have been accomplished, and how poor performance will be prevented in the future.

1.2.18 PROJECT SITE

Refers to the location where construction is accomplished under a specific task order. Also referred to as the construction site.

1.3 Government Furnished Property, Materials, and Services

1.3.1 Government Furnished Facilities- The government will not furnish facilities.

1.3.1.1 Storage space will not be provided other than that described in paragraph 1.3.1.5, Lay Down Storage.

1.3.1.2 Office trailer

Location for an office trailer will be as designated by the Contracting Officer. The Contractor shall arrange for the required utilities and be held responsible for the cost thereof including all costs associated with obtaining utilities. Arrangements for hookup to NSWC, Crane utilities shall be made with the Contracting Officer's Representative.

1.3.1.3 TOILET FACILITIES

Contractor's personnel will be permitted to use toilet facilities, when available, at the construction sites subject to regulation and control of the Contracting Officer or his designated representative. When not available on or near a construction site, the Contractor is required to provide toilet facilities in accordance with local, state and/or federal regulations, and EM 385 1, and shall be included as required in the contractors proposed price for each Task Order.

1.3.1.4 AVAILABILITY OF ELEVATORS

Any temporary use of an existing elevator shall be arranged through the Government Field Representative. Such use shall be of an intermittent nature, the Contractor shall provide and maintain suitable and adequate protective covering for the elevator. On completion of work the Contractor shall remove the protective coverings together with any resultant dirt and

debris, and leave the equipment in a condition equal to that in which he/she found it.

1.3.1.5 LAY DOWN STORAGE

Lay down storage space may be furnished as noted in individual task orders. Off site lay down areas, if required, will be at the Contractors expense and need to meet the Contract requirements.

1.4 Contractor Furnished Items

a. The contractor shall furnish all labor, facilities (furnished office space), equipment, materials, parts, supplies and tools necessary for the performance of the work of this contract unless otherwise specified.

b. Materials and supplies procured by the contractor shall meet the specifications, standards, and manuals listed in these specifications. The Contracting Officer will require test data showing that any materials or supplies procured by the contractor meets the specifications. The Contracting Officer may at any time require samples of materials to be used in work performed under this contract.

c. If the quality of an item is not specified, it shall be of acceptable industrial grade and quality, equal to or better than the manufacturer's original and will be compatible with existing systems.

d. Administrative supplies and equipment shall be furnished by the contractor.

e. The Contractor, with his own forces, at no additional cost to the Government, shall transport all Government furnished equipment/materials, if provided and described on the task orders. The equipment/materials will be transported from the Government storage area to the work site indicated on the task order.

1.5 Commencement, Prosecution, and Completion of Work

1.5.1 General

a. The contract award date is the date the Contracting Officer signs the SF 1442.

b. The contract time for the purposes of fixing the contract completion date shall be 365 calendar days from the date of award.

c. Within 15 calendar days after award, the contractor shall submit (1) Certificate of Insurance, (2) Certification as to the percentage of work to be performed by the Contractor, and (3) Other administrative requirements.

d. The Government reserves the right to establish or change priorities in the phases of work in process within a location or in the order of performance of Task Orders as necessary to comply with government requirements.

e. The Government reserves the right to require the Contractor to provide services under multiple task Orders for multiple locations simultaneously.

f. It is the Government's intention to provide Task Orders to the Contractor that will allow their start and completion in a fair and reasonable manner.

g. The Government may issue multiple specific Task Orders simultaneously with varying completion dates. The Contractor shall be expected to provide sufficient work capability to meet those separate work requirements and schedules.

h. The Contractor shall be required to prosecute the work diligently, and complete the entire work ready for use within the timeframe designated in the task order. The time stated for completion shall include final cleanup of the premises.

i. The time for completion of individual task orders shall be negotiated through the Contracting Officer. The basis for completion times shall include estimated material delivery time, actual work time, and job site cleanup.

j. The Contractor shall prosecute the work diligently and make every endeavor to complete emergency work as expeditiously as possible. If necessary, the Contractor shall remain in force, if required by the Government, beyond the regular work shift (compensation for which will be made by means of the appropriate ELIN) to complete repairs.

k. Inspection of any of the Contractor work sites may be accomplished by the Activity Environmental Protection Coordinator, or authorized officials on a no-notice basis during normal working hours.

l. The Contractor shall comply with the instructions of the cognizant Navy Medical Department with respect to avoidance of conditions which create a nuisance or which may be hazardous to the health of military or civilian personnel.

m. The work site(s) shall be cleaned-up on a daily basis. This refers to removal of daily trash, debris, or items posing a safety or environmental risk to the Center. All break and maintenance areas shall be policed and cans, bottles, paper, plastic wrap, and any container containing oil, hydraulic fluid, antifreeze, etc., shall be containerized and removed from the Center. Any maintenance area that is contaminated by oil, hydraulic, fluid, antifreeze, etc., shall be properly remediated

n. No contractor personnel except the Janitorial Service are allowed to dump material in trash or metal containers
assigned to buildings or areas.

o. Keep dust at a minimum at all times, including non-working hours, weekends, and holidays. Only wet cutting of concrete and asphalt is permitted. Contain run-off from all wet-cutting and washing operations and dispose of the material in accordance with local, state, and federal environmental regulations.

p. When the Contractor submits the schedule of work, the contracting officer's Representative will re-emphasize those areas requiring authorization for entry and will brief the Contractor on the proper notification and entry procedures for the specific area. Accordingly, the Contractor shall not deviate from the submitted and approved work schedule without the proper notification to, and approval from,the Contracting Officer. This is an extremely important procedure requirement and is necessary for the safety and welfare of the Contractor and the employees.

1.5.2 Station Regulations

The Contractor, all employees and all subcontractors shall become acquainted with and obey all Station Regulations, including fire, traffic, safety and security regulations.

1.5.2.1 SECURITY REQUIREMENTS

1.5.2.1.1 General

a. The Contractor shall comply with all activity security requirements, as well as, OPNAV INSTRUCTION 5530.14 Physical Security on Loss Prevention. The Contractor shall submit the name and address of each employee hired for work on this contract and shall cause to be filled out questionnaires and other forms as may be required for security.

b. Neither the Contractor nor any of its employees shall disclose or cause to be disseminated any information concerning the operations of the activity which could result in or increase the likelihood of the possibility of a breach of the activity's security or interrupt the continuity of its operations.

c. Disclosure of information relating to the services hereunder to any person not entitled to receive it, or failure to safeguard any classified information that may come to the Contractor or any person under his control in connection with work under this contract, may subject the Contractor, his agents or employees to criminal liability under 18 U.S.C., Sections 793 and 798.

d. All inquiries, comments or complaints arising from any matter observed, experienced, or learned as a result of or in connection with the performance of this contract, the resolution of which may require the dissemination of official information, will be directed to the activity Commander.

e. Deviations from or violations of any of the provisions of this paragraph will, in addition to all other criminal and civil remedies provided by law, subject the Contractor to immediate termination for default, and/or withdrawal of the Government's acceptance and approval of employment for the individuals involved.

f. Whenever work performed under this contract breaches the physical security of any building or grounds, the Contractor will be responsible for providing temporary measures in order to assure physical security is maintained. The Contractor shall notify the Contracting Officer's Representative prior to beginning such work.

g. By entering the military installation, contract employees understand that they are subject to all legal searches and inspections. Contract employees also understand that they are responsible for complying with all Indiana State and local traffic laws and regulations. Further, that they are prohibited from transporting, carrying, possessing, or otherwise using the following items on the installation: firearms, ammunition, explosives, pyrotechnics, alcohol, illegal drugs, or any item or substance prohibited by Federal or Indiana State law.

h. Contract employees shall not use cameras (to include photographic features on cellular phones), camcorders, video recorders, tape recorders, or other recording devices in any CAAA area or where otherwise prohibited.

i. Contractor employees shall not park within 30' of any structure or where otherwise posted as prohibited, except to drop off or pick up deliveries in

direct support of this agreement. The contractor shall not access any CAAA area unless specifically requested, authorized by this agreement, or authorized by the government representative.

j. Contractor employees shall not disclose or cause to be disclosed any information concerning the operations and activities of CAAA or the Naval Surface Warfare Center, Crane. Release or disclosure of such information may subject the contractor or the contractor's employees to criminal liability under Title 18, United States Code.

k. The contractor shall furnish a point of contact name and telephone number to the government representative for antiterrorism/force protection purposes. In turn, the government representative will notify the NSA Force Protection Officer. The contractor understands that this agreement and access to the base may be cancelled at anytime due to threat conditions that may arise. The government will make every reasonable attempt to keep contractor employees informed should emergencies or conditions that may have an effect on them or this agreement occur.

l. Upon entry into any CAAA area where operations are on-going, contractors shall report to the building/area supervisor. In some instances, sign in of a visitor log and/or escort may be required.

m. The contractor shall immediately report crimes and accidents that occur on the installation to the NSA Emergency Dispatch, 812-854-2529 or 812-854-5316.

1.5.2.1.2 Passes and Badges

a. All Contractor employees shall obtain the required employee passes. All Contract employees who will be working on-center at NSA Crane are required to be badged through the Navy Commercial Access Control System (NCACS) Contractors/Vendors Program (i.e. RapidGate). Each employee shall retain their badge on their person at all times while at the NSA Crane.

b. Employee identification shall not be substituted for the station required badge. Other badge or identification requirements may be spelled out in the Task Orders.

c. Rapid Gate information can be found at the following web site: http://www.rapidgate.com/

All cost associated with Rapid Gate shall be the responsibility of the Contractor.

d. All contractors and subcontractors including suppliers and delivery companies are required to get RapidGate passes or obtain a daily pass by stopping at the visitor's center each day to undergo a background check and obtain a pass which could take a minimum of 30 minutes each day. Passes of a duration longer than one day will not be issued. Please do not request passes of a duration longer than one day from the project manager, engineering tech, or contract specialist.

e. An exception to paragraph (d) above is that the visitor's center will issue a 28-day pass after the employee enrolls in RapidGate, the payment has been processed, and the employee undergoes a background check and is waiting for their RapidGate pass to be processed.

f. To request 1 day visitor passes:

- A SECNAV 5512-1 Access Form will need to be filled out and SIGNED by the individual needing a pass. (see part 6 of the contract documents under

'forms' for this)
- Base Sponsor will be your contract's assigned Construction Manager (CM), Design Manager (DM), or Engineer Technician (ET)
- Forms missing information including but not limited to the Base Sponsor information will not be processed but will be returned for completion and resubmission.
- Forms for subcontractors shall be forwarded to the CM/DM/ET by the prime contractor.
- Forms must be received by the CM/DM/ET FIVE WORKING days ahead of the requested visit date so security can conduct a background check.
- A completed SECNAV 5512-1 Access Form is only valid for 90 days. If it has been over 90 days a new signed SECNAV 5512-1 Form will need to be submitted by the individual.

g. Due to the requirement to conduct background checks, requests for one day passes that are not submitted at least 5 working days prior may not be granted.

h. Personnel requiring access for more than 10 working days in a 12-month period, regardless if it's for work on one or multiple contracts, will enroll in RapidGate. Requests for one day passes for the same individual exceeding 10 working days won't be processed.

i. If entry of any individual is denied, the Contractor will be immediately notified. Failure to obtain entry approval will not affect the contract price or time of completion.

j. When an employee leaves the Contractor's service or is removed from the contractor by request of the Contracting Officer, the employee's badge shall be returned to the contractor the same day. That same day, the contractor shall inform NSA Crane Security (Mr. Mark Zehnder 854-8393) that the employee is no longer allowed access to NSA Crane.

k. If an employee's badge is lost or stolen, it must be reported to the Government security Office immediately.

l. Be advised that the RapidGate process and the temporary badge process both involve a background check. Persons with any felony conviction, persons listed on the terrorist watch list, persons who are registered sex offenders, persons with any outstanding criminal warrants, and persons with certain misdemeanors (drugs, crimes of violence, repeat offenders, and larceny) will not be issued badges or passes. Note: These criteria for access to the center are subject to change.

m. The REAL ID Act of 2005, by DHS, effects access control to all federal facilities and DOD installations. Currently NSA is not authorized to accept State Driver Licenses and State ID Cards from the following States and Territory for access control purposes at our installation:

- Minnesota
- Illinois
- Missouri
- New Mexico
- Washington
- American Samoa

However, Minnesota and Washington currently issue Enhanced Drivers Licenses (EDL) as well. So if someone is using an EDL from either one of these state, we CAN accept it for access control purposes, but not the standard driver's license (DL) from these two states. This will change as states become compliant with the DL requirements.

n. Employee identification shall not be substituted for the station required

badge.

o. Badges shall be worn in such a manner as to be visible all times the employee is on Center. Workers involved in heavy labor tasks may keep their badges in a secure location, readily available for presentation to proper authorities.

1.5.2.1.3 ACCESS TO BUILDINGS

a. It shall be the Contractor's responsibility, through the Contracting Officer, to obtain access to buildings and facilities and arrange for them to be opened and closed.

b. Keys may be issued to the Contractor. In that event it is the Contractor's responsibility to secure the project site at the end of each work day.

c. The Contractor shall be responsible for the cost of replacing any keys that are furnished to and lost by his employees, plus immediately notifying the Contracting Officer's Representative. No locks or keys shall be replaced without prior approval of the Contracting Officer. If the Contracting Officer decides that a lock must be replaced because of the loss of a key by the Contractor's employees, the Contractor shall pay the cost of that replacement. Similarly, the Contractor shall pay the cost of changing a combination if the Contracting Officer has reasonable cause to believe that the combination has been compromised.

1.5.2.1.4 IDENTIFICATION OF CONTRACTOR EMPLOYEES

a. All contractor/subcontractor personnel shall by identified by a distinctive name plate, emblem, or patch attached in a predominant place on an outer garment. Employee identification shall not be substituted for station required passes and badges.

b. The Contractor shall provide to the Contracting Officer the name or names of the responsible supervisory person or persons authorized to act for the Contractor.

c. The Contractor shall furnish sufficient personnel to perform all work specified within the contract.

d. Contractor employees shall conduct themselves in a proper, efficient, courteous and businesslike manner.

e. The Contractor shall remove from the site any individual whose continued employment is deemed by the Contracting Officer to be contrary to the public interest or inconsistent with the best interests of national security.

f. No employee or representative of the Contractor will be admitted to the site of work unless he furnishes satisfactory proof that he or she is a citizen of the United States. It is the Contractor's responsibility to provide employees who comply with this requirement. The Contractor shall also be responsible for strict compliance with security regulations by all

employees including subcontractors, vendors, and their employees. All personnel employed on Center shall keep within the limits of the work and avenues of ingress and egress and shall not enter any restricted areas unless required to do so and cleared for such entry. All personnel must be off Center by sundown unless special permission for night operations is secured. Security guard challenges must be answered and all orders must be obeyed.

g. The Contractor is prohibited from hiring any Contract Surveillance Representative or any other Government employee associated with administration of this contract unless it with the Contracting Officer's prior written consent.

h. It is the Contractor's responsibility to maintain satisfactory labor relations with his/her employees. Representatives of/and the Contracting Officer will not participate in labor relations matters.

i. Each Contractor provided vehicle shall show the Contractor's name so that it is clearly visible and shall, at all times, display a valid state license plate. Contractor vehicles operated on Government property shall be maintained in good repair.

j. In accordance with FAR 52.236-7, PERMITS AND RESPONSIBILITIES, the Contractor shall, without additional expense to the Government, obtain all appointments, licenses, and permits required for the prosecution of the work. Evidence of such permits and licenses shall be provided to the Contracting Officer and/or his or her designated representative before work commences. All Contractor employees operating vehicles on Government property shall possess a valid state motor vehicle operator's license.

1.5.3 EXISTING WORK

a. The disassembling, disconnecting, cutting, removing or altering in any way of existing work shall be carried on in such a manner as to prevent injury or damage to all portions of existing work, whether they are to remain in place, be reused in the new work, or salvaged and stored.

b. All portions of existing work which have been cut, damaged or altered in any way during construction operations shall be repaired or replaced in kind and in a manner to match existing or inclusive and additional documentation may be required. All work of this nature shall be performed by the Contractor at his/her expense and shall be as directed by the Contracting Officer. Existing work shall, at the completion of all operations, be left in a condition as good as existing before the new work started.

c. Extreme hazards may be caused by rain or other natural elements entering the building through temporary openings. The Contractor shall take all immediate actions required to seal off such openings immediately when rain or other detrimental weather is imminent, and at the end of each workday, and shall ensure that the openings are completely sealed off to protect materials and equipment in and around the building from damage.

1.5.4 PERFORMANCE EVALUATIONS

The Government may, at its discretion, prepare evaluation reports on each task order and the contractor's overall performance. The contractor may be periodically requested to comment on these reports in writing.

1.5.5 MINIMUM WAGE RATES AND OTHER LABOR STANDARDS

a. The Contractor shall pay mechanics and laborers employed or working directly upon the site of the work wage rates not less than those determined

as prevailing by the Secretary of Labor and contained in the wage determination decisions that are attached to this specification or addendum thereto.

b. In the event of any difference between the Contractor and the Government concerning the proper wage rates to be paid, the classification of employees to conform to prevailing practice, the amount of wages due employees or any other application or interpretation of the labor standards provisions in this contract, the difference shall be referred to the Contracting Officer who shall determine that matter with advice from the Secretary of Labor as required by the Department of Labor Regulations.

c. Investigation of Labor Conditions. The wage determination decision of the Secretary of Labor attached hereto or included by amendment is made part of this contract for the purpose of setting forth the minimum hourly wage rates required to be paid by the Construction Wage Rate Requirements. The rates set forth in the wage determination are no warranty that labor will be available at these rates. Offerors are advised to make their own investigation to determine local labor conditions. Applicable wage determinations are found in an attachment to this document.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES
11/11

PART 1 GENERAL

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8	(2009) Construction Equipment Ownership and Operating Expense Schedule

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Schedule of Prices; G

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

Within 15 calendar days of notice of a task order award, prepare and deliver to the Contracting Officer a Schedule of Prices (construction contract) as directed by the Contracting Officer. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices. Costs shall be summarized and totals provided for each construction category.

1.3.2 Schedule Instructions

Payments will not be made until the Schedule of Prices has been submitted to and accepted by the Contracting Officer. Identify the cost for site work, and include incidental work to the 5 ft line. Identify costs for the building(s), and include work out to the 5 ft line. Work out to the 5 ft line shall include construction encompassed within a theoretical line 5 ft from the face of exterior walls and shall include attendant construction, such as pad mounted HVAC cooling equipment, cooling towers, and transformers placed beyond the 5 ft line.

1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting

records, equipment use rates shall be based upon the applicable provisions of the EP-1110-1-8.

1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

1.5.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract Clause FAR 52.232-27, Prompt Payment Construction Contracts and FAR 52.232-5, Payments Under Fixed-Price Construction Contracts. For task orders valued at $25,000.00 or less only one invoice shall be submitted unless prior approval is obtained from the Contracting Officer. For task orders valued at $25,000.00 or greater, multiple invoices may be submitted, but only one invoice should be submitted per each 30 calendar day period. The requests for payment shall include the documents listed below.

a. The Contractor's invoice, on NAVFAC Form 7300/30 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 7300/30 shall include certification by Quality Control (QC) Manager as required by the contract.

b. The Estimate for Voucher/ Contract Performance Statement on NAVFAC Form 7300/31 furnished by the Government, showing in detail: the estimated cost, percentage of completion, and value of completed performance for each of the construction categories stated in this contract. Use NAVFAC LANT Form 4-330/110 (New 7/84) on NAVFAC LANT contracts when a Monthly Estimate for Voucher is required.

c. Updated Project Schedule and reports required by the contract.

d. Contractor Safety Self Evaluation Checklist.

e. Other supporting documents as requested.

f. Updated copy of submittal register.

g. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.

1.5.2 Submission of Invoices

In accordance with DFARS 252.232-7006, the documents listed in paragraph "CONTENT OF INVOICE" shall be provided in their entirety as attachments in Wide Area Work Flow (WAWF) for each invoice submitted. The maximum size of each WAWF attachment is two megabytes, but there are no limits on the number of attachments. If a document cannot be attached in WAWF due to system or size restriction it shall be provided as instructed by the Contracting Officer.

1.5.3 Final Invoice

a. A final invoice shall be accompanied by the certification required by DFARS 252.247.7023 TRANSPORTATION OF SUPPLIES BY SEA, and the Contractor's Final Release. If the Contractor is incorporated, the Final Release shall contain the corporate seal. An officer of the corporation shall sign and the corporate secretary shall certify the

Final Release.

b. For final invoices being submitted via WAWF, the original Contractor's Final Release Form and required certification of Transportation of Supplies by Sea must be provided directly to the respective Contracting Officer prior to submission of the final invoice. Once receipt of the original Final Release Form and required certification of Transportation of Supplies by Sea has been confirmed by the Contracting Officer, the Contractor shall then submit final invoice and attach a copy of the Final Release Form and required certification of Transportation of Supplies by Sea in WAWF.

c. Final invoices not accompanied by the Contractor's Final Release and required certification of Transportation of Supplies by Sea will be considered incomplete and will be returned to the Contractor.

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the FAR and agency regulations including the following in accordance with "FAR 32.503-6:

a. Reasonable deductions due to defects in material or workmanship;

b. Claims which the Government may have against the Contractor under or in connection with this contract;

c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and

d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

1.6.2 Payment for Onsite and Offsite Materials

Progress payments may be made to the contractor for materials delivered on the site, for materials stored off construction sites, or materials that are in transit to the construction sites under the following conditions:

a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.

b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment shall be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings,precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs), and high-voltage electrical cable. Materials not acceptable for payment

include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.

c. Materials to be considered for progress payment prior to installation shall be specifically and separately identified in the Contractor's estimates of work submitted for the Contracting Officer's approval in accordance with Schedule of Prices requirement of this contract. Requests for progress payment consideration for such items shall be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 have been met.

d. Materials are adequately insured and protected from theft and exposure.

e. Provide a written consent from the surety company with each payment request for offsite materials.

f. Materials to be considered for progress payments prior to installation shall be stored either in Hawaii, Guam, Puerto Rico, or the Continental United States. Other locations are subject to written approval by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS
08/15

PART 1 GENERAL

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

View Location Map; G

Progress and Completion Pictures; G

1.3 VIEW LOCATION MAP

Submit, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.4 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color minimum resolution in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten views from points located by the Contracting Officer. Submit with the monthly invoice two sets of digital photographs, each set on a separate compact disc (CD) or data versatile disc (DVD), cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Provide photographs for each month in a separate monthly directory and name each file to indicate its location on the view location sketch. Also provide the view location sketch on the CD or DVD as a digital file. Include a date designator in file names. Cross reference submittals in the appropriate daily report. Photographs provided are for unrestricted use by the Government.

1.5 MINIMUM INSURANCE REQUIREMENTS

Provide the following minimum insurance coverage required by FAR 52.228-5, during the entire period of performance under this contract. Provide other insurance coverage as required by State law.
a. Comprehensive general liability: $500,000 per occurrence
b. Automobile liability: $200,00 per person, $500,000 per occurrence for bodily injury, $20,000 per occurrence for property damage;
c. Workman's compensation as required by Federal and State workers' compensation and occupational disease laws.;
d. Employer's liability coverage of $100,000, except in States where worker's compensation may not be written by private carriers;
e. Others as required by Indiana state law. These certificates of insurance shall be submitted to the Contracting Officer within 15 calendar days after award of the contract and resubmitted upon their expiration or renewal. Approval of the certificate of insurance is required to performing any on-site work on any task order in this contract.

1.6 FIRST TIER CONTRACTOR REQUIREMENTS FOR ASBESTOS CONTAINING MATERIALS

Accomplish all contract requirements of Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS, assigned to the Private Qualified Person, directly with a first tier subcontractor.

1.7 SUPERVISION

1.7.1 Minimum Communication Requirements

Have at least one qualified superintendent, or competent alternate, capable of reading, writing, and conversing fluently in the English language, on the job-site at all times during the performance of contract work. In addition, if a Quality Control (QC) representative is required on the contract, then that individual must also have fluent English communication skills.

1.7.2 Superintendent Qualifications

The project superintendent must have a minimum of 5 years experience in construction with at least 3 of those years as a superintendent on projects similar in size and complexity. The individual must be familiar with the requirements of EM 385-1-1 and have experience in the areas of hazard identification and safety compliance. The individual must be capable of interpreting a critical path schedule and construction drawings. The qualification requirements for the alternate superintendent are the same as for the project superintendent. The Contracting Officer may request proof of the superintendent's qualifications at any point in the project if the performance of the superintendent is in question.

For routine projects where the superintendent is permitted to also serve as the Quality Control (QC) Manager as established in Section 01 45 00.00 20 QUALITY CONTROL, the superintendent must have qualifications in accordance with that section.

1.7.2.1 Duties

The project superintendent is primarily responsible for managing and coordinating day-to-day production and schedule adherence on the project. The superintendent is required to attend NAVFAC Red Zone meetings, partnering meetings, and quality control meetings. The superintendent or

qualified alternative must be on-site at all times during the performance of this contract until the work is completed and accepted.

1.7.3 Non-Compliance Actions

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to insure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

1.8 PRECONSTRUCTION MEETING

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule of prices or earned value report, shop drawings, and other submittals, scheduling programming, prosecution of the work, and clear expectations of the "Interim DD Form 1354" Submittal. Major subcontractors who will engage in the work must also attend.

1.9 FACILITY TURNOVER PLANNING MEETINGS (NAVFAC Red Zone - NRZ)

Meet with the Government to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the turnover process at the Pre-Construction Conference meeting with a discussion of the NAVFAC Red Zone (NRZ) process and convene at regularly scheduled NRZ Meetings. Include the following in the facility Turnover effort:

1.9.1 NRZ Checklist

a. Contracting Officer's Technical Representative (COTR) will provide the Contractor a copy of the NRZ Checklist template prior to 75 percent completion.

b. Prior to 75 percent completion add/delete critical activities to the NRZ Checklist template as necessary to match the project scope, and schedule critical activities and insert planned completion dates in the NRZ checklist for each critical activity. Present the NRZ Checklist to COTR and review during a regularly scheduled QC Meeting.

1.9.2 Meetings

a. Upon Government acceptance of the NRZ Checklist, the Project Superintendent is required to lead regular NRZ Meetings beginning at approximately 75 percent project completion, or three to six months prior to Beneficial Occupancy Date (BOD), whichever comes first.

b. The Contracting Officer will determine the frequency of the meetings, which is expected to increase as the project completion draws nearer.

c. Using the NRZ Checklist as a Plan of Action and Milestones (POAM) and basis for discussion, review upcoming critical activities and strategies to ensure work is completed on time.

d. Coordinate with the COTR any upcoming activities that require Government involvement.

e. Maintain the NRZ Checklist by documenting the actual completion dates as work is completed and update the NRZ Checklist with revised planned completion dates as necessary to match progress. Distribute copies of the current NRZ Checklist to attendees at each NRZ Meeting.

1.10 PARTNERING

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members are from the Government, the Contractor and their Subcontractors. Key personnel from the Supported Command, the End User (who will occupy the facility), the Government Design and Construction team and Subject Matter Experts, the Installation, the Contractor and Subcontractors, and the Designer of Record will be invited to participate in the Partnering process. The Partnership will draw on the strength of each organization in an effort to achieve a project that is without any safety mishaps, conforms to the Contract, and stays within budget and on schedule.

The Contracting Officer will provide Information on the Partnering Process and a list of key and optional personnel who should attend the Partnering meeting.

1.11 ELECTRONIC MAIL (E-MAIL) ADDRESS

Establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments as text files, pdf files, and other similar formats. Within 10 days after contract award, provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes or terrorist threats. Multiple email addresses are not allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including field office(s). Promptly notify the Contracting Officer, in writing, of any changes to this email address.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
05/11

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

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

SD-01 Preconstruction Submittals

Submittals which are required prior to or commencing work on site.

Certificates of insurance

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction progress schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices or Earned Value Report

Health and safety plan

Work plan

Quality Control(QC) plan

Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts,

instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier,

installer or Subcontractor through Contractor. The document purpose is to further promote the orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS)concerning impedances, hazards and safety precautions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 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.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved (G)

Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings."

1.3.2 Sustainability Reporting Submittals (S)

Submittals for Guiding Principle Validation (GPV) or Third Party Certification (TPC) are indicated with an "S" designation. Submit the information required by the technical sections that demonstrates compliance with the sustainable requirement, and for inclusion in the Sustainability Notebook as required by Section 01 33 29 SUSTAINABILITY REPORTING. A full submittal for an item may be provided under another SD; however, for the "S" submittal, only provide that portion of the submittal that demonstrates compliance with the sustainable requirement. If the sustainable submittal does require Government Approval, it may be tagged under another SD with a "G."

Schedule submittals for these items throughout the course of construction as provided; do not wait until closeout.

1.4 FORWARDING SUBMITTALS REQUIRING GOVERNMENT APPROVAL

1.4.1 Submittals Required from the Contractor

As soon as practicable after award of contract, and before procurement of fabrication, forward to the Contracting officer submittals required in the technical sections of this specification, including shop drawings, product data and samples. Forward one copy of the transmittal form for all submittals to the Resident Officer in Charge of Construction.

NAVFAC Project manager will review and approve for the Contracting Officer those submittals reserved for Contracting Officer approval to verify submittals comply with the contract requirements.

1.4.1.1 O&M Data

NAVFAC Project manager will review and approve for the Contracting Officer O&M Data to verify the submittals comply with the contract requirements; submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.

In the event the Contractor fails to deliver O&M Data within the time limits specified, the Contracting Officer may withhold from progress payments 50 percent of the price of the item with which such O&M Data are applicable.

1.5 PREPARATION

1.5.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels to office of Project manager. Transmit submittals with transmittal form prescribed by Contracting Officer and standard for project. On the transmittal form identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph IDENTIFYING SUBMITTALS of this section. Process transmittal forms to record actions regarding samples .

1.5.2 Identifying Submittals

When submittals are provided by a Subcontractor, the Prime Contractor is to prepare, review and stamp with Contractor's approval all specified submittals prior to submitting for Government approval.

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

a. Project title and location.

b. Construction contract number.

c. Date of the drawings and revisions.

d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other subcontractor associated with the submittal.

e. Section number of the specification section by which submittal is required.

f. Submittal description (SD) number of each component of submittal.

g. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.

h. Product identification and location in project.

1.5.3 Format for SD-02 Shop Drawings

Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.

Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph IDENTIFYING SUBMITTALS.

Number drawings in a logical sequence. Contractors may use their own number system. Each drawing is to bear the number of the submittal in a uniform location adjacent to the title block. Place the Government contract number in the margin, immediately below the title block, for each

drawing.

Reserve a blank space, no smaller than 2 inches on the right hand side of each sheet for the Government disposition stamp.

Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Include the nameplate data, size and capacity on drawings. Also include applicable federal, military, industry and technical society publication references.

Submit drawings PDF format.

1.5.4 Format of SD-03 Product Data and SD-08 Manufacturer's Instructions

Present product data submittals for each section. Include table of contents, listing page and catalog item numbers for product data.

Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.

Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.

Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.

Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will be accepted for expedition of construction effort.

Submit manufacturer's instructions prior to installation.

1.5.5 Format of SD-04 Samples

Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:

a. Sample of Equipment or Device: Full size.

b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

e. Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples are to be in undamaged condition at time of use.

Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.

When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.5.6 Format of SD-05 Design Data and SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inches paper.

1.5.7 Format of SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

1.5.8 Format of SD-10 Operation and Maintenance Data (O&M)

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format.

1.5.9 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

1.5.10 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the Contractor. Only those requested by the Contractor to prepare shop drawings may be provided. Request the specific Drawing Number only for the preparation of Shop Drawings. These drawings may only be provided after award.

1.5.10.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic Source Drawing files are not construction documents. Differences may exist between the Source Drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic Source Drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source Drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic Source Drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Samples SD-04 Samples

a. Submit two samples, or two sets of samples showing range of variation,

of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.7 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.7.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.7.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.7.3 Warranting that Variations are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.7.4 Review Schedule is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.8 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and

materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Column (f): Indicate approving authority for each submittal.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

1.8.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.8.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.8.4 Action Codes

1.8.4.1 Government Review Action Codes

"A" - "Approved as submitted"; "Completed"
"B" - "Approved, except as noted on drawings"; "Completed"
"C" - "Approved, resubmission required"; "Resubmit"
"D" - "Returned by correspondence"; "Completed"
"E" - "Disapproved (See attached)"; "Resubmit"
"F" - "Receipt acknowledged"; "Completed"
"G" - "Other (Specify)"; "Resubmit"
"X" - "Receipt acknowledged, does not comply"; "Resubmit"

1.8.4.2 Contractor Action Codes

NR - Not Received
AN - Approved as noted
A - Approved
RR - Disapproved, Revise, and Resubmit

1.8.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.9 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 5 calendar days will be allowed and shown on the register for review and approval of submittals for .

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

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

e. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 10 working days for submittals for QC Manager approval and 12 working days for submittals for Contracting Officer approval. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization.

f. For submittals requiring review by fire protection engineer, allow review period, beginning when Government receives submittal from QC organization, of 15 working days for return of submittal to the Contractor.

g. Period of review for each resubmittal is the same as for initial submittal.

1.9.1 Reviewing, Certifying, Approving Authority

The QC organization is responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is QC Manager unless otherwise specified for specific submittal. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Contracting Officer is approving authority for that submittal item. An "S" following a submittal item, indicates that the QC Manager is the approving authority, and that a copy of the approved submittal must be provided to the Designer of Record.

1.9.2 Constraints

Conform to provisions of this section, unless explicitly stated otherwise for submittals listed or specified in this contract.

Submit complete submittals for each definable feature of work. Submit at the same time components of definable feature interrelated as a system.

When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.

Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.9.3 QC Organization Responsibilities

a. Note date on which submittal was received from Contractor on each submittal.

b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.

c. Review submittals for conformance with project design concepts and compliance with contract documents.

d. Act on submittals, determining appropriate action based on QC organization's review of submittal.

(1) When QC Manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph APPROVED SUBMITTALS.

(2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.

e. Ensure that material is clearly legible.

f. Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

(1) When approving authority is Contracting Officer, QC organization will certify submittals forwarded to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number , is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer_____, Date _____
(Signature when applicable)

Certified by QC Manager_____, Date_____"
(Signature)

(2) When approving authority is QC Manager, QC Manager will use the following approval statement when returning submittals to Contractor as "Approved" or "Approved as Noted."

"I hereby certify that the (material) (equipment) (article) shown and marked in this submittal and proposed to be incorporated with contract Number , is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is approved for use.

Certified by Submittal Reviewer_____, Date _____
(Signature when applicable)

Approved by QC Manager_____, Date_____"
(Signature)

g. Sign certifying statement or approval statement. The QC organization member designated in the approved QC plan is the person signing certifying statements. The use of original ink for signatures is required. Stamped signatures are not acceptable.

h. Update submittal register as submittal actions occur and maintain the submittal register at project site until final acceptance of all work

by Contracting Officer.

i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

j. For "S" submittals, provide a copy of the approved submittal to the Designer of Record.

1.10 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received from QC Manager.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. 2 copies of the submittal will be retained by the Contracting Officer and 2 copies of the submittal will be returned to the Contractor.

1.10.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" "or approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.11 DISAPPROVED OR REJECTED SUBMITTALS

Contractor shall make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the Contract clause CHANGES, is to be given to the Contracting Officer. Contractor is responsible for the

dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.12 APPROVED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that

Approval or 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.

After submittals have been approved or 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.

1.13 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
11/15

PART 1 GENERAL

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 SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems,

	Subsystems and Components
ASSE/SAFE Z359.6	(2009) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20	(2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
ASME B30.22	(2010) Articulating Boom Cranes
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware
ASME B30.3	(2012) Tower Cranes
ASME B30.5	(2014) Mobile and Locomotive Cranes
ASME B30.8	(2010) Floating Cranes and Floating Derricks
ASME B30.9	(2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2003) Guide for Protective Grounding of Power Lines
IEEE C2	(2012; Errata 1 2012; INT 1-4 2012; Errata 2 2013; INT 5-7 2013; INT 8-10 2014; INT 11 2015) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA Z535.2	(2011) Environmental and Facility Safety Signs

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2013) Standard for Portable Fire Extinguishers
NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 51B	(2014) Standard for Fire Prevention During

	Welding, Cutting, and Other Hot Work
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code
NFPA 70E	(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

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

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing

existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding

systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

a. Death, regardless of the time between the injury and death, or the length of the illness;

b. Days away from work (any time lost after day of injury/illness onset);

c. Restricted work;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

1.2.17 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or

roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the NAVFAC prescribed Navy Crane Center (NCC) form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G

LHE Inspection Reports

SD-07 Certificates

Contractor Safety Self-Evaluation Checklist

Crane Operators/Riggers

Standard Lift Plan; G

Critical Lift Plan ; G

Naval Architecture Analysis; G

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

Third Party Certification of Barge-Mounted Mobile Cranes

License Certificates

Radiography Operation Planning Work Sheet; G

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the

report may result in retention of up to 10 percent of the voucher.

1.5 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. Complete the checklist monthly and submit with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90 may result in retention of up to 10 percent of the voucher.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6.1 Subcontractor Safety Requirements

For this contract, neither Contractor nor any subcontractor may enter into contract with any subcontractor that fails to meet the following requirements. The term subcontractor in this and the following paragraphs means any entity holding a contract with the Contractor or with a subcontractor at any tier.

1.6.1.1 Experience Modification Rate (EMR)

Subcontractors on this contract must have an effective EMR less than or equal to 1.10, as computed by the National Council on Compensation Insurance (NCCI) or if not available, as computed by the state agency's rating bureau in the state where the subcontractor is registered, when entering into a subcontract agreement with the Prime Contractor or a subcontractor at any tier. The Prime Contractor may submit a written request for additional consideration to the Contracting Officer where the specified acceptable EMR range cannot be achieved. Relaxation of the EMR range will only be considered for approval on a case-by-case basis for special conditions and must not be anticipated as tacit approval. Contractor's Site Safety and Health Officer (SSHO) must collect and maintain the certified EMR ratings for all subcontractors on the project and make them available to the Government at the Government's request.

1.6.1.2 OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate

Subcontractors on this contract must have a DART rate, calculated from the most recent, complete calendar year, less than or equal to 3.4 when entering into a subcontract agreement with the Prime Contractor or a subcontractor at any tier. The OSHA Dart Rate is calculated using the following formula:

(N/EH) x 200,000

where:

N = number of injuries and illnesses with days away, restricted work, or job transfer

EH = total hours worked by all employees during most recent, complete calendar year

200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year)

The Prime Contractor may submit a written request for additional consideration to the Contracting Officer where the specified acceptable OSHA Dart rate range cannot be achieved for a particular subcontractor. Relaxation of the OSHA DART rate range will only be considered for approval on a case-by-case basis for special conditions and must not be anticipated as tacit approval. Contractor's Site Safety and Health Officer (SSHO) must collect and maintain self-certified OSHA DART rates for all subcontractors on the project and make them available to the Government at the Government's request.

1.7 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.7.1 Personnel Qualifications

1.7.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.7.1.2 Contractor Quality Control (QC) Manager:

The Contractor Quality Control Manager can be the SSHO on this project.

1.7.1.3 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health

Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for information in consultation with the Safety Office.

1.7.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

1.7.1.3.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.7.1.3.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.7.1.4 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards,Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.7.1.5 Dredging Contract Requirements

1.7.1.5.1 Dredging Safety Personnel Requirements

a. Provide a minimum of one SSHO assigned per project site for the primary working shift.

b. For a project involving multiple work shifts, provide one full-time or collateral duty SSHO for each additional shift.

c. For individual dredging projects or sites with a dredge crew and fill crew on watch of 8 employees or less, a CDSO must be appointed, instead of an SSHO. The CDSO assumes the same responsibilities as a full-time SSHO.

d. An example of one dredging project site is reflected in each of the following:

(1) a mechanical dredge, tug(s) and scow(s), scow route, and material placement site; or

(2) a hydraulic pipeline dredge, attendant plant, and material placement site; or,

(3) a hopper dredge (include land-based material placement site - if applicable.)

e. For Hopper Dredges with the U.S. Coast Guard, documented crews may designate an officer as a Collateral Duty Safety Officer (CDSO) instead of having a full-time SSHO onboard if the officer meets the SSHO training and experience requirements.

1.7.1.5.2 SSHO Requirements for Dredging

a. In addition to requirements stated elsewhere in this specification, an individual serving as a SSHO must be present at the project site, located so that they have full mobility and reasonable access to all major work operations, for at least one shift in each 24 hour period when work is being performed. The SSHO must be available during their shift for immediate verbal consultation and notification, either by phone or radio.

b. The SSHO is a full-time, dedicated position, except as noted above, who must report to a senior project (or corporate) official. When the SSHO is permitted to be a collateral duty, the SSHO is not permitted to be in another position requiring continuous mechanical or equipment operations, such as equipment operators.

c. The SSHO must inspect all work areas and operations during initial set-up and at least monthly observe and provide personal oversight on each shift during dredging operations for projects with many work sites, more often for those with less work sites.

d. If the SSHO is off-site for a period longer than 24 hours, anotherqualified SSHO must be provided and fulfill the same roles and responsibilities as the SSHO during their absence.

1.7.1.5.3 Collateral Duty Safety Officer (CDSO) Requirements for Dredging

a. A CDSO is an individual who is assigned collateral duty safety responsibilities in addition to their full-time occupation, and who supports and supplements the SSHO efforts in managing, implementing and enforcing the Contractor's Safety and Health Program. The assigned CDSO must be an individual(s) with work oversight responsibilities, such as master, mate, fill foreman, or superintendent. A CDSO must not

be an employee responsible for continuous mechanical or equipment operations, such as an equipment operator.

b. A CDSO performs safety program tasks as assigned by the SSHO and must report safety findings to the SSHO. The SSHO must document results of safety findings and provide information for inclusion in the CQC reports to the Contracting Officer.

1.7.1.5.4 Safety Personnel Training Requirements for Dredging

A SSHO and a CDSO for dredging contracts must take either a formal classroom or online OSHA 30-hour Construction Safety Course, or an equivalent 30 hours of formal classroom or online safety and health training covering the subjects of the OSHA 30-hour Course in accordance with EM 385-1-1 Appendix A, paragraph 3.d.(3), applicable to dredging work, and given by qualified instructors. In exception to EM 385-1-1, Section 01.A.17, comply with the following:

a. The SSHO must maintain competency through having taken 8 hours of formal classroom or online safety and health related coursework every year. Hours spent as an instructor in such courses will be considered the same as attending them, but each course only gets credit once (for example, instructing a 1-hour asbestos awareness course 5 times in a year provides one hour credit for training).

b. The SSHO and a CDSO must have a minimum of three years of experience within the past five years in one of the following:

(1) Supervising/managing dredging activities

(2) Supervising/managing marine construction activities

(3) Supervising/managing land-based construction activities

(4) Work managing safety programs or processes

(5) Conducting hazard analyses and developing controls in activities or environments with similar hazards

1.7.1.6 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.7.2 Personnel Duties

1.7.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily

production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300 on the site Safety Bulletin Board.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.7.3 Meetings

1.7.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government

review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin work until an APP is established that is acceptable to the Contracting Officer.

1.7.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.8 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as

necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.8.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.8.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.8.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.8.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made.

Maintain historical SLPs for a minimum of 3 months.

1.8.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of floating cranes. The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

c. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.8.2.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the

course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.8.2.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.8.2.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.8.2.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.8.2.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD.

1.8.2.9 Lead Compliance Plan

Identify the safety and health aspects of lead work, and prepare in accordance with Section 02 83 13.00 20 LEAD IN CONSTRUCTION.

1.8.2.10 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS.

1.8.2.11 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.8.2.12 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 DEMOLITION and referenced sources. Include engineering survey as applicable.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.9.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.9.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.10 DISPLAY OF SAFETY INFORMATION

1.10.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.06. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.10.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 NOTIFICATIONS and REPORTS

1.13.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.13.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS). The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: For Navy Projects, complete the applicable documentation in NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS). Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.13.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.13.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.14 HOT WORK

1.14.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.14.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.15 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO), and Contracting Oversight Technician (COT) for all specialized and licensed material and equipment proposed for use on the construction project. Maintain on-site records whenever licensed radiological materials or ionizing equipment are on government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.15.1 Radiography Operation Planning Work Sheet

Submit a Radiography Operation Planning Work Sheet to Contracting Officer 14 days prior to commencement of operations involving radioactive materials or radiation generating devices. The Contracting Officer will review this worksheet and submit questions and comments.

Contractors must use primary dosimeters process by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

1.15.2 Site Access and Security

Coordinate site access and security requirements with the Contracting Officer for all radiological materials and equipment containing ionizing radiation that are proposed for use on a government facility. The authorized representative will meet the Contractor at a designated location, ensure safety of the materials being transported, and will escort the Contractor to the job site and return upon completion of the work.

Provide a copy of all calibration records, and utilization records for radiological operations performed on the site.

1.15.3 Loss or Release and Unplanned Personnel Exposure

Loss or release of radioactive materials, and unplanned personnel exposures

must be reported immediately to the Contracting Officer, RSO, and Base Security Department Emergency Number.

1.15.4 Site Demarcation and Barricade

Properly demark and barricade an area surrounding radiological operations to preclude personnel entrance, in accordance with EM 385-1-1, Nuclear Regulatory Commission, and Applicable State regulations and license requirements, and in accordance with requirements established in the accepted Radiography Operation Planning Work Sheet.

Do not close or obstruct streets, walks, and other facilities occupied and used by the Government without written permission from the Contracting Officer.

1.15.5 Security of Material and Equipment

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment. In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, make no assumptions as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, position a fully instructed employee inside the building or area to prevent exiting while external radiographic operations are in process.

1.15.6 Transportation of Material

Comply with 49 CFR 173 for Transportation of Regulated Amounts of Radioactive Material. Notify Local Fire authorities and the site Radiation Safety officer (RSO) of any Radioactive Material use.

1.15.7 Schedule for Exposure or Unshielding

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

1.15.8 Transmitter Requirements

Adhere to the base policy concerning the use of transmitters, such as radios and cell phones. Obey Emissions control (EMCON) restrictions.

1.16 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.16.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate

tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.16.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.16.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

1.16.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.17 DIVE SAFETY REQUIREMENTS

Not used in this contract.

1.18 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs for confined spaces must comply with NEMA Z535.2. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" in bold letters a minimum of one inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" must be red and readable from 5 feet.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Use

Each hazardous material must receive approval from the Contracting Office or their designated representative prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

3.1.3 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.4 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and

handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 10 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such

as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:1 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed,

installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet.

k. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.6.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any WHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be

coordinated.Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the WHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees must keep clear of loads about to be lifted and of suspended loads.

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system.

3.7.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling

through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
11/14

PART 1 GENERAL

1.1 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.

1.2 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. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

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Ph: 202-289-7800
Fax: 202-289-1092
Internet: http://www.wbdg.org/references/docs_refs.php

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)
HUD User
P.O. Box 23268
Washington, DC 20026-3268
Ph: 800-245-2691 or 202-708-3178
TDD: 800-927-7589
Fax: 202-708-9981
Internet: http://www.huduser.org

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-272-0167
Internet: http://www2.epa.gov/libraries
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)

5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6050 or 1-688-584-8332
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: http://www.ntis.gov

U.S. GENERAL SERVICES ADMINISTRATION (GSA)
General Services Administration
1275 First St. NE
Washington, DC 20417
Ph: 202-501-1231
Internet: http://www.gsaelibrary.gsa.gov/ElibMain/home.do
Obtain documents from:
Acquisition Streamlining and Standardization Information System (ASSIST)
Internet: https://assist.dla.mil/online/start/; account registration required

U. S. GREEN BUILDING COUNCIL (USGBC)
2101 L St NW, Suite 500
Washington, D.C. 20037
Ph: 800-795-1747
Internet: http://www.usgbc.org

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: http://www.archives.gov
Order documents from:
Superintendent of Documents
U.S.Government Printing Office (GPO)
710 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: http://www.gpoaccess.gov

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)
1322 Patterson Ave. SE, Suite 1000
Washington Navy Yard, DC 20374-5065
Ph: 202-685-9387
Internet: http://www.navfac.navy.mil

UNDERWRITERS LABORATORIES (UL)
2600 N.W. Lake Road
Camas, WA 98607-8542
Ph: 877-854-3577
E-mail: CEC.us@us.ul.com
Internet: http://www.ul.com/
UL Directories available through IHS at http://www.ihs.com

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)
P.O. Box 23145
Portland, OR 97281
Ph: 503-639-0651

Fax: 503-684-8928
E-mail: info@wclib.org
Internet: http://www.wclib.org

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)
1500 SW First Ave., Suite 870
Portland, OR 97201
Ph: 503-224-3930
Fax: 503-224-3934
E-mail: info@wwpa.org
Internet: http://www.wwpa.org

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00.10 20

QUALITY CONTROL FOR MINOR CONSTRUCTION
02/10

PART 1 GENERAL

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

QC Plan; G

Submit a QC plan within 15 calendar days after receipt of Notice of Award.

1.3 INFORMATION FOR THE CONTRACTING OFFICER (KO)

Prior to commencing work on construction, the Contractor can obtain a single copy set of the current report forms from the KO. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log.

Deliver the following to the KO:

a. CQC Report: Original and one copy, by 10:00 AM the next working day after each day that work is performed;

b. Contractor Production Report: Original and one copy by 10:00 AM the next working day after each day that work is performed;

c. Preparatory Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;

d. Initial Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;

e. Field Test Reports: One copy, within two working days after

the test is performed, attached to the CQC Report;

f. QC Meeting Minutes: One copy, within the week after the meeting; and

g. QC Certifications: As required by the paragraph entitled "QC Certifications."

1.4 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. The QC program consists of a QC Manager, a QC plan, a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this contract. The QC program shall cover on-site and off-site work and shall be keyed to the work sequence. No work or testing may be performed unless the QC Manager is on the work site.

1.4.1 Preliminary Work Authorized Prior to Acceptance

The only work that is authorized to proceed prior to the acceptance of the QC plan is mobilization of storage and office trailers, temporary utilities, and surveying.

1.4.2 Acceptance

Acceptance of the QC plan is required prior to the start of construction. The KO reserves the right to require changes in the QC plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The KO reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications.

1.4.3 Notification of Changes

Notify the KO, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be subject to the acceptance by the KO.

1.5 QC ORGANIZATION

1.5.1 QC Manager

1.5.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. In addition to implementing and managing the QC program, the QC Manager may perform the duties of project superintendent. The QC Manager is required to attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by others.

1.5.1.2 Qualifications

An individual with a minimum of 5 years combined experience as a superintendent, inspector, QC Manager, project manager, or construction manager on similar size and type construction contracts which included the major trades that are part of this contract. The individual must be familiar with the requirements of the EM 385-1-1 and have experience in the areas of hazard identification and safety compliance.

1.5.1.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course Construction Quality Management for Contractors and will have a current certificate.

1.5.2 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager to serve in the event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC Manager.

1.6 QC PLAN

1.6.1 Requirements

Provide, for acceptance by the KO, a QC plan submitted in a three-ring binder that covers both on-site and off-site work and includes the following with a table of contents listing the major sections identified with tabs.

I. QC ORGANIZATION: A chart showing the QC organizational structure and its relationship to the production side of the organization.

II. NAMES AND QUALIFICATIONS: In resume format, for each person in the QC organization. Include the CQM for Contractors course certification required by the paragraph entitled "Construction Quality Management Training".

III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONAL: Of each person in the QC organization.

IV. OUTSIDE ORGANIZATIONS: A listing of outside organizations such as architectural and consulting engineering firms that will be employed by the Contractor and a description of the services these firms will provide.

V. APPOINTMENT LETTERS: Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for managing and implementing the QC program as described in this contract. Include in this letter the QC Manager's authority to direct the removal and replacement of non-conforming work.

VI. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval.

VII. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs "Accredited Laboratories" or "Testing Laboratory Requirements", as applicable.

VIII. TESTING PLAN AND LOG: A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.

IX. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify, record, track and complete rework items.

X. DOCUMENTATION PROCEDURES: Use Government formats.

XI. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the Contractor's Construction Schedule and the specification sections. For projects requiring a Progress Chart, the list of definable features of work shall include but not be limited to all items of work on the schedule. For projects requiring a Network Analysis Schedule, the list of definable features of work shall include but not be limited to all critical path activities.

XII. PROCEDURES FOR PERFORMING THREE PHASES OF CONTROL: For each DFOW provide Preparatory and Initial Phase Checklists. Each list shall include a breakdown of quality checks that will be used when performing the quality control functions, inspections, and tests required by the contract documents. The preparatory and initial phases shall be conducted with a view towards obtaining quality construction by planning ahead and identifying potential problems.

XIII. PERSONNEL MATRIX: Not Applicable.

XIV. PROCEDURES FOR COMPLETION INSPECTION: See the paragraph entitled "COMPLETION INSPECTIONS".

XV. TRAINING PROCEDURES AND TRAINING LOG: Not Applicable.

1.7 COORDINATION AND MUTUAL UNDERSTANDING MEETING

During the Pre-Construction conference and prior to the start of construction, discuss the QC program required by this contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, and the coordination of the Contractor's management, production and the QC personnel. At the meeting, the Contractor will be required to explain how three phases of control will be implemented for each DFOW. Contractor's personnel required to attend shall include the QC Manager, project manager, and superintendent. Minutes of the meeting will be prepared by the QC Manager and signed by both the Contractor and the KO. The Contractor shall provide a copy of the signed minutes to all attendees. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

1.8 QC MEETINGS

After the start of construction, the QC Manager shall conduct QC meetings once every one weeks at the work site with the superintendent and the foreman responsible for the ongoing and upcoming work. The QC Manager shall prepare the minutes of the meeting and provide a copy to the KO within two working days after the meeting. As a minimum, the following shall be accomplished at each meeting:

a. Review the minutes of the previous meeting;

b. Review the schedule and the status of work and rework;

c. Review the status of submittals;

d. Review the work to be accomplished in the next two weeks and documentation required;

e. Resolve QC and production problems (RFIs, etc.);

f. Address items that may require revising the QC plan; and

g. Review Accident Prevention Plan (APP).

1.9 THREE PHASES OF CONTROL

The three phases of control shall adequately cover both on-site and off-site work and shall include the following for each DFOW.

1.9.1 Preparatory Phase

Notify the KO at least two work days in advance of each preparatory phase. Conduct the preparatory phase with the superintendent and the foreman responsible for the definable feature of work. Document the results of the preparatory phase actions in the daily CQC Report and in the QC checklist. Perform the following prior to beginning work on each definable feature of work:

a. Review each paragraph of the applicable specification sections;

b. Review the contract drawings;

c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;

d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;

e. Examine the work area to ensure that the required preliminary work has been completed;

f. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;

g. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted; and

h. Discuss specific controls used and the construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW.

1.9.2 Initial Phase

Notify the KO at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the Initial Phase with the foreman responsible for that DFOW. Observe the initial segment of the work to ensure that it complies with contract requirements. Document the results of the Initial Phase in the daily CQC Report and in the QC checklist. Perform the following for each DFOW:

a. Establish the quality of workmanship required;

b. Resolve conflicts;

c. Ensure that testing is performed by the approved laboratory; and

d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.

1.9.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary, until the completion of each DFOW and document in the daily CQC Report and in the QC checklist:

a. Ensure the work is in compliance with contract requirements;

b. Maintain the quality of workmanship required;

c. Ensure that testing is performed by the approved laboratory;

d. Ensure that rework items are being corrected; and

e. Assure manufacturers representatives have performed necessary inspections, if required.

1.9.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same DFOW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFOW is resumed after substantial period of inactivity, or if other problems develop.

1.9.5 Notification of Three Phases of Control for Off-Site Work

Notify the KO at least two weeks prior to the start of the preparatory and initial phases.

1.10 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review, and approval of submittals are described in the submittal section of the specification.

1.11 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this contract.

1.11.1 Accreditation Requirements

Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (i.e.; E 329, C 1077, D 3666, D 3740, A 880, E 543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."

1.11.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology, the American Association of State Highway and Transportation Officials (AASHTO), International Accreditation Services, Inc. (IAS), U. S. Army Corps of Engineers Materials Testing Center (MTC), the American Association for Laboratory Accreditation (A2LA), the Washington Association of Building Officials (WABO) (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) (Approval authority by WACEL is limited to projects within the NAVFAC WASH and Public Works Center Washington geographical area).

1.11.3 Capability Check

The KO retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this contract.

1.11.4 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the KO immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the KO.

1.12 QC CERTIFICATIONS

1.12.1 Contractor Quality Control Report Certification

Each CQC Report shall contain the following statement: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report."

1.12.2 Invoice Certification

Furnish a certificate to the KO with each payment request, signed by the QC Manager, attesting that as-built drawings are current and attesting that the work for which payment is requested, including stored material, is in compliance with contract requirements.

1.12.3 Completion Certification

Upon completion of work under this contract, the QC Manager shall furnish a certificate to the KO attesting that "the work has been completed, inspected, tested and is in compliance with the contract."

1.13 COMPLETION INSPECTIONS

1.13.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract clause "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items of the "Rework Items List", which were not corrected prior to the Punch-Out inspection. The punch list shall include the estimated date by which the deficiencies will be corrected. A copy of the punch list shall be provided to the KO. The QC Manager or staff shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final Inspection".

1.13.2 Pre-Final Inspection

The Government and QC manager will perform this inspection to verify that the facility is complete and ready to be occupied. A Government pre-final punch list may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner and shall be accomplished before the contract completion date for the work or any particular increment thereof if the project is divided into increments by separate completion dates.

1.13.3 Final Acceptance Inspection

The QC Manager, the superintendent, or other Contractor management personnel and the KO will be in attendance at this inspection. Additional Government personnel may be in attendance. The final acceptance inspection will be formally scheduled by the KO based upon results of the "Pre-Final Inspection". Notice shall be given to the KO at least 14 days prior to the final inspection. The notice shall state that all specific items previously identified to the Contractor as being unacceptable will be complete by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the KO to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause "Inspection of Construction".

1.14 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities. The forms identified under the paragraph "INFORMATION FOR THE CONTRACTING OFFICER (KO)" shall be used. Reports are required for each day work is performed. Account for each calendar day throughout the life of the contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. The reporting of work shall be identified by terminology consistent with the construction schedule. In the "remarks" section in this report which will contain pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site. For each remark given, identify the Schedule Activity No. that is associated with the remark.

1.14.1 Quality Control Validation

Establish and maintain the following in a series of three ring binders. Binders shall be divided and tabbed as shown below. These binders shall be readily available to the Government's Quality Assurance Team during all business hours.

a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.

b. All milestone inspections, arranged by Activity/Event Number.

c. A current up-to-date copy of the Testing and Plan Log with supporting field test reports, arranged by specification section.

d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.

e. A current up-to-date copy of the Rework Items List.

f. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the Government.

1.14.2 As-Built Drawings

The QC Manager is required to review the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS, are kept current on a daily basis and marked to show deviations, which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation, e.g. PC number, modification number, RFI number, etc. The QC Manager shall initial each deviation or revision. Upon completion of work, the QC Manager shall submit a certificate attesting to the accuracy of the as-built drawings prior to submission to the KO.

1.15 NOTIFICATION ON NON-COMPLIANCE

The KO will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective

action. If the contractor fails or refuses to correct the non-compliant work, the KO will issue a non compliance notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the KO may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time, for excess costs, or damages.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 57 19.00 20 TEMPORARY

ENVIRONMENTAL CONTROLS
11/11

PART 1 GENERAL

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.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 530/F-93/004	(1993; Rev O; Updates I, II, IIA, IIB, and III) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II) (SW-846)
EPA 833-R-060-04	(2007) Developing Your Storm Water Pollution Prevention Plan, a Guide for Construction Sites

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

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 112.7	General Requirements for Spill Prevention, Control, and Countermeasure Plans
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste

40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	Specific Toxic Chemical Listings
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.

c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.

e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.

g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.

h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have

additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

a. Is regulated as a hazardous material per 49 CFR 173, or

b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or

c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated

biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oily Waste

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil and may be appropriately tested and discarded in a manner which is in compliance with other State and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that:

a. It is not prohibited in other State regulations or local ordinances

b. The amount generated is "de minimus" (a small amount)

c. It is the result of minor leaks or spills resulting from normal process operations

d. All free-flowing oil has been removed to the practical extent possible

Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination must be performed prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.10 Regulated Waste

Those solid wastes that have specific additional Federal, state, or local controls for handling, storage, or disposal.

1.2.11 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

chlorofluorocarbon-11 (CFC-11)
chlorofluorocarbon-12 (CFC-12)
chlorofluorocarbon-13 (CFC-13)

chlorofluorocarbon-111 (CFC-111)
chlorofluorocarbon-112 (CFC-112)
chlorofluorocarbon-113 (CFC-113)
chlorofluorocarbon-114 (CFC-114)
chlorofluorocarbon-115 (CFC-115)
chlorofluorocarbon-211 (CFC-211)
chlorofluorocarbon-212 (CFC-212)
chlorofluorocarbon-213 (CFC-213)
chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-216 (CFC-216)
chlorofluorocarbon-217 (CFC-217)
chlorofluorocarbon-500 (CFC-500)
chlorofluorocarbon-502 (CFC-502)
chlorofluorocarbon-503 (CFC-503)
halon-1211
halon-1301
halon-2402
carbon tetrachloride
methyl bromide
methyl chloroform

Class II ODS is defined in Section 602(s) of The Clean Air Act and includes the following chemicals:

hydrochlorofluorocarbon-21 (HCFC-21)
hydrochlorofluorocarbon-22 (HCFC-22)
hydrochlorofluorocarbon-31 (HCFC-31)
hydrochlorofluorocarbon-121 (HCFC-121)

hydrochlorofluorocarbon-122 (HCFC-122)
hydrochlorofluorocarbon-123 (HCFC-123)
hydrochlorofluorocarbon-124 (HCFC-124)
hydrochlorofluorocarbon-131 (HCFC-131)
hydrochlorofluorocarbon-132 (HCFC-132)
hydrochlorofluorocarbon-133 (HCFC-133)
hydrochlorofluorocarbon-141 (HCFC-141)
hydrochlorofluorocarbon-142 (HCFC-142)
hydrochlorofluorocarbon-221 (HCFC-221)
hydrochlorofluorocarbon-222 (HCFC-222)
hydrochlorofluorocarbon-223 (HCFC-223)
hydrochlorofluorocarbon-224 (HCFC-224)
hydrochlorofluorocarbon-225 (HCFC-225)
hydrochlorofluorocarbon-226 (HCFC-226)
hydrochlorofluorocarbon-231 (HCFC-231)
hydrochlorofluorocarbon-232 (HCFC-232)
hydrochlorofluorocarbon-233 (HCFC-233)
hydrochlorofluorocarbon-234 (HCFC-234)
hydrochlorofluorocarbon-235 (HCFC-235)
hydrochlorofluorocarbon-251 (HCFC-251)
hydrochlorofluorocarbon-252 (HCFC-252)
hydrochlorofluorocarbon-253 (HCFC-253)
hydrochlorofluorocarbon-261 (HCFC-261)
hydrochlorofluorocarbon-262 (HCFC-262)
hydrochlorofluorocarbon-271 (HCFC-271)

1.2.12 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (e.g., thermostats) and lamps

(e.g., fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey; G

Solid Waste Management Plan and Permit; G

Regulatory Notifications; G

Environmental Protection Plan; G

Storm Water Pollution Prevention Plan; G

Storm Water Notice of Intent (for NPDES coverage under the general permit for construction activities); G

Dirt and Dust Control Plan

Contractor Hazardous Material Inventory Log; G

SD-06 Test Reports

Laboratory Analysis

Disposal Requirements

Erosion and Sediment Control Inspection Reports

Storm Water Inspection Reports for General Permit

Solid Waste Management Report; G

SD-07 Certificates

Contractor 40 CFR employee training records; G

ECATTS certificate of completion

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Storm Water Pollution Prevention Plan compliance notebook; G

Waste Determination Documentation

Disposal Documentation for Hazardous and Regulated Waste

Contractor 40 CFR Employee Training Records

Solid Waste Management Permit

Solid Waste Management Report

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management

Regulatory Notifications

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

The Contractor may be required to promptly conduct tests and procedures for the purpose of assessing whether construction operations are in compliance with Applicable Environmental Laws. Analytical work shall be done by qualified laboratories; and where required by law, the laboratories shall be certified.

1.4.1 Environmental Compliance Assessment Training and Tracking System (ECATTS)

The QC Manager is responsible for environmental compliance on projects unless an Environmental Manager is named. The QC Manager (and alternative QC Manager) or Environmental Manager must complete ECATTS training prior to starting respective portions of on-site work under this contract. If personnel changes occur for any of these positions after starting work, replacement personnel must complete ECATTS training within 14 days of assignment to the project

Submit an ECATTS certificate of completion for personnel who have completed the required "Environmental Compliance Assessment Training and Tracking System (ECATTS)" training. This training is web-based and can be accessed from any computer with Internet access using the following instructions.

Register for NAVFAC Environmental Compliance Training and Tracking System, by logging on to http://navfac.ecatts.com/. Obtain the password for registration from the Contracting Officer.

This training has been structured to allow contractor personnel to receive credit under this contract and also to carry forward credit to future contracts. Contractors shall ensure that the QC Manager (and alternate QC

Manager) or Environmental Manager review their training plans for new modules or updated training requirements prior to beginning work. Some training modules are tailored for specific State regulatory requirements; therefore, Contractors working in multiple states will be requires to re-take modules tailored to the state where the contract work is being performed.

ECATTS is available for use by all contractor and subcontractor personnel associated with this project. These other personnel are encouraged (but not required) to take the training and may do so at their discretion.

1.4.2 Conformance with the Environmental Management System

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). Perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the EMS. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, take corrective and/or preventative actions. In addition, ensure that employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the contract.

Ensure that employees receive applicable environmental and occupational health and safety training, and keep up to date on regulatory required specific training for the type of work to be conducted onsite. All on-site Contractor personnel, and their subcontractor personnel, performing tasks that have the potential to cause a significant environmental impact shall be competent on the basis of appropriate education, training or experience. Upon contract award, the Contracting Officer's Representative will notify the installation's EMS coordinator to arrange EMS training. Refer to Section 01 57 19.01 20, SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for additional site specific EMS requirements related to construction. The installation's EMS coordinator will identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. Provide training documentation to the Contracting Officer. The EMS coordinator must retain associated records.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

Perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

1.5.2 Regulatory Notifications

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations. In cases where the Navy must also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition,

renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the activity; types and quantities of wastes/wastewater that may be generated during the contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and activity environmental staff to discuss the proposed Environmental Protection Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager will be directly responsible for coordinating contractor compliance with Federal, State, local, and station requirements. The Environmental Manager will ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the Environmental Protection Plan; ensure that all environmental permits are obtained, maintained, and closed out; ensure compliance with Storm Water Program Management requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out.

1.5.5 Contractor 40 CFR Employee Training Records

Prepare and maintain employee training records throughout the term of the contract meeting applicable 40 CFR requirements. Ensure every employee completes a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures compliance with Federal, State and local regulatory requirements for RCRA Large Quantity Generator. Provide a Position Description for each employee, by subcontractor, based on the Davis-Bacon Wage Rate designation or other equivalent method, evaluating the employee's association with hazardous and regulated wastes. This Position Description will include training requirements as defined in 40 CFR 265 for a Large Quantity Generator facility. Submit these training records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

1.6 ENVIRONMENTAL PROTECTION PLAN (EPP)

Prior to initiating any work on site, meet with the Contracting Officer to

discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Environmental Protection Plan must incorporate construction related objectives and targets from the installation's Environmental Management System. Submit the Environmental Protection Plan in the following format and include the elements specified below.

a. Description of the Environmental Protection Plan

(1) General overview and purpose

(a) A brief description of each specific plan required by environmental permit or elsewhere in this contract.

(b) The duties and level of authority assigned to the person(s) on the job site that oversee environmental compliance.

(c) A copy of any standard or project specific operating procedures that will be used to effectively manage and protect the environment on the project site.

(d) Communication and training procedures that will be used to convey environmental management requirements to contractor employees and subcontractors.

(e) Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

(2) General site information

(3) A letter signed by an officer of the firm appointing the Environmental Manager and stating that he/she is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

b. Management of Natural Resources

(1) Land resources

(2) Tree protection

(3) Replacement of damaged landscape features

(4) Temporary construction

(5) Stream crossings

(6) Fish and wildlife resources

(7) Wetland areas

c. Protection of Historical and Archaeological Resources

(1) Objectives

(2) Methods

d. Storm Water Management and Control

(1) Ground cover

(2) Erodible soils

(3) Temporary measures

(a) Mechanical retardation and control of runoff

(b) Vegetation and mulch

(4) Effective selection, implementation and maintenance of Best Management Practices (BMPs).

e. Protection of the Environment from Waste Derived from Contractor Operations

(1) Control and disposal of solid and sanitary waste. If Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT is included in the contract, submit the plan required by that section as part of the Environmental Protection Plan.

(2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

(a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;

(b) Sampling/analysis plan;

(c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);

(d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);

(e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);

(f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;

(g) Used oil management procedures in accordance with 40 CFR 279;

(h) Pollution prevention\hazardous waste minimization procedures;

(i) Plans for the disposal of hazardous waste by permitted facilities;

(j) Procedures to be employed to ensure all required employee training records are maintained.

f. Prevention of Releases to the Environment

(1) Procedures to prevent releases to the environment

(2) Notifications in the event of a release to the environment

g. Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 90 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of all applicable, environmental permits. The Plan will not be approved until all permits have been obtained.

h. Clean Air Act Compliance

(1) Identify air pollution generating equipment or processes that may require federal, state, or local permits under the clean air act.

(2) Identify portable and stationary internal combustion engines (ICE's) that will be supplied, utilized or serviced. Address compliance with 40 CFR 60 Subpart IIII, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine bhp), and EPA emission certification status of each engine.

(3) Identify management practices to ensure that HVAC work involving refrigerants complies with 40 CFR 82 requirements.

(4) Identify planned air pollution generating processes and management control measures (including but not limited to spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions)

1.6.1 Environmental Protection Plan Review

Within thirty days after the Contract award date, submit the proposed Environmental Protection Plan for review and approval. Commencement of work will not begin until the environmental protection plan has been approved.

1.6.2 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause 52.236-7.

No permits will be obtained by the Contracting Officer.

Where required by the State regulatory authority, the inspections and certifications will be provided through the services of a Professional Engineer (PE), registered in the State where the work is being performed.

Where a PE is not required, the individual must be otherwise qualified by other current State licensure, specific training and prior experience (minimum 5 years). As a part of the quality control plan, which is required by Section 01 45 00.00 20 QUALITY CONTROL, provide a sub item containing the name, appropriate professional registration or licence number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. If the work is near streams, lakes, or other waterways, conform to the national permitting requirements of the Clean Water Act.

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor will be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

The Contracting Officer's approval is required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.1.1 Erosion and Sediment Control Measures

3.1.1.1 Burnoff

Burnoff of the ground cover is not permitted.

3.1.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.1.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

a. Mechanical Retardation and Control of Runoff

Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

b. Vegetation and Mulch

(1) Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

(2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass.

3.1.2 Erosion and Sediment Control Inspection Reports

Note erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports if applicable.

3.1.2.1 Storm Water Notice of Intent for Construction Activities and Storm Water Pollution Prevention Plan

Submit a Storm Water Notice of Intent (for NPDES coverage under the general permit for construction activities) and a Storm Water Pollution Prevention Plan (SWPPP) for the project to the Contracting Officer prior and gain approval prior to the commencement of work. The SWPPP must meet the requirements of the EPA or State general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intents, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 14 calendar days prior to the start of any land disturbing activities. Maintain an approved copy of the SWPPP at the construction on-site office, and continually update as regulations require, reflecting current site conditions. Additional requirements may be found in UFGS Section 01 57 19.01 20, SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

Coverage under this permit requires the contractor prepare a Storm Water Pollution Prevention Plan (SWPPP), prepare and submit a Registration Statement as a co-permittee with the Construction Officer, and provide the

permit fee to the responsible state agency before any land disturbing activities begin. File for permit coverage on behalf of both the Construction Officer and themself, and file a Notice of Termination once construction is complete and the site is stabilized with a final sustainable cover.

Under the terms and conditions of the permit, the Contractor may be required to install, inspect, maintain best management practices (BMPs), and submit stormwater BMP inspection reports and stormwater pollution prevention plan inspection reports. Ensure construction operations and management are constantly in compliance with the terms and conditions of the general permit for storm water discharges from construction activities.

a. The SWPPP shall:

(1) Identify potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.

(2) Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge from the site.

(3) Ensure compliance with terms of the EPA or State general permit for storm water discharge.

(4) Select applicable best management practices from EPA 833-R-060-04.

(5) Include a completed copy of the Registration Statement, BMP Inspection Report Template and Notice of Termination except for the effective date.

(6) Storm Water Pollution Prevention Measures and Notice of Intent 40 CFR 122.26, EPA 833-R-060-04. Provide a "Storm Water Pollution Prevention Plan" (SWPPP) for the project. The SWPPP will meet the requirements of the EPA or State general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intents, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 14 calendar days prior to the start of construction. A copy of the approved SWPPP will be kept at the construction on-site office, and continually updated as regulations require reflecting current site conditions.

3.1.2.2 Storm Water Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the Stormwater Construction Activity permit. The binder shall include a copy of the permit Registration Statement, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports, copies of correspondence with the list agency that issued the permit and a copy of the permit Notice of Termination. At the completion of the project the notebook shall become the property of the Government. Provide the compliance notebook to Contracting Officer. Provide an advance copy of the Registration Statement to the Contracting Officer immediately after the form is presented to the permitting agency.

3.1.3 Stormwater Drainage and Construction Dewatering

There will be no discharge of excavation ground water to the sanitary sewer, storm drains, or to the river without prior specific authorization of the Environmental Division in writing. Discharge of hazardous substances will not be permitted under any circumstances.

Construction site runoff will be prevented from entering any storm drain or the river directly by the use of straw bales or other method suitable to the Environmental Division. Contractor will provide erosion protection of the surrounding soils.

Construction Dewatering shall not be discharged to the sanitary sewer. If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Authorization for any contaminated groundwater release shall be obtained in advance from the base Environmental Officer. Discharge of hazardous substances will not be permitted under any circumstances.

3.2 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. Upon discovery, notify the Contracting Officer. Stop work in the immediate area of the discovery until directed by the Contracting Officer to resume work. The Government retains ownership and control over historical and archaeological resources.

3.3 SOLID WASTE MANAGEMENT PLAN and PERMIT

Provide to the contracting officer written notification of the quantity of solid waste/debris that is anticipated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance or as applicable, submit one copy of a State and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

3.3.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

Include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification will include the receiver's tax identification number and business, EPA or State registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained by the Contractor for his own use, the Contractor will submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received will not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.3.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage spent hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, as per environmental law.

3.3.2.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Recourse Conservation and Recovery Act. Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions coordinate with the Activity Environmental office. Refer to Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for the Activity Point of Contact information.

3.3.2.2 Dumpsters

Equip dumpsters with a secure cover and paint the standard base color. Keep cover closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence or out of the public view. Empty site dumpsters at least once a week. or as needed to keep the site free of debris and trash. If necessary, provide 55 gallon trash containers painted the darker base color to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of the public view. Empty trash containers at least once a day. For large demolitions, large dumpsters without lids are acceptable but should not have debris higher than the sides before emptying.

3.4 WASTE DETERMINATION DOCUMENTATION

Complete a Waste Determination form (provided at the pre-construction conference) for all contractor derived wastes to be generated. Base the waste determination upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis (Material Safety Data Sheets (MSDS) by themselves are not adequate). Attach all support documentation to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting

and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

3.5 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the Environmental Protection Plan. Consult with the activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the types of the hazardous materials expected to be used in the construction when requesting information.

3.6 WASTE HAZARDOUS MATERIAL (WHM)/HAZARDOUS WASTE (HW) MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. The government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

3.7 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. Submit a MSDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.7.1 Contractor Hazardous Material Inventory Log

Submit the "Contractor Hazardous Material Inventory Log"(found at: http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf), which provides information

required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS), to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Keep copies of the MSDS for hazardous materials on site at all times. At the end of the project, provide the Contracting Officer with copies of all of these MSDS, and the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used.

Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.8 PETROLEUM PRODUCTS AND REFUELING

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

3.8.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Provide general secondary containment for oil transfer operations as required by 40 CFR 112.7.

3.8.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

If petroleum contaminated soil or suspected hazardous waste is found during construction that was not identified in the contract documents, the contractor shall immediately notify the contracting officer. The contractor shall not disturb this material until authorized by the contracting officer.

3.9 FUEL TANKS

Petroleum products and lubricants required to sustain up to 30 days of construction activity may be kept on site. Storage and refilling practices shall comply with 40 CFR Part 112. Secondary containment shall be provided and be no less than 110 percent of the tank volume plus five inches of free-board. If a secondary berm is used for containment then the berm shall be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Drips pans are required and the tanks must be covered during inclement weather.

3.10 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the Contracting Officer. If the contractor's response is inadequate, the Navy may respond. If this should occur, the contractor will be required to reimburse the government for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the federal 40 CFR 355, State, local regulations and Navy Instructions. Spill response will be in accordance with 40 CFR 300 and applicable State and local regulations. Contain and clean up these spills without cost to the Government. If Government assistance is requested or required, the Contractor will reimburse the Government for such assistance. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor shall reimburse the government for all material, equipment, and clothing generated during any spill cleanup. The Contractor shall reimburse the government for all costs incurred including sample analysis materials, equipment, and labor if the government must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or

b. If, in the government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

3.11 CONTROL AND MANAGEMENT OF ASBESTOS CONTAINING MATERIAL (ACM)

Items, components, or materials disturbed by or included in work under this contract do involve asbestos. Other materials in the general area around where work will be performed may contain asbestos. All thermal insulation, in all work areas, should be considered to be asbestos unless positively identified by conspicuous tags or previous laboratory analysis certifying them as asbestos free.

Inadvertent discovery of non-disclosed asbestos that will result in an abatement action requires a change in scope before proceeding. Upon discovery of asbestos containing material not identified in the contract documents, the Contractor shall immediately stop all work that would generate further damage to the material, evacuate the asbestos exposed area, and notify the Contracting Officer for resolution of the situation prior to resuming normal work activities in the affected area. Do not remove or perform work on any asbestos containing materials without the prior approval of the Contracting Officer. Do not engage in any activity, which would remove or damage such materials or cause the generation of

fibers from such materials.

Manage and dispose of asbestos containing waste in accordance with applicable environmental law. Asbestos containing waste shall be manifested and the manifest provided to the Contracting Officer.

3.12 CONTROL AND MANAGEMENT OF HAZARDOUS WASTES

3.12.1 Facility Hazardous Waste Generator Status

NSA Crane is designated as a Large Quantity Generator . All work conducted within the boundaries of this activity must meet the regulatory requirements of this generator designation. Comply with all provisions of Federal, State and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of all construction derived wastes.

3.12.2 Hazardous Waste/Debris Management

Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris will be identified, labeled, handled, stored, and disposed of in accordance with all Federal, State, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Hazardous waste will also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities will be identified as being generated by the Government.

Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste must be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.12.2.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor will request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90 Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

Contract Number	
Contractor	
Haz/Waste or Regulated Waste POC	

Phone Number	
Type of Waste	
Source of Waste	
Emergency POC	
Phone Number	
Location of the Site	

(Attach Site Plan to the Request)

Attach a waste determination form. Allow ten working days for processing this request. The designated area where waste is being stored shall be barricaded and a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.12.2.2 Sampling and Analysis of Hazardous Waste (HW)

a. Waste Sampling

Sample waste in accordance with EPA 530/F-93/004. Each sampled drum or container will be clearly marked with the Contractor's identification number and cross referenced to the chemical analysis performed.

b. Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. The Contractor will provide all analytical results and reports performed to the Contracting Officer

c. Analysis Type

Identify waste hazardous material/hazardous waste by analyzing for the following properties as a minimum: ignitability, corrosiveness, total chlorides, BTU value, PCBs, TCLP for heavy metals, and cyanide.

3.12.2.3 Universal Waste/e-Waste Management

Universal waste including but not limited to some mercury containing building products such florescent lamps, mercury vapor lamps, high pressure sodium lamps, CRTs, batteries, aerosol paint containers, electrical equipment containing PCBs, and consumed electronic devices, shall be managed in accordance with applicable environmental law and installation instructions.

3.12.3 Class I and II ODS Prohibition

Class I and II ODS in pure or blended form as defined and identified herein must not be used in the performance of this contract, nor be provided as part of the equipment except for the use of servicing existing government owned equipment. This prohibition will be considered to prevail over any other provision, specification, drawing, or referenced documents.

3.12.3.1 Recycling Requirements

Recycle used refrigerants and ozone depleting substances generated during the performance of this contract to the maximum extent practicable to minimize used refrigerant and ozone depleting substance disposal as HW.

Test, collect, transfer, recycle, and/or arrange for shipping and proper disposal of used refrigerants and ozone depleting substances generated during the performance of work under this contract. The Contractor is responsible for all associated costs.

Any and all Class I ODS and R-22 recovered by the Contractor as part of this contract shall be packaged and turned over to the Government for recycling upon the completion of the work covered by this contract. The Contractor shall arrange for recycling of used refrigerants not turned over to the government, at a licensed refrigerant recycler approved by the Contracting Officer.

3.12.3.2 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Copies of certifications shall be maintained at the employees' place of business and be carried as a wallet card by the technician, as provided by environmental law. .

3.12.3.3 Accidental Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported to the Contracting Officer

3.13 DUST CONTROL

Keep dust down at all times, including during nonworking periods.Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.13.1 Dirt and Dust Control Plan

Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

3.14 ABRASIVE BLASTING

3.14.1 Blasting Operations

The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive, agent, paint chips, and other debris . Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

3.14.2 Disposal Requirements

Submit analytical results of the debris generated from abrasive blasting operations per Laboratory Analysis in paragraph SAMPLING AND ANALYSIS OF HW. Hazardous waste generated from blasting operations will be managed in accordance with paragraph CONTROL AND MANAGEMENT OF HAZARDOUS WASTE and with the approved HWMP.

3.15 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/11

PART 1 GENERAL

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.

ASTM INTERNATIONAL (ASTM)

ASTM E1971	(2005; R 2011) Stewardship for the Cleaning of Commercial and Institutional Buildings

GREEN SEAL (GS)

GS-37	(2012) Cleaning Products for Industrial and Institutional Use

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are developed and maintained by the Contractor and depict actual conditions, including deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the Contracting Officer; designs which are the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site. As-built drawings are further defined in NFAS 5252.236-9310. These files serve as the basis for the creation of the record drawings.

1.2.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.3 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.3.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose

other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Warranty Management Plan
Warranty Tags
Final Cleaning
Spare Parts Data

SD-08 Manufacturer's Instructions

Posted Instructions

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G

SD-11 Closeout Submittals

As-Built Drawings; G
Record Drawings; G
As-Built Record of Equipment and Materials
Final Approved Shop Drawings

Construction Contract Specifications
Certification of EPA Designated Items; G
Interim DD FORM 1354; G
Checklist for DD FORM 1354; G
NAVFAC Sustainable & Energy Data Record Card; G

1.5 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

1.6 WARRANTY MANAGEMENT

1.6.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction in roofs. At least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. A list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.
(5) Names, addresses and telephone numbers of sources of spare parts.

(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

e. The plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

f. Procedure and status of tagging of all equipment covered by extended warranties.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.6.2 Performance Bond

The Performance Bond must remain effective throughout the construction period .

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.6.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction

warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.6.4 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time priority code	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

PART 2 PRODUCTS

2.1 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR

52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials:

1) The product does not meet appropriate performance standards;
2) The product is not available within a reasonable time frame;
3) The product is not available competitively (from two or more sources);
4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)."

Record each product used in the project that has a requirement or option of containing recycled content in accordance with SECTION 01 33 29 SUSTAINABILITY REPORTING, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled content values may be determined by weight or volume percent, but must be consistent throughout.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain As-Built Drawings in accordance with NFAS 5252.236-9310. Submit As-Built Drawings 30 days prior to Beneficial Occupancy Date(BOD).

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where items(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

a. Use base colors of red, green, and blue. Color code for changes as follows:

   (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

   (2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

   (3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

   1) Add an entire drawing to contract drawings

   2) Change the contract drawing to show

   3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Show on the as-built drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

j. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications) and compliance with FC 1-300-09N procedures.

l. Actual location of anchors, construction and control joints, etc., in concrete.

m. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

n. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

3.2 RECORD DRAWINGS

Prepare and provide Record Drawings in accordance with FC 1-300-09N. Provide 2 copies of Record Drawings on two separate CDs or DVDs 30 days after BOD.

3.3 OPERATION AND MAINTENANCE MANUALS

Provide project operation and maintenance manuals as specified in Section 01 78 23 OPERATION AND MAINTENANCE MANUALS DATA. Provide 2 electronic copies of the Operation and Maintenance Manual files. Submit to the Contracting Officer for approval within 10 calendar days of the Beneficial Occupancy Date (BOD). Update and resubmit files for final approval at BOD.

3.4 CLEANUP

Provide final cleaning in accordance with ASTM E1971 and submit twocopies of the listing of completed final clean-up items. Leave premises "broom clean." Comply with GS-37 for general purpose cleaning and bathroom cleaning. Use only nonhazardous cleaning materials, including natural cleaning materials, in the final cleanup. Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment and comply with the Indoor Air Quality (IAQ) Management Plan. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas.

Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS, and 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.

3.5 NAVFAC SUSTAINABLE & ENERGY DATA RECORD CARD

Within 60 days of the completion of Project, complete an electronic copy of the NAVFAC Sustainable & Energy Data Record Card, and submit to the Contracting Officer. Draft Record card for this project should be available from Designer of Record (DOR) or Contracting Officer. Instructions and a blank DD Form (fill-able) in ADOBE (PDF) may be obtained at the Whole Building Design Guide web site by navigating: Home > Participating Agencies > Department of Defense (DoD) > NAVFAC Sustainable Development Program > Contract Documents > NAVFAC Sustainable & Energy Data Record Card; or directly at http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf.

-- End of Section --

SECTION 02 41 00

DEMOLITION AND DECONSTRUCTION
05/10

PART 1 GENERAL

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.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K	(2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

CARPET AND RUG INSTITUTE (CRI)

CRI CIS	(2011) Carpet Installation Standard

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(Jun 2000; Reaffirmed Oct 2010) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders http://www.aviation.dla.mil/UserWeb/aviationengineering/

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures
MIL-STD-129	(2014; Rev R) Military Marking for Shipment and Storage

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

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 82	Protection of Stratospheric Ozone

49 CFR 173.301 Shipment of Compressed Gases in Cylinders

and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 Demolition/Deconstruction Plan

Prepare a Demolition Plan and submit proposed demolition, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Identify components and materials to be salvaged for reuse or recycling with reference to paragraph Existing Facilities to be Removed. Append tracking forms for all removed materials indicating type, quantities, condition, destination, and end use. Coordinate with Waste Management Plan. Include statements affirming Contractor inspection of the existing roof deck and its suitability to perform as a safe working platform or if inspection reveals a safety hazard to workers, state provisions for securing the safety of the workers throughout the performance of the work. Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by Contracting Officer prior to work beginning.

1.2.2 General Requirements

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes the value derived from the salvage and recycling of materials. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the buildings . The work includes demolition, , salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements . Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.3.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and

migration of dust and dirt in all work areas. Remove snow, dust, dirt, and debris from work areas daily.

1.3.2 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

1.3.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.3.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor the Government will disconnect and seal utilities serving each area of alteration or removal upon written request from the Contractor.

1.3.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted . Where burning is permitted, adhere to federal, state, and local regulations.

1.5 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available in accordance with the following schedule:

Schedule	
Area	Date

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Demolition Plan; G
Deconstruction Plan; G
Existing Conditions

SD-07 Certificates

Notification; G

SD-11 Closeout Submittals

Receipts

1.7 QUALITY ASSURANCE

Submit timely notification of demolition and renovation projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the State's environmental protection agency local air pollution control district/agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.7.1 Dust and Debris Control

Prevent the spread of dust and debris to occupied portions of the building and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Vacuum and dust the work area daily .

1.8 PROTECTION

1.8.1 Traffic Control Signs

a. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Anchor barricades in a manner to prevent displacement by wind. Notify the

Contracting Officer prior to beginning such work.

1.8.2 Protection of Personnel

Before, during and after the demolition work continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.9 FOREIGN OBJECT DAMAGE (FOD)

Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Contracting Officer may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

1.10 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.11 EXISTING CONDITIONS

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

2.1 FILL MATERIAL

a. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition or deconstruction of structures. Fill material shall be waste products from demolition or deconstruction until all waste appropriate for this purpose is consumed.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

a. Remove existing structures indicated to be removed to ROOF DECK .

b. Demolish structures in a systematic manner from the top of the structure to the ground. Complete demolition work above each tier or floor before the supporting members on the lower level are disturbed. Demolish concrete and masonry walls in small sections. Remove structural framing members and lower to ground by means of derricks, platforms hoists, or other suitable methods as approved by the Contracting Officer.

c. Locate demolition and deconstruction equipment throughout the structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

d.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities , as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location on the station in accordance with instructions of the Contracting Officer.

3.1.3 Chain Link Fencing

Remove chain link fencing, gates and other related salvaged items scheduled for removal and transport to designated areas. Remove gates as whole units. Cut chain link fabric to 25 foot lengths and store in rolls off the ground.

3.1.4 Paving and Slabs

Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the Contracting Officer. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.5 Roofing

Remove existing roof system and associated components in their entirety down to existing roof deck. Remove built-up single-ply roofing to effect the connections with new flashing or roofing. Remove gravel surfacing from existing roofing felts for a minimum distance of 18 inches back from the cut. Remove gravel without damaging felts. Salvage asphalt roofing materials. Cut existing felts membrane and insulation along straight lines. Remove roofing system and insulation without damaging the roof deck. Sequence work to minimize building exposure between demolition or deconstruction and new roof materials installation.

3.1.5.1 Temporary Roofing

Install temporary roofing and flashing as necessary to maintain a watertight condition throughout the course of the work. Remove temporary work prior to installation of permanent roof system materials unless approved otherwise by the Contracting Officer.

3.1.5.2 Reroofing

When removing the existing roofing system from the roof deck, remove only as much roofing as can be recovered by the end of the work day, unless approved otherwise by the Contracting Officer. Do not attempt to open the roof covering system in threatening weather. Reseal all openings prior to suspension of work the same day.

3.1.6 Masonry

Sawcut and remove masonry so as to prevent damage to surfaces to remain . Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as indicated . Provide square, straight edges and corners where existing masonry adjoins new work and other locations. .

3.1.7 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.8 Structural Steel

Dismantle structural steel at field connections and in a manner that will prevent bending or damage. Salvage for structural steel, steel joists, girders, angles, plates, columns and shapes. Flame-cutting torches are permitted when other methods of dismantling are not practical. Transport steel joists and girders as whole units and not dismantled. Transport structural steel shapes to a designated area as directed by the Contracting Officer, stacked according to size, type of member and length, and stored

off the ground, protected from the weather.

3.1.9 Miscellaneous Metal

Salvage shop-fabricated items such as access doors and frames, steel gratings, metal ladders, wire mesh partitions, metal railings, metal windows and similar items as whole units. Salvage light-gage and cold-formed metal framing, such as steel studs, steel trusses, metal gutters, roofing and siding, metal toilet partitions, toilet accessories and similar items. Scrap metal shall become the Contractor's property. Recycle scrap metal as part of demolition and deconstruction operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility, in accordance with the Waste Management Plan.

3.1.10 Carpentry

Salvage for lumber, millwork items, and finished boards, and sort by type and size. windows, doors, frames, and cabinets, and similar items as whole units, complete with trim and accessories. Brace the open end of door frames to prevent damage.

3.1.11 Carpet

Remove existing carpet for reclamation in accordance with manufacturer recommendations and as follows. Remove used carpet in large pieces, roll tightly, and pack neatly in a container. Remove adhesive according to recommendations of the Carpet and Rug Institute (CRI). Adhesive removal solvents shall comply with CRI CIS. Recycle removed carpet cushion.

3.1.12 Acoustic Ceiling Tile

Remove, neatly stack, and recycle acoustic ceiling tiles. Recycling may be available with manufacturer. Otherwise, priority shall be given to a local recycling organization. Recycling is not required if the tiles contain or may have been exposed to asbestos material.

3.1.13 Airfield Lighting

Remove existing airfield lighting as indicated and terminate in a manner satisfactory to the Contracting Officer. Remove , as indicated and .

3.1.14 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces, using on-site materials when available. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

a. Concrete and Masonry: Completely fill holes and depressions, left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

b. Where existing partitions have been removed leaving damaged or missing resilient tile flooring, patch to match the existing floor tile.

c. Patch acoustic lay-in ceiling where partitions have been removed. The transition between the different ceiling heights shall be effected by continuing the higher ceiling level over to the first runner on the lower ceiling and closing the vertical opening with a painted sheet metal strip.

3.1.15 Air Conditioning Equipment

Remove air conditioning, refrigeration, and other equipment containing refrigerants without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990.

3.1.16 Cylinders and Canisters

Remove all fire suppression system cylinders and canisters and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.17 Locksets on Swinging Doors

Remove all locksets from all swinging doors indicated to be removed and disposed of. Deliver the locksets and related items to a designated location for receipt by the Contracting Officer after removal.

3.1.18 Mechanical Equipment and Fixtures

Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Disconnect mechanical equipment and fixtures at fittings. Remove service valves attached to the unit. Salvage each item of equipment and fixtures as a whole unit; listed, indexed, tagged, and stored. Salvage each unit with its normal operating auxiliary equipment. Transport salvaged equipment and fixtures, including motors and machines, to a designated storage area as directed by the Contracting Officer. Do not remove equipment until approved. Do not offer low-efficiency equipment for reuse.

3.1.18.1 Preparation for Storage

Remove water, dirt, dust, and foreign matter from units; tanks, piping and fixtures shall be drained; interiors, if previously used to store flammable, explosive, or other dangerous liquids, shall be steam cleaned. Seal openings with caps, plates, or plugs. Secure motors attached by flexible connections to the unit. Change lubricating systems with the proper oil or grease.

3.1.18.2 Piping

Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. Store salvaged piping according to size and type. If the piping that remains can become pressurized due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve shall be attached to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and

residues are removed. Box prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Wrap sprinkler heads individually in plastic bags before boxing. Classify piping not designated for salvage, or not reusable, as scrap metal.

3.1.18.3 Ducts

Classify removed duct work as scrap metal.

3.1.18.4 Fixtures, Motors and Machines

Remove and salvage fixtures, motors and machines associated with plumbing, heating, air conditioning, refrigeration, and other mechanical system installations. Salvage, box and store auxiliary units and accessories with the main motor and machines. Tag salvaged items for identification, storage, and protection from damage. Classify broken, damaged, or otherwise unserviceable units and not caused to be broken, damaged, or otherwise unserviceable as debris to be disposed of by the Contractor.

3.1.19 Electrical Equipment and Fixtures

Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment. Salvage wiring systems and components. Box loose items and tag for identification. Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.

3.1.19.1 Fixtures

Remove and salvage electrical fixtures. Salvage unprotected glassware from the fixture and salvage separately. Salvage incandescent, mercury-vapor, and fluorescent lamps and fluorescent ballasts manufactured prior to 1978, boxed and tagged for identification, and protected from breakage.

3.1.19.2 Electrical Devices

Remove and salvage switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. Box and tag these items for identification according to type and size.

3.1.19.3 Wiring Ducts or Troughs

Remove and salvage wiring ducts or troughs. Dismantle plug-in ducts and wiring troughs into unit lengths. Remove plug-in or disconnecting devices from the busway and store separately.

3.1.19.4 Conduit and Miscellaneous Items

Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.1.20 Elevators and Hoists

Remove elevators, hoists, and similar conveying equipment and salvage as

whole units, to the most practical extent. Remove and prepare items for salvage without damage to any of the various parts. Salvage and store rails for structural steel with the equipment as an integral part of the unit.

3.1.21 Items With Unique/Regulated Disposal Requirements

Remove and dispose of items with unique or regulated disposal requirements in the manner dictated by law or in the most environmentally responsible manner.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the Contracting Officer to begin demolition and deconstruction. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials and equipment to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3.3 Salvaged Materials and Equipment

Remove materials and equipment that are to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site .

a. Salvage items and material to the maximum extent possible.

b. Store all materials salvaged for the Contractor as approved by the Contracting Officer and remove from Government property before completion of the contract. On site sales of salvaged material is prohibited.

c. Remove salvaged items to remain the property of the Government in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers. Deliver the

following items reserved as property of the Government to the areas designated: .

d. Remove the following items reserved as property of the using service prior to commencement of work under this contract: .

e. Remove historical items in a manner to prevent damage. Deliver the following historical items to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.

f.

3.3.4 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting AHRI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be removed from Government property and disposed of in accordance with 40 CFR 82. Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82. Submit Receipts or bills of lading, as specified. Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

3.3.4.1 Special Instructions

No more than one type of ODS is permitted in each container. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

a. Activity name and unit identification code

b. Activity point of contact and phone number

c. Type of ODS and pounds of ODS contained

d. Date of shipment

e. National stock number (for information, call (804) 279-4525).

3.3.4.2 Fire Suppression Containers

Deactivate fire suppression system cylinders and canisters with electrical charges or initiators prior to shipment. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.5 Transportation Guidance

Ship all ODS containers in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), 49 CFR 173.301, and DOD 4000.25-1-M.

3.3.6 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material in the disposal area located . The fill in the disposal area shall remain below elevation and after disposal is completed, the disposal area shall be uniformly graded to drain. Dispose of unsalvageable and non-recyclable combustible material off the site .

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the Waste Management Plan .

3.5.2 Burning on Government Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property .

3.5.3 Removal to Spoil Areas on Government Property

Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on Government property.

3.5.4 Removal from Government Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

3.6 REUSE OF SALVAGED ITEMS

Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

-- End of Section --

SECTION 02 82 16.00 20

ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS
08/11

PART 1 GENERAL

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE Z9.2	(2012) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

ASTM INTERNATIONAL (ASTM)

ASTM C732	(2006; R 2012) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D2794	(1993; R 2010) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D522/D522M	(2014) Mandrel Bend Test of Attached Organic Coatings
ASTM E119	(2014) Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E1368	(2014) Visual Inspection of Asbestos Abatement Projects
ASTM E1494	(2012) Encapsulants for Spray- or Trowel-Applied Friable Asbestos-Containing Building Materials
ASTM E736	(2000; R 2011) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E96/E96M	(2014) Standard Test Methods for Water Vapor Transmission of Materials

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book)

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.1101	Asbestos
29 CFR 1926.200	Accident Prevention Signs and Tags
29 CFR 1926.51	Sanitation
29 CFR 1926.59	Hazard Communication
40 CFR 61-SUBPART A	General Provisions
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

ND OPNAVINST 5100.23	(2005; Rev G) Navy Occupational Safety and Health (NAVOSH) Program Manual

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009; Reprint Sep 2014) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 ACM

Asbestos Containing Materials.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a maximum surface tension of 0.00042 psi.

1.2.3 Area Sampling

Sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.

1.2.4 Asbestos

The term asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos and any of these minerals that has been chemically treated or altered. Materials are considered to contain asbestos if the asbestos content of the material is determined to be at least one percent.

1.2.5 Asbestos Control Area

That area where asbestos removal operations are performed which is isolated by physical boundaries which assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris.

1.2.6 Asbestos Fibers

Those fibers having an aspect ratio of at least 3:1 and longer than 5 micrometers as determined by National Institute for Occupational Safety and Health (NIOSH) Method 7400.

1.2.7 Asbestos Permissible Exposure Limit

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101 or other Federal legislation having legal jurisdiction for the protection of workers health.

1.2.8 Background

The ambient airborne asbestos concentration in an uncontaminated area as measured prior to any asbestos hazard abatement efforts. Background concentrations for other (contaminated) areas are measured in similar but asbestos free locations.

1.2.9 Contractor

The Contractor is that individual, or entity under contract to the Navy to perform the herein listed work.

1.2.10 Competent Person

A person meeting the requirements for competent person as specified in 29 CFR 1926.1101 including a person capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, and is specifically trained in a training course which meet the criteria of EPA's Model Accreditation Plan (40 CFR 763) for project designer or supervisor, or its equivalent. The competent person shall have a current State of Indiana asbestos contractors or supervisors license.

1.2.11 Encapsulation

The abatement of an asbestos hazard through the appropriate use of chemical encapsulants.

1.2.12 Encapsulants

Specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulants as follows which must comply with performance requirements as specified herein.

a. Removal Encapsulant (can be used as a wetting agent)

b. Bridging Encapsulant (used to provide a tough, durable surface coating

to asbestos containing material)

c. Penetrating Encapsulant (used to penetrate the asbestos containing material encapsulating all asbestos fibers and preventing fiber release due to routine mechanical damage)

d. Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which asbestos containing material has been removed).

1.2.13 Friable Asbestos Material

One percent asbestos containing material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

1.2.14 Glovebag Technique

Those asbestos removal and control techniques put forth in 29 CFR 1926.1101 Appendix G.

1.2.15 HEPA Filter Equipment

High efficiency particulate air (HEPA) filtered vacuum and/or exhaust ventilation equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall retain 99.97 percent of particles 0.3 microns or larger as indicated in UL 586.

1.2.16 Navy Consultant (NC)

That qualified person employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The NC is normally a private consultant, but can be an employee of the Government.

1.2.17 Negative Pressure Enclosure (NPE)

That engineering control technique described as a negative pressure enclosure in 29 CFR 1926.1101.

1.2.18 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not normally release asbestos fibers during any appropriate use, handling, storage or transportation. It is understood that asbestos fibers may be released under other conditions such as demolition, removal, or mishap.

1.2.19 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with 29 CFR 1926.1101.

1.2.20 Private Qualified Person (PQP)

That qualified person hired by the Contractor to perform the herein listed tasks.

1.2.21 Qualified Person (QP)

A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under a legitimate State Model Accreditation Plan as described in 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in ASTM E1368. The QP shall be appropriately licensed in the State of Indiana.

1.2.22 TEM

Refers to Transmission Electron Microscopy.

1.2.23 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.2.24 Wetting Agent

A chemical added to water to reduce the water's surface tension thereby increasing the water's ability to soak into the material to which it is applied. An equivalent wetting agent must have a surface tension of at most 0.00042 psi.

1.3 REQUIREMENTS

1.3.1 Description of Work

The work covered by this section includes the handling and control of asbestos containing materials and describes some of the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of any asbestos containing materials generated by the work. More specific operational procedures shall be outlined in the Asbestos Hazard Abatement Plan called for elsewhere in this specification. The asbestos work includes the demolition and removal encapsulation of asbestos containing materials located at the building. Under normal conditions non-friable or chemically bound materials containing asbestos would not be considered hazardous; however, this material may release airborne asbestos fibers during demolition and removal and therefore must be handled in accordance with the removal and disposal procedures as specified herein. Provide negative pressure enclosure when required techniques as outlined in this specification. The Navy will evacuate the building or work area during the asbestos abatement work. All asbestos removal work shall be supervised by a competent person as specified herein.

1.3.1.1 Wallboard/Joint Compound

Both composite samples of the wallboard and discrete samples of the components (wallboard and joint compound) have been tested and results will be provided with each task order.

1.3.2 Medical Requirements

Provide medical requirements including but not limited to medical surveillance and medical record keeping as listed in 29 CFR 1926.1101.

1.3.2.1 Medical Examinations

Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101 or other pertinent State or local directives. This requirement must have been satisfied within the 12 months prior to the start of work on this contract. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."

1.3.2.2 Medical Records

Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of indefinite time after termination of employment and make records of the required medical examinations and exposure data available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA), or authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

1.3.3 Employee Training

Submit certificates, prior to the start of work but after the main abatement submittal, signed by each employee indicating that the employee has received training in the proper handling of materials and wastes that contain asbestos in accordance with 40 CFR 763; understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis. Certificates shall be organized by individual worker, not grouped by type of certification. Post appropriate evidence of compliance with the training requirements of 40 CFR 763. Train all personnel involved in the asbestos control work in accordance with United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) training criteria or State training criteria whichever is more stringent. The Contractor shall document the training by providing: dates of training, training entity, course outline, names of instructors, and qualifications of instructors upon request by the Contracting Officer. Furnish each employee with respirator training and fit testing administered by the PQP as required by 29 CFR 1926.1101. Fully cover engineering and other hazard control techniques and procedures. All asbestos workers shall have a current State of Indiana asbestos worker's license.

1.3.4 Permits , Licenses, and Notifications

Obtain necessary permits and licenses in conjunction with asbestos removal, encapsulation, hauling, and disposition, and furnish notification of such actions required by Federal, State, regional, and local authorities prior

to the start of work. Notify the Indiana Department of Environmental Management (IDEM) and the Contracting Officer in writing 10 working days prior to commencement of work in accordance with 40 CFR 61-SUBPART M. Notify the Contracting Officer and other appropriate Government agencies in writing 10 working days prior to the start of asbestos work as indicated in applicable laws, ordinances, criteria, rules, and regulations. Submit copies of all Notifications to the Contracting Officer. Notify the local fire department 3 days prior to removing fire-proofing material from the building including notice that the material contains asbestos.

1.3.5 Environment, Safety and Health Compliance

In addition to detailed requirements of this specification, comply with those applicable laws, ordinances, criteria, rules, and regulations of Federal, State, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.1101, 40 CFR 61-SUBPART A, 40 CFR 61-SUBPART M, and ND OPNAVINST 5100.23. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Government shall apply. The following laws, ordinances, criteria, rules and regulations regarding removal, handling, storing, transporting and disposing of asbestos materials apply:

a. Indiana administration code (IAC) 326, Article 14 (Indiana NESHAP)

b. Indiana administration code (IAC) 329, Article 10, Rule 8.2 (Waste Disposal)

c. Indiana administration code (IAC) 326, Article 18 (Licensing).

1.3.6 Respiratory Protection Program

Establish and implement a respirator program as required by AIHA Z88.6, 29 CFR 1926.1101, and 29 CFR 1926.103. Submit a written description of the program to the Contracting Officer. Submit a written program manual or operating procedure including methods of compliance with regulatory statutes.

1.3.6.1 Respirator Program Records

Submit records of the respirator program as required by AIHA Z88.6, 29 CFR 1926.103, and 29 CFR 1926.1101.

1.3.7 Asbestos Hazard Control Supervisor

The Contractor shall be represented on site by a supervisor, trained using the model Contractor accreditation plan as indicated in the Federal statutes for all portions of the herein listed work.

1.3.8 Hazard Communication

Adhere to all parts of 29 CFR 1926.59 and provide the Contracting Officer with a copy of the Safety Data Sheets (SDS) for all materials brought to the site.

1.3.9 Asbestos Hazard Abatement Plan

The Contractor shall develop an asbestos abatement plan, as applicable, to include elements addressed in paragraph 06.B.05 of EM385-1-1 and UFGS 02 82 16.00 20. Asbestos abatement plan shall address each task order once approved by the government. A marked-up floor plan layout drawing will be submitted for each task order and approved by the government before work may commence on the task order. Layout drawing shall include locations and quantities of asbestos to be removed or encapsulated, critical barriers, regulated areas/containment boundaries, waste route, dumpster location, negative air machine locations and exhaust locations, equipment and personnel decontamination unit locations, color coded legend, north arrow and any other information necessary to explain the work that is being accomplished so that it can be used for future reference in the government’s asbestos files for that particular building. The plan, not to be combined with other hazard abatement plans, shall be prepared, signed, and sealed by the PQP.

Provide a Table of Contents for each abatement submittal, which shall follow the sequence of requirements in the contract. Such plan shall include but not be limited to the precise personal protective equipment to be used including, but not limited to, respiratory protection, type of whole-body protection , the location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, change rooms, removal or encapsulation method, interface of trades involved in the construction, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, locations of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control environmental pollution.The plan shall also include (both fire and medical emergency) response plans. The Asbestos Hazard Abatement Plan must be approved in writing prior to starting any asbestos work. The Contractor, Asbestos Hazard Control Supervisor, and PQP shall meet with the Contracting Officer prior to beginning work, to discuss in detail the Asbestos Hazard Abatement Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the plan shall be identified specifically in the plan to allow for free discussion and approval by the Contracting Officer prior to starting work.

1.3.10 Testing Laboratory

Submit the name, address, and telephone number of each testing laboratory selected for the sampling, analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate State license and/or permits and certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited and that persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry (AAR) and successful participation of the laboratory in the Proficiency Analytical Testing (PAT) Program. Where analysis to determine asbestos content in bulk materials or transmission electron microscopy is required, submit evidence that the laboratory is accredited by the National Institute of Science and Technology (NIST) under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. The testing laboratory firm shall be independent of the asbestos contractor and shall have no employee or employer relationship which could constitute a conflict of interest.

1.3.11 Landfill Approval

Submit written evidence that the landfill is for asbestos disposal by the U.S. Environmental Protection Agency, Region 3, Air Enforcement Section (38W12), and local regulatory agencies. Within 3 working days after delivery, submit detailed delivery tickets, prepared, signed, and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill. Submit a copy of the waste shipment records within 1 day of the shipment leaving the project site.

1.3.12 Medical Certification

Provide a written certification for each worker and supervisor, signed by a licensed physician indicating that the worker and supervisor has met or exceeded all of the medical prerequisites listed herein and in 29 CFR 1926.1101 and 29 CFR 1926.103 as prescribed by law. Submit certificates prior to the start of work but after the main abatement submittal.

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.for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Local exhaust equipment; G

Vacuums; G

Respirators; G

Pressure differential automatic recording instrument; G

Amended water; G

Glovebags; G

Material Safety Data Sheets (MSDS) for all materials proposed for transport to the project site; G

Encapsulants; G

SD-06 Test Reports

Air sampling results; G

Pressure differential recordings for local exhaust system; G

Asbestos disposal quantity report; G

Encapsulation test patches; G

Clearance sampling; G

SD-07 Certificates

Asbestos hazard abatement plan; G

Testing laboratory; G

Private qualified person documentation; G

Contractor's license; G

Competent person documentation; G

Worker's license; G

Landfill approval; G

Employee training; G

Medical certification requirements; G

Waste shipment records and if applicable exemption report; G

Respiratory Protection Program; G

Delivery tickets; G

Vacuums; G

Water filtration equipment; G

Ventilation systems; G

Other equipment used to contain airborne asbestos fibers; G

Chemical encapsulants sealers;; G

Notifications

Show compliance with ASSE Z9.2 by providing manufacturers' certifications.

SD-11 Closeout Submittals

Notifications; G

Rental equipment; G

Respirator program records; G

Permits and licenses; G

Note: Some documents can be submitted one time at the beginning of the contract as long as the same asbestos abatement contractor is performing the work. These documents include: Accident Prevention Plan (APP) with Activity Hazard Analysis (AHA), Respirator Protection Plan, training certificates, Laboratory NVLAP Certificate, Landfill waste profile acceptance letter and Safety Data Sheets (SDS). The documents must be resubmitted immediately to the Contracting Officer if a new contracting company is hired, changes are made to the documents, training certificates expire or a new employee is hired.

Documents that must be submitted prior to commencing each project include: Asbestos abatement plan, PQP sampling plan, permits, asbestos licenses,

Indiana abatement contractor license, respirator fit certificates, medical certificate to wear a respirator, IDEM notification (if applicable), and waste manifest.

Do not include Personally Identifiable Information (PII) such as social security numbers on any of these documents.

1.5 QUALITY ASSURANCE

1.5.1 Private Qualified Person Documentation

Submit the name, address, and telephone number of the Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The PQP shall be appropriately licensed in the State of Indiana. The PQP and the asbestos contractor shall not have an employee/employer relationship or financial relationship which could constitute a conflict of interest. The PQP shall be a first tier subcontractor.

1.5.2 Competent Person Documentation

Submit training certification and a current State of Indiana Asbestos Contractor's and Supervisor's License.

1.5.3 Worker's License

Submit documentation that requires all workers have a current State of Indiana Asbestos Workers License.

1.5.4 Contractor's License

Contractor shall have current Indiana asbestos contractor's license. Submit a copy of the asbestos contractor's license issued by the State of Indiana.

1.5.5 Air Sampling Results

Complete fiber counting and provide results to the PQP for review within 16 hours of the "time off" of the sample pump. Notify the Contracting Officer immediately of any airborne levels of asbestos fibers in excess of the acceptable limits. Submit sampling results to the Contracting Officer and the affected Contractor employees where required by law within 3 working days, signed by the testing laboratory employee performing air sampling, the employee that analyzed the sample, and the PQP . Notify the Contractor and the Contracting Officer immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter or background whichever is higher. In no circumstance shall levels exceed 0.1 fibers per cubic centimeter.

1.5.6 Pressure Differential Recordings for Local Exhaust System

Provide a local exhaust system that creates a negative pressure of at least 0.02 inches of water relative to the pressure external to the enclosure and

operate it continuously, 24 hours a day, until the temporary enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the PQP for review and to the Contracting Officer within 24 hours from the end of each work day.

1.6 EQUIPMENT

1.6.1 Rental Equipment

Provide a copy of the written notification to the rental company concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Shall conform to current USEPA requirements, shall contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and shall conform to the following performance requirements.

2.1.1 Removal Encapsulants

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.2 Bridging Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M

Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.3 Penetrating Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84

Requirement	Test Standard
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Cohesion/Adhesion Test - 50 pounds of force/foot	ASTM E119
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.4 Lock-down Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M

Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E119
Bond Strength: 100 pounds of force/foot	ASTM E736
(Tests compatibility with cementitious and fibrous fireproofing)	

PART 3 EXECUTION

3.1 EQUIPMENT

At all times, provide the Contracting Officer or the Contracting Officer's Representative, with at least two complete sets of personal protective equipment as required for entry to and inspection of the asbestos control area. Provide equivalent training to the Contracting Officer or a designated representative as provided to Contractor employees in the use of the required personal protective equipment. Provide manufacturer's certificate of compliance for all equipment used to contain airborne asbestos fibers.

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

3.1.1.1 Respirators for Handling Asbestos

Provide personnel engaged in pre-cleaning, cleanup, handling, encapsulation, removal and/or demolition of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 29 CFR 1926.103.

3.1.2 Exterior Whole Body Protection

3.1.2.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable "non-breathable," whole body outer protective clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles, and make clothing secure at the neck by the use of tape.

3.1.2.2 Work Clothing

Provide cloth work clothes for wear under the outer protective clothing and foot coverings and either dispose of or properly decontaminate them as recommended by the PQP after each use.

3.1.2.3 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate

decontamination locker room and clean locker room with a shower that complies with 29 CFR 1926.51(f)(4)(ii) through (V) in between for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and street shoes in the clean locker. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. HEPA vacuum and remove asbestos contaminated reusable protective clothing while still wearing respirators at the boundary of the asbestos work area, seal in two impermeable bags, label outer bag as asbestos contaminated waste, and transport for decontamination. Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved water filtration equipment to remove asbestos contamination. Dispose of filters and residue as asbestos waste.Discharge clean water to the sanitary system. Dispose of asbestos contaminated work clothing as asbestos contaminated waste or properly decontaminate as specified in the Contractor's Asbestos Hazard Abatement Plan. Decontamination units shall be physically attached to the asbestos control area. Build both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area.

3.1.2.4 Decontamination of Reusable Outer Protective Clothing shall not be used When reusable outer protective clothing is used, transport the double bagged clothing to a previously notified commercial/industrial decontamination facility for decontamination.Perform non-destructive testing to determine the effectiveness of asbestos decontamination. If representative sampling is used, ensure the statistical validity of the sampling results. If representative sampling is used, reject any entire batch in which any of the pieces exceed 40 fibers per square millimeter. Inspect reusable protective clothing prior to use to ensure that it will provide adequate protection and is not or is not about to become ripped, torn, deteriorated, or damaged, and that it is not visibly contaminated. Notify, in writing, all personnel involved in the decontamination of reusable outer protective clothing as indicated in 29 CFR 1926.1101.

3.1.2.5 Eye Protection

Provide goggles to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.3 Warning Signs and Labels

Provide warning signs printed in English at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

3.1.3.1 Warning Sign

Provide vertical format conforming to 29 CFR 1926.200, and 29 CFR 1926.1101 minimum 20 by 14 inches displaying the following legend in the lower panel:

Legend	Notation

Danger	one inch Sans Serif Gothic or Block
Asbestos	one inch Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	1/4 inch Sans Serif Gothic or Block
Authorized Personnel Only	1/4 inch Sans Serif Gothic or Block

Legend	Notation
Respirators and Protective Clothing are Required in this Area	1/4 inch Sans Serif Gothic or Block

Spacing between lines shall be at least equal to the height of the upper of any two lines.

3.1.3.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AVOID CREATING DUST

3.1.4 Local Exhaust System

Provide a local exhaust system in the asbestos control area in accordance with ASSE Z9.2 and 29 CFR 1926.1101 that will provide at least four air changes per hour inside of the negative pressure enclosure. Local exhaust equipment shall be operated 24 hours per day, until the asbestos control area is removed and shall be leak proof to the filter and equipped with HEPA filters. Maintain a minimum pressure differential in the control area of minus 0.02 inch of water column relative to adjacent, unsealed areas.

Provide continuous 24-hour per day monitoring of the pressure differential with a pressure differential automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment shall conform to ASSE Z9.2 and UL 586. The local exhaust system shall terminate out of doors and remote from any public access or ventilation system intakes.

3.1.5 Tools

Vacuums shall be leak proof to the filter and equipped with HEPA filters. Filters on vacuums shall conform to ASSE Z9.2 and UL 586. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation systems. Remove all residual asbestos from reusable tools prior to storage or reuse.

3.1.6 Rental Equipment

If rental equipment is to be used, furnish written notification to the rental agency concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

3.1.7 Glovebags

Submit written manufacturers proof that glovebags will not break down under expected temperatures and conditions.

3.2 WORK PROCEDURE

Perform asbestos related work in accordance with 29 CFR 1926.1101, 40 CFR 61-SUBPART M, and as specified herein. Use wet or if given prior EPA approval, dry removal procedures appropriate encapsulation procedures as listed in the asbestos hazard abatement plan and negative pressure enclosure techniques. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, tobacco, or applying cosmetics shall not be permitted in the asbestos work or control areas. Personnel of other trades not engaged in the encapsulation, removal and/or demolition of asbestos containing material shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection and training provisions of this specification are complied with by the trade personnel. Seal all roof top penetrations, except plumbing vents, prior to asbestos roofing work. Shut down the building heating, ventilating, and air conditioning system, cap the openings to the system, and provide temporary heating, and ventilation, and air conditioning prior to the commencement of asbestos work. Disconnect electrical service when encapsulation or wet removal is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any water or encapsulant. If an asbestos fiber release or spill occurs outside of the asbestos control area, stop work immediately, correct the condition to the satisfaction of the Contracting Officer including clearance sampling, prior to resumption of work.

3.2.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent work. Where such work is damaged or contaminated as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust, or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained from the PQP work may proceed at the discretion of the Contracting Officer.

3.2.2 Furnishings

Furniture and equipment will be removed from the work area by the Government and stored in a location approved by the Contracting Officer prior to abatement activities or will be covered and sealed with 2 layers of 6-mil poly sheeting.

3.2.3 Precleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of an enclosure.

3.2.4 Asbestos Control Area Requirements

3.2.4.1 Negative Pressure Enclosure

Block and seal openings in areas where the release of airborne asbestos fibers can be expected. Establish an asbestos negative pressure enclosure with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos work area. Negative pressure enclosure development shall include protective covering of uncontaminated walls, and ceilings with a continuous membrane of two layers of minimum 6-mil plastic sheet sealed with tape to prevent water or other damage. Provide two layers of 6-mil plastic sheet over floors and extend a minimum of 12 inches up walls. Seal all joints with tape. Provide local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.4.2 Glovebag

If construction of a negative pressure enclosure is infeasible at any location and the PQP and Contracting Officer agree that it is infeasible use alternate techniques as indicated in 29 CFR 1926.1101. Establish designated limits for the asbestos regulated area with the use of rope or other continuous barriers, and maintain all other requirements for asbestos control areas. The PQP shall conduct personal samples of each worker engaged in asbestos handling (removal, disposal, transport and other associated work) throughout the duration of the project. If the quantity of airborne asbestos fibers monitored at the breathing zone of the workers at any time exceeds background or 0.01 fibers per cubic centimeter whichever is greater, stop work, evacuate personnel in adjacent areas or provide personnel with approved protective equipment at the discretion of the Contracting Officer. This sampling may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those obtained by the Contractor, the Government will determine which results predominate. If adjacent areas are contaminated as determined by the Contracting Officer, clean the contaminated areas, monitor, and visually inspect the area as specified herein.

3.2.5 Removal Procedures

Wet asbestos material with a fine spray of amended water during removal, cutting, or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 6 mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with continuous application of the amended water or wetting agent in such a manner that no asbestos material is disturbed prior to being adequately wetted. Where unusual circumstances prohibit the use of 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Asbestos containing material shall be containerized while wet. At no time shall asbestos material be allowed to accumulate or become dry. Lower and otherwise handle asbestos containing material as indicated in 40 CFR 61-SUBPART M.

3.2.5.1 Sealing Contaminated Items Designated for Disposal

Remove contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated items designated for removal by completely coating the items with an asbestos lock-down encapsulant at the demolition site before removing the items from the asbestos control area. These items need not be vacuumed. The asbestos lock-down encapsulant shall be tinted a contrasting color. It shall be spray-applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces. Lock-down encapsulants shall comply with the performance requirements specified herein.

3.2.5.2 Exposed Pipe Insulation Edges

Contain edges of asbestos insulation to remain that are exposed by a removal operation. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 1/4 inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by at least 4 inches. When insulating cement and cloth is an impractical method of sealing a raw edge of asbestos, take appropriate steps to seal the raw edges as approved by the Contracting Officer.

3.2.6 Encapsulation Procedures

3.2.6.1 Preparation of Test Patches

Install three test patches of encapsulant in the building, as indicated. Use airless spray at the lowest pressure and as recommended by the encapsulant manufacturer. Follow exactly the manufacturer's instructions for thinning recommendations, application procedures and rates. Curing time shall be not less than five days or that recommended by the manufacturer, whichever is more. A test patch shall be 9 square feet in size.

3.2.6.2 Field Testing

Field test the encapsulation test patches in accordance with ASTM E1494, paragraph "Required Field Test," in the presence of the Contracting Officer. Keep a written record of the testing procedures and test results. Upon successful testing of the encapsulant, submit a signed statement to the Contracting Officer certifying that the encapsulant is suitable for installation on the particular asbestos containing material.

3.2.6.3 Large-Scale Application

Apply encapsulant using the same equipment and procedures as employed for the test patches. Keep the encapsulant material stirred to prevent settling. Keep a clean work area. Change pre-filters in the ventilation equipment as soon as they appear clogged by encapsulant aerosol or pressure differential drops below 0.02 Hg.

3.2.7 Air Sampling

Sampling of airborne concentrations of asbestos fibers shall be performed

in accordance with 29 CFR 1926.1101 and as specified herein. Sampling performed in accordance with 29 CFR 1926.1101 shall be performed by the PQP. Sampling performed for environmental and quality control reasons shall be performed by the PQP . Unless otherwise specified, use NIOSH Method 7400 for sampling and analysis. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those results obtained by the Contractor, the Government will determine which results predominate.

3.2.7.1 Sampling Prior to Asbestos Work

Provide area air sampling and establish the baseline one day prior to the masking and sealing operations for each demolition, removal or encapsulation site. Establish the background by performing area sampling in similar but uncontaminated sites in the building.

3.2.7.2 Sampling During Asbestos Work

The PQP shall provide personal and area sampling as indicated in 29 CFR 1926.1101 and governing environmental regulations. In addition, provided the same type of work is being performed, provide area sampling at least once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

3.2.7.3 Sampling After Final Clean-Up (Clearance Sampling)

Provide area sampling of asbestos fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 and establish an airborne asbestos concentration of less than 0.01 fibers per cubic centimeter after final clean-up but before removal of the enclosure or the asbestos work control area. After final cleanup and the asbestos control area is dry but prior to clearance sampling, the PQP shall perform a visual inspection in accordance with ASTM E1368 to ensure that the asbestos control and work area is free of any accumulations of dirt, dust, or debris. Prepare a written report signed and dated by the PQP documenting that the asbestos control area is free of dust, dirt, and debris and all waste has been removed. Perform at least 5 samples. If the PQP determines that fewer samples could be taken, then discussions shall take place with the Contracting Officer. The Contracting Officer shall provide the final decision and approval for fewer samples to be taken. Use phase contrast microscopy (PCM)to analyze clearance samples and report the results in accordance with current NIOSH criteria. The asbestos fiber counts from these samples shall be less than 0.01 fibers per cubic centimeter or be not greater than the background, whichever is greater. Should any of the final samples indicate a higher value, the Contractor shall take appropriate actions to re-clean the area and shall repeat the sampling and PCM analysis at the Contractor's expense. Transmission electron microscopy (TEM) analysis may be used for particularly dirty environments with the Contracting Officer's approval.

3.2.8 Lock-Down

Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, the PQP shall conduct a visual inspection of all areas affected by the removal or encapsulation in accordance with ASTM E1368. Inspect for any visible fibers , and to ensure that encapsulants were applied evenly and appropriately. A post removal (lock-down) encapsulant shall then be spray applied to temporary ceiling, walls, floors and other critical barriers exposed in the removal area. The exposed area shall include but not be limited to plastic barriers, furnishings and articles to be discarded as well as dirty change room, air locks for bag removal and decontamination chambers.

3.2.9 Site Inspection

While performing asbestos engineering control work, the Contractor shall be subject to on-site inspection by the Contracting Officer who may be assisted by or represented by safety or industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. All related costs including standby time required to resolve the violation shall be at the Contractor's expense.

3.3 CLEAN-UP AND DISPOSAL

3.3.1 Housekeeping

Essential parts of asbestos dust control are housekeeping and clean-up procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep waste from being distributed over the general area. Use HEPA filtered vacuum cleaners. DO NOT BLOW DOWN THE SPACE WITH COMPRESSED AIR. When asbestos removal is complete, all asbestos waste is removed from the work-site, and final clean-up is completed, the Contracting Officer will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish HVAC mechanical, and electrical systems in proper working order. The Contracting Officer will visually inspect all surfaces within the enclosure for residual material or accumulated dust or debris. The Contractor shall re-clean all areas showing dust or residual materials. If re-cleaning is required, air sample and establish an acceptable asbestos airborne concentration after re-cleaning. The Contracting Officer must agree that the area is safe in writing before unrestricted entry will be permitted. The Government shall have the option to perform monitoring to determine if the areas are safe before entry is permitted.

3.3.2 Title to Materials

All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.

3.3.3 Disposal of Asbestos

3.3.3.1 Procedure for Disposal

Collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6 mils

thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Affix a warning and Department of Transportation (DOT) label to each container including the bags or use at least 6 mils thick bags with the approved warnings and DOT labeling preprinted on the bag. The name of the waste generator and the location at which the waste was generated shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or State-approved asbestos landfill off Government property. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. An area for interim storage of asbestos waste-containing drums or skids will be assigned by the Contracting Officer or his authorized representative. Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

3.3.3.2 Asbestos Disposal Quantity Report

Direct the PQP to record and report, to the Contracting Officer, the amount of asbestos containing material removed and released for disposal. Deliver the report for the previous day at the beginning of each day shift with amounts of material removed during the previous day reported in linear feet or square feet as described initially in this specification and in cubic feet for the amount of asbestos containing material released for disposal.

-- End of Section --

SECTION 02 83 13.00 20

LEAD IN CONSTRUCTION
08/11

PART 1 GENERAL

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

STATE OF VIRGINIA ADMINISTRATIVE CODE (VAC)

16 VAC 25-35	Title 16, Agency 25, Chapter 35: Regulation Concerning Certified Lead Contractor's Notification, Lead Project Permits And Permit Fees
18 VAC 15-30	Title 18, Agency 15, Chapter 30: Virginia Lead-Based Paint Activities Regulations

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of

	Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009; Reprint Sep 2014) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel (approximately 5 to 6 feet above the floor).

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment

(PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 High Efficiency Particulate Arrestor (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3 micron or larger size particles.

1.2.7 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.8 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.9 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.10 Material Containing Lead/Paint with Lead (MCL/PWL)

Any material, including paint, which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint or MCL using laboratory instruments with specified limits of detection (usually 0.01 percent). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.11 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.12 Physical Boundary

Area physically roped or partitioned off around lead control area to limit

unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

Construction activities impacting PWL or material containing lead which are covered by this specification include the demolition and/or removal of material containing lead in any condition, located NSA Crane and as indicated on the drawings.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Occupational and Environmental Assessment Data Report (if objective data is used to justify excluding the initial occupational exposure assessment); G

Lead Compliance Plan including CP approval (signature, date, and certification number); G

Competent Person qualifications; G

Training Certification of workers and supervisors; G

lead waste management plan; G

written evidence that TSD is approved for lead disposal; G

Certification of Medical Examinations; G

SD-06 Test Reports

sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Testing laboratory qualifications; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Competent Person (CP)

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained and licensed in accordance with federal, State (18 VAC 15-30) and local laws. The competent person shall be a licensed lead-based paint abatement Supervisor/Project Designer in the State of Indiana.

1.5.1.2 Training Certification

Submit a certificate for each worker and supervisor, signed and dated by the accredited training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62(l) .

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve Lead Compliance Plan for conformance to the applicable referenced standards.

c. Continuously inspect PWL or MCL work for conformance with the approved plan.

d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.

e. Ensure work is performed in strict accordance with specifications at all times.

f. Control work to prevent hazardous exposure to human beings and to the environment at all times.

g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.

h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead Compliance Plan

Submit a detailed job-specific plan of the work procedures to be used in the disturbance of PWL or MCL. The plan shall include a sketch showing the location, size, and details of lead control areas, critical barriers, physical boundaries, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, work practices, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking, hygiene facilities and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and dust containing lead and debris, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside of the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multicontractor worksites to inform affected employees and to clarify responsibilities to control exposures.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

a. The initial monitoring shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further

monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs MCL/PWL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State (18 VAC 15-30) and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations. and address:

a. Identification and classification of wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of USEPA State (in accordance with 16 VAC 25-35) and local hazardous waste .

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to

include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers. Wastes shall be cleaned up and containerized daily.

h. Include any process that may alter or treat waste rendering a hazardous waste non hazardous.

i. Unit cost for hazardous waste disposal according to this plan.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the Lead Waste Management Plan and the Lead Compliance Plan, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during PWL or MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 10 days prior to the start of any lead work.

3.1.1.2 Lead Control Area

a. Physical Boundary - Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

The Government will remove furniture and equipment from the building before lead work begins.

Furniture and equipment will remain in the building . Protect and cover furnishings or remove furnishings from the work area and store in a location approved by the Contracting Officer.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

a. To the extent feasible, use local exhaust ventilation or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

b. Vent local exhaust outside the building and away from building ventilation intakes or ensure system is connected to HEPA filters.

c. Use locally exhausted, power actuated tools or manual hand tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by completely establishing barriers and physical boundaries around the area or structure where PWL or MCL removal operations will be performed.

3.3 APPLICATION

3.3.1 Lead Work

Perform lead work in accordance with approved Lead Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62 or 40 CFR 745, and as specified herein. Dispose of all PWL or MCL and associated waste in compliance with federal, State, and local requirements.

3.3.2 Paint with Lead or Material Containing Lead Removal

Manual or power sanding or grinding of lead surfaces or materials is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited. Provide methodology for removing lead in the Lead Compliance Plan. Select lead removal processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris or waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this removal process in the Lead Compliance Plan.

3.3.2.1 Paint with Lead or Material Containing Lead - Indoor Removal

Perform manual or mechanical removal and thermal cutting in the lead control areas using enclosures, barriers or containments . Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Paint with Lead or Material Containing Lead - Outdoor Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the Lead Compliance Plan. The worksite preparation (barriers or containments) shall be job dependent and presented in the Lead Compliance Plan.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:

a. Vacuum all clothing before entering the contaminated change room.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, shower.

d. Change to clean clothes prior to leaving the clean clothes storage area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and wipe sampling and inspecting the PWL or MCL removal work to ensure that the requirements of the contract have been satisfied during the entire PWL or MCL operation.

b. Collect personal air samples on employees who are anticipated to have

the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

d. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

3.4.1.2 Sampling After Removal

After the visual inspection, collect wipe samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust in micrograms per square meter foot of surface area .

3.4.1.3 Testing of Material Containing Lead Residue

Test residue in accordance with 40 CFR 261 for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the lead operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the Lead Compliance Plan. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before clearance testing.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

Clear the lead control area in industrial facilities of all visible dust and debris.

3.5.2 Disposal

a. All material, whether hazardous or non-hazardous shall be disposed in accordance with all laws and provisions and all federal, State or local regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

b. Contractor is responsible for segregation of waste. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261.

c. Dispose of lead-contaminated material classified as hazardous waste at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

e. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility.

3.5.2.2 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 05 21 00

STEEL JOIST FRAMING
05/15

PART 1 GENERAL

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 WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2010; Errata 2011) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2012) International Building Code

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC PA 1	(2000; E 2004) Shop, Field, and Maintenance Painting of Steel
SSPC Paint 15	(1999; E 2004) Steel Joist Shop Primer
SSPC SP 2	(1982; E 2000; E 2004) Hand Tool Cleaning

STEEL JOIST INSTITUTE (SJI)

SJI COMPOSITE JOISTS	(2007; Supplement 1 2010) Standard Specifications for Composite Steel Joist Catalog
SJI LOAD TABLES	(2005; Errata 1 2006; Errata 2 2007; Errata 3 2007) 42nd Edition Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders
SJI MANUAL	(2009) 80 Years of Open Web Steel Joist Construction

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

29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.757	Steel Erection; Open Web Steel Joists

1.2 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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Welder Qualification

SD-02 Shop Drawings

Steel Joist Framing; G

SD-05 Design Data

Design Calculations; G

SD-06 Test Reports

Erection Inspection
Welding Inspections

SD-07 Certificates

Certification of Compliance

SD-11 Closeout Submittals

Recycled Content of Steel Products; S

1.3 QUALITY ASSURANCE

Perform all work in compliance with the requirements set forth in 29 CFR 1926.

1.3.1 Drawing Requirements

Submit drawings of steel joist framing including fabrication, specifications for shop painting, and identification markings of joists and joist girders. Show joist type and size, layout in plan, all applicable loads, deflection criteria, and erection details including methods of anchoring, framing at openings, type, size, and location and connections for and spacing of bridging, requirements for field welding, and details of accessories as applicable. Show steel joist field splice locations and details.

1.3.2 Certification of Compliance

Prior to construction commencement, submit certification for welder qualification, in compliance with AWS D1.1/D1.1M, welding operation, and tacker, stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualification tests. Submit certification of compliance for

the following:

a. SJI MANUAL

. Steel Joist Institute Member Fabricator

b. 29 CFR 1926

c. 29 CFR 1926.757

d. Statement from steel joist manufacturer, that work was performed in accordance with approved construction documents and with SJI standard specifications, in accordance with ICC IBC Section 1704.2.5.2.

1.4 DELIVERY, STORAGE, AND HANDLING

Handle, transport, and store joists and joist girders in a manner to prevent damage affecting their structural integrity. Verify piece count of all joist products upon delivery and inspect all joists products for damage. Report any damage to the joist supplier. Store all items off the ground in a well drained location protected from the weather and easily accessible for inspection and handling. Store joists with top chord down and with joists in a vertical position. Store deep joists horizontally if they were shipped on their sides.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Designate steel joists and joist girders on the drawings in accordance with the standard designations of the Steel Joist Institute. Joists of other standard designations or joists with properties other than those shown may be substituted for the joists designated provided the structural properties are equal to or greater than those of the joists shown and provided all other specified requirements are met.

2.2 STEEL JOISTS AND JOIST GIRDERS

Provide steel joists and joist girders conforming to SJI LOAD TABLES. Design joists designated K, KCS, LH and DLH to support the loads given in the applicable standard load tables of SJI LOAD TABLES. Submit design calculations for net uplift loads, non-SJI standard details, and field splices. Include cover letter signed and sealed by the joist manufacturer's registered design professional.

2.2.1 Steel Joist Camber

Camber joists according to SJI LOAD TABLES or as required.

2.2.2 Special Steel Joists

Provide special joists and connections capable of withstanding the design loads indicated with a live-load deflection less than L/360 for roof joists and L/360 for floor joists.

2.2.3 Steel Joist Substitutes and Outriggers

Provide joist substitutes and outriggers conforming to SJI LOAD TABLES with steel angle or channel members.

2.2.4 Composite Steel Joists

Provide composite steel joists conforming to SJI COMPOSITE JOISTS.

2.2.5 Joist Girders

Provide joist girders capable of withstanding the design loads indicated with a live-load deflection less than L/240 for roof girders and L/360 for floor girders. Where joist girders are part of the lateral load resisting system, design girder for the end moments indicated for wind and seismic.

Camber joist girders according to SJI LOAD TABLES.

2.3 RECYCLED CONTENT

Provide products with an average recycled content of steel products of postconsumer recycled content plus one half of preconsumer recycled content not less than 5 percent.

2.4 ACCESSORIES AND FITTINGS

2.4.1 Bridging

Provide bridging of material, size, and type required by SJI LOAD TABLES for type of joist, chord size, spacing and span. Furnish additional erection bridging if required for stability.

2.4.2 Bearing Plates

Fabricate steel bearing plats from ASTM A36/A36M steel of size and thickness indicated.

2.4.3 Ceiling Extensions

Furnish ceiling extensions, either bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface unless otherwise indicated.

2.5 SHOP PAINTING

SSPC Paint 15. Shop prime joists, except as modified herein, in accordance with SSPC PA 1. Clean joists in accordance with SSPC SP 2 before priming. Do not prime joists to receive sprayed-on fireproofing. If flash rusting occurs, re-clean the surface prior to application of primer. For joists which require finish painting under Section 09 90 00 PAINTS AND COATINGS, the primer paint must be compatible with the finish paint.

PART 3 EXECUTION

3.1 ERECTION

Install joists in conformance with SJI LOAD TABLES for the joist series indicated, and the requirements of 29 CFR 1926 and 29 CFR 1926.757. Handle and set joists avoiding damage to the members. Place the "tag end" of joists as shown on the joists placement plans. Ensure that square-end joists are erected right side up. Distribute temporary loads so that joist capacity is not exceeded. Remove damaged joists from the site, except when

field repair is approved and such repairs are satisfactorily made in accordance with the manufacturer's recommendations. Do not repair, field modify, or alter any joists without specific written instructions from the Designer of Record and/or joist manufacturer.

Install and connect bridging concurrently with joist erection, before construction loads are applied. Do not apply loads to bridging. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams. Do not cut away vertical leg of bridging where bridging makes an elevation transition; weld a separate piece of bridging at the transition. Perform all welding in accordance with AWS D1.1/D1.1M.

3.2 BEARING PLATES

Provide bearing plates to accept full bearing after the supporting members have been plumbed and properly positioned, but prior to placing superimposed loads. The area under the plate must be damp-packed solidly with bedding mortar, except where nonshrink grout is indicated on the drawings. Provide bedding mortar and grout as specified in Section 03 30 00.00 10 CAST-IN-PLACE CONCRETESection 03 30 00 CAST-IN-PLACE CONCRETE.

3.3 PAINTING

3.3.1 Touch-Up Painting

After erection of joists and joist girders, touch-up connections and areas of abraded shop coat with paint of the same type used for the shop coat.

3.3.2 Field Painting

Paint joists and joist girders requiring a finish coat in conformance with the requirements of Section 09 90 00 PAINTS AND COATINGS.

3.4 VISUAL INSPECTIONS

Perform the following visual inspections:

a. Verify that all joists are spaced properly.

b. Verify that there is sufficient joist bearing on steel beams, concrete, and masonry.

c. Verify all bridging lines are properly spaced and anchored.

d. Verify that damage has not occurred to the joists and joist girder during erection.

e. Verify the joists are aligned vertically and there is no lateral sweep in the joists.

f. Where concentrated loads are present on the joists verify that they are located in accordance with the joists placement plan.

g. Verify welding of bridging and joist seats in accordance with AWS D1.1/D1.1M, Section 6. Perform erection inspection and field welding inspections with AWS certified welding inspectors.

h. Verify proper bolting of diagonal bridging and joist seats where the

bolts are snug-tight.

-- End of Section --

SECTION 05 30 00

STEEL DECKS
05/15

PART 1 GENERAL

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 IRON AND STEEL INSTITUTE (AISI)

AISI D100	(1991; R 2008) Cold-Formed Steel Design Manual

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2010; Errata 2011) Structural Welding Code - Steel
AWS D1.3/D1.3M	(2008; Errata 2008) Structural Welding Code - Sheet Steel

ASTM INTERNATIONAL (ASTM)

ASTM A1008/A1008M	(2015) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened
ASTM A123/A123M	(2013) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A792/A792M	(2010) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM D1056	(2014) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

ASTM D1149	(2007; R 2012) Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber
ASTM D746	(2014) Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials

FM GLOBAL (FM)

FM APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/
FM DS 1-28R	(1998) Data Sheet: Roof Systems

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 20	(2002; E 2004) Zinc-Rich Primers (Type I, Inorganic, and Type II, Organic)

STEEL DECK INSTITUTE (SDI)

ANSI/SDI C	(2011; Int 1 2012; Errata 1 2012) Standard for Composite Steel Floor Deck - Slabs
ANSI/SDI NC	(2010) Standard for Non-Composite Steel Floor Deck
ANSI/SDI QA/QC	(2011) Standard for Quality Control and Quality Assurance for Installation of Steel Deck
ANSI/SDI RD	(2010) Standard for Steel Roof Deck
SDI DDMO3	(2004; Errata 2006; Add 2006) Diaphragm Design Manual; 3rd Edition
SDI DDP	(1987; R 2000) Deck Damage and Penetrations
SDI MOC2	(2006) Manual of Construction with Steel Deck

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-301-01	(2013; Change 1) Structural Engineering

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

29 CFR 1926	Safety and Health Regulations for Construction

UNDERWRITERS LABORATORIES (UL)

UL 580	(2006; Reprint Oct 2013) Tests for Uplift Resistance of Roof Assemblies
UL Fire Resistance	(2014) Fire Resistance Directory

1.2 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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29, SUSTAINABITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; G

SD-03 Product Data

Accessories

Deck Units

Galvanizing Repair Paint

Mechanical Fasteners

Touch-up Paint

Sound Absorbing Materials

Welding Equipment

Welding Rods and Accessories

SD-04 Samples

Metal Roof Deck Units

Cellular Metal Floor Deck Units

Flexible Closure Strips

Acoustical Material

SD-05 Design Data

Deck Units; G

SD-07 Certificates

Powder-Actuated Tool Operator

Welder Qualifications

Welding Procedures

Fire Safety

Wind Storm Resistance

Manufacturer's Certificate

Stud Manufacture's Certification

Stud Manufacture's Test Reports

SD-11 Closeout Submittals

Recycled Content of Steel Products; S

1.3 QUALITY ASSURANCE

1.3.1 Deck Units

Furnish deck units and accessory products from a manufacturer regularly engaged in manufacture of steel decking. Provide manufacturer's certificate s attesting that the decking material meets the specified requirements.

1.3.2 Certification of Powder-Actuated Tool Operator

Provide manufacturer's certificate attesting that the operators are authorized to use the low velocity powder-actuated tool.

1.3.3 Qualifications for Welding Work

Follow Welding Procedures of AWS D1.3/D1.3M for sheet steel and AWS D1.1/D1.1M for stud welding.
Submit qualified Welder Qualifications in accordance with AWS D1.3/D1.3M for sheet steel and AWS D1.1/D1.1M for stud welding, or under an equivalent approved qualification test. Perform tests on test pieces in positions and with clearances equivalent to those actually encountered. If a test weld fails to meet requirements, perform an immediate retest of two test welds until each test weld passes. Failure in the immediate retest will require the welder be retested after further practice or training, performing a complete set of test welds.

Submit manufacturer's catalog data for Welding Equipment and Welding Rods and Accessories.

1.3.4 Regulatory Requirements

1.3.4.1 Fire Safety

Test roof deck as a part of a roof deck construction assembly of the type used for this project, listing as fire classified in the UL Fire Resistance, or listing as Class I construction in the FM APP GUIDE, and so labeled.

1.3.4.2 Wind Storm Resistance

Provide roof construction assembly capable of withstanding a nominal uplift pressure of 90 pounds per square foot when tested in accordance with the uplift pressure test described in the FM DS 1-28R or as described in UL 580 and in general compliance with UFC 3-301-01.

1.3.5 Fabrication Drawings

Show type and location of units, location and sequence of connections, bearing on supports, methods of anchoring, attachment of accessories, adjusting plate details, cant strips, ridge and valley plates, metal closure strips, size and location of holes to be cut and reinforcement to be provided, the manufacturer's erection instructions and other pertinent details.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver deck units to the site in a dry and undamaged condition. Store and handle steel deck in a manner to protect it from corrosion, deformation, and other types of damage. Do not use decking for storage or as working platform until units have been fastened into position. Exercise care not to damage material or overload decking during construction. The maximum uniform distributed storage load must not exceed the design live load. Stack decking on platforms or pallets and cover with weathertight ventilated covering. Elevate one end during storage to provide drainage. Maintain deck finish at all times to prevent formation of rust. Repair deck finish using touch-up paint. Replace damaged material.

1.5 DESIGN REQUIREMENTS FOR ROOF DECKS

1.5.1 Properties of Sections

Properties of metal roof deck sections must comply with engineering design width as limited by the provisions of AISI D100.

1.5.2 Allowable Loads

Indicate total uniform dead and live load for detailing purposes.

PART 2 PRODUCTS

2.1 DECK UNITS

Submit manufacturer's design calculations, or applicable published literature for the structural properties of the proposed deck units.

Recycled content of steel products: provide products with an average recycled content of steel products so postconsumer recycled content plus one half of preconsumer recycled content not less than 5 percent.

2.1.1 Roof Deck

Conform to ASTM A792/A792M or ASTM A1008/A1008M for deck used in conjunction with insulation and built-up roofing. Fabricate roof deck units of Standard 24 ga. inch design thickness or thicker steel and shop painted galvanized painted with an epoxy coating or equivalent applied to prime-coating in accordance with manufacturer's standard . Furnish sample of Metal Roof Deck Units used to illustrate actual cross section dimensions and configurations.

2.1.2 Composite Deck

2.1.3 Cellular Metal Floor Deck Units

Provide decking as wire raceways conforming to NFPA 70. Conform to ASTM A653/A653M, SS, Grade 230, Grade 33; ASTM A1008/A1008M Coated Carbon Steel Sheets, Grade C, 33,000 psi minimum yield strength; or ASTM A792/A792M Coated Steel Sheets, Grade 33 for formed decking and accessories. Provide nominal thickness of the steel sheets, before galvanizing, a minimum 18-gage for the upper element of the floor deck unit, and a minimum 16-gage for the lower element of the floor deck unit as required by the design drawings. Furnish one sample of each type of Metal Floor Deck Units used to illustrate the actual cross section dimensions and configuration.

2.1.4 Form Deck

Conform to ASTM A653/A653M or ASTM A1008/A1008M for deck used as formwork for concrete. Fabricate form deck of the steel design thickness required by the design drawings.

Provide sufficient welds, forming the steel sheets into the cellular floor deck unit, to develop the full horizontal shear at the plane where the steel sheets are joined.

Cellular metal floor deck units must be fluted section cells combined on a flat platewith a matching fluted bottom section having interlocking type sidelaps. Provide depth, width of unit, number of cells per unit, and width of cells as indicated.

Use panels of maximum possible lengths to minimize end laps. Fabricate deck units in lengths to span 3 or more supports with flush, telescoped, or nested 2 inch laps at ends, and interlocking, or nested side laps, unless otherwise indicated. Factory apply a standard, phosphatized and painted, baked-on enamel finish to underside of steel decking. Roof deck system design is based on shored construction.

2.1.5 Non-Composite Vented Form Deck

To ensure positive venting from the underside, provide slotted or perforated steel deck to receive concrete fill, overlay, or a poured concrete deck. Provide deck with side lap venting clips, formed in side lap vents, or vent slots in the corrugation. Vent area shall be at least 0.10 square inch per square foot of roof deck area.

2.1.6 Length of Deck Units

Provide deck units of sufficient length to span three or more spacings where possible.

2.1.7 Shop Priming

Shop prime accessories and underside of deck at the factory after coating. Clean surfaces in accordance with the manufacturer's standard procedure followed by a spray, dip or roller coat of rust-inhibitive primer, oven cured.

2.1.8 Touch-Up Paint

Provide a high zinc-dust content paint for regalvanizing welds in galvanized steel conforming to ASTM A780/A780M.

Provide touch-up paint for shop-painted units of the same type used for the shop painting , and touch-up paint for zinc-coated units of an approved galvanizing repair paint with a high-zinc dust content . Touch-up welds with paint conforming to SSPC Paint 20 in accordance with ASTM A780/A780M. Maintain finish of deck units and accessories by using touch-up paint whenever necessary to prevent the formation of rust.

2.2 ACCESSORIES

Provide accessories of same material as deck, unless specified otherwise. Provide manufacturer's standard type accessories, as specified.

2.2.1 Adjusting Plates

Provide adjusting plates, or segments of deck units, of same thickness and configuration as deck units in locations too narrow to accommodate full size units. Provide factory cut plates of predetermined size where possible.

2.2.2 End Closures

Fabricated of sheet metal by the deck manufacturer. Provide end closures minimum 0.0295 inch thick to close open ends at exposed edges of floors, parapets, end walls, eaves, and openings through deck.

2.2.3 Partition Closures

Provide closures for closing voids above interior walls and partitions that are perpendicular to the direction of the configurations. Provide rubber, plastic, or sheet steel closures above typical partitions.

2.2.4 Flexible Closure Strips for Roof Decks

Provide strips made of vulcanized, closed-cell, synthetic rubber material specified and premolded to the configuration required to provide tight-fitting closures at open ends and sides of steel roof decking.

Conforming to ASTM D1056, Grade 2A1, with the following additional properties:

Brittleness temperature of minus 40 degrees F when tested in accordance with ASTM D746.

Flammability resistance with a flame spread rating of less than 25 when tested in accordance with ASTM E84.

Resistance to ozone must be "no cracks" after exposure of a sample kept under a surface tensile strain of 25 percent to an ozone concentration of 100 parts per million of air by volume in air for 100 hours at 104 degrees F and tested in accordance with ASTM D1149.

Provide a elastomeric type adhesive as recommended by the manufacturer of the flexible closure strips.

2.2.5 Closure Plates for Composite Deck

Support and retain concrete at each floor level. Provide edge closures at all edges of the slab of sufficient strength and stiffness to support the wet concrete. Provide metal closures for all openings in composite steel deck 1/4 inch and over.

2.2.6 Sheet Metal Collar

Where deck is cut for passage of pipes, ducts, columns, etc., and deck is to remain exposed, provide a neatly cut sheet metal collar to cover edges of deck. Do not cut deck until after installation of supplemental supports.

2.2.7 Cover Plates

Sheet metal to close panel edge and end conditions, and where panels change direction or butt. Polyethylene-coated, self-adhesive, 2 inch wide joint tape may be provided in lieu of cover plates on flat-surfaced decking butt joints.

Fabricate cover plates for abutting floor deck units from the specified structural-quality steel sheets not less than nominal 18 gagethick before galvanizing. Provide 6 inch wide cover plates and form to match the contour of the floor deck units.

2.2.8 Roof Sump Pans

Sump pans must be provided for roof drains and must be minimum 0.075 inch thick steel, recessed type. Shape sump pans to meet roof slope by the supplier or by a sheet metal specialist. Provide bearing flanges of sump pans to overlap steel deck a minimum of 3 inch. Shape, size, and reinforce the opening in bottom of the sump pan to receive roof drain.

2.2.9 Column Closures

Sheet metal, minimum 0.0358 inch thick or metal rib lath.

2.2.10 Access Hole Covers

Sheet metal, minimum 0.0474 inch thick.

2.2.11 Hanger

Provide clips or loops for utility systems and suspended ceilings of one or more of the following types:

a. Lip tabs or integral tabs where noncellular decking or flat plate of cellular section is 0.0474 inch thick or more, and a structural concrete fill is used over deck.

b. Slots or holes punched in decking for installation of pigtails.

c. Tabs driven from top side of decking and arranged so as not to pierce electrical cells.

d. Decking manufacturer's standard as approved by the Contracting Officer.

2.2.12 Shear Connectors

Provide shear connectors in accordance with AWS D1.1/D1.1M headed stud Type B. Submit stud manufacture's certification that the studs delivered conform to the material requirements. Submit stud manufacture's test reports for the last completed in-plant quality control mechanical tests.

2.2.13 Cant Strips for Roof Decks

Fabricate cant strips from the specified commercial-quality steel sheets not less than nominal 0.0358 inch thick before galvanizing. Bend strips to form a 45-degree cant not less than 5 inch wide, with top and bottom flanges a minimum 3 inch wide. Length of strips 10 feet.

2.2.14 Ridge and Valley Plates for Roof Decks

Fabricate plates from the specified structural-quality steel sheets, not less than nominal 0.0358 inch thick before galvanizing. Provide plates of minimum 4-1/2 inch wide and bent to provide tight fitting closures at ridges and valleys. Provide a minimum length of ridge and valley plates of 10 feet.

2.2.15 Metal Closure Strips for Roof Decks

Fabricate strips from the specified commercial-quality steel sheets not less than nominal 0.0358 inch thick before galvanizing. Provide strips from the configuration required to provide tight-fitting closures at open ends and sides of steel roof decking.

2.2.16 Galvanized Steel Angles for Roof Decks

Provide hot-rolled carbon steel angles conforming to ASTM A36/A36M, and hot-dip galvanized in accordance with ASTM A123/A123M.

2.2.17 Mechanical Fasteners

Provide mechanical fasteners, such as powder actuated fasteners, pneumatically driven fasteners or self-drilling screws, for anchoring the deck to structural supports and adjoining units that are designed to meet the loads indicated.

2.2.18 Miscellaneous Accessories

Furnish the manufacturer's standard accessories to complete the deck installation. Furnish metal accessories of the same material as the deck and with the minimum design thickness as follows: saddles, 0.0474 inch welding washers, 0.0598 inch other metal accessories, 0.0358 inch unless otherwise indicated.

PART 3 EXECUTION

3.1 EXAMINATION

Prior to installation of decking units and accessories, examine worksite to verify that as-built structure will permit installation of decking system without modification.

3.2 INSTALLATION

Install steel deck units in accordance with 29 CFR 1926, Subpart R – Steel

Erection, ANSI/SDI QA/QC, ANSI/SDI CANSI/SDI NCANSI/SDI RDSDI DDMO3 and approved shop drawings. Place units on structural supports, properly adjusted, leveled, and aligned at right angles to supports before permanently securing in place. Damaged deck and accessories including material which is permanently stained or contaminated, deformed, or with burned holes shall not be installed. Extend deck units over three or more supports unless absolutely impractical. Report inaccuracies in alignment or leveling to the Contracting Officer and make necessary corrections before permanently anchoring deck units. Locate deck ends over supports only. Lap 2 inch or Butted deck ends. Do not use unanchored deck units as a work or storage platform. Do not fill unanchored deck with concrete. Permanently anchor units placed by the end of each working day. Do not support suspended ceilings, light fixtures, ducts, utilities, or other loads by steel deck unless indicated. Distribute loads by appropriate means to prevent damage. Prepare shoring in position before concrete placement begins in composite or form deck. Neatly fit acoustical material into the rib voids.

3.2.1 Attachment

Immediately after placement and alignment, and after correcting inaccuracies, permanently fasten steel deck units to structural supports and to adjacent deck units by welding with normal 5/8 inchdiameter puddle welds, fastened with screws, powder-actuated fasteners, or pneumatically driven fasteners as indicated on the design drawings and in accordance with manufacturer's recommended procedure and ANSI/SDI C, ANSI/SDI NC or ANSI/SDI RD. Clamp or weight deck units to provide firm contact between deck units and structural supports while performing welding or fastening. Attachment of adjacent deck units by button-punching is prohibited.

3.2.1.1 Welding

Perform welding in accordance with AWS D1.3/D1.3M using methods and electrodes recommended by the manufacturers of the base metal alloys being used. Ensure only operators previously qualified by tests prescribed in AWS D1.3/D1.3M make welds. Immediately recertify, or replace qualified welders, that are producing unsatisfactory welding. Conform to the recommendations of the Steel Deck Institute and the steel deck manufacturerfor location, size, and spacing of fastening. use welding washers as required at the connections of the deck to supports. Do not use welding washers at sidelaps. Holes and similar defects will not be acceptable. Attach all partial or segments of deck units to structural supports in accordance with Section 2.5 of SDI DDMO3. Attach shear connectors as shown and welded as per AWS D1.1/D1.1M through the steel deck to the steel member or directly to the steel member. Immediately clean welds by chipping and wire brushing. Heavily coat welds, cut edges and damaged portions of shop primed and painted finish with the manufacturer's standard touch-up paint.

3.2.1.2 Mechanical Fastening

Anchor deck to structural supports and adjoining units with mechanical fasteners. Drive the powder-actuated fasteners with a low-velocity piston tool by an operator authorized by the manufacturer of the powder-actuated tool, Drive pneumatically fasteners with a low-velocity fastening tool and comply with the manufacturer's recommendations or Drive screws to properly clamp desk to supporting steel.

3.2.1.3 Sidelap Fastening

Lock sidelaps between adjacent floor deck units together by welding or screws as indicated.

3.2.2 Openings

Cut or drill all holes and openings required and be coordinated with the drawings, specifications, and other trades. Frame and reinforce openings through the deck in conformance with SDI DDP. Reinforce holes and openings 6 to 12 inch across by 0.0474 inch thick steel sheet at least 12 inch wider and longer than the opening and be fastened to the steel deck at each corner of the sheet and at a maximum of 6 inch on center. Reinforce holes and openings larger than 12 inch by steel channels or angles installed perpendicular to the steel joists and supported by the adjacent steel joists. Install steel channels or angles perpendicular to the deck ribs and fasten to the channels or angles perpendicular to the steel joists.

3.2.3 Deck Damage

SDI MOC2, for repair of deck damage.

3.2.4 Touch-Up Paint

3.2.4.1 Roof Deck

After roof decking installation, wire brush, clean, and touchup paint the scarred areas on top and bottom surfaces of metal roof decking. The scarred areas include welds, weld scars, bruises, and rust spots. Touchup galvanized surfaces with galvanizing repair paint. Touchup painted surfaces with repair paint of painted surfaces.

3.2.4.2 Floor Deck

For floor decking installation, wire brush, clean, and touchup paint the scarred areas on the top and bottom surfaces of the metal floor decking and on the surface of supporting steel members. Include welds, weld scars, bruises, and rust spots for scarred areas. Touched up the galvanized surfaces with galvanizing repair paint. Touch up the painted surfaces with paint for the repair of painted surfaces.

3.2.5 Accessory Installation

3.2.5.1 Adjusting Plates

Provide in locations too narrow to accommodate full-size deck units and install as shown on shop drawings.

3.2.5.2 End Closures

Provide end closure to close open ends of cells at columns, walls, and openings in deck.

3.2.5.3 Closures Above Partitions

Provide for closing voids between cells over partitions that are perpendicular to direction of cells. Provide a one-piece closure strip for partitions 4 inch nominal or less in thickness and two-piece closure strips for wider partitions. Provide sheet metal closures above fire-rated

partitions at both sides of partition with space between filled with fiberglass insulation.

3.2.5.4 Cover Plates

Where concrete leakage would be a problem, provide metal cover plates, or joint tape, at joints between decking sheets, cellular or noncellular, to be covered with concrete fill.

3.2.5.5 Column Closures

Provide for spaces between floor decking and columns which penetrate the deck. Field cut closure plate to fit column in the field and tack weld to decking and columns.

3.2.5.6 Access Hole Covers

Provide access whole covers to seal holes cut in decking to facilitate welding of the deck to structural supports.

3.2.5.7 Hangers

Provide as indicated to support utility system and suspended ceilings. Space devices as required.

3.2.6 Concrete Work

Prior to placement of concrete, inspect installed decking to ensure that there has been no permanent deflection or other damage to decking. Replace decking which has been damaged or permanently deflected as approved by the Contracting Officer. Place concrete on metal deck in accordance with Construction Practice of ANSI/SDI C or ANSI/SDI NC.

3.2.7 Preparation of Fire-Proofed Surfaces

Provide deck surfaces, both composite and noncomposite, which are to receive sprayed-on fireproofing, galvanized and free of all grease, mill oil, paraffin, dirt, salt, and other contaminants which impair adhesion of the fireproofing. Complete any required cleaning prior to steel deck installation using a cleaning method that is compatible with the sprayed-on fireproofing.

3.3 ROOF SUMP PANS

Place sump pans over openings in roof decking and fusion welded to top surface of roof decking. Do not exceed spacing of welds of 12 inch with not less than one weld at each corner. Field cut opening in the bottom of each roof sump pan to receive the roof drain as part of the work of this section.

3.4 CANT STRIPS FOR ROOF DECKS

Provide strips to be fusion welded to surface of roof decking, secured to wood nailers by galvanized screws or to steel framing by galvanized self-tapping screws or welds. Do not exceed spacing of welds and fasteners of 12 inch. Lap end joints a minimum 3 inch and secure with galvanized sheet metal screws spaced a maximum 4 inch on center.

3.5 RIDGE AND VALLEY PLATES FOR ROOF DECKS

Provide plates to be fusion welded to top surface of roof decking. Lap end joints a minimum 3 inch. For valley plates, provide endlaps to be in the direction of water flow.

3.6 CLOSURE STRIPS FOR ROOF DECKS

Provide closure strips at open, uncovered ends and edges of the roof decking and in voids between roof decking and top of walls and partitions where indicated. Install closure strips in position in a manner to provide a weathertight installation.

3.7 ROOF INSULATION SUPPORT FOR ROOF DECKS

Provide metal closure strips for support of roof insulation where rib openings in top surface of metal roof decking occur adjacent to edges and openings. Weld metal closure strips in position.

3.8 CLEANING AND PROTECTION FOR ROOF DECKS

Upon completion of the deck, sweep surfaces clean and prepare for installation of the roofing.

3.9 FIELD QUALITY CONTROL

3.9.1 Headed Stud Inspection

In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.

b. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

3.9.2 Deck Weld Inspection

Visual inspect welds in accordance with AWS D1.3/D1.3M.

3.9.3 Decks Not Receiving Concrete

Inspect the decking top surface for distortion after installation. For roof decks not receiving concrete, verify distortion by placing a straight edge across three adjacent top flanges. The maximum allowable gap between the straight edge and the top flanges is 1/16 inch; when gap is more than 1/16 inch, provide corrective measures or replacement. Reinspect decking after performing corrective measures or replacement.

-- End of Section --

SECTION 05 51 33

METAL LADDERS
05/10

PART 1 GENERAL

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.

ALUMINUM ASSOCIATION (AA)

AA DAF45	(2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2010; Errata 2011) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2013) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	(2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM A47/A47M	(1999; R 2014) Standard Specification for Ferritic Malleable Iron Castings
ASTM A500/A500M	(2013) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A53/A53M	(2012) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A924/A924M	(2014) Standard Specification for General

	Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B108/B108M	(2015) Standard Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B26/B26M	(2014; E 2015) Standard Specification for Aluminum-Alloy Sand Castings
ASTM D1187/D1187M	(1997; E 2011; R 2011) Asphalt-Base Emulsions for Use as Protective Coatings for Metal

MASTER PAINTERS INSTITUTE (MPI)

MPI 79	(Oct 2009) Alkyd Anti-Corrosive Metal Primer

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 3	(1982; E 2004) Power Tool Cleaning
SSPC SP 6/NACE No.3	(2007) Commercial Blast Cleaning

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

29 CFR 1910.27	Fixed Ladders

1.2 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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Ladders, installation drawings

Ship's ladder (with or without guards), installation drawings

SD-03 Product Data

Ladders

Ship's ladder (with or without guards)

1.3 QUALIFICATION OF WELDERS

Qualify welders in accordance with AWS D1.1/D1.1M. Use procedures, materials, and equipment of the type required for the work.

1.4 DELIVERY, STORAGE, AND PROTECTION

Protect from corrosion, deformation, and other types of damage. Store items in an enclosed area free from contact with soil and weather. Remove

and replace damaged items with new items.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Structural Carbon Steel

ASTM A36/A36M.

2.1.2 Structural Tubing

ASTM A500/A500M.

2.1.3 Steel Pipe

ASTM A53/A53M, Type E or S, Grade B.

2.1.4 Fittings for Steel Pipe

Standard malleable iron fittings ASTM A47/A47M.

2.1.5 Aluminum Alloy Products

Conform to ASTM B209 for sheet plate, ASTM B221 for extrusions and ASTM B26/B26M or ASTM B108/B108M for castings, as applicable. Provide aluminum extrusions at least 1/8 inch thick and aluminum plate or sheet at least 0.050 inch thick.

2.2 FABRICATION FINISHES

2.2.1 Galvanizing

Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing: ASTM A123/A123M, ASTM A153/A153M, ASTM A653/A653M or ASTM A924/A924M, G90, as applicable.

2.2.2 Galvanize

Anchor bolts, washers, and parts or devices necessary for proper installation, unless indicated otherwise.

2.2.3 Repair of Zinc-Coated Surfaces

Repair damaged surfaces with galvanizing repair method and paint conforming to ASTM A780/A780M or by application of stick or thick paste material specifically designed for repair of galvanizing, as approved by Contracting Officer. Clean areas to be repaired and remove slag from welds. Heat surfaces to which stick or paste material is applied, with a torch to a temperature sufficient to melt the metallics in stick or paste; spread molten material uniformly over surfaces to be coated and wipe off excess material.

2.2.4 Shop Cleaning and Painting

2.2.4.1 Surface Preparation

Blast clean surfaces in accordance with SSPC SP 6/NACE No.3. Surfaces that will be exposed in spaces above ceiling or in attic spaces, crawl spaces,

furred spaces, and chases may be cleaned in accordance with SSPC SP 3 in lieu of being blast cleaned. Wash cleaned surfaces which become contaminated with rust, dirt, oil, grease, or other contaminants with solvents until thoroughly clean.

2.2.4.2 Pretreatment, Priming and Painting

Apply pretreatment, primer, and paint in accordance with manufacturer's printed instructions. On surfaces concealed in the finished construction or not accessible for finish painting, apply an additional prime coat to a minimum dry film thickness of 1.0 mil. Tint additional prime coat with a small amount of tinting pigment.

2.2.5 Nonferrous Metal Surfaces

Protect by plating, anodic, or organic coatings.

2.2.6 Aluminum Surfaces

2.2.6.1 Surface Condition

Before finishes are applied, remove roll marks, scratches, rolled-in scratches, kinks, stains, pits, orange peel, die marks, structural streaks, and other defects which will affect uniform appearance of finished surfaces.

2.2.6.2 Aluminum Finishes

Unexposed plate and extrusions may have mill finish as fabricated. Sandblast castings' finish, medium, AA DAF45. Unless otherwise specified, provide all other aluminum items with standard mill finish. Provide a coating thickness not less than that specified for protective and decorative type finishes for items used in interior locations or architectural Class I type finish for items used in exterior locations in AA DAF45.

2.3 LADDERS

Fabricate vertical ladders conforming to Section 7 of 29 CFR 1910.27. Use 2 1/2 by 3/8 inch steel flats for stringers and 3/4 inch diameter steel rods for rungs. Rungs to be not less than 16 inches wide, spaced one foot apart, plug welded or shouldered and headed into stringers. Install ladders so that the distance from the rungs to the finished wall surface will not be less than 7 inches. Provide heavy clip angles riveted or bolted to the stringer and drilled for not less than two 1/2 inch diameter expansion bolts as indicated. Provide intermediate clip angles not over 48 inches on centers.

2.3.1 Ladder Cages

Conform to 29 CFR 1910.27. Fabricate 2 by 1/4 inchhorizontal bands and 1 1/2 by 3/16 inch vertical bars. Provide attachments for fastening bands to the side rails of ladders or directly to the structure. Provide and fasten vertical bars on the inside of the horizontal bands. Extend cages not less than 27 inches or more than 28 inches from the centerline of the rungs, excluding the flare at the bottom of the cage, and not less than 27 inches in width. Clear the inside of the cage of projections.

2.3.2 Ship's Ladder

Fabricate stringers and framing of steel plate or shapes. Bolt, rivet or weld connections and anchor to supporting construction. Provide treads with non-slip surface as specified for safety treads. Aluminum ladders may be provided, subject to approval of treads, materials, and shop drawings. Requirements shown or specified for steel apply. Provide anchor items of zinc-coated steel. Design assembly, including tread connections and methods of attachment, to support a live load of 300 pounds per tread. Provide railings as specified for metal handrails.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Install items at locations indicated, according to manufacturer's instructions. Verify all measurements and take all field measurements necessary before fabrication. Provide Exposed fastenings of compatible materials, generally matching in color and finish, and harmonize with the material to which fastenings are applied. Include materials and parts necessary to complete each item, even though such work is not definitely shown or specified. Poor matching of holes for fasteners will be cause for rejection. Conceal fastenings where practicable. Thickness of metal and details of assembly and supports must provide strength and stiffness. Formed joints exposed to the weather to exclude water. Items listed below require additional procedures.

3.2 WORKMANSHIP

Metalwork must be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching must produce clean true lines and surfaces. Continuously weld along the entire area of contact. Do not tack weld exposed connections of work in place. Grid smooth exposed welds. Provide smooth finish on exposed surfaces of work in place, unless otherwise approved. Where tight fits are required, mill joints. Cope or miter corner joints, well formed, and in true alignment. Install in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS

Provide anchorage where necessary for fastening metal items securely in place. Include for anchorage not otherwise specified or indicated slotted inserts, expansion anchors,and powder-actuated fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine bolts, carriage bolts and powder-actuated threaded studs for steel; through bolts, lag bolts, and screws for wood. Do not use wood plugs in any material. Provide non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish, to which fastenings are applied. Conceal fastenings where practicable.

3.4 WELDING

Perform welding, welding inspection, and corrective welding, in accordance with AWS D1.1/D1.1M. Use continuous welds on all exposed connections. Grind visible welds smooth in the finished installation.

3.5 FINISHES

3.5.1 Dissimilar Materials

Where dissimilar metals are in contact, protect surfaces with a coat conforming to MPI 79 to prevent galvanic or corrosive action. Where aluminum is in contact with concrete, plaster, mortar, masonry, wood, or absorptive materials subject to wetting, protect with ASTM D1187/D1187M, asphalt-base emulsion.

3.5.2 Field Preparation

Remove rust preventive coating just prior to field erection, using a remover approved by the rust preventive manufacturer. Surfaces, when assembled, must be free of rust, grease, dirt and other foreign matter.

3.5.3 Environmental Conditions

Do not clean or paint surface when damp or exposed to foggy or rainy weather, when metallic surface temperature is less than 5 degrees F above the dew point of the surrounding air, or when surface temperature is below 45 degrees F or over 95 degrees F, unless approved by the Contracting Officer.

3.6 LADDERS

Secure to the adjacent construction with the clip angles attached to the stringer. Secure to masonry or concrete with not less than two 1/2 inch diameter expansion bolts. Install intermediate clip angles not over 48 inches on center. Install brackets as required for securing of ladders welded or bolted to structural steel or built into the masonry or concrete. Ends of ladders must not rest upon finished roof .

-- End of Section --

SECTION 06 10 00

ROUGH CARPENTRY
02/12

PART 1 GENERAL

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 HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995; R 2004) Basic Hardboard

AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC)

AITC 111	(2005) Recommended Practice for Protection of Structural Glued Laminated Timber During Transit, Storage and Erection
AITC TCM	(2012) Timber Construction Manual, 5th Edition
ANSI/AITC A190.1	(2007) American National Standard, Structural Glued Laminated Timber

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC PS 20	(2010) American Softwood Lumber Standard

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)

AREMA Eng Man	(2012) Manual for Railway Engineering

AMERICAN WOOD COUNCIL (AWC)

AWC NDS	(2012) National Design Specification (NDS) for Wood Construction
AWC WFCM	(2012) Wood Frame Construction Manual for One- and Two-Family Dwellings

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA BOOK	(2012) AWPA Book of Standards
AWPA M2	(2011) Standard for Inspection of Treated Wood Products
AWPA M6	(2013) Brands Used on Preservative Treated Materials
AWPA P18	(2014) Nonpressure Preservatives

AWPA P49	(2010) Standard for Fire Retardant FR-1
AWPA P5	(2014) Standard for Waterborne Preservatives
AWPA T1	(2014) Use Category System: Processing and Treatment Standard
AWPA U1	(2014) Use Category System: User Specification for Treated Wood

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E30	(2011) Engineered Wood Construction Guide
APA E445	(2002) Performance Standards and Qualification Policy for Structural-Use Panels (APA PRP-108)
APA EWS R540	(2007) Builder Tips Proper Storage and Handling of Glulam Beams
APA EWS T300	(2007) Technical Note: Glulam Connection Details
APA F405	(1999) Performance Rated Panels
APA L870	(2010) Voluntary Product Standard, PS 1-09, Structural Plywood
APA S350	(2011) Performance Standard for Wood-Based Structural-Use Panels

ASME INTERNATIONAL (ASME)

ASME B18.2.1	(2012; Errata 2013) Square and Hex Bolts and Screws (Inch Series)
ASME B18.2.2	(2010) Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
ASME B18.5.2.1M	(2006; R 2011) Metric Round Head Short Square Neck Bolts
ASME B18.5.2.2M	(1982; R 2010) Metric Round Head Square Neck Bolts
ASME B18.6.1	(1981; R 2008) Wood Screws (Inch Series)

ASTM INTERNATIONAL (ASTM)

ASTM A153/A153M	(2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A307	(2014) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C1136	(2012) Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation
ASTM C1396/C1396M	(2014a) Standard Specification for Gypsum Board
ASTM C208	(2012) Cellulosic Fiber Insulating Board
ASTM D1435	(2013) Standard Practice for Outdoor Weathering of Plastics
ASTM D1972	(1997; R 2005) Standard Practice for Generic Marking of Plastic Products
ASTM D198	(2014) Standard Test Methods of Static Tests of Lumber in Structural Sizes
ASTM D2344/D2344M	(2013) Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
ASTM D2898	(2010) Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
ASTM D3498	(2003; R 2011) Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems
ASTM D6108	(2013) Standard Test Method for Compressive Properties of Plastic Lumber and Shapes
ASTM D6109	(2013) Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products
ASTM D6111	(2013a) Standard Test Method for Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement
ASTM D6112	(2013) Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes
ASTM D6117	(2013; E 2014) Standard Test Methods for Mechanical Fasteners in Plastic Lumber and Shapes
ASTM D6330	(1998; R 2014) Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined

	Test Conditions
ASTM D696	(2008; E 2013) Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C With a Vitreous Silica Dilatometer
ASTM E96/E96M	(2014) Standard Test Methods for Water Vapor Transmission of Materials
ASTM F1667	(2013) Driven Fasteners: Nails, Spikes, and Staples
ASTM F547	(2006; R 2012) Nails for Use with Wood and Wood-Base Materials

FM GLOBAL (FM)

FM 4435	(2013) Roof Perimeter Flashing

FOREST STEWARDSHIP COUNCIL (FSC)

FSC STD 01 001	(2000) Principles and Criteria for Forest Stewardship

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2012) International Building Code

NATIONAL HARDWOOD LUMBER ASSOCIATION (NHLA)

NHLA Rules	(2011) Rules for the Measurement & Inspection of Hardwood & Cypress

NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

NELMA Grading Rules	(2013) Standard Grading Rules for Northeastern Lumber

REDWOOD INSPECTION SERVICE (RIS) OF THE CALIFORNIA REDWOOD ASSOCIATION (CRA)

RIS Grade Use	(1998) Redwood Lumber Grades and Uses

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule 1168	(1989; R 2005) Adhesive and Sealant Applications

SOUTHERN CYPRESS MANUFACTURERS ASSOCIATION (SCMA)

SCMA Spec	(1986; Supple. No. 1, Aug 1993) Standard Specifications for Grades of Southern Cypress

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003	(2002) Standard Grading Rules for Southern

	Pine Lumber
TRUSS PLATE INSTITUTE (TPI)	
TPI 1	(2007; R 2006) National Design Standard for Metal Plate Connected Wood Truss Construction; Commentary and Appendices
TPI HIB	(1991) Commentary and Recommendations for Handling, Installing and Bracing Metal Plate Connected Wood Trusses
U.S. DEPARTMENT OF COMMERCE (DOC)	
DOC/NIST PS58	(1973) Basic Hardboard (ANSI A135.4)
U.S. GENERAL SERVICES ADMINISTRATION (GSA)	
CID A-A-1923	(Rev A; Notice 2) Shield, Expansion (Lag, Machine and Externally Threaded Wedge Bolt Anchors)
CID A-A-1924	(Rev A; Notice 2) Shield, Expansion (Self Drilling Tubular Expansion Shell Bolt Anchors
CID A-A-1925	(Rev A; Notice 2) Shield Expansion (Nail Anchors)
FS UU-B-790	(Rev A; Notice 2) Building Paper Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
WEST COAST LUMBER INSPECTION BUREAU (WCLIB)	
WCLIB 17	(2004) Standard Grading Rules
WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)	
WWPA G-5	(2011) Western Lumber Grading Rules

1.2 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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Trussed rafters; G

Trussed joists; G

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

Plastic Lumber; (LEED NC)
Fiberboard Wall Sheathing; (LEED NC)
Cellulose Honeycomb Panels; (LEED NC)

Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project. Where recycled lumber materials are used for structural applications, include lumber certification and quality grading.

Fire-retardant treatment
Engineered wood products; (LEED NC)
Structural-use and OSB panels; (LEED NC)

Submit documentation verifying that no urea-formaldehyde resins were used.

Oriented Strand Board; (LEED NC)

Submit documentation indicating relative dollar value of rapidly renewable materials to total dollar value of products included in project.

Adhesives; (LEED NC)

Submit manufacturer's product data, indicating VOC content.

SD-05 Design Data

Modifications of structural members; G

Design analysis and calculations showing design criteria used to accomplish the applicable analysis.

SD-06 Test Reports

Preservative-treated lumber and plywood

SD-07 Certificates

Forest Stewardship Council (FSC) Certification; (LEED NC)

Preservative treatment

SD-10 Operation and Maintenance Data

Plastic

When not labeled, identify types in Operation and Maintenance Manual.

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 and/or reuse.

SD-11 Closeout Submittals

Local/Regional Materials; (LEED NC)

LEED documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Plastic Lumber; (LEED NC)
Fiberboard Wall Sheathing; (LEED NC)
Cellulose Honeycomb Panels; (LEED NC)

LEED documentation relative to recycled content credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Adhesives; (LEED NC)

LEED documentation relative to low emitting materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Oriented Strand Board; (LEED NC)

LEED documentation relative to rapidly renewable materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Engineered Wood Products; (LEED NC)
Structural-use and OSB Panels; (LEED NC)

LEED documentation relative to low emitting materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Certified Wood; (LEED NC)

LEED documentation relative to certified wood credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

1.3 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. Laminated timber shall be handled and stored in accordance with AITC 111 or APA EWS R540. Remove defective and damaged materials and provide new materials. Store separated reusable wood waste convenient to cutting station and area of work.

1.4 GRADING AND MARKING

1.4.1 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 shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. Surfaces that are to be exposed to view shall 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.

1.4.2 Structural Glued Laminated Timber

Mark each member with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of structural glued laminated timber products. The marking shall indicate compliance with ANSI/AITC A190.1 and shall include all identification information required by ANSI/AITC A190.1.

1.4.3 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 shall 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 shall not bear grademarks or other types of identifying marks.

1.4.4 Structural-Use and OSB Panels

Mark each panel with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the panel. The mark shall indicate end use, span rating, and exposure durability classification. Oriented Strand Board (OSB), APA F405.

1.4.5 Preservative-Treated Lumber and Plywood

The Contractor shall be responsible for the quality of treated wood products. Each treated piece shall be inspected in accordance with AWPA M2 and permanently marked or branded, by the producer, in accordance with AWPA M6. The Contractor shall 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.

1.4.6 Fire-Retardant Treated Lumber

Mark each piece in accordance with AWPA M6, except pieces that are to be natural or transparent finished. In addition, exterior fire-retardant lumber shall be distinguished by a permanent penetrating blue stain. Labels of a nationally recognized independent testing agency will be accepted as evidence of conformance to the fire-retardant requirements of AWPA M6.

1.4.7 Hardboard, Gypsum Board, and Fiberboard

Mark each sheet or bundle to identify the standard under which the material is produced and the producer.

1.4.8 Plastic Lumber

Label plastic products to be incorporated into the project in accordance with ASTM D1972, or provide product data indicating polymeric information in the Operation and Maintenance Manual.

a. Type 1: Polyethylene Terephthalate (PET, PETE).
b. Type 2: High Density Polyethylene (HDPE).
c. Type 3: Vinyl (Polyvinyl Chloride or PVC).
d. Type 4: Low Density Polyethylene (LDPE).
e. Type 5: Polypropylene (PP).
f. Type 6: Polystyrene (PS).
g. Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

1.5 SIZES AND SURFACING

ALSC PS 20 for dressed sizes of yard and structural lumber. Lumber shall be surfaced four sides. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced. Other measurements are IP or SI standard.

1.6 MOISTURE CONTENT

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products shall 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

c. Roof planking, 15 percent maximum

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

1.7 PRESERVATIVE TREATMENT

Treat wood products with waterborne wood preservatives conforming to AWPA P5. Pressure treatment of wood products shall conform to the requirements of AWPA BOOK Use Category System Standards U1 and T1. Pressure-treated wood products shall not contain arsenic, chromium, or other agents classified as carcinogenic, probably carcinogenic, or possibly carcinogenic to humans (compounds in Groups 1, 2A, or 2B) by the International Agency for Research on Cancer (IARC), Lyon, France. Pressure-treated wood products shall not exceed the limits of the U.S. EPA's Toxic Characteristic Leaching Procedure (TCLP), and shall not be classified as hazardous waste. Submit certification from treating plant stating chemicals and process used and net amount of preservatives retained are in conformance with specified standards.

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 shall be air or kiln dried after treatment. Specific treatments shall be verified by the report of an approved independent inspection agency, or the AWPA Quality Mark on each piece. Minimize cutting and avoid breathing sawdust. 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. Plastic lumber shall not be preservative treated. The following items shall 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.

1.7.1 Existing Structures

Use borate, permathrin, or a sodium silicate wood mineralization process to treat wood. Use borate for interior applications only.

1.7.2 New Construction

Use a boron-based preservative conforming to AWPA P18, sodium silicate wood mineralization process, or Ammoniacal Copper Quaternary Compound to treat

wood. Use boron-based preservatives for above-ground applications only.

1.8 FIRE-RETARDANT TREATMENT

Fire-retardant treated wood shall be pressure treated with fire retardants conforming to AWPA P49. Fire retardant treatment of wood products shall conform to the requirements of AWPA U1, Commodity Specification H and AWPA T1, Section H. Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance in accordance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with ASTM D2898 prior to being tested. Such items which will not be inside a building, and such items which will be exposed to heat or high humidity, shall receive exterior fire-retardant treatment. Fire-retardant-treated wood products shall be free of halogens, sulfates, ammonium phosphate, and formaldehyde. Items to be treated include the following:

a. all wood exposed to the outside.

1.9 QUALITY ASSURANCE

1.9.1 Drawing Requirements

For fabricated structural members, trusses, qlu-lam members, indicate materials, details of construction, methods of fastening, and erection details. Include reference to design criteria used and manufacturers design calculations. Submit drawings for all proposed modifications of structural members. Do not proceed with modifications until the submittal has been approved.

1.9.2 Data Required

Submit calculations and drawings for all proposed modifications of structural members. Do not proceed with modifications until the submittal has been approved.

1.9.3 Humidity Requirements

Sequence work to minimize use of temporary HVAC to dry out building and control humidity.

1.9.4 Plastic Lumber Performance

Plastic lumber intended for use in exterior applications shall have no fading or discoloration and no change in dimensional stability as tested in accordance with ASTM D1435 for a period of 5 years.

1.10 ENVIRONMENTAL REQUIREMENTS

During and immediately after installation of treated wood, engineered wood products, and laminated wood products at interior spaces, provide temporary ventilation.

1.11 SUSTAINABLE DESIGN REQUIREMENTS

1.11.1 Local/Regional Materials

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources.See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Wood and materials may be locally available.

1.11.2 Forest Stewardship Council (FSC) Certification

Use FSC-certified wood where specified. Provide letter of certification signed by lumber supplier. Indicate compliance with FSC STD 01 001 and identify certifying organization. Submit FSC certification numbers; identify each certified product on a line-item basis. Submit copies of invoices bearing the FSC certification numbers.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Virgin Lumber

Lumber fabricated from old growth timber is not permitted. Avoid companies who buy, sell, or use old growth timber in their operations, when possible.

2.1.2 Salvaged Lumber

Provide salvaged lumber where specified. Unless otherwise noted, salvaged lumber shall be delivered clean, denailed, and free of paint, finish materials, and other contamination.

2.1.3 Recovered Lumber

Use recovered lumber where practical. Unless otherwise noted, recovered lumber shall be delivered clean and free of contamination. Provide grading certificates for any recovered wood materials used in structural applications.

2.1.4 Engineered Wood Products

Products shall be FSC-certified and shall contain no added urea-formaldehyde if exposed to interior spaces. Determine Volatile Organic Compounds (VOCs), excluding formaldehyde, emitted from manufactured wood-based panels in accordance with ASTM D6330. Products shall not be used if VOC emissions exceed 3.5.

2.1.5 Natural Decay- and Insect-Resistant Wood

Naturally durable wood shall be FSC-certified or salvaged. An occasional piece with corner sapwood shall be permitted if 90 percent or more of the width of each side on which the sapwood occurs is heartwood.

2.1.6 Plastic Lumber

HDPE lumber shall contain a minimum of 5 percent recycled content, with a minimum of 5 percent post-consumer recycled content. Mixed plastics and

cellulose lumber shall contain a minimum of 5 percent recycled content, with a minimum of 5 percent post-consumer recycled content. HDPE/fiberglass lumber shall contain a minimum of 5 percent recycled content with a minimum of 5 percent post-consumer recycled content. Other mixed resin lumber shall contain a minimum of 25 percent recycled content with a minimum of 5 percent post-consumer recycled content.

2.1.6.1 Shear Parallel to Length

Maximum 1,000 psi in accordance with ASTM D2344/D2344M.

2.1.6.2 Density

ASTM D6111.

2.1.6.3 Compressive Strength

a. Secant Modulus: Minimum 70,000 psi in accordance with ASTM D6108.

b. Stress at 3 percent strain: Minimum 1,500 psi in accordance with ASTM D6108.

c. Compression Parallel to Grain: Minimum 3,000 psi in accordance with ASTM D6112.

d. Compression Perpendicular to Grain: Minimum 1,000 psi in accordance with ASTM D6112.

2.1.6.4 Flexural Strength

Minimum 2,000 psi in accordance with ASTM D6109.

2.1.6.5 Tensile Strength

Minimum 1,250 psi in accordance with ASTM D198.

2.1.6.6 Coefficient of Thermal Expansion

Maximum 0.000080 in/in/degree F in accordance with ASTM D696.

2.1.6.7 Screw Withdrawal

350 lbs in accordance with ASTM D6117.

2.1.6.8 Nail Withdrawal

150 lbs in accordance with ASTM D6117.

2.2 LUMBER

2.2.1 Structural Lumber

Except where a specific grade is indicated or specified, Any of the species and grades listed in AWC NDS that have allowable unit stresses in pounds per square inch (psi) not less than allowable unit stresses indicated. Use for joists, rafters, headers, trusses, beams (except collar beams), columns, posts, stair stringers, girders, and all other members indicated to be stress rated. Design of members and fastenings shall conform to AITC TCM. Other stress graded or dimensioned items such as blocking,

carriages, and studs shall be standard or No. 2 grade except that studs may be Stud grade.

2.2.2 Framing Lumber

Framing lumber such as studs, plates, caps, collar beams, cant strips, bucks, sleepers, nailing strips, and nailers and board lumber such as subflooring and wall and roof sheathing shall be one of the species listed in the table below. Minimum grade of species shall be as listed.

Table of Grades for Framing and Board Lumber

Grading Rules	Species	Framing	Board Lumber
WWPA G-5 standard grading rules	Aspen, Douglas Fir-Larch, Douglas Fir South, Engelmann Spruce-Lodgepole Pine, Engelmann Spruce, Hem-Fir, Idaho White Pine, Lodgepole Pine, Mountain Hemlock, Mountain Hemlock-Hem-Fir, Ponderosa Pine-Sugar Pine, Ponderosa Pine-Lodgepole Pine, Subalpine Fir, White Woods, Western Woods, Western Cedars, Western Hemlock	All Species: Standard Light Framing or No. 3 Structural Light Framing (Stud Grade for 2x4 nominal size, 10 feet and shorter)	All Species: No. 3 Common

Table of Grades for Framing and Board Lumber			
Grading Rules	Species	Framing	Board Lumber
WCLIB 17 standard grading rules	Douglas Fir-Larch, Hem-Fir, Mountain Hemlock, Sitka Spruce, Western Cedars, Western Hemlock	All Species: Standard Light Framing or No. 3 Structural Light Framing (Stud Grade for 2x4 nominal size, 10 feet and shorter)	All Species: Standard
SPIB 1003 standard grading rules	Southern Pine	All Species: Standard Light Framing or No. 3 Structural Light Framing (Stud Grade for 2x4 nominal size, 10 feet and shorter)	No. 2 Boards
SCMA Spec standard specifications	Cypress	No. 2 Common	No. 2 Common
NELMA Grading Rules standard grading rules	Balsam Fir, Eastern Hemlock-Tamarack, Eastern Spruce, Eastern White Pine, Northern Pine, Northern Pine-Cedar	All Species: Standard Light Framing or No. 3 Structural Light Framing (Stud Grade for 2x4 nominal size, 10 feet and shorter)	All Species: No. 3 Common except Standard for Eastern White and Northern Pine

Table of Grades for Framing and Board Lumber			
Grading Rules	Species	Framing	Board Lumber
RIS Grade Use standard specifications	Redwood	All Species: Standard Light Framing or No. 3 Structural Light Framing (Stud Grade for 2x4 nominal size, 10 feet and shorter)	Construction Heart
NHLA Rules rules for the measurement and inspection of hardwood and cypress lumber	Cypress	No. 2 Dimension	No. 2 Common

2.2.3 Structural Glued Laminated Timber

ANSI/AITC A190.1, allowable working stress values for loads of normal duration in pounds per square inch (psi) not less than the following:

Bending Members, as required Fb, Fv, E.
Compression Members, as required Fc, E.
Tension Members, as required Ft, E.

Fabricated with wet-use adhesives. Beams shall use glue-laminated lumber. Posts and studs shall use laminated-strand lumber. Joists shall use laminated-veneer lumber. Members shall be Industrial Appearance Grade, sealed with a penetrating sealer, and individually wrapped as standard with the manufacturer and approved. Members shall be complete with hardware for joining laminated members and for their connection to other construction.

2.3 PLYWOOD, STRUCTURAL-USE, AND ORIENTED STRAND BOARD (OSB) PANELS

APA L870, APA S350, APA E445, and APA F405 respectively.

2.3.1 Subflooring

2.3.1.1 Plywood

C-D Grade, Exposure 1 durability classification, Span rating of 24/16 or greater.

2.3.1.2 Structural-Use and OSB Panels

Sheathing grade with durability equivalent to Exposure 1, Span Rating of

32/16 or greater. OSB, APA E445, Rated Sturd-I-Floor.

2.3.2 Combination Subfloor-Underlayment

2.3.2.1 Plywood

Exterior Type, C-C (Plugged) Grade. Minimum thickness shall be as listed below .

Support Spacing	Underlayment Minimum Thickness
16 inches	1/2 inch for Group 1 species
	19/32 inch for Group 2 and 3 species
	23/32 inch for Group 4 species
24 inches	23/32 inch for Group 1 species
	7/8 inch for Group 2 and 3 species
	1 inch for Group 4 species

2.3.2.2 Structural-Use Panel

Combination subfloor-underlayment grade with durability equivalent to Exterior plywood, Span Rating of 24 or greater.

2.3.3 Wall Sheathing

2.3.3.1 Plywood

C-D Grade, Exposure 1, and a minimum thickness of 1/2 inch , except where indicated to have greater thickness. Provide exterior grade particleboard with phenol resin for interior and exterior applications.

2.3.3.2 Structural-Use and OSB Panels

Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0 or greater. OSB, APA Rated Sheathing. OSB shall be a phenolic-glued, low-formaldehyde board.

2.3.4 Roof Sheathing

2.3.4.1 Plywood

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

2.3.4.2 Structural-Use Panel

Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0 or greater.

2.3.5 Diaphragms

2.3.5.1 Plywood

Structural I, Structural II, C-C C-D grade, Exposure 1, and a minimum thickness of 3/4 inch.

2.3.5.2 Structural-Use and OSB Panels

Sheathing grade with durability equivalent to Exposure 1 and a minimum thickness of 3/4 inch.

2.3.6 Shear Walls

2.3.6.1 Plywood

Structural I Structural II, Grade and a minimum thickness of 3/4 inch.

2.3.6.2 Structural-Use and OSB Panels

Sheathing grade with durability equivalent to Interior plywood with Exterior glue (Exposure 1) and a minimum thickness of 3/4 inch.

2.3.7 Other Uses

2.3.7.1 Plywood

Plywood for roof decking

2.3.7.2 Structural-Use and OSB Panels

Structural-use and OSB panels for roofs

2.4 UNDERLAYMENT

Underlayment shall conform to one of the following:

2.4.1 Hardboard

AHA A135.4 service class, sanded one side, 1/4 inch thick, 4 feet wide.

2.4.2 Plywood

Plywood shall conform to APA L870, underlayment grade with exterior glue, or C-C (Plugged) exterior grade 11/32 inch thick, 4 feet wide.

2.4.3 Oriented Strand Board

OSB underlayment grade 0.225 inch.

2.4.4 Fiberboard

Use gypsum fiberboard, minimum 2 percent post-consumer newspaper. .

2.4.5 Strawboard Panels

Minimum 5 percent agricultural waste straw with no added formaldehyde binders. Submit data indicating formaldehyde content.

2.4.6 Cork

Minimum 5 percent post-consumer recycled content, or minimum 5 percent post-industrial recycled content. Minimum 5 percent biobased content.

2.5 OTHER MATERIALS

2.5.1 Hardboard Underlayment

DOC/NIST PS58, service class, sanded on one side, 1/4 inch thick 4 feet wide.

2.5.2 Fiberboard Wall Sheathing

ASTM C208, 2 feet wide by 1/2 inch thick for supports 16 inches (o.c.) 25/32 inch thick for supports 24 inches o.c. or 4 feet wide by 1/2 inch thick for supports 16 inches o.c. 3/4 inch thick for supports 24 inches o.c., except only 4 feet wide by 1/2 inch thick sheathing over supports at 16 inches o.c. may be applied without corner bracing of framing Sheathing shall be asphalt impregnated or asphalt coated to render the sheathing water resistant but vapor permeable. Structural fiberboard shall contain a minimum of 5 percent recycled content. Non-structural fiberboard shall contain a minimum of 5 percent post-consumer recycled content.

2.5.3 Gypsum Wall Sheathing

ASTM C1396/C1396M, 1/2 inch thick fire retardant (Type X) 5/8 inch thick; 4 feet wide with square edge for supports 16 inches o.c. with or without corner bracing of framing or for supports 24 inches o.c. with corner bracing of framing; 2 feet wide with V-tongue and groove (T&G) edge for supports 16 or 24 inches o.c. with corner bracing of framing.

2.5.4 Foil-Faced Insulative Sheathing

Wood fiber core, chemically treated for water resistance, with aluminum foil laminated under pressure to both sides with water-resistant adhesive; 48 inches or 48 3/4 inches wide; 0.078 inch thick when used with corner bracing, 0.115 inch thick with studs up to 16 inches o.c. without corner bracing, or 0.137 inch thick with studs up to 24 inches o.c. without corner bracing. The sheathing and installation shall have been accepted by ICC as conforming to ICC IBC. The sheathing alone shall have a thermal resistance value (R value) of not less than 0.20.

2.5.5 Cellulose Honeycomb Panels

ASTM C208. Panels shall be made of . Panels shall contain a minimum of 100 percent post-consumer recycled content.

2.5.6 Building Paper

FS UU-B-790, Type I, Grade D, Style 1.

2.5.7 Trussed Rafters

Metal plate connected trusses designed in accordance with TPI 1 and TPI HIB and fabricated in accordance with TPI 1.

2.5.8 Trussed Joists

Metal plate connected parallel chord wood trusses designed and fabricated in accordance with TPI 1.

2.5.9 Roof Decking

Roof decking shall be commercial grade with minimum design value of 1100 psi in bending. Decking shall be 2 inches thick with single tongue and groove; V-jointed, matched and dressed. As an option, fabricated laminated lumber decking with interlocking tongue and groove joints may be provided.

2.5.10 Miscellaneous Wood Members

2.5.10.1 Nonstress Graded Members

Members shall include bridging, corner bracing, furring, grounds, and nailing strips. Members shall be in accordance with TABLE I for the species used. Sizes shall be as follows unless otherwise shown:

Member	Size inch
Bridging	1 x 3 or 1 x 4 for use between members 2 x 12 and smaller; 2 x 4 for use between members larger than 2 x 12.
Corner bracing	1 x 4.
Furring	1 x 3
Grounds	Plaster thickness by 38.
Nailing strips	1 x 3 or 1 x 4 when used as shingle base or interior finish, otherwise 2 inch stock.

2.5.10.2 Wood Bumpers

AREMA Eng Man, Industrial grade cross ties

2.5.10.3 Sill Plates

Sill plates shall be standard or number 2 grade.

2.5.10.4 Blocking

Blocking shall be standard or number 2 grade.

2.5.10.5 Rough Bucks and Frames

Rough bucks and frames shall be straight standard or number 2 grade.

2.5.11 Adhesives

Comply with applicable regulations regarding toxic and hazardous materials, SCAQMD Rule 1168, and as specified. Use water-based adhesives with maximum VOC content of 15 grams/liter .

2.6 ROUGH HARDWARE

Unless otherwise indicated or specified, rough hardware shall be of the type and size necessary for the project requirements. Sizes, types, and spacing of fastenings of manufactured building materials shall be as recommended by the product manufacturer unless otherwise indicated or specified. Rough hardware exposed to the weather or embedded in or in contact with preservative treated wood, exterior masonry, or concrete walls or slabs shall be hot-dip zinc-coated in accordance with ASTM A153/A153M. Nails and fastenings for fire-retardant treated lumber and woodwork exposed to the weather shall be copper alloy or hot-dipped galvanized fasteners as recommended by the treated wood manufacturer.

2.6.1 Bolts, Nuts, Studs, and Rivets

ASME B18.2.1, ASME B18.5.2.1M, ASME B18.5.2.2M and ASME B18.2.2.

2.6.2 Anchor Bolts

ASTM A307, size as indicated, complete with nuts and washers.

2.6.3 Expansion Shields

CID A-A-1923, CID A-A-1924, and CID A-A-1925. Except as shown otherwise, maximum size of devices shall be 3/8 inch.

2.6.4 Lag Screws and Lag Bolts

ASME B18.2.1.

2.6.5 Wood Screws

ASME B18.6.1.

2.6.6 Nails

ASTM F547, size and type best suited for purpose. For sheathing and subflooring, length of nails shall be sufficient to extend 1 inch into supports. In general, 8-penny or larger nails shall be used for nailing through 1 inch thick lumber and for toe nailing 2 inch thick lumber; 16-penny or larger nails shall be used for nailing through 2 inch thick lumber. Nails used with treated lumber and sheathing shall be hot-dipped galvanized in accordance with ASTM A153/A153M. Nailing shall be in accordance with the recommended nailing schedule contained in AWC WFCM. Where detailed nailing requirements are not specified, nail size and spacing shall be sufficient to develop an adequate strength for the connection. The connection's strength shall be verified against the nail capacity tables in AWC NDS. Reasonable judgment backed by experience shall ensure that the designed connection will not cause the wood to split. If a load situation exceeds a reasonable limit for nails, a specialized connector shall be used.

2.6.7 Wire Nails

ASTM F1667.

2.6.8 Timber Connectors

Unless otherwise specified, timber connectors shall be in accordance with TPI 1, APA EWS T300 or AITC TCM.

2.6.9 Clip Angles

Steel, 3/16 inch thick, size best suited for intended use; or zinc-coated steel or iron commercial clips designed for connecting wood members.

2.6.10 Joist Hangers

Steel or iron, zinc coated, sized to fit the supported member, of sufficient strength to develop the full strength of the supported member in accordance with ICC IBC, and furnished complete with any special nails required.

2.6.11 Tie Straps

For joists supported by the lower flange of steel beams, provide 1/8 by 1-1/2 inch steel strap, 2 feet long , except as indicated otherwise.

2.6.12 Joist Anchors

For joists supported by masonry walls, provide anchors 3/16 by 1 1/2 inch steel tee or strap, bent and of length to provide 4 inches embedment into wall and 12 inches along joist except as indicated otherwise. For joists parallel to masonry or concrete walls, provide anchors 1/4 by 1-1/4 inch minimum cross-sectional area, steel strap, length as necessary to extend over top of first three joists and into wall 4 inches, and with wall end of bend or pin type , except as indicated otherwise.

2.6.13 Door Buck Anchors

Metal anchors, 1/8 by 1-1/4 inch steel, 12 inches long, with ends bent 2 inches , except as indicated otherwise. Anchors shall be screwed to the backs of bucks and built into masonry or concrete. Locate 8 inches above sills and below heads and not more than 24 inches intermediately between. Anchorage of bucks to steel framing shall be as necessary to suit the conditions.

2.6.14 Metal Bridging

Where not indicated or specified otherwise, No. 16 U.S. Standard gage, cadmium-plated or zinc-coated.

2.6.15 Toothed Rings and Shear Plates

AWC NDS.

2.6.16 Beam Anchors

Steel U-shaped strap anchors 1/4 inch thick by 1-1/2 inches wide .

2.6.17 Metal Framing Anchors

Construct anchors to the configuration shown using hot dip zinc-coated steel conforming to ASTM A653/A653M, G90. Steel shall be not lighter than 18 gage. Special nails supplied by the manufacturer shall be used for all

nailing.

2.6.18 Panel Edge Clips

Extruded aluminum or galvanized steel, H-shaped clips to prevent differential deflection of roof sheathing.

2.7 AIR INFILTRATION BARRIER

Air infiltration barrier shall be building paper meeting the requirements of ASTM C1136, Type IV, style optional or a tear and puncture resistant olefin building wrap (polyethylene or polypropylene) with a moisture vapor transmission rate of 125 g per square meter per 24 hours in accordance with ASTM E96/E96M, Desiccant Method at 23 degrees C or with a moisture vapor transmission rate of 670 g per square meter per 24 hours in accordance with ASTM E96/E96M, Water Method at 23 degrees C.

PART 3 EXECUTION

3.1 INSTALLATION

Conform to AWC WFCM and install in accordance with the National Association of Home Builders (NAHB) Advanced Framing Techniques: Optimum Value Engineering, unless otherwise indicated or specified. Select lumber sizes to minimize waste. Fit framing lumber and other rough carpentry, set accurately to the required lines and levels, and secure in place in a rigid manner. Space plastic lumber boards as necessary to allow for lengthwise expansion and contraction. Do not splice framing members between bearing points. Set joists, rafters, and purlins with their crown edge up. Frame members for the passage of pipes, conduits, and ducts. Provide adequate support as appropriate to the application, climate, and modulus of elasticity of the product. Do not cut or bore structural members for the passage of ducts or pipes without approval. Reinforce all members damaged by such cutting or boring by means of specially formed and approved sheet metal or bar steel shapes, or remove and provide new, as approved. Provide as necessary for the proper completion of the work all framing members not indicated or specified. Spiking and nailing not indicated or specified otherwise shall be in accordance with the Nailing Schedule contained in ICC IBC; perform bolting in an approved manner. Spikes, nails, and bolts shall be drawn up tight. Install plastic lumber with screws or bolts; if nails are used, use ring shank or spiral shank nails. Provide 2 inch minimum clearance between chimneys and wood framing; provide 4 inch minimum clearance at fireplaces. Fill the spaces with strips of approved noncombustible material. Use slate or steel shims when leveling joists, beams, and girders on masonry or concrete. Do not use shimming on wood or metal bearings. When joists, beams, and girders are placed on masonry or concrete, a wood base plate shall be positioned and leveled with grout. The joist, beam, or girder shall then be placed on the plate. When joists, beams, and girders are set into masonry or concrete, a pocket shall be formed into the wall. The joist, beam, or girder shall then be placed into the pocket and leveled with a steel shim.

3.1.1 Sills

Set sills level and square and wedge with steel or slate shims; point or grout with non-shrinking cement mortar to provide continuous and solid bearing. Anchor sills to the foundations as indicated. Where sizes and spacing of anchor bolts are not indicated, provide not less than 5/8 inch diameter bolts at all corners and splices and space at a maximum of 6 feet

o.c. between corner bolts. Provide at least two bolts for each sill member. Lap and splice sills at corners and bolt through the laps or butt the ends and through-bolt not more than 6 inches from the ends. Provide bolts with plate washers and nuts. Bolts in exterior walls shall be zinc-coated.

3.1.1.1 Anchors in Masonry

Embed anchor bolts not less than 15 inches in masonry unit walls and provide each with a nut and a 2 inch diameter washer at bottom end. Fully grout bolts with mortar.

3.1.1.2 Anchors in Concrete

Embed anchor bolts not less than 8 inches in poured concrete walls and provide each with a nut and a 2 inch diameter washer at bottom end. A bent end may be substituted for the nut and washer; bend shall be not less than 90 degrees. Powder-actuated fasteners spaced 3 feet o.c. may be provided in lieu of bolts for single thickness plates on concrete.

3.1.2 Beams and Girders

Set beams and girders level and in alignment and anchor to bearing walls, piers, or supports with U-shaped steel strap anchors. Embed anchors in concrete or masonry at each bearing and through-bolt to the beams or girders with not less than two bolts. Provide bolts not less than 1/2 inch in diameter and with plate washers under heads and nuts. Install beams and girders with 8 inch minimum end bearing on walls or supports. Install beams and girders into walls with 1/2 inch clearance at the top, end, and sides or standard steel wall-bearing boxes. Provide joints and splices over bearings only and bolt or spike together.

3.1.3 Roof Framing or Rafters

Tops of supports or rafters shall form a true plane. Valley, ridge, and hip members shall be of depth equal to cut on rafters where practicable, but in no case less than depth of rafters and nominally 2 inches thick. Rafters shall be notched and have full and solid bearing on plates. Valleys, hips, and ridges shall be straight and true intersections of roof planes. Necessary crickets and watersheds shall be formed. Rafters, except hip and valley rafters, shall be spiked to wall plate and to ceiling joists with no less than three 8-penny nails. Rafters shall be toe-nailed to ridge, valley, or hip members with at least three 8-penny nails. Rafters shall be braced to prevent movement until permanent bracing, decking or sheathing is installed. Hip and valley rafters shall be secured to wall plates by clip angles. Openings in roof shall be framed with headers and trimmers. Unless otherwise indicated, headers carrying more than two rafters and trimmers supporting headers carrying more than one rafter shall be double. Hip rafters longer than the available lumber shall be butt jointed and scabbed. Valley rafters longer than the available lumber shall be double, with pieces lapped not less than 4 feet and well spiked together. Trussed rafters shall be installed in accordance with TPI HIB. Engineered wood joists shall be installed in accordance with distributor's instructions.

3.1.4 Joists

Provide joists of the sizes and spacing indicated, accurately and in alignment, and of uniform width. Joists shall have full bearing on sills,

plates, beams, girders, and trusses; provide laps over bearing only and spike. Where joists are of insufficient length to produce a 12 inch lap, butt joists over bearing and provide wood scabs 2 nominal inches thick by depth of joists by 24 inches long or metal straps 1/4 by 1 1/2 inch by not less than 18 inches long nailed to each joist with not less than four 10-penny nails, or approved sheet metal connectors installed in accordance with the manufacturer's recommendations. Provide joists built into masonry with a beveled fire cut so that the top of the joist does not enter the wall more than one inch or standard steel wall bearing boxes. Provide metal hangers for joists framing into the side of headers, beams, or girders. When a portion of the joist extends above the top flange of a steel beam or girder, provide a 3/8 inch space between the top flange and the extended portion of the joists to allow for shrinkage of joists. The minimum joist end bearing shall be 4 inches, and joists built into concrete or masonry shall have a 1/2 inch minimum clearance at the top, end, and sides. For joists approved to be bored for the passage of pipes or conduits, bore through the neutral axis of the joist. Provide steel joist hangers of proper size and type to receive the ends of framed joists.

3.1.4.1 Floor (Ceiling) Framing

Except where otherwise indicated joists shall have bearings not less than 4 inches on concrete or masonry and 1-1/2 inches on wood or metal. Joists, trimmers, headers, and beams framing into carrying members at the same relative levels shall be carried on joist hangers. Joists shall be lapped and spiked together at bearings or butted end-to-end with scab ties at joint and spiked to plates. Openings in floors shall be framed with headers and trimmers. Headers carrying more than two tail joists and trimmers supporting headers carrying more than one tail joist shall be doubled, unless otherwise indicated. Joists built into masonry shall be provided with a beveled fire cut so that the top of the joist does not enter the wall more than 1 inch or standard steel wall bearing boxes. Engineered wood joists shall be installed in accordance with distributor's instructions.

3.1.4.2 Doubled Joists

Provide under bearing walls and partitions running parallel with the floor joists, around stairways, chimneys, fireplaces, and at other openings where joists are cut and framed. Double, space for clearance, block apart 4 feet on center, rigidly frame, and spike together joists under partitions that are to receive ducts, pipes, and conduits.

3.1.4.3 Tie Straps

For joists supported by the lower flange of steel beams, provide straps at every fourth joist and the corresponding fourth joist on the opposite side. Tie joists across the top of the steel beam with a steel strap. Form straps to lie flat across the top of the beam and twist at the ends to provide flat contact with the side of each joist. Nail each strap at each end with three 10-penny nails spaced 2 inches o.c.

3.1.4.4 Joist Anchors

Provide anchors for each fourth joist supported by a masonry wall. Build wall end of anchors into the wall. Nail anchor to the joist with three 10-penny nails spaced 2 inches o.c. Anchor the first three joists parallel to concrete or masonry walls at bridging points, but not less than 8 feet o.c. from end walls. Let anchors into the tops of each joist and spike to

the top of joist with one 10-penny nail. Extend anchors at least 4 inches into the wall.

3.1.5 Bridging

Provide bridging for floor and ceiling joists and for roof rafters having slopes of less than 1/3. Locate bridging as indicated and as specified herein. Provide bridging for spans greater than 6 feet, but do not exceed 8 feet maximum spacing between rows of bridging. Install rows of bridging uniformly. Provide metal or wood cross-bridging, except where solid bridging is indicated. Do not nail the bottom end of cross-bridging until the subfloor has been laid.

3.1.5.1 Wood Cross-Bridging

Provide wood cross-bridging not less than 2 by 4 nominal size. Nail wood cross-bridging at each end with two 8-penny nails for one by thick material and three 8-penny nails for 2 by thick material.

3.1.5.2 Metal Cross-Bridging

Shall be the manufacturer's standard product, not less than 16 gage before forming and coating. Metal bridging shall be the compression type, lodged into or nailed to the wide faces of opposite joists at points diagonally across from each other near the bottoms and tops of joists.

3.1.6 Subflooring

3.1.6.1 Plywood, Structural-Use, and OSB Panels

Apply best side up with the grain of outer plies or the long dimension at right angles to joists. Stagger end joints and locate over the centerline of joists. Support panel edges by nominal 2 by 4 members framed between joists so the edge joints of subfloor occur over the centerline of blocking. Allow 1/8 inch spacing at panel ends and 1/4 inch at panel edges. Panels shall be continuous over two or more spans. Nail panels 6 inches o.c. at supported edges and 10 inches o.c. over intermediate bearing. Nails shall be 8-penny common or 6-penny threaded. Provide at least 1/2 inch clearance between subflooring and masonry or concrete walls. Subflooring may be installed with adhesive conforming to ASTM D3498 and nails spaced at 12 inches on center unless otherwise shown.

3.1.6.2 Combination Subfloor-Underlayment

Apply with the grain of the face plies or the long dimension at right angles to joists. Panels shall be continuous over two or more spans. Stagger end joints of adjacent panels. Panel edges shall be T&G or supported by 2 by 4 members framed between joists so the edge joints of subfloor-underlayment occur over the centerline of blocking. Provide end joints of panels over the centerline of joists. Allow 1/8 inch spacing between panel edge and end joints. Nail panels 6 inches o.c. at ends and edges and 10 inches o.c. along intermediate bearings unless they are glue-nailed in accordance with APA E30. Nails shall be 8-penny coated common or 6-penny threaded. Provide at least 1/2 inch clearance between subfloor-underlayment and masonry or concrete walls.

3.1.6.3 Wood

Subflooring shall be applied diagonally with end joints made over

supports. Each board shall bear on at least three supports and shall be nailed at each support using two nails for boards 6 inches and less in width and three nails for boards more than 6 inches in width.

3.1.6.4 Depressed Subfloors

Provide depressed subfloors to receive ceramic and quarry tile floors. Nail cleats or ledgers of one by four material to the sides of joists to support the flooring material. Place the cleats at a depth below the top of the joists sufficient to allow the installation of the subflooring below the tops of joists. Snugly fit subflooring as specified herein between joists.

3.1.7 Underlayment

Install underlayment over subfloor just prior to laying of resilient flooring and protect from water and physical damage. Underlayment shall be hardboard or particleboard or plywood or OSB. Stagger end joints of underlayment with respect to each other, and stagger all joints with respect to paralleling panel joints in subfloor. Space panels 1/16 inch apart at ends and 1/8 inch apart at edges and at least 1/2 inch from concrete or masonry walls. Nail panels 6 inches o.c. along edges and 6 inches o.c. each way throughout panel, but not closer than 3/8 inch to panel edges. Nails shall be 4-penny annular ring or screw type and shall be countersunk 1/16 inch. Lightly sand all joints to receive flooring.

3.1.8 Columns and Posts

Set columns and posts, plumb, in alignment, and with full and uniform bearing. Do not embed the bottom and bearing surfaces of posts in concrete or set in direct contact with concrete slabs on grade.

3.1.9 Wall Framing

3.1.9.1 Studs

Select studs for straightness and set plumb, true, and in alignment. In walls and partitions more than eight feet tall, provide horizontal bridging at not more than 8 feet o.c. using nominal 2 inch material of the same width as the studs; install the bridging flat. Sizes and spacing of studs shall be as indicated. Double studs at jambs and heads of openings and triple at corners to form corner posts. Frame corner posts to receive sheathing, lath, and interior finish. Truss over openings exceeding 4 feet in width or use a header of sufficient depth. Toe-nail studs to sills or sole plates with four 8-penny nails or fasten with metal nailing clips or connectors. Anchor studs abutting concrete or masonry walls thereto near the top and bottom and at midheight of each story using expansion bolts or powder-actuated drive studs.

3.1.9.2 Plates

Use plates for walls and partitions of the same width as the studs to form continuous horizontal ties. Splice single plates; stagger the ends of double plates. Double top plates in walls and bearing partitions, built up of two nominal 2 inch thick members. Top plates for nonbearing partitions shall be single or double plates of the same size as the studs. Nail lower members of double top plates and single top plates to each stud and corner post with two 16-penny nails. Nail the upper members of double plates to the lower members with 10-penny nails, two near each end, and stagger 16

inches o.c. intermediately between. Nail sole plates on wood construction through the subfloor to each joist and header; stagger nails. Anchor sole plates on concrete with expansion bolts, one near each end and at not more than 6 feet o.c., or with powder-actuated fasteners, one near each end and at not more than 3 feet o.c. Provide plates cut for the passage of pipes or ducts with a steel angle as a tie for the plate and bearing for joist.

3.1.9.3 Firestops

Provide firestops for wood framed walls and partitions and for furred spaces of concrete or masonry walls at each floor level and at the ceiling line in the top story. Where firestops are not automatically provided by the framing system used, they shall be formed of closely fitted wood blocks of nominal 2 inch thick material of the same width as the studs and joists. Lightweight concrete units may be used at the first-floor level to serve jointly as firestopping and ratproofing.

3.1.9.4 Diagonal Bracing

Provide diagonal bracing at all external corners and internal angles and at maximum 40 foot centers in stud walls, except that bracing may be omitted where diagonally applied wood sheathing, plywood or structural-use panel sheathing, 4 by 8 foot fiberboard sheathing, or gypsum board sheathing is used. Bracing shall be of 1 by 6 material, let into the exterior face of studs. Extend bracing from top plates to sill at an angle of approximately 45 degrees and double nail at each stud. When openings occur near corners, provide diagonal knee braces extending from the corner post above headers to top plates and from below window sills to the main sill. Nail bracing at each bearing with two 8-penny nails.

3.1.10 Wall Sheathing

3.1.10.1 Plywood, Structural-Use, and OSB Panel Wall Sheathing

Apply horizontally or vertically. Extend sheathing over and nail to sill and top plate. Abut sheathing edges over centerlines of supports. Allow 1/8 inch spacing between panels and 1/8 inch at windows and doors. If sheathing is applied horizontally, stagger vertical end joints. Nail panels with 6-penny nails spaced 6 inches o.c. along edges of the panel and 12 inches o.c. over intermediate supports. Keep nails 3/8 inches away from panel ledges. Provide 2 by 4 blocking for horizontal edges not otherwise supported.

3.1.10.2 Fiberboard Wall Sheathing

Apply fiberboard wall sheathing allowing a 1/8 inch joint at edges to permit expansion, except at frames and openings where sheathing shall be fitted snugly. Pre-expand sheathing before application, allowing sheathing to condition for humidity as recommended by the sheathing manufacturer. Provide 2 by 4 blocking for horizontal edges not otherwise supported.

a. Fiberboard wall sheathing used with diagonal-braced framing shall be either 2 or 4 feet wide. Sheathing 2 feet wide shall have T&G or shiplapped edges and shall be applied horizontally with vertical joints staggered. Apply sheathing with tongued edge up and nail at edges and intermediate bearings with 1-3/4 inch long, zinc-coated steel roofing nails spaced on maximum 4-1/2 inch centers. Apply sheathing 4 feet wide either horizontally or vertically. Nail sheathing with 1-3/4 inch long, zinc-coated steel roofing nails spaced 4 inches maximum o.c. at

edges and 8 inches maximum o.c. at intermediate bearings.

b. Fiberboard wall sheathing used with unbraced framing shall be 4 feet wide. Apply sheathing vertically. Extend sheathing over and nail to sill and top plates. Locate joints over centerlines of supports. Nail sheathing with 1-1/2 inch long, zinc-coated steel roofing nails with 3/8 inch diameter heads. Space nails 3 inches o.c. at edges and ends and 6 inches o.c. at intermediate bearings.

3.1.10.3 Gypsum Sheathing Board

Apply gypsum sheathing board either horizontally or vertically. Butt joints and locate over the centerlines of supports. Horizontally applied sheathing shall be T&G, applied with tongued edge up. Stagger vertical joints and abut sheet closely to frames of openings. Nail sheathing with 11 gage, 3/8 inch head, zinc-coated nails 1-1/2 inches long for 1/2 inch sheathing and 1-3/4 inches long for 5/8 inch sheathing, spaced 3/8 inch minimum from edges. Provide 2 by 4 blocking for horizontal edges of 4 foot wide panels not otherwise supported.

a. Gypsum Sheathing Board Used with Diagonal-Braced Framing: Sheathing shall be either 2 or 4 feet wide. Apply sheathing 2 feet wide horizontally. Nail 4 inches maximum o.c. at edges and over intermediate bearings. Apply sheathing 4 feet wide either horizontally or vertically. Nail 4 inches maximum o.c. at edges and 8 inches maximum o.c. at intermediate bearings.

b. Gypsum Sheathing Board Used with Unbraced Frames: Sheathing shall be 4 feet wide and applied vertically. Extend sheathing over and nail to both sill and top plates. Nail 4 inches maximum o.c. at edges and 8 inches maximum o.c. at intermediate bearings.

3.1.10.4 Foil-Faced Insulative Sheathing

Apply sheathing vertically. Butt or overlap joints and locate over centerline of supports. Attach sheathing to framing with 1-1/4 inch, large, flat-head, 11 gage, galvanized roofing nails or 16 gage, 7/16 inch minimum crown, galvanized staples with 1-1/4 inch legs. For nonstructural application (with corner bracing), space fasteners 6 inches o.c. on all panel edges and 12 inches o.c. on intermediate supports, regardless of sheathing thickness, for studs not more than 24 inches o.c. For structural application (without corner bracing), for studs not more than 16 inches o.c., space fasteners 3 inches o.c. on all edges and 6 inches o.c. on intermediate members using minimum 0.115 inch thickness; for studs up to 24 inches o.c., space fasteners 3 inches o.c. on all edges and 3 inches o.c. on intermediate supports using minimum 0.137 inch thickness.

3.1.10.5 Particleboard

Install according to manufacturer's instructions and accepted industry standards.

3.1.10.6 Cellulose Honeycomb Panels

Install according to manufacturer's instructions and accepted industry standards.

3.1.11 Wood Sheathing

Sheathing end joints shall be made over framing members and so alternated that there will be at least two boards between joints on the same support. Each board shall bear on at least three supports. Boards shall be nailed at each support using two nails for boards 6 inches and less in width and three nails for boards more than 6 inches in width. Roof sheathing shall not be installed where roof decking is installed.

3.1.12 Building Paper

Provide building paper on wood board sheathing for all types of exterior siding. Apply paper shingle fashion, horizontally, beginning at the bottom of the wall. Lap edges 4 inches, and nail with one inch, zinc-coated roofing nails, spaced 12 inches o.c. and driven through tin discs.

3.1.13 Ceiling Joists

Size as indicated and set accurately and in alignment. Toe-nail joists to all plates with not less than three 10-penny nails. Frame openings in ceilings with headers and trimmers.

3.1.14 Metal Framing Anchors

Provide framing anchors at every rafter or trussed rafter to fasten rafter or trussed rafter to plates and studs against uplift movement and forces as indicated. Anchors shall be punched and formed for nailing so that nails will be stressed in shear only. Nails shall be zinc-coated; drive a nail in each nail hole provided in the anchor.

3.1.15 Trusses

Metal plate connected wood trusses shall be handled, erected, and braced in accordance with TPI HIB and as indicated.

3.1.16 Structural Glued Laminated Timber Members

Brace members before erection. Align members and complete all connections before removal of bracing. Unwrap individually wrapped members only after adequate protection by a roof or other cover has been provided. Treat scratches and abrasions of factory applied sealer with two brush coats of the same sealer used at the factory.

3.1.17 Plywood and Structural-Use Panel Roof Sheathing

Install with the grain of the outer plies or long dimension at right angles to supports. Stagger end joints and locate over the centerlines of supports. Allow 1/8 inch spacing at panel ends and 1/4 inch at panel edges. Nail panels with 8-penny common nails or 6-penny annular rings or screw-type nails spaced 6 inches o.c. at supported edges and 12 inches o.c. at intermediate bearings. Do not use staples in roof sheathing. Where the support spacing exceeds the maximum span for an unsupported edge, provide adequate blocking, tongue-and-groove edges, or panel edge clips, in accordance with APA E30.

3.1.18 Stair Framing

Cut carriages to exact shape required to receive treads and risers, with risers of uniform height and treads of uniform width. Provide trimmers,

nailers, and blocking as required to support finish materials.

3.1.19 Plastic Lumber

In conjunction with above requirements, follow manufacturer's recommendations for plastic lumber installation, including requirements for structural support, thermal movement, working, fastening, and finishing. Use standard woodworking tools, including carbide tips, coarse saw blades, and routers with aggressive cutters. Follow manufacturer's recommendations for repair by melting.

3.2 MISCELLANEOUS

3.2.1 Wood Roof Nailers, Edge Strips, Crickets, Curbs, and Cants

Provide sizes and configurations indicated or specified and anchored securely to continuous construction.

3.2.1.1 Roof Nailing Strips

Provide roof nailing strips for roof decks as indicated. Apply nailing strips in straight parallel rows in the direction and spacing indicated. Strips shall be surface applied.

a. Surface-Applied Nailers: Shall be 3 inches wide and of thickness to finish flush with the top of the insulation. Anchor strips securely to the roof deck with powder actuated fastening devices or expansion shields and bolts, spaced not more than 24 inches o.c. On decks with slopes of one inch or more, provide surface applied wood nailers for securing insulation and for nailing of roofing felts.

b. Embedded Nailers: Shall be nominal 2 by 3 with 2 inch sides beveled. Set and anchor nailers to finish flush with the roof deck surface.

3.2.1.2 Roof Edge Strips and Nailers

Provide at perimeter of roof, around openings through roof, and where roofs abut walls, curbs, and other vertical surfaces. Except where indicated otherwise, nailers shall be 6 inches wide and the same thickness as the insulation. Anchor nailers securely to underlying construction. Anchor perimeter nailers in accordance with FM 4435. Strips shall be grooved for edge venting; install at walls, curbs, and other vertical surfaces with a 1/4 to 1/2 inch air space.

3.2.1.3 Crickets, Cants, and Curbs

Provide wood saddles or crickets, cant strips, curbs for scuttles and ventilators, and wood nailers bolted to tops of concrete or masonry curbs and at expansion joints, as indicated, specified, or necessary and of lumber or 3/4 inch thick exterior plywood.

3.2.2 Rough Wood Bucks

2 inch nominal thickness. Set wood bucks true and plumb. Anchor bucks to concrete or masonry with steel straps extending into the wall 8 inches minimum. Place anchors near the top and bottom of the buck and space uniformly at 2 foot maximum intervals.

3.2.3 Wood Blocking

Provide proper sizes and shapes at proper locations for the installation and attachment of wood and other finish materials, fixtures, equipment, and items indicated or specified.

3.2.4 Wood Grounds

Provide for fastening wood trim, finish materials, and other items to plastered walls and ceilings. Install grounds in proper alignment and true with an 8 foot straightedge.

3.2.5 Wood Furring

Provide where shown and as necessary for facing materials specified. Except as shown otherwise, furring strips shall be nominal one by 3, continuous, and spaced 16 inches o.c. Erect furring vertically or horizontally as necessary. Nail furring strips to masonry. Do not use wood plugs. Provide furring strips around openings, behind bases, and at angles and corners. Furring shall be plumb, rigid, and level and shall be shimmed as necessary to provide a true, even plane with surfaces suitable to receive the finish required. Form furring for offsets and breaks in walls or ceilings on 1 by 4 wood strips spaced 16 inches o.c.

3.2.6 Wood Bumpers

Dress to the sizes indicated, and bevel edges. Bore, countersink, and bolt bumpers in place.

3.2.7 Temporary Closures

Provide with hinged doors and padlocks and install during construction at exterior doorways and other ground level openings that are not otherwise closed. Cover windows and other unprotected openings with polyethylene or other approved material, stretched on wood frames. Provide dustproof barrier partitions to isolate areas as directed.

3.2.8 Temporary Centering, Bracing, and Shoring

Provide for the support and protection of masonry work during construction as specified in Section . Forms and centering for cast-in-place concrete work are specified in Section 03 30 00 CAST-IN-PLACE CONCRETE.

3.2.9 Wood Sleepers

Run wood sleepers in lengths as long as practicable and stagger end joints in adjacent rows.

3.2.10 Diaphragms

Install plywood, structural-use, or OSB panels with the long dimension perpendicular to supports. End joints shall be staggered and located over the centerline of supports. Longitudinal joints shall be staggered and provided with blocking. Nail panels with 10-penny nails spaced not more than 12 inches on centers around the diaphragm boundaries and 6 inches on centers at all other supported edges and 12 inches o.c. over intermediate bearings.

3.2.11 Shear Walls

Install plywood or structural-use panels with long dimension parallel or perpendicular to supports. Provide blocking behind edges not located over supports. Nail panels with 10-penny nails spaced not more than 8 inches on centers along panel edges and 6 inches o.c. over intermediate bearings.

3.2.12 Bridging

Wood bridging shall have ends accurately bevel-cut to afford firm contact and shall be nailed at each end with two nails. Metal bridging shall be installed as recommended by the manufacturer. The lower ends of bridging shall be driven up tight and secured after subflooring or roof sheathing has been laid and partition framing installed.

3.2.13 Corner Bracing

Corner bracing shall be installed when required by type of sheathing used or when siding, other than panel siding, is applied directly to studs. Corner bracing shall be let into the exterior surfaces of the studs at an angle of approximately 45 degrees, shall extend completely over wall plates, and shall be secured at each bearing with two nails.

3.2.14 Sill Plates

Sill plates shall be set level and square and anchor bolted at not more than 6 feet on centers and not more than 12 inches from end of each piece. A minimum of two anchors shall be used for each piece.

3.3 INSTALLATION OF TIMBER CONNECTORS

Installation of timber connectors shall conform to applicable requirements of AWC NDS.

3.4 ERECTION TOLERANCES

a. Framing members which will be covered by finishes such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

(1) Layout of walls and partitions: 1/4 inch from intended position;

(2) Plates and runners: 1/4 inch in 8 feet from a straight line;

(3) Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and

(4) Face of framing members: 1/4 inch in 8 feet from a true plane.

b. Framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive shall be within the following limits:

(1) Layout of walls and partitions: 1/4 inch from intended position;

(2) Plates and runners: 1/8 inch in 8 feet from a straight line;

(3) Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and

(4) Face of framing members: 1/8 in 8 feet from a true plane.

3.5 SPECIAL INSPECTION AND TESTING FOR SEISMIC-RESISTING SYSTEMS

Special inspections and testing for seismic-resisting systems and components shall be done in accordance with Section 01 45 35 SPECIAL INSPECTIONS.

3.6 WASTE MANAGEMENT

In accordance with the Waste Management Plan and as specified. Clearly separate damaged wood and other scrap lumber for acceptable alternative uses on site, including bracing, blocking, cripples, ties, and shims.

Separate treated, stained, painted, and contaminated wood and place in designated area for hazardous materials. Dispose of according to local regulations. Do not leave any wood, shavings, sawdust, or other wood waste buried in fill or on the ground. Prevent sawdust and wood shavings from entering the storm drainage system. Compost sawdust. Do not burn scrap lumber that has been pressure treated, or lumber that is less than one year old.

-- End of Section --

SECTION 07 14 00

FLUID-APPLIED WATERPROOFING top coat
02/12

PART 1 GENERAL

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.

ASTM INTERNATIONAL (ASTM)

ASTM C33/C33M	(2013) Standard Specification for Concrete Aggregates
ASTM C578	(2014a) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C836/C836M	(2012) High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use With Separate Wearing Course
ASTM D1056	(2014) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D1751	(2004; E 2013; R 2013) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	(2004a; R 2013) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion

1.2 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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Fluid-applied membrane

Membrane primer

Elastomeric sheet

Flexible foam-backed elastomeric sheet

Solvent

Moisture meter

Protection board

Bond breaker

Submit material description and physical properties, application details, and recommendations regarding shelf life, application procedures, and precautions on flammability and toxicity.

SD-11 Closeout Submittals

Warranty

Information Card

Instructions To Government Personnel

Include copies of Material Safety Data Sheets for maintenance/repair materials.

1.3 PREWATERPROOFING CONFERENCE

Prior to starting application of waterproofing system, arrange and attend a prewaterproofing conference to ensure a clear understanding of drawings and specifications. Give the Contracting Officer 7 days advance written notice of the time and place of meeting. Ensure that the mechanical and electrical subcontractor, flashing and sheetmetal subcontractor, and other trades that may perform other types of work on or over the membrane after installation, attend this conference.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver waterproofing materials in manufacturer's original, unopened containers, with labels intact and legible. Containers of materials covered by a referenced specification number shall bear the specification number, type, and class of the contents. Deliver materials in sufficient quantity to continue work without interruption. Store and protect materials in accordance with manufacturer's instructions, and use within their indicated shelf life. When hazardous materials are involved, adhere to special precautions of the manufacturer, unless precautions conflict with local, state, and federal regulations. Promptly remove from the site materials or incomplete work adversely affected by exposure to moisture or freezing. Store materials on pallets and cover from top to bottom with canvas tarpaulins.

1.5 ENVIRONMENTAL CONDITIONS

Apply materials when ambient temperature is 40 degrees F or above for a period of 24 hours prior to the application and when there is no ice, frost, surface moisture, or visible dampness on the substrate surface. Apply materials when air temperature is expected to remain above 40 degrees F during the cure period recommended by the manufacturer. Moisture test for substrate is specified under paragraph entitled "Moisture Test." Work may be performed within heated enclosures, provided the surface temperature

of the substrate is maintained at a minimum of 40 degrees F for 24 hours prior to the application of the waterproofing, and remains above that temperature during the cure period recommended by the manufacturer.

1.6 WARRANTY

Provide roof system material and workmanship warranties meeting specified requirements. Provide revisions or amendment to standard membrane manufacturer warranty to comply with the specified requirements. Minimum manufacturer warranty shall have no dollar limit, cover full system water-tightness, and shall have a minimum duration of 20 years.

1.6.1 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. Write the warranty directly to the Government commencing at time of Government's acceptance of the roof work. Provide the the following statements 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, 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 cost associated with the repair or replacement work are the responsibility of the roof membrane manufacturer.

b. The warranty must remain in full force and effect, including emergency temporary repairs performed by others, when the manufacturer or his approved applicator fail to perform the repairs within 72 hours of notification.

1.6.2 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.

1.6.3 Continuance of Warranty

Approve repair or replacement work that becomes necessary within the warranty period 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.

PART 2 PRODUCTS

2.1 FLUID-APPLIED MEMBRANE

ASTM C836/C836M.

2.2 MEMBRANE PRIMER

As recommended by the fluid-applied membrane manufacturer unless specifically prohibited by the manufacturer of the fluid-applied membrane.

2.3 SEALANT

As specified in Section 07 92 00 JOINT SEALANTS.

2.4 SEALANT PRIMER

As specified in Section 07 92 00 JOINT SEALANTS.

2.5 BACKING MATERIAL

Premolded, closed-cell, polyethylene, or polyurethane foam rod having a diameter 25 percent larger than joint width before being compressed into joint. Provide bond breaker of polyethylene film or other suitable material between backing material and sealant.

2.6 JOINT FILLER

As specified in ASTM D1751 or ASTM D1752.

2.7 BOND BREAKER

As recommended by the fluid-applied membrane manufacturer. Bond breaker shall not interfere with the curing process or other performance properties of the fluid-applied membrane.

2.8 ELASTOMERIC SHEET

Preformed; as recommended by the fluid-applied membrane manufacturer. Bond strength between the fluid-applied membrane and the preformed elastomeric sheet shall be a minimum of one psi when tested in accordance with ASTM C836/C836M.

2.9 ELASTOMERIC SHEET ADHESIVE

As recommended by the elastomeric sheet manufacturer.

2.10 FLEXIBLE FOAM-BACKED ELASTOMERIC SHEET

Flexible foam-backed elastomeric sheet for protection over preformed elastomeric sheet at expansion joints shall be 1/2 inch thick, minimum, closed cell foam conforming to ASTM D1056, Type 2, Class B, Grades 2 or 3, factory-bonded to 1/16 inch thick, minimum, preformed elastomeric sheet.

2.11 PROTECTION BOARD

Premolded bitumen composition board, 1/8 inch minimum thickness or other composition board compatible with the fluid-applied membrane.

2.12 DRAINAGE COURSE AGGREGATE

ASTM C33/C33M, size No. 8.

2.13 INSULATION

Polystyrene foam conforming to ASTM C578, Class IV, thickness as required by indicated R-value.

PART 3 EXECUTION

3.1 PREPARATION

Coordinate work with that of other trades to ensure that components to be incorporated into the waterproofing system are available when needed. Inspect and approve surfaces immediately before application of waterproofing materials. Remove laitance, loose aggregate, sharp projections, grease, oil, dirt, curing compounds, and other contaminants which could adversely affect the complete bonding of the fluid-applied membrane to the concrete surface.

3.1.1 Flashings

Make penetrations through sleeves in concrete slab watertight before application of waterproofing. After flashing is completed, cover elastomeric sheet with fluid-applied waterproofing during waterproofing application.

3.1.1.1 Drains

Make drain flanges flush with surface of structural slab. Apply a full elastomeric sheet around the drain, with edges fully adhered to drain flange and to structural slab. Do not adhere elastomeric sheet over joint between drain and concrete slab. Do not plug drainage or weep holes. Cover elastomeric sheet with fluid-applied waterproofing during waterproofing application. Lap elastomeric sheet a minimum of 4 inches onto concrete slab.

3.1.1.2 Penetrations and Projections

Flash penetrations and projections through structural slab with an elastomeric sheet adhered to the concrete slab and the penetration. Leave elastomeric sheet unadhered for one inch over joint between penetration and concrete slab. Adhere elastomeric sheet a minimum of 4 inches onto horizontal deck.

3.1.1.3 Walls and Vertical Surfaces

Flash wall intersections which are not of monolithic pour or constructed with reinforced concrete joints with an elastomeric sheet adhered to both vertical wall surfaces and concrete slab. Flash intersections which are monolithically poured or constructed with reinforced concrete joints with either an elastomeric sheet or a vertical grade of fluid-applied waterproofing adhered to vertical wall surfaces and concrete slab. Leave sheet unadhered for a distance of one inch from the corner on both vertical and horizontal surfaces.

3.1.2 Cracks and Joints

Prepare visible cracks and joints in substrate to receive fluid-applied waterproofing membrane by placing a bond breaker and an elastomeric slip sheet between membrane and substrate. Cracks that show movement shall receive a 2 inch bond breaker followed by an elastomeric sheet adhered to the deck. Nonmoving cracks shall be double coated with fluid-applied waterproofing.

3.1.3 Priming

Prime surfaces to receive fluid-applied waterproofing membrane. Apply primer as required by membrane manufacturer's printed instructions.

3.2 SPECIAL PRECAUTIONS

Protect waterproofing materials during transport and application. Do not dilute primers and other materials, unless specifically recommended by materials manufacturer. Keep containers closed except when removing contents. Do not mix remains of unlike materials. Thoroughly remove residual materials before using application equipment for mixing and transporting materials. Do not permit equipment on the project site that has residue of materials used on previous projects. Use cleaners only for cleaning, not for thinning primers or membrane materials. Ensure that workers and others who walk on cured membrane wear clean, soft-soled shoes to avoid damaging the waterproofing materials.

3.3 APPLICATION

Over primed surfaces, provide a uniform, wet, monolithic coating of fluid-applied membrane, 60 mils thick, plus or minus 5 mils by following manufacturer's printed instructions. Apply material by trowel, squeegee, roller, brush, spray apparatus, or other method recommended by membrane manufacturer. Check wet film thickness as specified in paragraph entitled "Film Thickness" and adjust application rate as necessary to provide a uniform coating of the thickness specified. Where possible, mark off surface to be coated in equal units to facilitate proper coverage. At expansion joints, control joints, prepared cracks, flashing, and terminations, carry membrane over preformed elastomeric sheet in a uniform 60 mil thick, plus or minus 5 mils, wet thickness to provide a monolithic coating. If membrane cures before next application, wipe previously applied membrane with a solvent to remove dirt and dust that could inhibit adhesion of overlapping membrane coat. Use solvent recommended by the membrane manufacturer, as approved.

3.3.1 Work Sequence

Perform work so that protection board is installed prior to using the waterproofed surface. Do not permanently install protection board until the membrane has passed the flood test specified under paragraph entitled "Flood Test." Move material storage areas as work progresses to prevent abuse of membrane and overloading of structural deck.

3.3.2 Protection Board

Protect fluid-applied membrane by placing protection board over membrane at a time recommended by the membrane manufacturer. Protect membrane application when protection board is not placed immediately. Butt protection boards together and do not overlap.

3.3.3 Drainage Course

Place drainage course where shown after flood tests are completed and concrete protection slab or wearing course is ready to be installed.

3.3.4 Insulation

Place insulation of thickness indicated, on top of drainage course just prior to placement of concrete protection slab.

3.4 FIELD QUALITY CONTROL

3.4.1 Moisture Test

Prior to application of fluid-applied waterproofing, measure moisture content of substrate with a moisture meter in the presence of the Contracting Officer. An acceptable device is the Delmhorst Moisture Meter, Model BD7/2E/CS, Type 21 E. Similar meters by other manufacturers, which are suitable for the purpose, may be used as approved by the Contracting Officer. Do not begin application until meter reading indicates "dry" range.

3.4.2 Film Thickness

Measure wet film thickness every 100 square feetduring application by placing flat metal plates on the substrate or using a mil-thickness gage especially manufactured for the purpose.

3.4.3 Flood Test

After application and curing is complete, plug drains and fill waterproofed area with water to a depth of 2 inches. A minimum 48 hour cure time, or longer cure time if recommended by the membrane manufacturer, shall be required prior to flood testing. Allow water to stand 24 hours. Test watertightness by measuring water level at beginning and end of the 24 hour period. If water level falls, drain water, allow installation to dry, and inspect. Make repairs or replace as required and repeat the test. Work shall not proceed before approval of repairs or replacement.

3.5 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.

3.6 INFORMATION CARD

For each roof application, furnish a minimum 8-1/2 inch by 11 inch 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. 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 contract 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.

FORM 1
FLUID-APPLIED WATERPROOFING SYSTEM COMPONENTS
1. Contract Number
2. Date Work Completed
3. Project Specification Designation
4. Substrate Material
5. Slope of Substrate
6. Drains Type/Manufacturer
7. Waterproofing
a. Membrane
b. Sealant
c. Elastomeric Sheet
d. Materials Manufacturer(s)
8. Protection Board
a. Type
b. Thickness
c. Manufacturer's Name
9. Drainage Course Material Graduation
10. Insulation
a. Type
b. Thickness
c. Manufacturer's Name
11. Protection Slab
a. Material
b. Thickness
c. Support
d. Joint System

FORM 1	
FLUID-APPLIED WATERPROOFING SYSTEM COMPONENTS	
12. Wearing Course	
a. Type	
b. Slope	
c. Joint System	
d. Sealant/Gasket Type	
13. Wearing Surface Type	
Manufacturer's Name	
14. Warranty	
a. Manufacturer warranty expiration	
b. Warranty reference number	
15. Statement of Compliance or Exception	
Contractor's Signature	Date Signed
Inspector's Signature	Date Signed

-- End of Section --

SECTION 07 22 00

ROOF AND DECK INSULATION
08/11

PART 1 GENERAL

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.

ASTM INTERNATIONAL (ASTM)

ASTM C1177/C1177M	(2013) Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
ASTM C1289	(2014a) Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
ASTM C208	(2012) Cellulosic Fiber Insulating Board
ASTM C552	(2014) Standard Specification for Cellular Glass Thermal Insulation
ASTM C578	(2014a) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C726	(2012) Mineral Fiber Roof Insulation Board
ASTM C728	(2013) Perlite Thermal Insulation Board
ASTM D2178/D2178M	(2014) Asphalt Glass Felt Used in Roofing and Waterproofing
ASTM D226/D226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D4263	(1983; R 2012) Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM D4601/D4601M	(2004; R 2012) Asphalt-Coated Glass Fiber Base Sheet Used in Roofing
ASTM D4897/D4897M	(2001; R 2009) Standard Specification for Asphalt-Coated Glass-Fiber Venting Base Sheet Used in Roofing
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials

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 APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/
FM P9513	(2002) Specialist Data Book Set for Roofing Contractors; contains 1-22 (2001), 1-28 (2002), 1-29 (2002), 1-28R/1-29R (1998), 1-30 (2000), 1-31 (2000), 1-32 (2000), 1-33 (2000), 1-34 (2001), 1-49 (2000), 1-52 (2000), 1-54 (2001)

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir	(2012) Building Materials Directory

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval.for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Wood nailers

Tapered roof insulation system; G

Taper cants and crickets

Show location and spacing of wood nailers that are required for securing insulation and for backnailing of roofing felts. Show a complete description of the procedures for the installation of each phase of the system indicating the type of materials, thicknesses, identity codes, sequence of laying insulation, location of ridges and valleys, special methods for cutting and fitting of insulation, and special precautions. The drawings shall be based on field measurements.

SD-03 Product Data

Fasteners ; G

Insulation; G

Recycled materials; (LEED NC)

MR4; Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

Local/Regional Materials; (LEED NC)

MR5; Submit documentation indicating distance between manufacturing facility and the project site. Indicate distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in project.

SD-06 Test Reports

Flame spread and smoke developed ratings

Submit in accordance with ASTM E84.

SD-07 Certificates

Installer qualifications

SD-08 Manufacturer's Instructions

Nails and fasteners

Roof insulation, including field of roof and perimeter attachment requirements.

1.3 MANUFACTURER'S CERTIFICATE

Submit certificate from the insulation manufacturer attesting that the installer has the proper qualifications for installing tapered roof insulation systems.

Certificate attesting that the expanded perlite or polyisocyanurate insulation contains recovered material and showing estimated percent of recovered material. Certificates of compliance for felt materials.

1.4 QUALITY ASSURANCE

1.4.1 Insulation on Combustible Steel or Concrete Decks

Roof insulation shall have a flame spread rating not greater than 75 and a smoke developed rating not greater than 150, exclusive of covering, when tested in accordance with ASTM E84. Insulation bearing the UL label and listed in the UL Bld Mat Dir as meeting the flame spread and smoke developed ratings will be accepted in lieu of copies of test reports. Compliance with flame spread and smoke developed ratings will not be required when insulation has been tested as part of a roof construction assembly of the type used for this project and the construction is listed as fire-classified in the UL Bld Mat Dir or listed as Class I roof deck construction in the FM APP GUIDE. Insulation tested as part of a roof

construction assembly shall bear UL or FM labels attesting to the ratings specified herein.

1.4.2 Foam Board on Combustible or Steel Decks

Separate polyurethane or polystyrene insulation from a combustible or steel deck with a thermal barrier of glass mat gypsum roof board or roof insulation in accordance with the requirements of the UL Bld Mat Dir or the FM APP GUIDE.

1.4.3 Insulation for Cool Roofing

Provide thermal insulation above the roof deck with an R value of 20 or greater.

1.4.4 Local/Regional Materials

See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Roof insulation and materials may be locally available.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

Deliver materials to site in manufacturer's unopened and undamaged standard commercial containers bearing the following legible information:

a. Name of manufacturer;

b. Brand designation;

c. Specification number, type, and class, as applicable, where materials are covered by a referenced specification; and

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

1.5.2 Storage and Handling

Store and handle materials in a manner to protect from damage, exposure to open flame or other ignition sources, and from wetting, condensation or moisture absorption. Store in an enclosed building or trailer that provides a dry, adequately ventilated environment. Store felt rolls on ends. For the 24 hours immediately before application of felts, store felts in an area maintained at a temperature no lower than 50 degrees F above grade and having ventilation around all sides. Replace damaged material with new material.

1.6 ENVIRONMENTAL CONDITIONS

Do not install roof insulation during inclement weather or when air temperature is below 40 degrees F and interior humidity is 45 percent or greater, or when there is visible ice, frost, or moisture on the roof deck.

1.7 PROTECTION OF PROPERTY

Provide protection as specified.

1.7.1 Special Protection

Provide special protection approved by the insulation manufacturer, or avoid heavy traffic on completed work when ambient temperature is above 80 degrees F.

PART 2 PRODUCTS

2.1 INSULATION

2.1.1 Insulation Types

Roof insulation shall be one or an assembly of a maximum of three of the following materials and compatible with attachment methods for the specified insulation and roof membrane:

a. Expanded Perlite Board: ASTM C728. Minimum 3/4 inch thick when both top and bottom surfaces will be in contact with asphalt.
b. Polyisocyanurate Board: ASTM C1289 Type I -- foil faced both sides or Type II, fibrous felt or glass mat membrane both sides, except minimum compressive strength shall be 20 pounds per square inch (psi).

c. Composite Boards: ASTM C1289, Type III, perlite insulation board faced one side, fibrous felt or glass fiber mat membrane on other side. Type V, oriented strand board or waferboard on one side and fibrous felt or glass fiber mat membrane or aluminum foil on the other.; ASTM C1289 (Polyisocyanurate-perlite).

d. Cellular Glass Boards: ASTM C552, Type IV.

e. Polystyrene Board: Shall be in accordance with ASTM C578, Type II, IV, or X.

f. Wood Fiberboard: ASTM C208, high density, except 4 by 4 feet maximum board size.

ASTM C208 Type II, Grade 1 or 2, roof insulating board, treated with sizing, wax or bituminous impregnation. Bituminous impregnation shall be limited to 4 percent by weight when used over steel decks. Maximum board size: 4 feet by 4 feet.

2.1.2 Mineral-Fiber Insulation Board

ASTM C726.

2.1.3 Recovered Materials

Provide thermal insulation materials containing recycled materials to the extent practical. The required minimum recycled material content for the listed materials are:

Perlite Composition Board:	75 percent postconsumer paper

Polyisocyanurate/polyurethane:	9 percent recovered material
Wood Fiberboard:	25 percent recovered material
Cellular Glass Insulation:	75 percent recovered content
Structural Fiberboard:	100 percent recovered content
Fiberglass Insulation:	20-25 percent recovered content
Fiber (felt) or Fiber composite:	50-100 percent recovered content
Rubber:	12-100 percent recovered content
Plastic or Plastic/Rubber composite:	100 percent recovered content
Wood/Plastic Composite:	100 percent Total Recovered content

2.1.4 Insulation Thickness

As necessary to provide a thermal resistance (R value) of 20 or more for average thickness of tapered system. Thickness shall be based on the "R" value for aged insulation. Insulation over steel decks shall satisfy both specified R value and minimum thickness for width of rib opening recommended in insulation manufacturer's published literature.

2.1.5 Tapered Roof Insulation

One layer of the tapered roof insulation assembly shall be factory tapered to a slope of not less than 1/4 inch per foot. Provide starter and filler blocks as required to provide the total thickness of insulation necessary to meet the specified slope and thermal conductance. Mitered joints shall be factory fabricated and shall consist of two diagonally cut boards or one board shaped to provide the required slopes. Identify each piece of tapered insulation board by color or other identity coding system, allowing the identification of different sizes of tapered insulation board required to complete the roof insulation system.

2.1.6 Cants and Tapered Edge Strips

Provide preformed cants and tapered edge strips of the same material as the roof insulation; or, when roof insulation material is unavailable, provide pressure-preservative treated wood, wood fiberboard, or rigid perlite board cants and edge strips as recommended by the roofing manufacturer, unless otherwise indicated. Face of cant strips shall have incline of 45 degrees and vertical height of 4 inches. Taper edge strips at a rate of one to 1 1/2 inch per foot down to approximately 1/8 inch thick.

2.2 PROTECTION BOARD

For use as a thermal barrier (underlayment), fire barrier (overlayment), or protection board for hot-mopped, torched-down, or adhesively-applied roofing membrane over roof insulation.

2.2.1 Glass Mat Gypsum Roof Board

ASTM C1177/C1177M, 0 Flame Spread and 0 Smoke Developed when tested in accordance with ASTM E84, 500 psi, Class A, non-combustible, 1/2 inch thick, 4 by 8 feet board size.

2.2.2 High Density Wood Fiber

Provide improved impact resistance to roof covers, but is hydroscopic in nature. High density fiber board shall be Grade 2 in accordance with ASTM C208 with a transverse load of 12 lbf.

2.3 SHEATHING PAPER FOR WOOD DECKS

Rosin-sized building paper or unsaturated felt weighing not less than 5 pounds per 100 square feet.

2.4 MOISTURE CONTROL

2.4.1 Vapor Retarder

2.4.1.1 Asphalt-Saturated Felt Base Sheet for Single Layer Application

ASTM D4601/D4601M, weighing not less than 35 pounds per 100 square feet.

2.4.1.2 Asphalt-Coated Glass Felt

ASTM D2178/D2178M, Type VI.

2.4.2 Ventilating Felt for Poured or Precast Concrete Decks

ASTM D4897/D4897M, Type II, non-perforated, with spot mopping holes where specified.

2.4.3 Organic Roofing

ASTM D226/D226M, Type I.

2.5 FASTENERS

Flush-driven through flat round or hexagonal steel or plastic plates. Steel plates shall be zinc-coated, flat round not less than 1 3/8 inch diameter or hexagonal not less than 28 gage. Plastic plates shall be high-density, molded thermoplastic with smooth top surface, reinforcing ribs and not less than 3 inches in diameter. Fastener head shall recess fully into the plastic plate after it is driven. Plates shall be formed to prevent dishing. Do not use bell-or cup-shaped plates. Fasteners shall conform to insulation manufacturer's recommendations except that holding power, when driven, shall be not less than 120 pounds each in steel deck. Fasteners for steel or concrete decks shall conform to FM APP GUIDE for Class I roof deck construction, and shall be spaced to withstand an uplift pressure of 90 pounds per square foot.

2.5.1 Roofing Nails for Wood Decks

Barbed 11 gage, zinc-coated nails with 7/16 to 5/8 inch diameter heads or annular ring shank, square head, one-piece composite nails. Nails shall be long enough to penetrate wood deck at least 5/8 inch but shall not protrude

through underside of decking.

2.5.2 Fasteners for Plywood Decks

Annular ring shank, square head, one-piece composite nails long enough to penetrate into plywood decks approximately 1/2 inch but not protrude through underside of decking.

2.5.3 Fasteners for Steel Decks

Approved hardened penetrating fasteners or screws conforming to FM 4470 and listed in FM APP GUIDE for Class I roof deck construction. Quantity and placement to withstand a minimum uplift pressure of 90 psf conforming to FM APP GUIDE.

2.5.4 Fasteners for Poured Concrete Decks

Approved hardened fasteners or screws to penetrate deck at least one inch but not more than 1 1/2 inches, conforming to FM 4470, and listed in FM APP GUIDE for Class I roof deck construction. Quantity and placement to withstand an uplift pressure of 90 psf conforming to FM APP GUIDE.

2.6 WOOD NAILERS

Pressure-preservative-treated as specified in Section 06 10 00 ROUGH CARPENTRY.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

3.1.1 Surface Inspection

Surfaces shall be clean, smooth, and dry. Surfaces receiving vapor retarder shall be free of projections which might puncture the vapor retarder. Check roof deck surfaces, including surfaces sloped to roof drains and outlets, for defects before starting work.

The Contractor shall inspect and approve the surfaces immediately before starting installation. Prior to installing vapor retarder, ventilating felt or insulation, perform the following:

a. Examine wood decks to ascertain that deck boards have been properly nailed and that exposed nail heads have been set.

b. Examine steel decks to ensure that panels are properly secured to structural members and to each other and that surfaces of top flanges are flat or slightly convex.

c. Examine precast concrete decks to ensure that joints between precast units are properly grouted and leveled to provide suitable surfaces for installation of vapor retarder and insulation.

e. Prior to installing any roof system on a concrete deck, conduct a test per ASTM D4263. The deck is acceptable for roof system application when there is no visible moisture on underside of plastic sheet after 24 hours.

3.1.2 Surface Preparation

Correct defects and inaccuracies in roof deck surface to eliminate poor drainage and hollow or low spots and perform the following:

a. Install wood nailers the same thickness as insulation at eaves, edges, curbs, walls, and roof openings for securing cant strips, gravel stops, gutters, and flashing flanges. On decks with slopes of one inch per foot or more, install wood nailers perpendicular to slope for securing insulation and for backnailing of roofing felts. Space nailers in accordance with approved shop drawings.

b. Fill or cover cracks or knot holes larger than 1/2 inch in diameter in wood decks as necessary to form an unyielding surface.

d. Cover wood and steel decks with a layer of insulation board of sufficient thickness to span the width of a deck rib opening, and conforming to fire safety requirements. Secure with piercing or self-drilling, self-tapping fasteners of quantity and placement conforming to FM APP GUIDE. Insulation joints parallel to ribs of deck shall occur on solid bearing surfaces only, not over open ribs.

3.2 INSTALLATION OF VAPOR RETARDER

Install vapor retarder in direct contact with roof deck surface insulation. Vapor retarder shall consist of either two plies of No. 15 asphalt-saturated felt, two plies of asphalt-coated glass felt , or one layer of asphalt-saturated felt base sheet. Lay vapor retarder at right angles to direction of slope. Install first ply of felt or base sheet as specified herein for the specific deck. Apply second ply of 2-ply vapor retarder system using asphalt at rate of 20 to 35 lbs per 100 square feet, applied within plus or minus 25 degrees F of EVT. Do not heat asphalt above asphalt's FBT or 525 degrees F, whichever is less. Use thermometers to check temperatures during heating and application. Side and end laps shall be completely sealed. Asphalt shall be visible beyond all edges of each ply as it is being installed. Plies shall be laid free of wrinkles, buckles, creases or fishmouths. Workers shall not walk on mopped surfaces when the asphalt is sticky. Press out air bubbles to obtain complete adhesion between surfaces. At walls, eaves and rakes, and other vertical surfaces, the vapor retarder organic felts shall be extended9 inches, or separate organic felt plies shall be extended 9 inches, with not less than 9 inches on the substrate, and the extended portion turned back and mopped in over the top of the insulation. At roof penetrations other than walls, eaves and rakes, and vertical surfaces, the vapor retarder or separate plies shall be extended 9 inches to form a lap which shall later be folded back over the edge of the insulation. Asphalt roof cement shall be used under the vapor retarder for at least 9 inches from walls, eaves, rakes and other penetrations.

3.2.1 Vapor Retarder on Wood Decks

Lay first ply of 2 ply system dry with each sheet lapping 2 inches over the preceding sheet. Lap ends not less than 4 inches. Stagger laps a minimum of 12 inches. Nail felt at 6 inch intervals along side laps and install two rows of nails approximately 11 inches apart down longitudinal center of each sheet, with nails staggered at 18 inches O.C. For vapor retarder consisting of one layer of asphalt base sheet, lap each sheet 4 inches over

the preceding sheet. Provide end laps not less than 4 inches and stagger laps a minimum of 12 inches. Cement side and end laps together with solid mopping of asphalt or heavy coat of asphalt roof cement. Nail side laps at 6 inch intervals. Apply asphalt mopping at rate of 20 to 35 lbs per 100 square feet. Install two rows of nails approximately 11 inches apart down longitudinal center of each sheet, with nails staggered at 18 inches O.C.

3.2.2 Over Gypsum Insulating Concrete or Lightweight Insulating Concrete

One ply of venting inorganic base sheet shall be laid, without mopping, at right angle to the slope with 4 inch side laps and 6 inch end laps. Laps shall be bonded with hot asphalt. End laps shall be staggered. Base sheet shall be nailed 9 inches on centers at side laps and in 2 rows 11 inches apart down the center of the sheet with nails 18 inches on centers and staggered . The 2-ply vapor retarder shall then be applied over the base sheet as specified above.

3.2.3 Over Concrete Decks and First Layer of Insulation on Steel Decks

The 2-ply vapor retarder shall be applied as specified above except that venting inorganic base sheet shall be deleted.

3.2.4 Over Structural Concrete on Non-Venting Support

One ply of venting inorganic base sheet with mopping holes shall be laid dry at right angle to the slope with 4 inch side laps and 6 inch end laps. The vapor retarder shall then be applied as specified.

3.3 INSTALLATION OF VENTILATING FELT

Apply ventilating felt in accordance with manufacturer's printed instructions. Extend over roof cants, up vertical surfaces and terminate under cap flashing; at roof edges terminate under outside edge of perimeter edge nailers or under gravel stop fascia.

3.4 INSULATION INSTALLATION

Apply insulation in two layers with staggered joints when total required thickness of insulation exceeds 1/2 inch. Lay insulation so that continuous longitudinal joints are perpendicular to direction of roofing, as specified , and end joints of each course are staggered with those of adjoining courses. When using multiple layers of insulation, joints of each succeeding layer shall be parallel and offset in both directions with respect to layer below. Keep insulation 1/2 inch clear of vertical surfaces penetrating and projecting from roof surface.

3.4.1 Installation Using fully adhered or Mechanical Fasteners

Secure total thickness of insulation with penetrating type fasteners.

3.4.2 Special Precautions for Installation of Foam Insulation

3.4.2.1 Polyisocyanurate Insulation

Where polyisocyanurate foam board insulation is provided, install 1/2 inch thick wood fiberboard, glass mat gypsum roof board, or 3/4 inch thick expanded perlite board insulation over top surface of foam board insulation. Stagger joints of insulation with respect to foam board

insulation below.

3.4.2.2 Polystyrene Insulation

a. Over top surface of non-composite polystyrene board, install 1/2 inch thick high density wood fiberboard, 3/4 inch thick expanded perlite board, glass mat gypsum roof board, or other overlayment approved by roofing sheet manufacturer. Tightly butt and stagger joints of field applied overlayment board at least 6 inches with respect to the polystyrene board below. Apply 6 inch wide glass fiber roofing tape centered over joints and edges of overlayment board.

b. Where composite boards consisting of polystyrene insulation are provided, apply 6 inch wide glass-fiber roofing tape centered over joints and edges of composite board. Apply joint strips as recommended by roofing sheet manufacturer.

3.4.3 Cant Strips

Where indicated, provide cant strips at intersections of roof with walls, parapets, and curbs extending above roof. Wood cant strips shall bear on and be anchored to wood blocking. Fit cant strips flush against vertical surfaces. Where possible, nail cant strips to adjoining surfaces. Where cant strips are installed against non-nailable materials, install in .

3.4.4 Tapered Edge Strips

Where indicated, provide edge strips in the right angle formed by junction of roof and wood nailing strips that extend above level of roof. Install edge strips flush against vertical surfaces of wood nailing strips. Where possible, nail edge strips to adjoining surfaces. Where installed against non-nailable materials, install in .

3.5 PROTECTION

3.5.1 Protection of Applied Insulation

Completely cover each day's installation of insulation with the finished roofing specified in SOW on same day. Do not permit phased construction. Protect open spaces between insulation and parapets or other walls and spaces at curbs, scuttles, and expansion joints, until permanent roofing and flashing are applied. Do not permit storing, walking, wheeling, or trucking directly on insulation or on roofed surfaces. Provide smooth, clean board or plank walkways, runways, and platforms near supports, as necessary, to distribute weight to conform to indicated live load limits of roof construction . Exposed edges of the insulation shall be protected by cutoffs at the end of each work day or whenever precipitation is imminent. Cutoffs shall be 2 layers of bituminous-saturated felt set in plastic bituminous cement or single ply or EPDM membrane set in roof cement. Fill all profile voids in cut-offs to prevent entrapping of moisture into the area below the membrane. Cutoffs shall be removed when work is resumed.

3.5.2 Damaged Work and Materials

Restore work and materials that become damaged during construction to original condition or replace with new materials.

3.6 INSPECTION

The Contractor shall establish and maintain an inspection procedure to assure compliance of the installed roof insulation with the contract requirements. Any work found not to be in compliance with the contract shall be promptly removed and replaced or corrected in an approved manner. Quality control shall include, but not be limited to, the following:

a. Observation of environmental conditions; number and skill level of insulation workers; start and end time of work.

b. Verification of certification, listing or label compliance with FM P9513.

c. Verification of proper storage and handling of insulation and vapor retarder materials before, during, and after installation.

d. Inspection of vapor retarder application, including edge envelopes and mechanical fastening.

e. Inspection of mechanical fasteners; type, number, length, and spacing.

f. Coordination with other materials, cants, sleepers, and nailing strips.

g. Inspection of insulation joint orientation and laps between layers, joint width and bearing of edges of insulation on deck.

h. Installation of cutoffs and proper joining of work on subsequent days.

i. Continuation of complete roofing system installation to cover insulation installed same day.

-- End of Section --

SECTION 07 24 00

EXTERIOR INSULATION AND FINISH SYSTEMS
05/11

PART 1 GENERAL

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.

ASTM INTERNATIONAL (ASTM)

ASTM B117	(2011) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM C1177/C1177M	(2013) Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
ASTM C1186	(2008; R 2012) Standard Specification for Flat Non-Asbestos Fiber Cement Sheets
ASTM C1278/C1278M	(2007a; R 2011) Standard Specification for Fiber-Reinforced Gypsum Panel
ASTM C1325	(2014) Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets
ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C473	(2012) Physical Testing of Gypsum Panel Products
ASTM C578	(2014a) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C67	(2014) Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
ASTM C847	(2014a) Standard Specification for Metal Lath
ASTM C920	(2014a) Standard Specification for Elastomeric Joint Sealants
ASTM D2247	(2011) Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D3273	(2012) Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
ASTM D968	(2005; R 2010) Abrasion Resistance of Organic Coatings by Falling Abrasive

ASTM E136	(2012) Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
ASTM E2098/E2098M	(2013) Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS) after Exposure to a Sodium Hydroxide Solution
ASTM E2486	(2006) Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)
ASTM E2570/E2570M	(2007; R 2014; E 2014) Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage
ASTM E330/E330M	(2014) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
ASTM E331	(2000; R 2009) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
ASTM E695	(2003; R 2015; E 2015) Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G153	(2013) Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2012) International Building Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 268	(2012) Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source
NFPA 285	(2012) Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.2 SYSTEM DESCRIPTION AND REQUIREMENTS

The exterior insulation and finish system (EIFS) must be a job-fabricated, drainable, exterior wall covering consisting of sheathing, insulation board, reinforcing fabric, base coat, finish coat, adhesive and mechanical fasteners as applicable. The system components must be compatible with each other and with the substrate as recommended or approved by, and the products of, a single manufacturer regularly engaged in furnishing Exterior Insulation and Finish Systems. All materials must be installed by an applicator approved by the system manufacturer. EIFS must be Class PB or Class PMas indicated and must be as indicated in SOW color and as indicated in SOW finish.

1.2.1 System Requirements and Tests

The system must meet the performance requirements as verified by the tests listed below. Where a wall system of similar type, size, and design as specified for this project has been previously tested under the condition specified herein, the resulting test reports may be submitted in lieu of job specific tests.

1.2.1.1 Water Penetration

Test the system for water penetration by uniform static air pressure in accordance with ASTM E331. There must be no penetration of water beyond the plane of the base coat/EPS board interface after 15 minutes at 6.4 psf, or 20 percent of positive design wind pressure, whichever is greater.

1.2.1.2 Wind Load

Test the system for wind load by uniform static air pressure in accordance with ASTM E330/E330M (procedure A) to a minimum pressure of as required by SOW psf. There must be no permanent deformation, delamination, or other deterioration.

1.2.1.3 Full scale or intermediate scale fire test

Conduct wall fire test using apparatus, specimen, performance criteria, and procedure in accordance with NFPA 285 when required by ICC IBC 2603.5.5. The following requirements must be met:

a. No vertical spread of flame within core of panel from one story to the next.

b. No flame spread over the exterior surface.

c. No vertical flame spread over the interior surface from one story to the next.

d. No significant lateral spread of flame from compartment of fire origin to adjacent spaces.

1.2.1.4 Mock-Up Installation of EIFS

Complete wall mock-up installation 1 ft high by 1 ft wide, including typical control joints . Control joints to be filled with sealant of type, manufacturer, and color selected. Construct mock-up installation at manufacturer's plant or job site. Build mock-up to comply with the following requirements, using materials indicated for the completed work:

a. Locate mock-up installation(s)in the location and size indicated .

b. Demonstrate the proposed range of color, texture, thickness, insulation, and workmanship.

c. Obtain Contracting Officer's written approval of mock-up before starting fabrication of work.

d. Maintain mock-up installation(s) during construction as a standard for judging the completed work by protecting them from weather and construction activities.

e. When directed, demolish and remove mock-up from the site.

1.2.2 Component Requirements and Tests

The components of the system must meet the performance requirements as verified by the tests listed below.

1.2.2.1 Surface Burning Characteristics

Conduct ASTM E84 test on samples consisting of base coat, reinforcing fabric, and finish coat. Cure for 28 days. The flame spread index must be 25 or less and the smoke developed index must be 450 or less.

1.2.2.2 Radiant Heat

The system must be tested in accordance with NFPA 268 on both the minimum and maximum thickness of insulation intended for use with no ignition during the 20-minute period.

1.2.2.3 Impact Resistance

a. Class PB Systems: Hemispherical Head Test; 28 day cured specimen of PB EIFS in accordance with ASTM E2486. The test specimen must exhibit no broken reinforcing fabric per ASTM E2486 at an impact of 30 in/lb.

b. Impact Mass: Test 28 day cured specimen of PM EIFS in accordance with ASTM E695. The test specimen must exhibit no cracking or denting after twelve impacts by 30 lbs lead shot mass from 6 in to 6 ft drop heights in 6 in intervals.

1.2.3 Sub-Component Requirements and Tests

Unless otherwise stated, the test specimen must consist of reinforcing mesh, base coat, and finish coat applied in accordance with manufacturer's printed recommendations to the insulation board to be used on the building. For mildew resistance, only the finish coat is applied onto glass slides for testing. These specimen must be suitably sized for the apparatus used and be allowed to cure for a minimum of 28 days prior to testing.

1.2.3.1 Abrasion Resistance

Test in accordance with ASTM D968, Method A. Test a minimum of two specimens. After testing, the specimens must show only very slight smoothing, with no loss of film integrity after 132 gallons of sand.

1.2.3.2 Accelerated Weathering

Test in accordance with ASTM G153, Cycle 1. After 2000 hours specimens must exhibit no visible cracking, flaking, peeling, blistering, yellowing, fading, or other such deterioration.

1.2.3.3 Mildew Resistance

Test in accordance with ASTM D3273. The specimen shall consist of the finish coat material, applied to clean 3 inch by 4 inch glass slides and must be allowed to cure for 28 days. After 28 days of exposure, the specimen must not show any growth.

1.2.3.4 Salt Spray Resistance

Test in accordance with ASTM B117. The specimen must be a minimum of 4 inch by 6 inch and must be tested for a minimum of 300 hours. After exposure, the specimen must exhibit no observable deterioration, such as chalking, fading , or rust staining.

1.2.3.5 Water Resistance

Test in accordance with ASTM D2247. The specimen must be a minimum of 4 inch by 6 inch. After 14 days, the specimen must exhibit no cracking, checking, crazing, erosion, blistering, peeling, or delamination.

1.2.3.6 Absorption-Freeze/Thaw

Class PB systems must be tested in accordance with ASTM E2570/E2570M for 60 cycles of freezing and thawing. After testing, the specimen must exhibit no cracking, checking, or splitting, and negligible weight gain. Class PM systems must be tested in accordance with ASTM C67 for 50 cycles of freezing and thawing. After testing, the specimens must exhibit no cracking or checking and have negligible weight gain.

1.2.3.7 Sample Boards

Unless otherwise stated, provide sample EIFS Component 12 by 24 inches, on sheathing board, including finish color and texture, typical joints and sealant. If more than one color, finish, or pattern is used, provide one sample for each. The test specimen must consist of reinforcing mesh, base coat, and finish coat applied in accordance with manufacturer's printed recommendations to the insulation board to be used on the building.

1.2.4 Moisture Analysis

Perform a job specific vapor transmission analysis based on project specific climate and specified wall components and materials. Indicate the temperatures and relative humidities for the inside and outside of the building; a complete listing of the building components, their thickness, thermal resistance and permeance, as well as building location and use. If a mathematical model was used for the analysis, include the name of the model and the supplier/developer.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control

approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings; G

Show wall layout, construction and expansion joints, decorative grooves, layout of sheathing board, thermal insulation board, and reinforcing mesh and strip reinforcing fabric; joint and flashing details; details at wall penetrations; types and location of fasteners; details at windows and or doors; and details at base, roof, parapet, corners, .

SD-03 Product Data

Sheathing Board

Thermal Insulation

Adhesive

Mechanical Fasteners

Accessories

Base Coat

Portland Cement

Reinforcing Fabric

Finish Coat

Joint Sealant

Sealant Primer

Bond Breaker

Backer Rod

Insulation Board

Warranty

Include joint and other details, such as end conditions, corners, windows, and parapet. Include shelf life and recommended cleaning solvents in data for sealants. Include material safety data sheets (MSDS)for all components of the EIFS. The MSDS shall be available at the job site.

SD-04 Samples

Sample Boards; G

Color and Texture

SD-05 Design Data

Wind Load Calculations

Moisture Analysis Calculations

SD-06 Test Reports

Abrasion Resistance

Accelerated Weathering

Impact Resistance

Mildew Resistance

Salt Spray Resistance

Water Vapor Transmission

Absorption-Freeze-Thaw

Wall Fire Test

Surface Burning Characteristics

Radiant Heat

Substrate

Wind Load

SD-07 Certificates

Qualifications of EIFS Manufacturer

Qualification of EIFS Installer

Qualification of Sealant Applicator

Certify that EIFS installer meets requirements specified under paragraph "Qualification of Installer," and that sealant applicator is approved by the EIFS Manufacturer.

Qualifications of Third Party Inspector

Inspection Check List; G

Submit filled-out inspection check list as required in paragraph "Quality Control," certifying that the installation of critical items meets the requirements of this specification.

SD-08 Manufacturer's Instructions

Installation

Manufacturer's standard printed instructions for the installation of the EIFS. Include requirements for condition and preparation

of substrate, installation of EIFS, and requirements for sealants and sealing.

SD-10 Operation and Maintenance Data

EIFS

Include detailed finish repair procedures and information regarding compatibility of sealants with base and finish coatings.

SD-11 Closeout Submittals

1.4 QUALITY ASSURANCE

1.4.1 Qualifications of EIFS Manufacturer

The EIFS must be the product of a manufacturer who has been in the practice of manufacturing and designing EIFS for a period of not less than 3 years, and has been involved in at least five projects similar to this project in size, scope, and complexity, in the same or a similar climate as this project.

1.4.2 Qualification of EIFS Installer

The EIFS Installer must be trained by the EIFS manufacturer to perform the installation of the System and must have successfully installed at least five projects at or near the size and complexity of this project. The contractor must employ qualified workers trained and experienced in installing the manufacturer's EIFS.

1.4.3 Qualification of Sealant Applicator

The sealant applicator must be experienced and competent in the installation of high performance industrial and commercial sealants and must have successfully installed at least five projects at or near the size and complexity of this project.

1.4.4 Qualifications of Third Party Inspector

Submit evidence that third party inspector has current certification from the Exterior Design Institute or equal inspector certification as inspector for the installation of EIFS.

1.4.5 Insulation Board-

Insulation Board must be approved and labeled under third party quality program as required by applicable building code.

1.4.6 Pre-Installation Conference

After approval of submittals and before commencing any work on the EIFS, including installation of any sheathing board, insulation, and associated work, the Contracting Officer will hold a pre-installation conference to review:

a. Drawings, specifications, and samples;

b. Procedure for on site inspection and acceptance of EIFS substrate and pertinent details (for example, mock-up installation);

c. Contractor's plan for coordination of work of the various trades involved in providing EIF system and other components;

d. Inspection procedures; and

e. Safety requirements.

Pre-installation conference must be attended by the Contractor, and all personnel directly responsible for installation of the EIF system, including sealant applicator, and personnel responsible for related work, such as flashing and sheet metal, windows and doors, and a representative of the EIFS manufacturer. Before beginning EIFS work, the contractor must confirm in writing the resolution of conflicts among those attending the pre-installation conference.

1.5 DELIVERY AND STORAGE

Deliver materials to job site in original unopened packages, marked with manufacturer's name, brand name, and description of contents. Store materials off the ground and in accordance with the manufacturer's recommendations in a clean, dry, well-ventilated area. Protect stored materials from rain, sunlight, and excessive heat. Keep coating materials which would be damaged by freezing at a temperature not less than 40 degrees F. Do not expose insulation board to flame or other ignition sources.

1.6 ENVIRONMENTAL CONDITIONS

a. Do not prepare materials or apply EIFS during inclement weather unless appropriate protection is provided. Protect installed materials from inclement weather until they are dry.

b. Apply sealants and wet materials only at ambient temperatures of 40 degrees F or above and rising, unless supplemental heat is provided. The system must be protected from inclement weather and maintain this temperature for a minimum of 24 hours after installation.

c. Do not leave insulation board exposed to sunlight after installation.

1.7 WARRANTY

Furnish manufacturer's standard warranty for the EIFS. Warranty must run directly to Government and cover a period of not less than 5 years from date Government accepted the work.

PART 2 PRODUCTS

2.1 COMPATIBILITY

Provide all materials compatible with each other and with the substrate, and as recommended by EIFS manufacturer.

2.2 SHEATHING BOARD

2.2.1 Fiber Reinforced Cement Sheathing Board

a. Meet ASTM C1186, Type A, Grade I , or.

b. Meet ASTM C1325, Type A, Flexural Strength

c. Non-combustible per ASTM E136.

d. Nail Pull Resistance: No less than 120 lb when tested in accordance with ASTM C473.

e. Thickness no less than 1/2 inch.

f. Water Absorption not to exceed 17 percent.

2.2.2 Glass Mat Gypsum Sheathing Board

a. Conform to ASTM C1177/C1177M; or.

b. ASTM C1278/C1278M, Water Resistant Exterior Type only

c. Flexural Strength

d. Nail Pull Resistance: No less than 120 lb when tested in accordance with ASTM C473.

2.3 ADHESIVE

Manufacturer's standard product, including primer as required, must be compatible with substrate and insulation board to which the system is applied.

2.4 LATHING AND FURRING

Conform to ASTM C847, 2.5 lb/sqyd, self-furring, galvanized.

2.5 MECHANICAL FASTENERS

Corrosion resistant and as approved by EIFS manufacturer. Select fastener type and pattern based on applicable wind loads and substrate into which fastener will be attached, to provide the necessary pull-out, tensile, and shear strengths.

2.6 THERMAL INSULATION

2.6.1 Manufacturer's Recommendations

Provide only thermal insulation recommended by the EIFS manufacturer for the type of application intended.

2.6.2 Insulation Board

Insulation board must be standard product of manufacturer and must be compatible with other systems components. Boards must be factory marked individually with the manufacturer's name or trade mark, the material specification number, the R-value at 75 degree F, and thickness. No layer of insulation shall be less than 3/4 inch thick. The maximum thickness of all layers must not exceed 4 inches. Insulation Board must be certified as aged, in block form, prior to cutting and shipping, a minimum of 6 weeks by air drying, or equivalent.

a. Thermal resistance: As indicated on drawings.

b. Insulating material: ASTM C578 Type I as recommended by the EIFS manufacturer and treated to be compatible with other EIFS components. Age insulation by air drying a minimum of 6 weeks prior to cutting and shipping.

c. Drainage: Preform channels into the interior face of insulation board or provide polypropylene drainage lath spacer to provide water drainage system.

2.7 BASE COAT

Manufacturer's standard product and compatible with other systems components.

2.8 PORTLAND CEMENT

Conform to ASTM C150/C150M, Type I or II as required, fresh and free of lumps, and approved by the systems manufacturer.

2.9 REINFORCING FABRIC

Reinforcing fabric mesh must be alkali-resistant, balanced, open weave , glass fiber fabric made from twisted multi-end strands specifically treated for compatibility with the other system materials, and comply with ASTM E2098/E2098M and as recommended by EIFS manufacturer.

2.10 FINISH COAT

Manufacturer's standard product conforming to the requirements in the paragraph on Sub-Component Requirements and Tests. For color consistency, use materials from the same batch or lot number.

2.11 SEALANT PRIMER

Non-staining, quick-drying type recommended by sealant manufacturer and EIFS manufacturer.

2.12 ACCESSORIES

Conform to recommendations of EIFS manufacturer, including trim, edging, anchors, and expansion joints. All metal items and fasteners to be corrosion resistant.

2.13 JOINT SEALANT

Non-staining, quick-drying type meeting ASTM C920, as Type S or M, minimum Grade NS, minimum Class 25 and compatible with the finish system type and grade, and recommended by both the sealant manufacturer and EIFS manufacturer.

2.14 BOND BREAKER

As required by EIFS manufacturer and recommended by sealant manufacturer and EIFS manufacturer.

2.15 BACKER ROD

Closed cell polyethylene free from oil or other staining elements and as recommended by sealant manufacturer and EIFS manufacturer. Do not use absorptive materials as backer rod. The backer rod should be sized 25 percent larger than the width of the joint.

PART 3 EXECUTION

3.1 EXAMINATION

Examine substrate and existing conditions to determine that the EIFS can be installed as required by the EIFS manufacturer and that all work related to the EIFS is properly coordinated. Surface must be sound and free of oil, loose materials or protrusions which will interfere with the system installation. If deficiencies are found, notify the Contracting Officer and do not proceed with installation until the deficiencies are corrected. The substrate must be plane, with no deviation greater than 1/4 inch when tested with a 10 foot straightedge. Determine flatness, plumbness, and any other conditions for conformance to manufacturer's instructions.

3.2 SURFACE PREPARATION

Prepare existing surfaces for application of the EIFS to meet flatness tolerances and surface preparation according to manufacturer's installation instructions but provide a flatness of not more that 1/4 inch in 10 feet. Provide clean surfaces free of oil and loose material without protrusions adversely affecting the installation of the insulation board. For adhesively attached EIFS, existing deteriorated paint must be removed. Due to substrate conditions or as recommended by the system manufacturer, a primer may be required. Apply the primer to existing surfaces as recommended by the manufacturer. Use masking tape to protect areas adjacent to the EIFS to prevent base or finish coat to be applied to areas not intended to be covered with the EIFS. The contractor must not proceed with the installation until all noted deficiencies of the substrate are corrected.

3.3 INSTALLATION

Install EIFS as indicated, comply with manufacturer's instructions except as otherwise specified, and in accordance with the shop drawings. EIFS must be installed only by an applicator trained by the EIFS manufacturer. Specifically, include all manufacturer recommended provisions regarding flashing and treatment of wall penetrations. Any materials that show visual evidence of biological growth due to the presence of moisture must not be installed on the building project.

3.3.1 Sheathing Board

Edges and ends of boards must be butted snugly with vertical joints staggered to provide full and even support for the insulation. Do not align sheathing board joints with wall openings. Provide support at both vertical and horizontal joints. Attach sheathing board to metal studs with self-tapping drywall screws to concrete or masonry with corrosion resistant metal fasteners. Place fasteners sufficiently close to support imposed loads, but not more than:

a. Maximum of 8 inches apart on each supporting stud

Space fasteners more closely when required for negative wind load resistance.

3.3.2 Insulation Board

Unless otherwise specified by the system manufacturer, place the long edge horizontally from level base line. Stagger vertical joints and interlock at corners. Butt joints tightly. Provide flush surfaces at joints. Offset insulation board joints from joints in sheathing by at least 8 inches. Align drainage channels of integral drainage system or provide polypropylene drainage lath space to provide a path for any water weeped from behind the insulation to escape wall construction. Use L-shaped insulation board pieces at corners of openings. Joints of insulation must be butted tightly. Surfaces of adjacent insulation boards must be flush at joints. Gaps greater than 1/16 inch between the insulation boards must be filled with slivers of insulation. Uneven board surfaces with irregularities projecting more than 1/16 inch must be rasped in accordance with the manufacturer's instructions to produce an even surface. Attach insulation board as recommended by manufacturer. The adhered insulation board must be allowed to remain undisturbed for 24 hours prior to proceeding with the installation of the base coat/reinforcing mesh, or longer if necessary for the adhesive to dry. However, do not leave insulation board exposed longer than recommended by insulation manufacturer.

Mechanically Fastened Insulation Boards Fasten with manufacturer's standard corrosion resistant anchors, spaced as recommended by manufacturer, but not more than 2 feet horizontally and vertically. or Adhesively Fastened Insulation Boards Apply insulation board using adhesive spread with a notched trowel to the back of the insulation boards in accordance with the manufacturer’s instructions. 3.3.3 Base Coat and Reinforcing Fabric Mesh,

3.3.3.1 Class PB Systems

Allow the adhered insulation board to dry for 24 hours, or longer if necessary, prior to proceeding with the installation of the base coat/reinforcing fabric mesh. Install reinforcing fabric in accordance with manufacturer's instructions. Mix base coat in accordance with the manufacturer's instructions and apply to insulated wall surfaces to the thickness specified by the system manufacturer and provide any other reinforcement recommended by EIFS manufacturer. Trowel the reinforcing fabric mesh into the wet base coat material. Fully embed the mesh in the base coat. When properly worked-in, the pattern of the reinforcing fabric mesh must not be visible. Provide diagonal reinforcement at opening corners. Back-wrap or edge wrap all terminations of the EIFS. Overlap the reinforcing fabric mesh a minimum of 2.5 inches on previously installed mesh, or butted, in accordance with the manufacturer’s instructions.

3.3.3.2 Class PM Systems

Mechanically fasten reinforcing fabric mesh to the insulated wall using the type and spacing of fasteners specified in the manufacturer’s instructions. Provide diagonal reinforcement at opening corners. Mix base coat in accordance with manufacturer's instructions. Apply base coat in accordance with manufacturer's instruction to provide a complete, tight coating of uniform thickness as specified by the manufacturer. Cover all fiberglass reinforcing fabric, including at back wrapped areas at panel joints and at fasteners.

3.3.4 Finish Coat

The base coat/reinforcing mesh must be allowed to dry a minimum of 24 hours prior to application of the finish coat. Surface irregularities in the base coat, such as trowel marks, board lines, reinforcing mesh laps, etc., must be corrected prior to the application of the finish coat. Apply and level finish coat in one operation. Obtain final texture by trowels, floats, or by spray application as necessary to achieve the required finish matching approved sample . Apply the finish coat to the dry base coat maintaining a wet edge at all times to obtain a uniform appearance. The thickness of the finish coat must be in accordance with the system manufacturer’s current published instructions. Apply finish coat so that it does not cover surfaces to which joint sealants are to be applied.

3.4 JOINT SEALING

Seal EIFS at openings as recommended by the system manufacturer. Apply sealant only to the base coat or base coat with EIFS Manufacturer's color coating. Do not apply sealant to the finish coat.

3.4.1 Surface Preparation, Backer Rod, and Primer

Immediately prior to application, remove loose matter from joint. Ensure that joint is dry and free of finish coat, or other foreign matter. Install backer rod. Apply primer as required by sealant and EIFS manufacturer. Check that joint width is as shown on drawings but in no case shall it be less than 0.5 inch for perimeter seals and 0.75 inch for expansion joints. The width must not be less than 4 times the anticipated movement. Check sealant manufacturer's recommendations regarding proper width to depth ratio.

3.4.2 Sealant

Do not apply sealant until all EIFS coatings are fully dry. Apply sealant in accordance with sealant manufacturer's instructions with gun having nozzle that fits joint width. Do not use sealant that has exceeded shelf life or cannot be discharged in a continuous flow. Completely fill the joint solidly with sealant without air pockets so that full contact is made with both sides of the joint. Tool sealant with a round instrument that provides a concave profile and a uniformly smooth and wrinkle free sealant surface. Do not wet tool the joint with soap, water, or any other liquid tooling aid. During inclement weather, protect the joints until sealant application. Use particular caution in sealing joints between window and door frames and the EIFS wall and at all other wall penetrations. Clean all surfaces to remove excess sealant.

3.5 FIELD QUALITY CONTROL

Throughout the installation, the contractor must establish and maintain an inspection procedure to assure compliance of the installed EIFS with contract requirements. Work not in compliance must be removed and replaced or corrected in an approved manner. The inspection procedures, from acceptance of deliveries through installation of sealants and final acceptance must be performed by qualified inspector trained by the manufacturer. No work on the EIFS is allowed unless the inspector is present at the job site.

3.5.1 Inspection Check List

During the installation and at the completion of installation, perform inspections covering at the minimum all applicable items enumerated on the attached check list. The inspector must initial and date all applicable items, sign the check list, and submit it to the Contracting Officer at the completion of the EIFS erection.

CHECK LIST

Item	Description	Appr'd/Date_
a.	Materials are handled and stored correctly.	_____
b.	Environmental conditions are within specified limits, including temperature not below 4 degrees C (40 degrees F), and the work is protected from the elements as required.	_____
c.	Preparation and installation is performed by qualified personnel using the correct tools.	_____
d.	Adjacent areas to which EIFS is not to be applied (such as on window and door frames) are protected with masking tape, plastic films, drop cloths, etc. to prevent accidental application of EIFS materials.	_____
e.	Control, expansion and aesthetic joints are installed as indicated or recommended. Accessories are properly installed.	_____
f.	Substrate is in-plane, properly attached, clean, dry, and free of contaminants. Concrete substrate is free of efflorescence.	_____
g.	Materials are mixed thoroughly and in proper proportions.	_____
h.	Adhesive is applied in sufficient quantity with proper-size notched trowel.	_____
i.	Mechanical attachments have proper spacing, layout and fastener depth.	_____
j.	Insulation boards are tightly abutted, in running bond pattern, with joints staggered with the sheathing, board corners interlocked, L-shaped boards around openings, edges free of adhesive, and provision for joints. Gaps are filled and surfaces rasped.	_____
k.	Insulation adhesive must be allowed to dry (a minimum of 24-hours) prior to the application of the base coat.	_____
l.	Reinforcing fabric mesh is properly back-wrapped at terminations.	_____
m.	Reinforcing fabric mesh is fully embedded and properly placed. Corners are reinforced. Openings are diagonally reinforced. Mesh overlaps minimum 65 mm (2-1/2 inches).	_____

CHECK LIST

Item	Description	Appr'd/Date_
n.	Base coat thickness is within specified limits.	_____
o.	The base coat/reinforcing fabric mesh must be allowed to dry (a minimum of 24-hours) prior to the application of the finish coat.	_____
p.	Finish coat is applied with sufficient number of personnel and stopped at suitable points. Floats and methods of texturing are uniform.	_____
q.	All flashings are properly installed.	_____
r.	All joints are properly sealed in their entire length at time and under environmental conditions as specified by the manufacturer.	_____
s.	All scaffolding, equipment, materials, debris and temporary protection are removed from site upon completion.	_____

Name of Inspector:_____ Signed:_____ Date:_____

3.6 CLEANUP

Upon completion, remove all scaffolding, equipment, materials and debris from site. Remove all temporary protection installed to facilitate installation of EIFS.

-- End of Section --

SECTION 07 31 13

ASPHALT SHINGLES
11/11

PART 1 GENERAL

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.

ASTM INTERNATIONAL (ASTM)

ASTM D1970/D1970M	(2015) Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
ASTM D226/D226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D3018/D3018M	(2011) Standard Specification for Class A Asphalt Shingles Surfaced With Mineral Granules
ASTM D3161/D3161M	(2014) Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method)
ASTM D3462/D3462M	(2010a) Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules
ASTM D41/D41M	(2011) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D4586/D4586M	(2007; E 2012; R 2012) Asphalt Roof Cement, Asbestos-Free
ASTM D4869/D4869M	(2015) Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing
ASTM D6380/D6380M	(2003; E 2013; R 2013) Standard Specification for Asphalt Roll Roofing (Organic Felt)

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA 0418	(2009) Steep-slope Roof System Manual

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

UNDERWRITERS LABORATORIES (UL)

UL 2218	(2010; Reprint May 2012) UL Standard for Safety Impact Resistance of Prepared Roof Covering MaterialsRef Title
UL 790	(2004; Reprint Jul 2014) Standard Test Methods for Fire Tests of Roof Coverings

1.2 DEFINITIONS

1.2.1 Top Lap

That portion of shingle overlapping shingle in course below.

1.2.2 Head Lap

The triple coverage portion of top lap which is the shortest distance from the butt edge of an overlapping shingle to the upper edge of a shingle in the second course below.

1.2.3 Exposure

That portion of a shingle exposed to the weather after installation.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Shingles

Submit data including type, weight, class, UL labels, and special types of underlayment and eave flashing.

Local/Regional Materials; (LEED NC)

Recycled Materials; (LEED NC)

SD-04 Samples

Shingles; G

Full shingle sample and manufacturer's standard size samples of materials and products requiring color or finish selection.

Color charts; G

SD-08 Manufacturer's Instructions

Application

1.4 DELIVERY AND STORAGE

Deliver materials in the manufacturer's unopened bundles and containers bearing the manufacturer's brand name. Keep materials dry, completely covered, and protected from the weather. Store according to manufacturer's written instructions. Roll goods shall be stored on end in an upright position or in accordance with manufacturer's recommendations. Immediately before laying, roofing felt shall be stored for 24 hours in an area maintained at a temperature not lower than 50 degrees F.

1.5 WARRANTIES

Warranties shall begin on the date of Government acceptance of the work.

1.5.1 Manufacturer's Warranty

Furnish the asphalt shingle manufacturer's standard 30 year warranty for the asphalt shingles. The warranty shall run directly to the Government.

1.5.2 Contractor's Warranty

The Contractor shall warrant for 5 years that the asphalt shingle roofing system, as installed, is free from defects in workmanship. When repairs due to defective workmanship are required during the Contractor's warranty period, the Contractor shall make such repairs within 72 hours of notification. When repairs are not performed within the specified time, emergency repairs performed by others will not void the warranty.

1.6 QUALITY ASSURANCE

1.6.1 Local/Regional Materials

MR5; Submit documentation indicating distance between manufacturing facility and the project site. Indicate distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in project.

See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Roof shingles and materials may be locally available.

1.6.2 Recycled Materials

MR4; Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

Provide roofing component materials containing recycled materials to the extent practical. The required minimum recycled material content for the listed materials are:

Steel:	25-30 percent recovered content
Aluminum:	20-95 percent recovered content

Fiber (felt) or Fiber composite:	50-100 percent recovered content
Rubber:	100 percent recovered content
Plastic or Plastic/Rubber composite:	100 percent recovered content
Wood/Plastic Composite:	100 percent recovered content

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Shingles

Mineral granule-surfaced asphalt shingles, self-sealing, square tab, strip , fungus-resistant impact resistant shingles conforming to UL 2218, Class 4. ASTM D3018/D3018M, Type I, and ASTM D3462/D3462M , architectural shingles weighing not less than 290 pounds per 100 square feet. Shingles shall meet the fire resistance requirements of UL 790 for Class A and the wind resistance requirements of ASTM D3161/D3161M, Class F. Color shall be as selected from the manufacturer's standard color charts. Shingle color shall be in accordance with COLOR SCHEDULE .

2.1.2 Mineral-Surfaced Asphalt Roll Roofing

ASTM D6380/D6380M.

2.1.3 Smooth-Surfaced Asphalt Roll Roofing

ASTM D6380/D6380M, Type II.

2.1.4 Underlayment

Asphalt-saturated felt conforming to ASTM D4869/D4869M or ASTM D226/D226M, Type II, number 30, without perforations or other material specified by the shingle manufacturer for use as underlayment.

2.1.4.1 Leak Barrier Underlayment

Self-adhering leak barrier or ice dam underlayment shall comply with ASTM D1970/D1970M for sealability around nails.

2.1.5 Self-Adhering Membrane

Self-adhering rubberized asphaltic membrane, a minimum of 40 mils thick, and recommended by the shingle manufacturer for use as eaves flashing.

2.1.6 Nails for Applying Shingles and Asphalt-Saturated Felt

Aluminum or hot-dipped galvanized steel or equivalent corrosion resistant with sharp points and flat heads 3/8 to 7/16 inch in diameter. Shank diameter of nails shall be a minimum of 0.105 inch and a maximum of 0.135 inch with garb or otherwise deformed for added pull-out resistance. Nails shall be long enough to penetrate completely through or extend a minimum of 3/4 inch into roof deck, whichever is less, when driven through materials to be fastened.

2.1.7 Asphalt Roof Cement

ASTM D4586/D4586M, Type II.

2.1.8 Asphalt Primer

ASTM D41/D41M.

2.1.9 Ventilators

2.1.9.1 Nailable Plastic Shingle Over Type Ridge Vents

Ridge vents shall be constructed of UV stabilized nailable rigid polypropylene material, approximately 1 foot wide and 1 inch thick, and shall be in 4 foot long interlocking sections with self-aligning ends or corrugated polyethylene rigid roll or rigid strip ridge vent with aluminum wind deflectors on each side. Vents shall be designed to prevent infiltration of insects, rain, and snow.

2.1.9.2 Nailable Mesh Shingle Over Type Ridge Vents

Ridge vents shall be constructed of UV stabilized nailable polyester mesh material, approximately one foot wide. Vents shall be designed to prevent infiltration of insects, rain, and snow.

PART 3 EXECUTION

3.1 VERIFICATION OF CONDITIONS

Ensure that roof deck is smooth, clean, dry, and without loose knots. Roof surfaces shall be firm and free from loose boards, large cracks,and projecting ends that might damage the roofing. Vents and other projections through roofs shall be properly flashed and secured in position, and projecting nails shall be driven flush with the deck.

3.2 SURFACE PREPARATION

Cover knotholes and cracks with sheet metal nailed securely to sheathing. Flash and secure vents and other roof projections, and drive projecting nails firmly home.

3.3 APPLICATION

Apply roofing materials as specified herein unless specified or recommended otherwise by shingle manufacturer's written instructions or by NRCA 0418.

3.3.1 Underlayment

Provide for roof slopes 4 inches per foot and greater. Apply one layer of shingle underlayment to roof deck. Lay underlayment parallel to roof eaves, starting at eaves. Provide minimum 2 inch head laps, 4 inch end laps, and 6 inch laps from both sides over hips and ridges. Nail sufficiently to hold until shingles are applied. Turn up vertical surfaces a minimum of 4 inches.

3.3.2 Drip Edges

Provide metal drip edges as specified in Section 07 60 00 FLASHING AND

SHEET METAL applied directly on the wood deck at eaves and over the underlayment at rakes. Extend back from edge of deck a minimum of 3 inches, and secure with nails spaced a maximum of 10 inches o.c. along inner edge.

3.3.3 Starter Strip

Apply starter strip at eaves, using 9 inch wide strip of mineral-surfaced roll roofing of a color to match shingles. Optionally, use a row of shingles with tabs removed and trimmed to ensure that joints are not exposed at shingle cutouts. Apply starter strip along eaves, overhanging the metal drip edge at eaves and rake edges 1/4 inch to 3/8 inch; fasten in a line parallel to and 3 to 4 inches above eave edge. Place nails so top of nail is not exposed in cutouts of first course of shingles. Fasten with 6 nails per strip of shingles or space nails at 6 inches o.c. for roll roofing. Seal tabs of first course of shingles with asphalt roof cement as specified below.

3.3.4 Shingle Courses

Start first course with full shingle, and apply succeeding courses with joints staggered at thirds or halves. Butt-end joints of shingles shall not align vertically more often than every fourth course. Apply shingle courses as follows:

a. Fastening: Do not drive fasteners into or above the factory-applied adhesive unless adhesive is located 5/8 inch or closer to top of cutouts. Place fasteners so they are concealed by shingle top lap and penetrate the head lap.

b. Shingles applied with nails: Nominal 5 inch exposure. Apply each shingle with minimum of four nails. Place one nail one inch from each end, and evenly space nails on a horizontal line a minimum of 5/8 inch above top of cutouts. Cement each tab with one spot of asphalt roof cement placed one to 2 inches from bottom edge of shingle.

3.3.5 Hips and Ridges

Form with 9 by 12 inch individual shingles or with 12 by 12 inch shingles cut from 12 by 36 inch strip shingles. Bend shingles lengthwise down center with equal exposure on each side of hip or ridge. Lap shingles to provide a maximum 5 inch exposure, and nail each side in unexposed area 5-1/2 inches from butt and one inch in from edge.

3.3.6 Valleys

Provide either closed cut, woven, open roll roofing, or open sheet metal valleys.

3.3.6.1 Closed Cut Valleys

Provide 36 inch wide valley lining of single layer of smooth-surfaced or mineral-surfaced roll roofing, with mineral-surface facing down, for full length of valley as follows:

a. Center lining in valley over underlayment. Provide minimum 12 inch end laps in the lining and seal laps with asphalt roof cement. Fasten lining to hold it in place until shingles are applied.

b. Apply first regular course of shingles along eaves of one of the

intersecting roof planes and across valley. Extend course at least 12 inches onto adjoining roof.

c. Apply succeeding courses in same manner as first course, extending across valley and onto adjoining roof.

d. Press shingles tightly into valley and nail in normal manner, except apply nails not closer than 6 inches to valley centerline, and apply additional nail in top corner of each shingle crossing valley.

e. Apply shingles on the adjoining roof plane, starting along eaves and across valley onto previously applied shingles. Trim overlapping courses back to a line parallel to and a minimum of 2 inches back from valley centerline.

f. Trim one inch on a 45 degree angle from upper corner of each end shingle. Embed end shingles in a 3 inch wide band of asphalt roof cement.

3.3.6.2 Woven Valleys

Provide valley lining as specified for closed cut valley. Lay valley shingles over lining by either of the following methods:

a. Method I: Apply regular shingles on both roofs simultaneously. Weave each course in turn over the valley. Lay the first regular course of shingles along eaves of roof up to and over valley. Extend course along adjoining roof deck at least 12 inches. Carry first regular course of shingles of adjoining roof over valley on top of previously applied shingles. Lay succeeding courses alternately, weaving valley shingles over each other for full length of valley.

b. Method II: Apply regular shingles on each roof surface separately to a line about 3 feet from center of valley, and weave valley shingles in place later, as specified for Method I.

In following either method, press shingles tightly into valley, and fasten in normal manner; except apply nails not closer than 6 inches to valley centerline, and apply additional nail in top corner of terminal shingle on both sides of valley.

3.3.6.3 Open Roll Roofing Valleys

Provide 18 inch wide strip of mineral-surfaced asphalt roll roofing, of a color to blend with asphalt shingles, and with granular surface facing down, for the full length of valley as follows:

a. Center roll roofing strip in valley over underlayment. Lay centered in valley over felt underlayment and with granular face down. Nail strip only enough to hold in place. Apply nails in rows one inch from each edge. As fastening along second side proceeds, press strip firmly into valley.

b. Center second strip 36 inches wide in valley and lay it over first strip with granular face exposed and nail as specified for 18 inch strip.

c. Before applying roofing shingles, snap two chalk lines for full length of valley. Locate each line 3 inches from centerline of valley at top,

and increase width between lines by one inch for each 8 feet of valley length, continuing to eaves.

d. Apply a 2 inch band of asphalt roof cement along each edge of 36 inch strip from edge to chalk line. Cut regular shingle courses true along valley chalk lines, and nail in normal manner.

3.3.6.4 Open Sheet Metal Valleys

Sheet metal flashing for valleys is specified in Section 07 60 00 FLASHING AND SHEET METAL. Before installing and fastening flashing in place with metal cleats:

a. Install single layer of 36 inch wide, asphalt-saturated felt, centered on valley and extending entire length of valley over felt underlayment.

b. Cut regular shingle courses on each roof on true line 2 inches from valley centerline at top of valley, and increase width between lines by one inch for each 8 feet of valley length, continuing to eaves.

c. Apply 2 inch band of asphalt roof cement over flashing, along and under side of shingles adjoining valley.

d. Press shingles tightly into cement, and nail in normal manner, except apply nails not closer than 5 inches to valley centerline. Do not drive nails through valley flashing.

e. Provide a 4 inch band of asphalt roof cement for fastening shingle tabs down along open metal gutters.

3.3.7 Flashing

3.3.7.1 Eave Flashing

Provide for roof slopes 4 inches per foot and greater. Provide eave flashing strips consisting of smooth-surfaced roll roofing. Flashing strips shall overhang metal drip edge 1/4 inch to 3/8 inch and extend up the slope far enough to cover a point 12 inches inside interior face of exterior wall. Where overhangs require flashings wider than 36 inches, locate laps outside exterior wall face. Laps shall be at least 2 inches wide and cemented with asphalt roof cement over entire length of lap. Lap end 12 inches and cement.

3.3.7.2 Stepped Flashing

For sloping roofs which abut vertical surfaces, provide stepped metal flashing as specified in Section 07 60 00 FLASHING AND SHEET METAL.

3.3.7.3 Vent and Stack Flashing

Apply shingles up to point where vent or stack pipe projects through roof, and cut nearest shingle to fit around pipe. Before applying shingles beyond pipe, prepare flange of metal pipe vent flashing as specified in Section 07 60 00 FLASHING AND SHEET METAL, by applying a 1/8 inch thick coating of asphalt roof cement on bottom side of flashing flange. Slip flashing collar and flange over pipe, and set coated flange in 1/16 inch coating of asphalt roof cement. After applying flashing flange, continue shingling up roof. Lap lower part of flange over shingles. Overlap flange

with side and upper shingles. Fit shingles around pipe, and embed in 1/16 inch thick coating of asphalt roof cement where shingles overlay flange.

3.3.7.4 Chimney Flashing

Provide treated wood crickets as specified in Section 06 10 00 ROUGH CARPENTRY. Provide metal base and counterflashing as specified in Section 7 60 00 FLASHING AND SHEET METAL. Uniformly coat masonry surfaces which are to receive flashing with asphalt primer applied at rate of one gallon per 100 square feet. Apply shingles over underlayment up to front face of chimney. Apply metal front base flashing with lower section extending at least 4 inches over shingles. Set base flashing in a 1/16 inch coating of asphalt roof cement on shingles and chimney face. Apply metal step flashing at sides in a coating of asphalt roof cement. Embed end shingles in each course that overlaps step flashing with asphalt roof cement. Apply metal rear base flashing over cricket and back of chimney in coating of asphalt roof cement. Apply end shingles in each course up to cricket, and cement in place. Lap base flashing minimum of 3 inches with metal counterflashing.

-- End of Section --

SECTION 07 41 13

METAL ROOF / WALL PANELS
05/11

PART 1 GENERAL

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.

ALUMINUM ASSOCIATION (AA)

AA ADM	(2015) Aluminum Design Manual

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 341	(2010) Seismic Provisions for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI S100	(2012) North American Specification for the Design of Cold-Formed Steel Structural Members
AISI SG03-3	(2002; Suppl 2001-2004; R 2008) Cold-Formed Steel Design Manual Set

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

AMERICAN WELDING SOCIETY (AWS)

AWS A5.1/A5.1M	(2012) Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding
AWS D1.1/D1.1M	(2010; Errata 2011) Structural Welding Code - Steel
AWS D1.2/D1.2M	(2014) Structural Welding Code - Aluminum

ASTM INTERNATIONAL (ASTM)

ASTM A1008/A1008M	(2015) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened
ASTM A123/A123M	(2013) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM A463/A463M	(2010) Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A755/A755M	(2015) Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
ASTM A924/A924M	(2014) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B117	(2011) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM C552	(2014) Standard Specification for Cellular Glass Thermal Insulation
ASTM C553	(2013) Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
ASTM C792	(2004; R 2008) Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants
ASTM C920	(2014a) Standard Specification for Elastomeric Joint Sealants
ASTM D1056	(2014) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D1308	(2013) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D1654	(2008) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D1667	(2005; R 2011) Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell)
ASTM D1970/D1970M	(2015) Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
ASTM D2244	(2015) Calculation of Color Tolerances and

	Color Differences from Instrumentally Measured Color Coordinates
ASTM D2247	(2011) Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D226/D226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D2794	(1993; R 2010) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D3359	(2009; E 2010; R 2010) Measuring Adhesion by Tape Test
ASTM D3363	(2005; E 2011; R 2011; E 2012) Film Hardness by Pencil Test
ASTM D4214	(2007) Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D4587	(2011) Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings
ASTM D4637/D4637M	(2014; E 2014) EPDM Sheet Used in Single-Ply Roof Membrane
ASTM D4869/D4869M	(2015) Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing
ASTM D522/D522M	(2014) Mandrel Bend Test of Attached Organic Coatings
ASTM D523	(2014) Standard Test Method for Specular Gloss
ASTM D5894	(2010) Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)
ASTM D610	(2008; R 2012) Evaluating Degree of Rusting on Painted Steel Surfaces
ASTM D714	(2002; R 2009) Evaluating Degree of Blistering of Paints
ASTM D822	(2001; R 2006) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
ASTM D968	(2005; R 2010) Abrasion Resistance of Organic Coatings by Falling Abrasive

ASTM E1592	(2005; R 2012) Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
ASTM E2140	(2001; R 2009) Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G152	(2013) Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G153	(2013) Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

FM GLOBAL (FM)

FM 4471	(2010) Class I Panel Roofs

METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)

MBMA RSDM	(2000) Metal Roofing Systems Design Manual

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA 0420	(2010) Architectural Metal Flashing, Condensation Control and Reroofing
NRCA RoofMan	(2011 thru 2014) The NRCA Roofing Manual

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

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition

UNDERWRITERS LABORATORIES (UL)

UL 580	(2006; Reprint Oct 2013) Tests for Uplift Resistance of Roof Assemblies
UL Bld Mat Dir	(2012) Building Materials Directory

1.2 DESCRIPTION OF METAL ROOF SYSTEM

1.2.1 Performance Requirements

Steel panels and accessory components must conform to the following standards:

ASTM A1008/A1008M
ASTM A123/A123M
ASTM A36/A36M
ASTM A463/A463M for aluminum coated steel sheet

ASTMA755/A755M for metallic coated steel sheet for exterior coil prepainted applications.
ASTM A924/A924M for metallic coated steel sheet
ASTM D522/D522M for applied coatings
UL Bld Mat Dir

1.2.1.1 Hydrostatic Head Resistance

No water penetration when tested according to ASTM E2140. Submit leakage test report upon completion of installation.

1.2.1.2 Wind Uplift Resistance

Provide metal roof panel system that conform to the requirements of ASTM E1592 and UL 580. Uplift force due to wind action governs the design for panels. Submit wind uplift test report prior to commencing installation.

Roof system and attachments must resist the wind loads as determined by ASCE 7, in pounds per square foot. Metal roof panels and component materials must also comply with the requirements in FM 4471 as part of a panel roofing system as listed in Factory Mutual Guide (FMG) "Approval Guide" for class 1 or noncombustible construction, as applicable. Identify all materials with FMG markings.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Roofing Panels; G

Flashing and Accessories; G

Gutter/Downspout Assembly; G

SD-03 Product Data

Submit manufacturer's catalog data for the following items:

Roof panels; G

Factory-Applied Color Finish; G

Accessories; G

Fasteners; G

Pressure Sensitive Tape; G

Underlayments; G

Gaskets and Sealing/Insulating Compounds; G

Aluminized Steel Repair Paint; G

Enamel Repair Paint; G

Galvanizing Repair Paint; G

SD-04 Samples

Roof Panels; G

Factory-applied Color Finish, samples, 9 inch lengths, full width; G

Accessories; G

Fasteners; G

Gaskets and Sealant/Insulating Compounds; G

SD-05 Design Data

Wind Uplift Resistance; G

SD-06 Test Reports

Leakage Test Report; G

Wind Uplift Test Report; G

Fire Rating Test Report; G

Factory Finish and Color Performance Requirements; G

SD-07 Certificates

Roof Panels; G

Coil stock compatibility; G

Qualification of Manufacturer; G

Qualification of Applicator; G

SD-08 Manufacturer's Instructions

INSTALLATION MANUAL; G

SD-11 Closeout Submittals

Warranties; G

Information Card; G

Date Of Installation Wall-Mounted Placard; G

1.4 QUALITY ASSURANCE

1.4.1 Qualification of Manufacturer

Submit documentation verifying metal roof panel manufacturer has been in the business of manufacturing metal roof panels for a period of not less than 5 5 years.

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 the project conforming to the stated references.

1.4.1.1 Single Source

Roofing panels, clips, closures, and other accessories must be standard products of the same manufacturer, and the most recent design of the manufacturer to operate as a complete system for the intended use.

1.4.2 Qualification of Applicator

Metal roof system applicator must be approved, authorized, or licensed in writing by the roof panel manufacturer and have a minimum of three years experience as an approved, authorized, or licensed applicator with that manufacturer, approved at a level capable of providing the specified warranty. Supply the names, locations and client contact information of 5 projects of similar size and scope constructed by applicator using the manufacturer's roofing products submitted for this project within the previous three years.

1.4.3 Field Verification

Prior to the preparation of drawings and fabrication, verify location of roof framing, roof openings and penetrations, and any other special conditions. Indicate all special conditions and measurements on final shop drawings.

1.4.4 Qualifications for Welding Work

Welding procedures must conform to AWS D1.1/D1.1Mfor steel or AWS D1.2/D1.2M for aluminum.

Operators are permitted to make only those types of weldments for which each is specifically qualified.

1.4.5 Pre-roofing Conference

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

a. Drawings, specifications, and submittals related to the roof work. Submit, as a minimum; sample profiles of roofing panels, with factory-applied color finish samples, flashing and accessories, gutter/downspout assembly samples, typical fasteners and pressure sensitive tape, sample gaskets and sealant/insulating compounds. Also include technical data on coil stock and coil stock compatibility, and manufacturer's installation manual.

b. Roof system components installation;

c. Procedure for the roof manufacturer's technical representative's onsite inspection and acceptance of the 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;

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 plan for the roof system installation;

f. Safety requirements.

Coordinate pre-roofing conference scheduling with the Contracting Officer. Attendance is mandatory for the Contractor, the Contracting Officer's designated personnel, personnel directly responsible for the installation of metal roof system, flashing and sheet metal work, , other trades interfacing with the roof work, and representative of the metal roofing 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.

1.5 DELIVERY, HANDLING, AND STORAGE

Deliver, store, and handle panel materials, bulk roofing products, accessories, and other manufactured items in a manner to prevent damage and deformation, as recommended by the manufacturer, and as specified.

1.5.1 Delivery

Package and deliver materials to the site in undamaged condition. Provide adequate packaging to protect materials during shipment. Do not uncrate materials until ready for use, except for inspection. Immediately upon arrival of materials at jobsite, inspect materials for damage, deformation, dampness, and staining. Remove affected materials from the site and immediately replace. Remove moisture from wet materials not otherwise affected, restack and protect from further moisture exposure.

1.5.2 Handling

Handle materials in a manner to avoid damage. Select and operate material handling equipment so as not to damage materials or applied roofing.

1.5.3 Storage

Stack materials stored on site on platforms or pallets, and cover with tarpaulins or other weathertight covering which prevents trapping of water or condensation under the covering. Store roof panels so that water which may have accumulated during transit or storage will drain off. Do not store panels in contact with materials that might cause staining. Secure coverings and stored items to protect from wind displacement.

1.6 PROJECT CONDITIONS

Weather Limitations: Proceed with installation only when existing and

forecast weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements, and specified safety requirements.

1.7 FABRICATION

Fabricate and finish metal roof panels and accessories on a factory stationary industrial type rolling mill to the greatest extent possible, per manufacturer's standard procedures and processes, and as necessary to fulfill indicated performance requirements. Comply with indicated profiles, dimensional and structural requirements.

Provide panel profile, as indicated on drawings including major ribs and intermediate stiffening ribs for full length of panel. Fabricate panel side laps with factory installed captive gasketsseparator strips providing a weather tight seal and preventing metal-to metal contact, and minimizing noise from movements within the panel assembly.

1.7.1 Finishes

Finish quality and application processes must conform to the related standards specified within this section. Noticeable variations within the same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved samples and are assembled or installed to minimize any contrasting variations.

1.7.2 Accessories

Fabricate flashing and trim to comply with recommendations in SMACNA 1793 as applicable to the design, dimensions, metal, and other characteristics of the item indicated.

a. Form exposed sheet metal accessories which are free from excessive oil canning, buckling, and tool marks, and are true to line and levels indicated, with exposed edges folded back to form hems.

b. End Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

c. Sealed Joints: Form non-expansion, but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA 1793.

d. Conceal fasteners and expansion provisions where possible.

e. Fabricate cleats and attachments devices of size and metal thickness recommended by SMACNA or by metal roof panel manufacturer for application, but not less than the thickness of the metal being secured.

1.8 WARRANTIES

Provide metal roof system material and workmanship warranties meeting specified requirements. Provide revision or amendment to manufacturer's standard warranty as required to comply with the specified requirements.

1.8.1 Metal Roof Panel Manufacturer Warranty

Furnish the metal roof panel manufacturer's 20-year no dollar limit roof system materials and installation workmanship warranty, including flashing, insulation, components, trim, and accessories necessary for a watertight

roof system construction. Make warranty directly to the Government, commencing at time of Government's acceptance of the roof work. The warranty must state that:

a. If within the warranty period, the metal 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, displaces, corrodes, perforates, 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 metal roof system and correction of defective workmanship is the responsibility of the metal roof panel manufacturer. All costs associated with the repair or replacement work are the responsibility of the metal roof panel manufacturer.

b. If 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.

1.8.2 Manufacturer's Finish Warranty

Provide a manufacturer's no-dollar-limit 20 year warranty for the roofing system. Issue the warranty directly to the Government at the date of Government acceptance.warranting that the factory color finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of a numerical rating of 8 when measured in accordance with ASTM D4214; or fade or change colors in excess of 5 NBS units as measured in accordance with ASTM D2244.

1.8.3 Metal Roof System Installer Warranty

Provide roof system installer warranty for a period of not less than five years that the roof system, as installed, is free from defects in installation workmanship, to include the roof panel installation, flashing, insulation, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. Issue warranty directly to the Government. Correction of defective workmanship and replacement of damaged or affected materials is the responsibility of the metal roof system installer. All costs associated with the repair or replacement work are the responsibility of the installer.

1.8.4 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 metal roof system manufacturer warranty for the remainder of the manufacturer warranty period.

1.9 CONFORMANCE AND COMPATIBILITY

The entire metal roofing and flashing system must be in accordance with specified and indicated requirements, including wind resistance and seismic per AISC 341 requirements. Work not specifically addressed and any deviation from specified requirements must be in general accordance with recommendations of the MBMA RSDM, NRCA RoofMan, the metal panel manufacturer's 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.

PART 2 PRODUCTS

2.1 ROOF PANELS

2.1.1 Aluminum Sheet Panels

Roll-form aluminum roof panels to the specified profile, with fy = ksi, .032inch thickness and depth as indicated.

Material must be plumb and true, and within the tolerances listed:

a. Aluminum sheet conforming to ASTM B209, and AA ADM

b. Individual panels to have continuous length sufficient to cover the entire length of any unbroken roof slope with no joints or seams and formed without warping, waviness, or ripples that are not a part of the panel profile and free from damage to the finish coating system.

c. Provide panels with thermal expansion and contraction consistent with the type of system specified, and the following profile:

1. profile and coverage to be a minimum height and width from the manufacturer's standard for the indicated roof slope.

2. profile to be a 1-1/2 inch high rib at 12 inches o.c. with small stiffening ribs, 38 inch overall panel width with 36 inch exposed panel and exposed fasteners.

3. profile to be a 1-1/2 inch high rib at 7.2 inches o.c.; 38-7/8 inch overall width with 36 inch exposed panel and exposed fasteners.

4. profile to be a 1 inch high rib at 4 inches o.c.; 49-5/8 inch overall width with 48 inch exposed panel and exposed fasteners.

5. profile to be a 1 inch high rib at 8 inches o.c.; 41-5/8 inch overall width with 40 inch exposed panel and exposed fasteners.

6. profile to be a 1-3/4 inch high V-beam rib at 5 inches o.c.; 44-7/8 inch overall width with 42 inch exposed panel and exposed fasteners.

7. profile to be a 7/8 inch high corrugated rib at 2 inches o.c., 38-7/8 inch overall width with 36 inch exposed panel and exposed fasteners.

8. profile to be a 3 inch high standing seam, 24 inch coverage, factory-caulked and mechanical crimping or snap-together seams with concealed clips and fasteners.

9. profile to be a 2 inch high standing seam, min 16 inch coverage with mechanical crimping or snap-together seams with concealed clips and fasteners.

10. profile to be smooth, flat, embossed pattern or textured as indicatedsurface.

11. profile to be custom, as shown on drawings.

2.1.2 Steel Sheet Panels

Roll-form steel sheet roof panels to the specified profile, with fy = ksi,26 gauge and depth as indicated.
Material must be plumb and true, and within the tolerances listed:

a. Galvanized steel sheet conforming to ASTM A653/A653M and AISI SG03-3.

c. Individual panels to have continuous length sufficient to cover the entire length of any unbroken roof slope with no joints or seams and formed without warping, waviness, or ripples that are not a part of the panel profile and free from damage to the finish coating system.

d. Provide panels with thermal expansion and contraction consistent with the type of system specified, and the following profile:

1. profile and coverage to be a minimum height and width from the manufacturer's standard for the indicated roof slope.

2. profile to be a 1-1/2 inch high rib at 12 inches o.c. with small stiffening ribs, 38 inch overall panel width with 36 inch exposed panel and exposed fasteners.

3. profile to be a 1-1/2 inch high rib at 7.2 inches o.c.; 38-7/8 inch overall width with 36 inch exposed panel and exposed fasteners.

4. profile to be a 1 inch high rib at 4 inches o.c.; 49-5/8 inch overall width with 48 inch exposed panel and exposed fasteners.

5. profile to be a 1 inch high rib at 8 inches o.c.; 41-5/8 inch overall width with 40 inch exposed panel and exposed fasteners.

6. profile to be a 1-3/4 inch high V-beam rib at 5 inches o.c.; 44-7/8 inch overall width with 42 inch exposed panel and exposed fasteners.

7. profile to be a 7/8 inch high corrugated rib at 2 inches o.c., 38-7/8 inch overall width with 36 inch exposed panel and exposed fasteners.

8. profile to be a 2 inch high standing seam, min 16 inch coverage with mechanical crimping or snap-together seams with concealed clips and fasteners.

9. profile to be smooth, flat, embossed pattern or textured as indicatedsurface.

10. profile to be custom, as shown on drawings.

2.2 FACTORY FINISH AND COLOR PERFORMANCE REQUIREMENTS

All panels are to receive a factory applied Kynar 500/Hylar 5000 finish consisting of a baked topcoat with a manufacturer's recommended prime coat conforming to the following:

a. Metal Preparation: All metal is to have the surfaces carefully prepared for painting on a continuous process coil coating line by

alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with an acid rinse, and thorough drying.

b. Prime Coating: A base coat of epoxy paint, specifically formulated to interact with the top-coat, is to be applied to the prepared surfaces by roll coating to a dry film thickness of 0.20 plus 0.05 mils. The prime coat must be oven cured prior to application of the finish coat.

c. Exterior Finish Coating: Apply the exterior finish coating over the primer by roll coating to a dry film thickness of 0.80 plus 0.05 mils (3.80 plus 0.05 mils for Vinyl Plastisol) for a total dry film thickness of 1.00 plus 0.10 mils (4.00 plus 0.10 mils for Vinyl Plastisol). This exterior finish coat must be oven-cured.

d. Interior finish coating: Apply a wash coat on the reverse side over primer by roll coating to a dry film thickness of 0.30 plus 0.05 mils for a total dry fill thickness of 0.50 plus 0.10 mils. The wash coat must be oven cured.

e. Color: The exterior finish chosen from the manufacturer's standard color chart.

f. Physical Properties: Coating must conform to the industry and manufacturer's standard performance criteria as listed by the following certified test reports:

General:	ASTM D5894 and ASTM D4587
Abrasion:	ASTM D968
Adhesion:	ASTM D3359
Chalking:	ASTM D4214
Chemical Pollution:	ASTM D1308
Color Change and Conformity:	ASTM D2244
Creepage:	ASTM D1654
Cyclic Corrosion Test:	ASTM D5894
Flame Spread:	ASTM E84
Flexibility:	ASTM D522/D522M
Formability:	ASTM D522/D522M
Gloss at 60 and 85 degrees:	ASTM D523
Humidity:	ASTM D2247 and ASTM D714
Oxidation:	ASTM D610

Pencil Hardness:	ASTM D3363
Reverse Impact:	ASTM D2794
Salt Spray:	ASTM B117
Weatherometer:	ASTM G152, ASTM G153 and ASTM D822

2.2.1 Specular Gloss

Finished roof surfaces to have a specular gloss value of 30 plus or minus 5 at an angle of 60 degrees 10 or less at an angle of 85 degrees when measured in accordance with ASTM D523.

2.3 MISCELLANEOUS METAL FRAMING

2.3.1 General

Provide cold formed metallic-coated steel sheet conforming to ASTM A653/A653M, AISI S100, and as specified in 05 40 00 COLD-FORMED METAL FRAMING unless otherwise indicated.

2.3.2 Fasteners and Miscellaneous Metal Framing

Provide compatible type, corrosion resistant, of sufficient size and length to penetrate the supporting element a minimum of one inch with other required properties to fasten miscellaneous metal framing members to substrates in accordance with the roof panel manufacturer's and ASCE 7 requirements.

2.3.2.1 Exposed Fasteners

Fasteners for roof panels must be corrosion resistant , compatible with the sheet panel or flashing material and of the type and size recommended by the manufacturer to meet the performance requirements and design loads. Fasteners for accessories must be the manufacturer's standard. Provide an integral metal washer, matching the color of attached material with compressible sealing EPDM gasket approximately 3/32 inch thick for exposed fasteners.

2.3.2.2 Screws

Provide corrosion resistant screws, of the type and size recommended by the manufacturer to meet the performance requirements.

2.3.2.3 Rivets

Provide closed-end type rivets, corrosion resistant where watertight connections are required.

2.3.2.4 Attachment Clips

Provide hot-dip galvanized, conforming to ASTM A653/A653M, stainless steel, series 300 clips. Size, shape, thickness and capacity must meet the thickness and design load criteria specified.

2.3.3 Electrodes for Manual, Shielded Metal Arc Welding

Electrodes for manual, shielded metal arc welding must meet the requirements of AWS D1.1/D1.1M, and be covered, mild-steel electrodes conforming to AWS A5.1/A5.1M.

2.4 ACCESSORIES

Accessories must be compatible with the metal roof panels. Sheet metal flashing, trim, metal closure strips, caps, and similar metal accessories must be not less than the minimum thicknesses specified for roof panels. Provide exposed metal accessories to match the panels furnished, except as otherwise indicated. Molded foam rib, ridge and other closure strips must be closed-cell or solid-cell synthetic rubber or neoprene premolded to match configuration of the panels and not absorb or retain water.

2.4.1 Pre-manufactured Accessories

Pre-manufactured accessories must be manufacturer's standard for intended purpose, comply with applicable specification section, compatible with the metal roof system and approved for use by the metal roof panel manufacturer. Construct curbs to match roof slope.

2.4.2 Metal Closure Strips

Provide factory fabricated aluminum closure strips or steel closure strips of the same gaugethickness, color, finish and profile as the specified roof panel.

2.4.3 Rubber Closure Strips

Provide closed-cell, expanded cellular rubber closure strips conforming to ASTM D1056 and ASTM D1667, extruded or molded to the configuration of the specified roof panel profile and in lengths supplied by roof panel manufacturer.

2.5 JOINT SEALANTS

2.5.1 Sealants

Sealants are to be an approved gun type for use in hand or air pressure caulking guns at temperatures above 40 degrees F (or frost-free application at temperatures above 10 degrees F) with a minimum solid content of 85 percent of the total volume. Sealant must dry with a tough, durable surface skin which permits it to remain soft and pliable underneath, providing a weather tight joint. No migratory staining, in conformance with to ASTM C792, is permitted on painted or unpainted metal, stone, glass, vinyl or wood.

Prime all joints to receive sealants with a compatible one-component or two-component primer as recommended by the roof panel manufacturer.

2.5.1.1 Shop Applied Sealants

Sealant for shop-applied caulking must be an approved gun grade, non-sag one-component polysulfide or silicone conforming to ASTM C792 and ASTM C920, Type II, with a curing time which ensures the sealants plasticity at the time of field erection. Color to match panel color.

2.5.1.2 Field Applied Sealants

Sealants for field-applied caulking must be an approved gun grade, non-sag on-component polysulfide or two component polyurethane with an initial maximum Shore A durometer hardness of 25, conforming to ASTM C920, Type II. Color to match panel color.

2.5.1.3 Tape Sealants

Provide pressure sensitive, 100 percent solid tape sealant with a release paper backing; permanently elastic, non-sagging, non-toxic and non-staining as approved by the roof panel manufacturer.

2.5.2 Sheet Metal Flashing and Trim

2.5.2.1 Fabrication, General

Custom fabricate sheet metal flashing and trim to comply with recommendations within the SMACNA 1793 that apply to design, dimensions, metal type, and other characteristics of design indicated. Shop fabricate items to the greatest extent possible. Obtain and verify field measurements for accurate fit prior to shop fabrication. Fabricate flashing and trim without excessive oil canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

2.5.2.2 Roof Drainage Sheet Metal Fabrications

Gutters: Fabricate to cross section indicated, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required. Fabricate in minimum 96 inch long sections. Fabricate expansion joints and accessories from the same metal as gutters, unless otherwise indicated.

Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangars of same material as downspouts and anchors.

2.6 INSULATION

Insulation, facer material and attachment must be compatible with metal roof system specified, as approved by the roof panel manufacturer, and conform to ASTM C552 (cellular glass) or ASTM C553 (fiber blankets).

2.6.1 Fire Rated Assembly System

Provide semi-rigid glass-fiber insulation board conforming to ASTM C553, Form A, Class 1, Class A fire-hazard classification with a minimum density of 1.55 pounds per cubic foot (pcf) and 1-1/2 inches thick. Thermal conductivity (K) must not exceed 0.24.

2.6.2 Fire Rated Roof Panel Assembly

Provide materials for fire-rated roof panel construction as follows:

Impaling clips, accessories, and fasteners must be UL listed 40 U18.24 UL Bld Mat Dir galvanized steel sheet or impaling bolts welded to each wall unit joint and spaced not more than 48 inches on center.

Provide bar subgirts 1-1/2 by 1/8 inch galvanized steel with slotted holes

for welding to end of impaling clip spikes.

Provide galvanized steel structural angles and flashing angles, gage or thickness as indicated, or material as specified. Flashing angles must be not less than No. 18 U.S. standard gage.

Provide hot-dip galvanized steel metal facing conforming to ASTM A653/A653M, Grade A. Coating must conform to, ASTM A653/A653M and ASTM A924/A924M.

Metal facing must be as indicated and fabricated of enamel-coated hot-dip galvanized steel conforming to ASTM A653/A653M, Grade A. Coating must conform to ASTM A653/A653M and ASTM A924/A924M. Provide Class A fire hazard classification finish. Flame spread, fuel contributed, or smoke developed cannot exceed a value of 25.

Submit fire rating test report to contracting officer for review and approval. Secure written approval prior to commencement of installation.

2.7 UNDERLAYMENTS

2.7.1 Felt Underlayment

Provide No. 30 asphalt-saturated organic , non-perforated felt underlayment in compliance with ASTM D226/D226M, Type II, or ASTM D4869/D4869M.

2.7.2 Self-Adhering Modified Bitumen Underlayment

Provide self-adhering modified bitumen membrane underlayment material in compliance with ASTM D1970/D1970M, suitable for use as underlayment for metal roofing. Use membrane resistant to cyclical elevated temperatures for extended period of time in high heat service conditions. Provide membrane with integral non-tacking top surface of polyethylene film or other surface material to serve as separator between bituminous material and metal products to be applied above.

2.7.3 EPDM Membrane

Ethylene Propylene Diene Terpolymer (EPDM), ASTM D4637/D4637M, Type I, non-reinforced, minimum 1.1 mm (0.045 inch) thick.

2.7.4 Slip Sheet

Provide 5 pounds per 100 sf rosin sized unsaturated building paper for slip sheet.

2.8 GASKETS AND SEALING/INSULATING COMPOUNDS

Gaskets and sealing/insulating compounds must be nonabsorptive and suitable for insulating contact points of incompatible materials. Sealing/insulating compounds must be non-running after drying.

2.9 FINISH REPAIR MATERIAL

Repair paint for color finish enameled roofing must be compatible paint of the same formula and color as the specified finish furnished by the manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the work. Ensure surfaces are suitable, dry and free of defects and projections which might affect the installation.

Examine primary and secondary roof framing to verify that rafters, purlins, angels, channels, and other structural support members for panels and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer, UL, ASTM, and ASCE 7 and applicable seismic requirements.

Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking; and that installation is within flatness tolerances required by metal roof panel manufacturer.

Examine rough-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of panels prior to installation.

Submit a written report to the Contracting Officer, endorsed by the installer, listing conditions detrimental to the performance of the work. Proceed with installation only after defects have been corrected.

3.2 INSTALLATION

Installation must meet specified requirements and be in accordance with the manufacturer's installation instructions and approved shop drawings. Do not install damaged materials. Dissimilar materials which are not compatible when contacting each other must be insulated by means of gaskets or sealing/insulating compounds. Keep all exposed surfaces and edges clean and free from sealant, metal cuttings, hazardous burrs, and other foreign material. Remove stained, discolored, or damaged materials from the site.

3.2.1 Preparation

Clean all substrate substances which may be harmful to insulation,and roof panels including removing projections capable of interfering with with insulation, and roof panel attachment.

Install sub-purlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.

3.2.2 Underlayment

Install underlayment according to roof panel manufacturer's written recommendations and recommendation in NRCA "The NRCA Roofing and Waterproofing Manual".

3.2.2.1 Single Layer Felt Underlayment for a Standard Slope Roof Deck

Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps

between succeeding courses a minimum of 72 inches. Fasten with felt underlayment roofing nails.

3.2.2.2 Self-Adhering Sheet Underlayment

Install self-adhering sheet underlayment; wrinkle free on roof deck. Comply with low-temperature installation restrictions of manufacturer where applicable. Install at locations indicated on project drawings, lapped in a direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

3.2.2.3 Slip Sheet

Install slip sheet over deck substrates prior to roof panel installation.

3.3 INSULATION INSTALLATION

Install insulation concurrently with metal roof panel installation, in thickness indicated, to cover entire roof, according to manufacturer's written instructions.

3.4 PROTECTION OF APPLIED MATERIALS

Do not permit storing, walking, wheeling, and trucking directly on applied roofing/insulation materials. Provide temporary walkways, runways, and platforms of smooth clean boards or planks as necessary to avoid damage to applied roofing/insulation materials, and to distribute weight to conform to indicated live load limits of roof construction.

3.5 FASTENER INSTALLATION

Anchor metal roof panels and other components of the Work securely in place, using approved fasteners according to manufacturer's written instructions.

3.5.1 Welding

Procedures for manual, shielded metal-arc welding, the appearance and quality of welds made, and the methods used in correcting welding work must be in accordance with AWS D1.1/D1.1M.

3.6 FLASHING, TRIM, AND CLOSURE INSTALLATION

3.6.1 General Requirements

Comply with performance requirements, manufacturer's written installation instructions, and SMACNA 1793. Provide concealed fasteners where possible. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently water tight and weather resistant. Work is to be accomplished to form weather tight construction without waves, warps, buckles, fastening stresses or distortion, and to allow for expansion and contraction. Cutting, fitting, drilling, and other operations in connection with sheet metal required to accomplish the work must conform to the manufacturers written instructions.

3.6.2 Metal Flashing

Install exposed metal flashing at building corners, rakes, eaves, junctions

between metal siding and roofing, valleys and changes off slope or direction in metal roofing, building expansion joints and gutters.

Exposed metal flashing must be the same material, color, and finish as the specified metal roofing panels. Furnish flashing in minimum 8 foot lengths. Exposed flashing must have 1 inch locked and blind soldered end joints, with expansion joints at intervals of no greater than 16 feet.

Fasten flashing at not more than 8 inches on center for roofs, except where flashing is held in place by the same screws used to secure panels. Exposed flashing and flashing subject to rain penetration must be bedded in specified joint sealant. Flashing which is contact with dissimilar metals must be isolated by means of the specified asphalt mastic material to prevent electrolytic deterioration.

Form drips to the profile indicated, with the edge folded back 1/2 inch to form a reinforced drip edge.

3.7 ROOF PANEL INSTALLATION

Provide metal roof panels of full length from eave to ridge or eave to wall as indicated, unless otherwise indicated or restricted by shipping limitations. Anchor metal roof panels or other components of the Work securely in place, with provisions for thermal and structural movement in accordance with NRCA 0420.

Steel Roof Panels: Use stainless steel fasteners for exterior surfaces and galvanized fasteners for unexposed surfaces.

Aluminum Roof Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior and aluminum or galvanized steel fasteners for unexposed surfaces.

Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using approved fasteners according to manufacturer's written instructions. Provide all blocking and nailers as required.

Metal Protection: Where dissimilar metals contact each other or possibly corrosive substrates, protect against galvanic action by permanent separation as recommended by the metal roof panel manufacturer.

Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and required for weatherproof performance of metal roof panel system. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

3.7.1 Handling and Erection

Erect roofing system in accordance with the approved erection drawings, printed instructions and safety precautions of the manufacturer.

Do not subject panels to overloading, abuse, or undue impact. Do not apply bent, chipped, or defective panels. Damaged panels must be replaced and removed from the site at the contractors expense. Erect panels true, plumb, and in exact alignment with the horizontal and vertical edges of the building, securely anchored, and with indicated rake, eave, and curb overhang. Allow for thermal movement of the roofing, movement of the building structure, and provide permanent freedom from noise due to wind pressure.

Do not permit storage, walking, wheeling or trucking directly on applied roofing materials. Provide temporary walkways, runways, and platforms of smooth clean boards or planks as necessary to avoid damage to the installed roofing materials, and to distribute weight to conform to the indicated live load limits of the roof construction.

Roof panels must be laid with corrugations in the direction of the roof slope. End laps of exterior roofing must not be less than 8 inches; side laps of standard exterior corrugated panels must not be less than 2-1/2 corrugations.

Field cutting of metal roof panels by torch is not permitted. Field cut only as recommended by manufacturer's written instructions.

3.7.2 Closure Strips

Install metal closure strips at open ends of metal ridge rolls; open ends of corrugated or ribbed pattern roofs, and at intersection of wall and roof, unless open ends are concealed with formed eave flashing; rake of metal roof unless open end has a formed flashing member; and in other required areas.

Install closure strips at intersection of the wall with metal roofing; top and bottom of metal siding; heads of wall openings; and in other required locations.

3.7.3 Workmanship

Make lines, arises, and angles sharp and true. Free exposed surfaces from any visible wave, warp, buckle and tool marks. Fold back exposed edges neatly to form a 1/2 inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction.

Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA 1793. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and as necessary to make the work watertight.

3.8 ACCEPTANCE PROVISIONS

3.8.1 Erection Tolerances

Erect metal roofing straight and true with plumb vertical lines correctly lapped and secured in accordance with the manufacturer's written instructions. Horizontal lines must not vary more than 1/8 inch in 40 feet.

3.8.2 Leakage Tests

Finished application of metal roofing is to be subject to inspection and test for leakage by the Contracting Officer or his designated representative, and Architect/Engineer. Inspection and tests will be conducted without cost to the Government.

Inspection and testing is to be made promptly after erection to permit

correction of defects and removal/replacement of defective materials.

3.8.3 Repairs to Finish

Scratches, abrasions, and minor surface defects of finish may be repaired with the specified repair materials and as recommended by the metal roof panel manufacturer. Finished repaired surfaces must be uniform and free from variations of color and surface texture. Repaired metal surfaces that are not acceptable to the project requirements are to be immediately removed and replaced with new material.

3.8.4 Paint Finished Metal Roofing

Paint finished metal roofing will be tested for color stability by the Contracting Officer during the manufacturer's specified guarantee period. Panels that indicate color changes, fading, or surface degradation, determined by visual examination, must be removed and replaced with new panels at no expense to the Government. New panels will be subject to the specified tests for an additional year from the date of their installation.

3.9 CLEAN UP AND DISPOSAL

Clean exposed sheet metal work at completion of installation. Remove metal shavings, filings, nails, bolts, and wires from roofs. Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean. Exposed metal surfaces must be free of dents, creases, waves, scratch marks, solder or weld marks, and damage to the finish coating. Touch up scratches in panel finish with manufacturer supplied touch-up paint system to match panel finish. Treat exposed cut edges with manufacturer supplied paint coat.

Collect all scrap/waste materials and place in containers. Promptly dispose of demolished and scrap materials. Do not allow scrap/waste materials to accumulate on-site; transport immediately from the government property and legally dispose of them.

3.10 FIELD QUALITY CONTROL

3.11 INFORMATION CARD

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. Format as directed in paragraph titled "Form One".

Make card 8 1/2 by 11 inches minimum. Information card must identify facility name and number; location; contract number; approximate roof area; detailed roof system description, including deck type, roof panel manufacturer and product name, type underlayment(s), date of completion; installing contractor identification and contact information; manufacturer warranty expiration, warranty reference number, and contact information. Install card at and provide a paper copy to the Contracting Officer.

3.11.1 Form One

FORM 1 - PREFORMED PANEL ROOFING SYSTEM AND COMPONENTS

1. Contract Number:

2. Building Number & Location:

3. NAVFAC Specification Number:

4. Deck/Substrate Type:

5. Slopes of Deck/Roof Structure:

6. Insulation Type & Thickness:

7. Insulation Manufacturer:

8. Vapor Retarder: ( )Yes ( )No

9. Vapor Retarder Type:

10. Preformed Steel Standing Seam Roofing Description:

a. Manufacturer (Name, Address, & Phone No.):
b. Product Name: c. Width: d. Gage:
e. Base Metal: f. Method of Attachment:

11. Repair of Color Coating:

a. Coating Manufacturer (Name, Address & Phone No.):
b. Product Name:
c. Surface Preparation:
d. Recoating Formula:
e. Application Method:

12. Statement of Compliance or Exception:_____
_____
_____

13. Date Roof Completed:

14. Warranty Period: From_____ To_____

15. Roofing Contractor (Name & Address):

16. Prime Contractor (Name & Address):

Contractor's Signature _____ Date:

Inspector's Signature _____ Date:Text

-- End of Section --

SECTION 07 41 63

FABRICATED ROOF / WALL PANEL ASSEMBLIES
05/09

PART 1 GENERAL

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.

ALUMINUM ASSOCIATION (AA)

AA ADM	(2015) Aluminum Design Manual

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 341	(2010) Seismic Provisions for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG03-3	(2002; Suppl 2001-2004; R 2008) Cold-Formed Steel Design Manual Set

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

AMERICAN WELDING SOCIETY (AWS)

AWS A5.1/A5.1M	(2012) Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding
AWS D1.1/D1.1M	(2010; Errata 2011) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A1008/A1008M	(2015) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened
ASTM A123/A123M	(2013) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM A463/A463M	(2010) Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip

	Process
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A792/A792M	(2010) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM A924/A924M	(2014) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B117	(2011) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B209	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B659	(1990; R 2014) Standard Guide for Measuring Thickness of Metallic and Inorganic Coatings
ASTM C273/C273M	(2011) Shear Properties of Sandwich Core Materials
ASTM C553	(2013) Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
ASTM C612	(2014) Mineral Fiber Block and Board Thermal Insulation
ASTM C920	(2014a) Standard Specification for Elastomeric Joint Sealants
ASTM D1056	(2014) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D1308	(2013) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D1621	(2010) Compressive Properties of Rigid Cellular Plastics
ASTM D1622	(2008) Apparent Density of Rigid Cellular Plastics
ASTM D1667	(2005; R 2011) Flexible Cellular Materials

	- Poly (Vinyl Chloride) Foam (Closed-Cell)
ASTM D2244	(2015) Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
ASTM D2247	(2011) Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D2794	(1993; R 2010) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D2856	(1994; R 1998) Open-Cell Content of Rigid Cellular Plastics by the Air Pycnometer
ASTM D333	(2001; R 2013) Standard Guide for Clear and Pigmented Lacquers
ASTM D3363	(2005; E 2011; R 2011; E 2012) Film Hardness by Pencil Test
ASTM D4214	(2007) Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D522	(1993a; R 2008) Mandrel Bend Test of Attached Organic Coatings
ASTM D523	(2014) Standard Test Method for Specular Gloss
ASTM D714	(2002; R 2009) Evaluating Degree of Blistering of Paints
ASTM D822	(2001; R 2006) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
ASTM D968	(2005; R 2010) Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM E119	(2014) Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E136	(2012) Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
ASTM E1592	(2005; R 2012) Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
ASTM E2140	(2001; R 2009) Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building

	Materials
ASTM G152	(2013) Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G153	(2013) Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

FM GLOBAL (FM)

FM 4471	(2010) Class I Panel Roofs

METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)

MBMA RSDM	(2000) Metal Roofing Systems Design Manual

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM AMP 500	(2006) Metal Finishes Manual

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA 0405	(2001; 5th Ed) Roofing and Waterproofing Manual
NRCA 0409	(2006) Architectural Sheet Metal and Metal Roofing Manual

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

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC PS 9.01	(1982; E 2004) Cold-Applied Asphalt Mastic Painting System with Extra-Thick Film

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS SS-L-30	(Rev D; Int Am 3; Notice 1) Lath and Board Products, Gypsum

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

NAVFAC A-A-50570	(1997) Paint, Water-Borne, Acrylic Or Modified Acrylic, Semigloss, For Metal Surfaces

UNDERWRITERS LABORATORIES (UL)

UL 580	(2006; Reprint Oct 2013) Tests for Uplift Resistance of Roof Assemblies
UL Bld Mat Dir	(2012) Building Materials Directory

1.2 PERFORMANCE REQUIREMENTS

a. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E2140.

b. Wind-Uplift Resistance: Provide roof panel assemblies that comply with the requirements of the roof systems and attachments in accordance with ASTM E1592 and UL 580. Uplifting force due to wind action governs the design for panels.

   (1) Roof systems and attachments are to resist the wind loads as determined by ASCE 7 in pounds per square foot.

c. FMG Listing: Provide FRP roof panels and component materials that comply with requirements in FM 4471 as part of a panel roofing system and that are listed in FMG "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

d. Structural Performance: Provide roof panel assemblies capable of withstanding the effects of gravity loads and stresses within limits and under conditions indicated, based on testing according to ASTM E1592.

e. Seismic Performance: Provide fabricated roof panel assemblies conforming to and AISC 341 with test data.

1.3 DEFINITIONS

Fabricated Roof Panel Assembly: Metal roof and liner panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories shop fabricated or field assembled for a complete weather-tight roofing system.

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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualification of Manufacturer; G

Qualification of Installer; G

Qualifications for Welding

SD-02 Shop Drawings

Roofing Panels

Flashing and Accessories

Gutter/Downspout Assembly

SD-03 Product Data

Sustainable Acquisition.

Coil Stock

Factory Color Finish; G

Sub-girts and Formed Shapes; G

Closure Materials

Insulation; G

Pressure Sensitive Tape

Sealants and Caulking

Rated Wall Assembly

Accessories

SD-04 Samples

Coil Stock

Roofing Panels; G

Fasteners

Metal Closure Strips

Insulation; G

Manufacturer's Color Charts and Chips; G

SD-05 Design Data

Wind Design Analysis; G

SD-06 Test Reports

Test Reports

Leakage Tests

Fire Rating Test Report

Coatings and Base Metals of Metal Roofing

Factory Finish and Color Performance Requirements; G

Wind Uplift Test Report

SD-07 Certificates

Coil Stock

Fasteners

SD-08 Manufacturer's Instructions

Installation of Roof Panel Assemblies

SD-11 Closeout Submittals

Warranty; G

Information Form and Placard; G

Manufacturer's Field Inspection Reports; G

Instructions

Material Safety Data Sheets

]1.5 QUALITY ASSURANCE

1.5.1 Pre-roofing Conference

After submittals are received and approved but before roofing and insulation work, including associated work, is performed, the Contracting Officer will hold a pre-roofing conference to review the following:

a. The drawings and specifications:

(1) Fabrication and Installation drawings for the following items are to indicate completely dimensioned structural frame and erection layouts, openings in roof, special framing details and construction details at corners, ridges, eaves, building intersections, curbs and flashing, location and type of mastic and metal filler strips, location and erection of flashing and gutter/downspout assembly:

(2) Installation of Roof panel assemblies

(3) Roofing Panels, submit sample 12 inches long by actual panel width

(4) Flashing and Accessories, submit sample 10 inches long of each type

(5) Gutter/Downspout Assembly

Submit certification from coil stock manufacturer or supplier that the machinery used will form the provided coil stock without warping, waviness, or rippling that is not a part of the panel profile, and without damage, abrasion or marring of the finish coating, and certification of conformance with the standards specified herein. Submit sample 12 inches long by the actual panel width.

Submit manufacturer's color charts and chips, approximately 4 by 4 inches, showing full range of colors, textures and patterns available for roof panels with Factory Color Finish.

Submit Factory Finish and Color Performance Requirements verified by an independent testing agency.

Submit a wind design analysis from the manufacturer including, but not limited to, wind speed, exposure category, co-efficient, importance factor, designate type of facility, negative pressures for each zone, methods and requirements of attachment. Include a roof plan delineating dimensions and attachment patterns for each zone. Prepare signed and sealed wind design analysis with a Licensed Project Engineer,in the geographic area where the construction will take place.

(6) Wind Uplift Test Report

(9) Fire Rating Test Report

b. Qualifications including:

(1) Qualification of Manufacturer

Certify that the manufacturer of the metal roofing system meets requirements specified.

(2) Qualification of Installer

Certify that the applicator meets requirements specified, and provide evidence that products used within this specification are manufactured in the United States.

(3) Qualifications for Welding

Provide certification of welding procedures conforming to AWS A5.1/A5.1M and AWS D1.1/D1.1M

c. Submit procedure for on site inspection and acceptance of the roofing substrate and pertinent structural details relating to the roofing system, including; but not limited to:

(1) Material Safety Data Sheets

(2) Sub-girts and Formed Shapes

(3) Closure Materials

(4) Insulation

(5) Pressure Sensitive Tape

(6) Sealants and Caulking

(7) Rated Wall Assembly

(11) Accessories

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

Include detailed application instructions and standard manufacturer drawings altered as required by these specifications. Explicitly identify in writing, differences between manufacturer's instructions and the specified requirements.

e. Safety requirements

f. Submit Manufacturer's data indicating percentage of recycle material in roofing panels to verify sustainable acquisition compliance.

1.5.2 Manufacturer's Technical Representative

Ensure the representative has authorization from manufacturer to approve field changes and is thoroughly familiar with the products and installations in the geographical area where construction will take place.

1.5.3 Qualification of Manufacturer

Guarantee the metal roof panel system manufacturer possesses the following:

a. A minimum of five years experience in manufacturing metal roof system and accessory products.

b. Engineering services of an authorized engineer; currently licensed in the geographical area where construction will take place, having a minimum of four years experience as an engineer knowledgeable in roof wind design analysis, protocols and procedures for the MBMA Metal Roofing System Design Manual; ASCE 7, UL 580 and FM wind design guide for metal roof systems.

c. Certified engineering calculations using the products submitted for:

Wind uplift requirements in accordance with FM Wind Design Guide and ASCE 7.

1.5.4 Qualification of Installation Contractor

Confirm that the installation contractor is approved and certified by the roofing panel manufacturer prior to beginning the installation of the metal roofing system.

1.5.5 Single Source

Obtain each type of metal roof and liner panels, clips, closures and other accessories from the standard products of the single source from a single manufacturer to operate as a complete system for the intended use.

1.5.6 Surface-Burning Characteristics

Provide metal roof panels having insulation core material with the following surface-burning characteristics as determined by testing identical products according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: 25 or less.

Smoke-Developed Index: 450 or less.

1.5.7 Fire-Resistance Ratings

Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency. Combustion Characteristics: ASTM E136.

1.5.8 Fabrication

Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles, dimensional and structural requirements conforming to AISI SG03-3.

Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weather-tight and minimize noise from movements within panel assembly.

Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA 1793 that apply to the design, dimensions, metal, and other characteristics of item indicated.

Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

End Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA 1793.

Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA 1793 or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

1.5.9 Finishes

Comply with NAAMM AMP 500 for recommendations for applying and designating finishes.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

1.6 DELIVERY, HANDLING, AND STORAGE

Deliver components, sheets, metal roof panels, and other manufactured items to prevent damage or deformation; package metal roof panels for protection during transportation and handling.

Unload, store, and erect metal roof panels in a manner to prevent bending,

warping, twisting, and surface damage.

Stack metal roof panels on platforms or pallets, covered with suitable weather-tight and ventilated covering; store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

Protect foam-plastic insulation as follows:

a. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

b. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.7 PROJECT CONDITIONS

Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.

Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.8 WARRANTY

Furnish the metal roof panel manufacturer's 20-year roof system materials and installation workmanship warranty, including flashing, insulation, components, trim, and accessories necessary for a watertight roof system construction. Make warranty directly to the Government, commencing at time of Government's acceptance of the roof work. Provide a warranty with the following conditions:

a. If within the warranty period, the metal 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, displaces, corrodes, perforates, 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 metal roof system and correction of defective workmanship is the responsibility of the metal roof panel manufacturer. All costs associated with the repair or replacement work are the responsibility of the metal roof panel manufacturer. Conform galvanized repairs to ASTM A780/A780M.

b. If 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.

1.8.1 Manufacturer's Finish Warranty

Provide a manufacturer's 20 year "No-Dollar-Limit" warranty for labor and

materials for the roofing system. Issue the warranty directly to the Government at the date of Government acceptance.warranting that the factory color finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of a numerical rating of 8 when measured in accordance with ASTM D4214; or fade or change colors in excess of 5 NBS units as measured in accordance with ASTM D2244.

1.8.2 Metal Roof System Installer Warranty

Provide roof system installer warranty for a period of not less than five years that the roof system, as installed, is free from defects in installation workmanship, to include the roof panel installation, flashing, insulation, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. Issue warranty directly to the Government. Correction of defective workmanship and replacement of damaged or affected materials is the responsibility of the metal roof system installer. All costs associated with the repair or replacement work are the responsibility of the installer.

1.8.3 Continuance of Warranty

Approve and accomplish required repair or replacement work that becomes necessary within the warranty period in a manner so as to restore the integrity of the roof system assembly and maintain the validity of the metal roof system manufacturer warranty for the remainder of the manufacturer warranty period.

1.9 CONFORMANCE AND COMPATIBILITY

Provide an entire roofing and flashing system in accordance with specified and indicated requirements, including wind resistance requirements. Perform any work not specifically addressed, or any deviation from specified requirements in general accordance with recommendations of the MBMA RSDM, NRCA 0405, the metal panel manufacturer's 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.

1.10 SCHEDULE

Some metric measurements in this section are based on mathematical conversion of English unit measurements, and not on metric measurement commonly agreed to by the manufacturers or other parties. The English and metric units for the measurements shown are as follows:

	PRODUCTS	ENGLISH UNITS
a.	Sheet Aluminum	0.040 inch
b.	Panels	12 inches
	- vertical legs	2 inches
	- stiffening ribs	4 inches
c.	Screws	No. 14
		No. 12
d.	Bolts	1/4 inch
e.	Studs	3/16 inch

PRODUCTS	ENGLISH UNITS
f. Fasteners	1/2 inch One inch
g. Rivets	1/16 inch 1/8 inch

PART 2 PRODUCTS

2.1 PANEL MATERIALS

2.1.1 Aluminum Sheet

Roll-form aluminum roof and liner panels to the specified profile, with fy equals ksi, .032 inch thickness and depth as indicated. Ensure the material is plumb and true, and within the tolerances listed:

a. Aluminum Sheet conforming to ASTM B209, ASTM B209M, and AA ADM.

b. Individual panels to have continuous length to cover the entire length of any unbroken roof slope with no joints or seams and formed without warping, waviness, or ripples that are not part of the panel profile and free of damage to the finish coating system.

c. Provide panels with thermal expansion and contraction consistent with the type of system specified.

(1) Provide profile and coverage of minimum height and width from manufacturer s standard for the indicated roof slope.

(2) Provide a profile of 1-1/2 inch high rib at 12 inches o.c. with small stiffening ribs, 38 inch overall width with 36 inch coverage and exposed fasteners.

(3) Provide a profile of 1-1/2 inch high rib at 7.2 inches o.c., 38-7/8 inch overall width with 36 inch coverage and exposed fasteners.

(4) Provide a profile of 1 inch high rib at 4 inches o.c., 49-5/8 inch overall width with 48 inch coverage and exposed fasteners.

(5) Provide a profile of 1 inch high rib at 8 inches o.c., 41-5/8 inch overall width with 40 inch coverage and exposed fasteners.

(6) Provide a profile of 1-3/4 inch high V-beam rib at5 inches o.c., 44-7/8 inch overall width with 42 inch coverage and exposed fasteners.

(7) Provide a profile of 7/8 inch high corrugated rib at 2 inches 38-7/8 inch overall width with 36 inch coverage and exposed fasteners.

(8) Provide a profile of 3 inch high standing seam,24 inch coverage, factory-caulked and mechanical crimping or snap-together seams with concealed clips and fasteners.

(9) Provide a profile of 2 inch high standing seam, min 16 inch

coverage, with mechanical crimping or snap-together seams with concealed clips and fasteners.

(10) Provide smooth, flat or embossed Surface Texture.

2.1.2 Steel Sheet

Provide roll-form steel roof and liner panels to the specified profile, with fy equals ksi, 26 gauge and depth as indicated, conforming to ASTM A1008/A1008M, ASTM A36/A36M. Ensure the material is plumb and true, and within the tolerances listed:

a. Galvanized/Galvannealed Steel Sheet conforming to ASTM A123/A123M, ASTM A653/A653M, ASTM A653/A653M, ASTM A653/A653M, ASTM A792/A792M, and AISI SG03-3.

b. Metallic coated steel sheet conforming to ASTM A924/A924M.

c. Aluminum-Zinc Alloy-coated Steel Sheet conforming to ASTM A463/A463M, ASTM A792/A792M and AISI SG03-3.

e. Individual panels to have continuous length to cover the entire length of any unbroken roof slope with no joints or seams and formed without warping, waviness, or ripples that are not part of the panel profile and free of damage to the finish coating system.

f. Provide panels with thermal expansion and contraction consistent with the type of system specified.

(1) Profile and coverage: a minimum height and width from manufacturer's standard for the indicated roof slope.

(2) Profile: a 1-1/2 inch high rib at 12 inches o.c. with small stiffening ribs, 38 inch overall width with 36 inch coverage and exposed fasteners.

(3) Profile: a 1-1/2 inch high rib at 7.2 inches o.c., 38-7/8 inch overall width with 36 inchcoverage and exposed fasteners.

(4) Profile: a 1 inch high rib at 4 inches o.c., 49-5/8 inch overall width with 48 inch coverage and exposed fasteners.

(5) Profile: a 1 inch high rib at 8 inches o.c., 41-5/8 inch overall width with 40 inch coverage and exposed fasteners.

(6) Profile: a 7/8 inch high corrugated rib at 2 inches o.c., 98.74 cm 38-7/8 inch overall width with 36 inch coverage and exposed fasteners.

(7) Profile: a 3 inch high standing seam, 24 inchcoverage, factory-caulked and mechanical crimping or snap-together seams with concealed clips and fasteners.

(8) Profile: a 2 inch high standing seam, 16 inch coverage, with mechanical crimping or snap-together seams with concealed clips and fasteners.

(9) Provide smooth, flat or embossed surface texture.

2.1.3 Foam-Insulation Core Roof Panel

Provide factory-formed steel roof panel assembly fabricated from two sheets of metal with modified polyisocyanurate or polyurethane foam insulation core foamed-in-place during fabrication with joints between panels designed to form weather-tight seals. Include accessories required for weather-tight installation.

a. Closed-Cell Content: 90 percent when tested according to ASTM D2856.

b. Density: 2.0 to 2.6 lb/cu. ft. when tested according to ASTM D1622.

c. Compressive Strength: Minimum 20 psi when tested according to ASTM D1621.

d. Shear Strength: 26 psi when tested according to ASTM C273/C273M.

2.1.4 Insulated Panel Construction

Shop fabricate or field assemble insulated panel construction with specified exterior and interior steel sheet in accordance with manufacturer's printed instructions.

Provide pre-finished interior lath or board finished interior surface for panel assemblies conforming to FS SS-L-30 and UL Bld Mat Dir.

Provide glass-fiber, slag-wool-fiber or rock-wool-fiber insulation conforming to ASTM C553 and ASTM C612 of thickness and density as required for the geographical area where construction will take place. Glass-Fiber and Mineral-Wool-Fiber are materials listed in the EPA's Comprehensive Procurement Guidelines (CPG) (http://www.epa.gov/cpg/). Submit sample of insulation approximately 8 by 11 inches.

Provide insulation fasteners of adhesively attached type, plate welded to projecting spindle anchors; capable of holding insulation of thickness indicated, secured in position with self-locking washer and complying with the following requirements:

a. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

b. Spindle: Copper-coated, low carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.

c. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

d. Provide anchor adhesive with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

2.1.5 Finish

All panels are to receive a factory-applied Kynar 500/Hylar 5000 finish consisting of a baked-on top-coat with a manufacturer's recommended prime coat conforming to the following:

a. Metal Preparation: All metal is to have the surfaces carefully prepared for painting on a continuous process coil coating line by alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with acid rinse, and thorough drying.

b. Prime Coating: Apply a base coat of epoxy paint, specifically formulated to interact with the top-coat, to the prepared surfaces by roll coating to a dry film thickness of 0.20 plus 0.05 mils. Ensure the prime coat is oven cured prior to application of finish coat.

c. Exterior Finish Coating: Apply the finish coating over the primer by roll coating to dry film thickness of 0.80 plus 5 mils (3.80 plus 0.50 mils for Vinyl Plastisol) for a total dry film thickness of 1.00 plus 0.10 mils (4.00 plus 0.10 mils for Vinyl Plastisol). Ensure the finish coat is oven-cured.

d. Interior Finish Coating: Apply a wash-coat on the reverse side over the primer by roll coating to a dry film thickness of 0.30 plus 0.05 mils for a total dry film thickness of 0.50 plus 0.10 mils. Ensure the wash-coat is oven-cured.

e. Color: The exterior finish chosen from the manufacturer's standard color chart.

f. Physical Properties: Provide coating conforming to the industry and manufacturer's standard performance criteria as listed by the following certified test reports:

(1) Chalking: ASTM D333

(2) Coating Thickness: ASTM B659

(3) Color Change and Conformity: ASTM D2244

(4) Weatherometer: ASTM G152, ASTM G153 and ASTM D822

(5) Humidity: ASTM D2247 and ASTM D714

(6) Salt Spray: ASTM B117

(7) Chemical Pollution: ASTM D1308

(8) Gloss at 60: ASTM D523

(9) Pencil Hardness: ASTM D3363

(10) Reverse Impact: ASTM D2794

(11) Flexibility: ASTM D522

(12) Abrasion: ASTM D968

(13) Flame Spread: ASTM E84

2.2 MISCELLANEOUS METAL FRAMING

2.2.1 General

Cold-formed metallic-coated steel sheet conforming to AISI SG03-3 and ASTM A653/A653M and specified in Section 05 40 00 COLD-FORMED METAL FRAMING unless other wise indicated.

2.2.2 Fasteners for Miscellaneous Metal Framing

Type, material, corrosion resistance, size and sufficient length to penetrate the supporting member a minimum of 1 inch with other properties required to fasten miscellaneous metal framing members to substrates in accordance with the roof panel manufacturer's and ASCE 7 requirements.

2.3 FASTENERS

2.3.1 General

Type, material, corrosion resistance, size and sufficient length to penetrate the supporting member a minimum of 1 inch with other properties required to fasten miscellaneous metal framing members to substrates in accordance with the roof panel manufacturer's and ASCE 7 requirements.

2.3.2 Exposed Fasteners

Provide corrosion resistant coated steel, aluminum, stainless steel, or nylon capped, steel compatible, exposed fasteners with the sheet panel or flashing and of a type and size recommended by the manufacturer to meet the performance requirements and design loads. Provide manufacturer's standard fasteners for accessories. Provide an integral metal washer matching the color of attached material with compressible sealing EPDM gasket approximately 3/32 inch thick.

2.3.3 Screws

Provide corrosion resistant coated steel, aluminum and/or stainless steel screws of the type and size recommended by the manufacturer to meet the performance requirements.

2.3.4 Rivets

Provide closed-end type rivets, made of corrosion resistant coated steel, aluminum or stainless steel where watertight connections are required.

2.3.5 Attachment Clips

Fabricate clips from steel hot-dipped galvanized in accordance with ASTM A653/A653M Z275 G 90 or Series 300 stainless steel. Size, shape, thickness and capacity as required meeting the insulation thickness and design load criteria specified.

2.4 ACCESSORIES

2.4.1 General

Provide only accessories which are compatible with the metal roof panels. Sheet metal flashing, trim, metal closure strips, caps and similar metal accessories can not be less than the minimum thickness specified for the

roof panels. Submit sample of metal closure strips 10 inches long of each type. Exposed metal accessories/finishes to match the panels furnished, except as otherwise indicated. Provide molded foam rib, ridge and other closure strips which are non-absorbent closed-cell or solid-cell synthetic rubber or pre-molded neoprene to match configuration of the panels.

2.4.2 Rubber Closure Strips

Closed-cell, expanded cellular rubber conforming to ASTM D1056 and ASTM D1667; extruded or molded to the configuration of the specified roof panel and in lengths supplied by the roof panel manufacturer.

2.4.3 Metal Closure Strips

Factory fabricated steel closure strips to be the same thickness, color, finish and profile of the specified roof panel.

2.4.4 Joint Sealants

2.4.4.1 Sealants

Provide an approved gun type sealant for use in hand- or air-pressure caulking guns at temperatures above 40 degrees F (or frost-free application at temperatures above 10 degrees F with minimum solid content of 85 percent of the total volume. Provide sealant that has a tough, durable dry surface skin which permits it to remain soft and pliable underneath, providing a weather-tight joint. No migratory staining is permitted on painted or unpainted metal, stone, glass, vinyl, or wood.

Prime all joints to receive sealants with a compatible one-component or two-component primer as recommended by the roof panel manufacturer.

a. Shop Applied Caulking: An approved gun grade, non-sag one component polysulfide or silicone conforming to ASTM C920, Type II, with a curing time to ensure the sealant s plasticity at the time of field erection.

b. Field Applied Caulking: An approved gun grade, non-sag one component polysulfide or two-component polyurethane with an initial maximum Shore A durometer hardness of 25, conforming to ASTM C920, Type II. Match color to panel colors.

c. Tape Sealant: Pressure sensitive, 100 percent solid with a release paper backing; permanently elastic, non-sagging, non-toxic and non-staining as approved by the roof panel manufacturer.

2.5 SHEET METAL FLASHING AND TRIM

2.5.1 Fabrication, General

Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA 1793 that apply to the design, dimensions, metal and other characteristics of the items indicated. Shop fabricated items where practicable. Obtain field measurements for accurate fit before shop fabrication.

2.5.2 Roof Drainage Sheet Metal Fabrications

a. Gutters: Fabricate to cross section indicated, with riveted and soldered joints, complete with end pieces, outlet tubes, and other

special accessories as required. Fabricate in minimum 96-inchlong sections. Fabricate expansion joints and accessories from same metal as gutters, unless otherwise indicated.

b. Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts and anchors.

2.6 REPAIR OF FINISH PROTECTION

Provide repair paint for color finish enameled roofing that is compatible with the paint of the same formula and color as the specified finish furnished by the roofing manufacturer. Conform acrylic or modified acrylic to NAVFAC A-A-50570.

PART 3 EXECUTION

3.1 EXAMINATION

Contracting Officer may request verification and certification testing of coatings and base metals of metal roofing prior to installation.

a. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the work.

b. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer, UL, ASTM, ASCE 7 and as required for the geographical area where construction will take place.

c. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

d. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.

e. Submit to the Contracting Officer a written report, endorsed by Installer, listing conditions detrimental to performance of the work.

f. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

a. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

b. Miscellaneous Framing: Install sub-purlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.

3.3 ROOF PANEL INSTALLATION

Provide metal roof panels of full length from eave to ridge or eave to wall as indicated, unless otherwise indicated or restricted by shipping

limitations. Anchor metal roof panels and other components of the Work securely in place, with provisions for thermal and structural movement in accordance with NRCA 0409.

Steel Roof Panels: Use stainless-steel fasteners for exterior surfaces and galvanized steel fasteners for interior surfaces.

Anchor Clips: Anchor metal roof panels and other components of the work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating conforming to SSPC PS 9.01, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

Erect roofing system in accordance with the approved erection drawings, the printed instructions and safety precautions of the manufacturer.

Do not subject sheets to overloading, abuse, or undue impact. Do not apply bent, chipped, or defective sheets.

Erect sheets true and plumb and in exact alignment with the horizontal and vertical edges of the building, securely anchored, and with the indicated rake, eave, and curb overhang.

Allow for thermal movement of the roofing, movement of the building structure, and provide permanent freedom from noise due to wind pressure.

Field cutting metal roof panels by torch is not permitted.

Lay roofing sheets with corrugations in the direction of the roof slope. End laps of exterior roofing can not be less than 8 inches; the side laps of standard exterior corrugated sheets can not be not less than 2-1/2 corrugations.

Do not permit storage, walking, wheeling, and trucking directly on applied roofing materials. Provide temporary walkways, runways, and platforms of smooth clean boards or planks as necessary to avoid damage to the installed roofing materials, and to distribute weight to conform to the indicated live load limits of roof construction.

3.4 FASTENER INSTALLATION

Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturer's written instructions.

3.5 FLASHING, TRIM AND CLOSURE INSTALLATION

3.5.1 General Requirements

Comply with performance requirements, manufacturer's written installation instructions, and SMACNA 1793. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

Install sheet metalwork to form weather-tight construction without waves, warps, buckles, fastening stresses or distortion, and allow for expansion and contraction. Perform cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades by sheet metal mechanics.

3.5.2 Metal Flashing

Install metal flashing at building corners, rakes and eaves, junctions between metal siding and roofing, valleys and changes of slope or direction in metal roofing, and building expansion joints and gutters.

Provide exposed metal flashing that is the same material, color, and finish as the specified metal roofing.

Fasten flashing at not more than 8 inches on center for roofs, except where flashing are held in place by the same screws that secure covering sheets.

Furnish flashing in at least 8-foot lengths. Provide exposed flashing that has one inch locked and blind-soldered end joints, and expansion joints at intervals of not more than 16 feet.

Bed exposed flashing and flashing subject to rain penetration in the specified joint sealant.

Isolate flashing which is in contact with dissimilar metals by means of the specified asphalt mastic material to prevent electrolytic deterioration.

Form drips to the profile indicated, with the edge folded back 1/2 inch to form a reinforced drip edge.

3.5.3 Closures

Install metal closure strips at open ends of metal ridge rolls; open ends of corrugated or ribbed pattern roofs, and at intersection of wall and roof unless open ends are concealed with formed eave flashing; rake of metal roof unless open end has a formed flashing member; and in other required areas.

Install mastic closure strips at intersection of the wall with metal roofing; top and bottom of metal siding; heads of wall openings; and in other required locations.

3.6 WORKMANSHIP

Ensure lines, arises, and angles are sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a 1/2 inch hem on the concealed side. Ensure that sheet metal that is exposed to the weather is watertight with provisions for expansion and contraction.

Ensure surfaces that are to receive sheet metal are plumb and true, clean, even, smooth, dry, and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA 1793. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight.

3.7 ACCEPTANCE PROVISIONS

3.7.1 Erection Tolerances

Erect metal roofing straight and true with plumb vertical lines correctly lapped and secured in accordance with the manufacturer's written instructions. Do not vary horizontal lines more than 1/8 inch in 40 feet.

3.7.2 Leakage Tests

Finished application of metal roofing is subject to inspection and test for leakage by the Contracting Officer, Architect/Engineer. Conduct inspections and tests without cost to the Government.

Perform inspections and tests promptly after erection to permit correction of defects and the removal and replacement of defective materials.

3.7.3 Repairs to Finish

Repair scratches, abrasions, and minor surface defects of finish with the specified repair materials. Ensure finished repaired surfaces are uniform and free from variations of color and surface texture.

Immediately remove and replace repaired metal surfaces that are not acceptable to the project requirements with new material.

3.7.4 Paint-Finish Metal Roofing

Test paint-finish metal roofing for color stability by the Contracting Officer during the manufacturer's specified guarantee period.

Remove and replace panels that indicate color changes, fading, or surface degradation, determined by visual examination, with new panels at no expense to the Government.

New panels are subject to the specified tests for an additional year from the date of their installation.

3.8 CLEAN-UP AND DISPOSAL

Clean all exposed sheet metal work at completion of installation. Remove metal shavings, filings, nails, bolts, and wires from roofs. Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean. Ensure exposed metal surfaces are free of dents, creases, waves, scratch marks, solder or weld marks, and damage to the finish coating.

Collect and place scrap/waste materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site; transport demolished materials from government property and

legally dispose of them.

3.9 FIELD QUALITY CONTROL

3.10 INFORMATION FORM AND PLACARD

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. Format as directed in paragraph titled "Form One".

Provide an information card 8 1/2 by 11 inches minimum,identifying the facility name and number; location; contract number; approximate roof area; detailed roof system description, including deck type, roof panel manufacturer and product name, type underlayment(s), date of completion; installing contractor identification and contact information; manufacturer warranty expiration, warranty reference number, and contact information. Install card at and provide a paper copy to the Contracting Officer.

3.11 FORM ONE

FORM 1 - PREFORMED PANEL ROOFING SYSTEM AND COMPONENTS

1. Contract Number:

2. Building Number & Location:

3. NAVFAC Specification Number:

4. Deck/Substrate Type:

5. Slopes of Deck/Roof Structure:

6. Insulation Type & Thickness:

7. Insulation Manufacturer:

8. Vapor Retarder: ( )Yes ( )No

9. Vapor Retarder Type:

10. Preformed Steel Standing Seam Roofing Description:

a. Manufacturer (Name, Address, & Phone No.):
b. Product Name: c. Width: d. Gage:
e. Base Metal: f. Method of Attachment:

11. Repair of Color Coating:

a. Coating Manufacturer (Name, Address & Phone No.):
b. Product Name:
c. Surface Preparation:
d. Recoating Formula:
e. Application Method:

12. Statement of Compliance or Exception: _____

_____

_____

13. Date Roof Completed:

14. Warranty Period: From _____ To _____

15. Roofing Contractor (Name & Address):

16. Prime Contractor (Name & Address):

Contractor's Signature _____ Date:

Inspector's Signature _____ Date:

-- End of Section --

SECTION 07 53 23

ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING
05/12

PART 1 GENERAL

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 SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

ASTM INTERNATIONAL (ASTM)

ASTM D4637/D4637M	(2014; E 2014) EPDM Sheet Used in Single-Ply Roof Membrane
ASTM D4811/D4811M	(2006; E 2013; R 2013) Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing
ASTM D6369	(1999; R 2006) Design of Standard Flashing Details for EPDM Roof Membranes
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 APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA RoofMan	(2011 thru 2014) The NRCA Roofing Manual

SINGLE PLY ROOFING INDUSTRY (SPRI)

ANSI/SPRI RD-1	(2009) Performance Standard for Retrofit Drains

UNDERWRITERS LABORATORIES (UL)

UL 790	(2004; Reprint Jul 2014) Standard Test Methods for Fire Tests of Roof Coverings

UL RMSD	(2012) Roofing Materials and Systems Directory

1.2 DESCRIPTION OF ROOF MEMBRANE SYSTEMS

Fully adheredMechanically fastenedCombination fully adhered and mechanically fastened EPDM roof membrane system applied over insulation substrate.

: Fully adheredMechanically fastenedCombination fully adhered and mechanically fastened EPDM roof membrane system applied over insulationconcrete roof deck substrate.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Roof Plan Drawing

Wind Load Calculations

Boundaries of Enhanced Perimeter

Corner Attachments of Roof System Components

Location of Perimeter Half-Sheets

Spacing of Perimeter, Corner, and Infield Fasteners

Slopes and Drain Locations

SD-03 Product Data

Cement

EPDM Sheet; G

Seam Tape

Bonding Adhesive

Lap Splice Adhesive

Water Cutoff Mastic/Water Block

Lap Cleaner, Lap Sealant, and Edge Treatment

Flashings

Flashing Accessories

Flashing Tape

Fasteners and Plates

Roof Insulation

Sample warranty certificate; G

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

SD-05 Design Data

Wind Uplift Calculations; G

Engineering calculations validating the wind resistance of roof system.

SD-07 Certificates

Qualification of Manufacturer

Certify that the manufacturer of the roof membrane meets requirements specified under paragraph entitled "Qualification of Manufacturer."

Qualification of Applicator

Certify that the applicator meets requirements specified under paragraph entitled "Qualification of Applicator."

Wind Uplift Resistance classification, as applicable; G

Fire Resistance classification; G

Submit the roof system assembly wind uplift and fire rating classification listings.

SD-08 Manufacturer's Instructions

Application; G

Application Method; G, including pattern and frequency of mechanical attachments required in the field of roof, corners, and perimeters to provide for the specified wind resistance

Membrane Flashing; G

Seam Tape

Tape Seams / Lap Splices

Adhesive Seams / Lap Splices

Perimeter Attachment

Primer

Fasteners

Protection Mat

Cold Weather Installation; G

Include detailed application instructions and standard manufacturer drawings altered as required by these specifications. Explicitly identify in writing, differences between manufacturer's printed instructions and the specified requirements.

SD-11 Closeout Submittals

Warranty

Information Card

Instructions To Government Personnel

Include copies of Material Safety Data Sheets for maintenance/repair materials.

1.3.1 Shop Drawings

Roof plan drawing depicting wind load calculations 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. The drawing must reflect the project roof plan of each roof level and conditions indicated. Provide all slopes and drain locations.

1.4 QUALITY ASSURANCE

1.4.1 Qualification of Manufacturer

EPDM sheet roofing membrane manufacturer must have at least 5 years experience in manufacturing EPDM roofing products.

1.4.2 Qualification of Applicator

Roofing system applicator must be approved, authorized, or licensed in writing by the roof membrane manufacturer and must have a minimum of three years experience as an approved, authorized, or licensed applicator with that manufacturer and be approved at a level capable of providing the specified warranty. The applicator must supply the names, locations and client contact information of 5 projects of similar size and scope that the applicator has constructed using the manufacturer's roofing products submitted for this project within the previous three years.

1.4.3 Qualifications of Photovoltaics (PV) Rooftop Applicator

The PV rooftop applicator must be approved, authorized, or certified by a Roof Integrated Solar Energy (RISE) Certified Solar Roofing Professional (CSRP), and comply with applicable codes, standards, and regulatory requirements to maintain the weatherproofing abilities of both the integrated roof system and photovoltaic system.

1.4.4 Fire Resistance

Complete roof covering assembly must:

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

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

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

1.4.5 Wind Uplift Resistance

The complete roof system assembly shall be rated and installed to resist wind loads indicated and validated by uplift resistance testing in accordance with Factory Mutual (FM) test procedures. Do not installnon-rated systems except as approved by the Contracting Officer. Submit licensed engineer's wind uplift calculations and substantiating data to validate any non-rated roof system. Base wind uplift measurements based on a design wind speed of 90 mph in accordance with ASCE 7 and/or other applicable building code requirements

1.4.6 Preroofing Conference

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

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

b. Roof system components installation;

c. Procedure for the roof manufacturer's technical representative's onsite inspection and acceptance of the 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;

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 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, 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.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

Deliver materials in their original, unopened containers or wrappings with labels intact and legible. Where materials are covered by a referenced specification number, the labels must bear the specification number, type, class, and shelf life expiration date where applicable. Deliver materials in sufficient quantity to allow continuity of work.

1.5.2 Storage

Store and protect materials from damage and weather in accordance with manufacturer's printed instructions, except as specified otherwise. Keep materials clean and dry. Store and maintain adhesives, sealants, primers and other liquid materials above 60 degrees F. Insulated hot boxes or other enclosed warming devices must be required in cold weather. Mark and remove damaged materials from the site. Use pallets to support and canvas tarpaulins to completely cover material materials stored outdoors. Do not use polyethylene as a covering. Locate materials temporarily stored on the roof in approved areas, and distribute the load to stay within the live load limits of the roof construction. Remove unused materials from the roof at the end of each days work.

1.5.3 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. Do not use materials contaminated by exposure or moisture. Remove contaminated materials from the site. When hazardous materials are involved, adhere to the special precautions of the manufacturer. Adhesives may contain petroleum distillates and may be extremely flammable; prevent personnel from breathing vapors, and do not use near sparks or open flame.

1.6 ENVIRONMENTAL REQUIREMENTS

Do not install EPDM sheet roofing during high winds or inclement weather, or when there is ice, frost, moisture, or visible dampness on the substrate surface, or when condensation develops on surfaces during application. Unless recommended otherwise by the EPDM sheet manufacturer and approved by the Contracting Officer, do not install EPDM sheet when air temperature is below 40 degrees F or within 5 degrees F of the dewpoint. Follow manufacturer's printed instructions for installation during cold weather conditions.

1.7 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 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.

1.8 WARRANTY

Provide roof system material and workmanship warranties meeting specified requirements. Provide revision or amendment to standard membrane manufacturer warranty as required to comply with the specified requirements. Minimum manufacturer warranty shall have no dollar limit, cover full system water-tightness, and shall have a minimum duration of 20 years.

1.8.1 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. The warranty must run directly to the Government and commence 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, shrinks to the point of bridging or tenting membrane at transitions, 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 must be the responsibility of the roof membrane manufacturer. The roof membrane manufacturer is responsible for all costs associated with the repair or replacement work.

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.

1.8.2 Roofing System Installer Warranty

The roof system installer must warrant for a 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.

1.8.3 Continuance of Warranty

Approve repair or replacement work that becomes necessary within the warranty period and accomplish 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.

1.9 CONFORMANCE AND COMPATIBILITY

The entire roofing and flashing system must be in accordance with specified and indicated requirements, including fire and wind resistance requirements. Work not specifically addressed and any deviation from

specified requirements must be in general accordance with recommendations of the NRCA RoofMan, membrane manufacturer published recommendations and details, ASTM D6369, and compatible with surrounding components and construction. Submit any deviation from specified or indicated requirements to the Contracting Officer for approval prior to installation.

1.10 ELIMINATION, PREVENTION OF FALL HAZARDS

1.10.1 Fall Protection

1.11 COOL ROOFS

1.12 SUSTAINABILITY REPORTING

Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION.

1.12.1 Recycled Materials

Contractor shall select materials so that the sum of post-consumer recycled content value plus one-half of post-industrial recycled content value constitutes at least 5 percent of the total materials cost for the project. EPA Comprehensive Procurement Guidelines has a supplier database: http://www.epa.gov/cpg/products/

1.12.2 Local/Regional Materials

Contractor shall select materials so that a minimum of 5 percent (by dollar value) of materials and products for the project are extracted, harvested, or recovered, as well as manufactured, regionally within a 500 mile radius of the project site. PART 2 PRODUCTS

2.1 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.

2.1.1 EPDM Sheet

Ethylene Propylene Diene Terpolymer (EPDM), ASTM D4637/D4637M, Type I, non-reinforcedType II, scrim or fabric reinforced, 0.090 inch nominal thickness for fully adhered combined fully adhered and mechanically fastened application. The minimum thickness must not be less than minus 10 percent of the specified thickness value. EPDM membrane thickness specified is exclusive of backing material on the EPDM membrane. Principal polymer used in manufacture of the membrane sheet must be greater than 95 percent EPDM. Width and length of sheet must be maximum width attainable as recommended by the manufacturer to minimize field formed seams in the field of the roof.

2.1.2 Seam Tape

Double-sided synthetic rubber tape, minimum 0.03 inch thick, minimum 3 inch

wide. The roof membrane manufacturer must supply seam tape recommended by the manufacturer's printed data for forming watertight bond of EPDM sheet materials to each other for the application specified and conditions encountered. 6 inch wide tape is required for seam seals along lines of mechanical attachment of membrane.

2.1.3 Lap Splice Adhesive

Low volatile organic compound (VOC) synthetic rubber adhesive as supplied by roof membrane manufacturer and recommended by the manufacturer's printed data for forming watertight bond of EPDM sheet membrane materials to each other in areas of membrane flashing. Do not use splice adhesive to form membrane seams in field of roof or at standard base flashing conditions.

2.1.4 Bonding Adhesive

Low volatile organic compound (VOC) adhesive as supplied by roof membrane manufacturer and recommended by the manufacturer's printed data for bonding EPDM membrane materials to insulation, wood, metal, concrete or other substrate materials. Do not use bonding adhesive to bond membrane materials to each other.

2.1.5 Lap Cleaner, Lap Sealant, and Edge Treatment

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

2.1.6 Water Cutoff Mastic/Water Block

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

2.1.7 Membrane Flashings and Flashing Accessories

Membrane flashing, including self-adhering membrane flashing, perimeter flashing, flashing around roof penetrations, and prefabricated pipe seals, must be minimum 0.060 inch minimum cured EPDM, as recommended by the roof membrane manufacturer or minimum 0.060 inch thick uncured EPDM sheet in compliance with ASTM D4811/D4811M, Type I. Use cured EPDM membrane 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 flash 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.

2.1.7.1 Flashing Tape

EPDM-backed synthetic rubber tape, minimum 6 inch wide as supplied by the roof membrane manufacturer and recommended by the manufacturer's printed data.

2.1.8 Membrane Fasteners and Plates

Coated, corrosion-resistant fasteners as recommended by the roof membrane manufacturer and meeting the requirements of FM 4470 and FM APP GUIDE for Class I roof deck construction and the wind uplift resistance specified. As supplied and warranted for the substrate type(s) by EPDM sheet manufacturer and recommended by EPDM sheet manufacturer's printed data.

2.1.8.1 Stress Plates for Fasteners

Flat corrosion-resistant round stress plates as recommended by the roof membrane manufacturer's printed instructions and meeting the requirements of FM 4470; not less than 2 inch in diameter. Provide pre-formed discs to prevent dishing or cupping.

2.1.8.2 Auxiliary Fasteners

Corrosion resistance screws, nails, or anchors suitable for intended attachment purpose and as recommended by the roof membrane manufacturer.

2.1.8.3 Powder-Driven Fasteners

Powder-driven fasteners may be used only when approved in writing.

2.1.8.4 Metal Disks

Provide flat metal disks of minimum 1 inch in diameter. Metal disks must be of nonferrous material compatible with the nails or fasteners.

2.1.9 Roof Insulation Below EPDM Sheet

Insulation system and facer material must be compatible with membrane application specified and as approved by the roof membrane manufacturer.

2.1.10 Photovoltaic (PV) Systems - Rack Mounted Systems

The Contractor shall adhere to the following guidelines:

a. Building Owners Guide to Roof-mounted PV Systems, published by NRCA.

b. Guidelines for Roof-Mounted PV Systems, published by NRCA.

2.1.11 Wood Products

Do not allow fire retardant treated materials be in contact with EPDM membrane or EPDM accessory products, unless approved by the membrane manufacturer and the Contracting Officer.

2.1.12 Membrane Liner

Self-adhering EPDM membrane liner conforming to ASTM D4637/D4637M, or other waterproof membrane liner material as approved by the roof membrane manufacturer and the Contracting Officer.

2.2 FLASHING CEMENT

Provide a self-vulcanizing butyl compound flashing cement for splicing laps and for flashings workable at 20 degrees F. Obtain a recommendation for such flashing cement from the roofing membrane manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

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

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

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

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 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 inch 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. Embedded nailers are flush with deck surfaces. Surface-applied nailers are the same thickness as the roof insulation.

h. Avoid contact of EPDM materials with fire retardant treated wood, except as approved by the roof membrane manufacturer and Contracting Officer.

i. 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 3-1/2 inch.

j. Venting is provided in accordance with the following:

(1) Edge Venting: Perimeter nailers are kerfed across the width of the nailers to permit escape of gaseous pressure at roof edges.

(2) Underside Venting: Vent openings are provided in steel form decking for cast-in-place concrete substrate.

(3) Vapor pressure relief vents: Holes equal to the outside diameter of vents are provided through the insulation where vents are required. Space vents in accordance with membrane manufacturer's recommendations.

k. Exposed nail heads in wood substrates are properly set. Warped and split boards or sheets have been replaced. There are no cracks or end joints 1/4 inch in width or greater. Joints in plywood substrates are taped or otherwise sealed to prevent air leakage from the underside.

l. 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.

3.2 APPLICATION

Apply entire EPDM sheet utilizing fully adhered combined fully adhered and mechanically fastened application methods. Apply roofing materials as specified herein unless approved otherwise by the Contracting Officer.

3.2.1 Special Precautions

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

3.2.2 EPDM Sheet Roofing

Provide a watertight roof membrane sheet free of contaminants and defects that might affect serviceability. Provide a uniform, straight, and flat edge. Unroll EPDM sheet roofing in position without stretching membrane. Inspect for holes. Remove sections of EPDM sheet roofing that are damaged. Allow sheets to relax minimum 30 minutes before seaming. Lap sheets as specified, to shed water, and as recommended by the roof membrane manufacturer's published installation instructions for the application required but not less than 3 inch in any case.

3.2.3 Application Method

3.2.3.1 Combined Fully Adhered and Mechanically Fastened Application

Install combined fully adhered and mechanically fastened roof membrane system in the manner specified and including seaming, perimeter and infield fastening and half sheets.

3.2.3.2 Fully Adhered Membrane Application

Layout membrane and side lap adjoining sheets in accordance with membrane manufacturer's printed installation instructions. Allow for sufficient membrane to form proper membrane terminations. Remove dusting agents and dirt from membrane and substrate areas where bonding adhesives are to be applied. Apply specified adhesive evenly and continuously to substrate and underside of sheets at rates recommended by the roof membrane manufacturer's printed application instructions. When adhesive is spray applied, roll with a paint roller to ensure proper contact and coverage. Do not apply bonding adhesive to surfaces of membrane in seam or lap areas. Allow adhesive to flash off or dry to consistency prescribed by manufacturer before adhering sheets to the substrate. Roll each sheet into adhesive slowly and evenly to avoid wrinkles; broom or roll the membrane to remove air pockets and fishmouths and to ensure full, continuous bonding of sheet to substrate. Form field lap splices or seams as specified. Check all seams and ensure full lap seal. Apply lap sealant to all adhesive formed seams and all cut edges of reinforced membrane materials.

3.2.4 Tape Seams / Lap Splices

Field form seams, or lap splices, with seam tape in accordance with membrane manufacturer's printed instructions and as specified. Clean and prime mating surfaces in the seam area. After primer has dried or set in accordance with membrane manufacturer's instructions, apply seam tape to bottom membrane and roll with a 3 inch to 4 inch wide smooth silicone or steel hand roller, or other manufacturer approved rolling device, to ensure full contact and adhesion of tape to bottom membrane. Tape end laps must be minimum 1 inch. Roll top membrane into position to check for proper overlap and alignment. Remove release paper from top of seam tape and form seam splice. Ensure top membrane contact with seam tape as release paper is removed. Roll the closed seam with a smooth silicone or steel hand roller, rolling first across the width of the seam then along the entire length, being careful not to damage the membrane. Apply minimum 9 inch long strip of membrane-backed flashing tape over T-intersections of roof membrane. Roll tape to ensure full adhesion and seal over T-joint.

3.2.5 Adhesive Seams / Lap Splices

Use only field-applied adhesive formed seams where approved by the membrane manufacturer and the Contracting Officer. Do not use adhesive formed seams for field of roof membrane seaming, except as approved by the membrane manufacturer and the Contracting Officer. Thoroughly and completely clean mating surfaces of materials throughout the lap area. Remove all dirt, dust, and contaminants and allow to dry.

Apply primer as recommended by the membrane manufacturer. Apply splice adhesive with a 3 inch to 4 inch wide, 1/2 inch thick, solvent-resistant brush in a smooth, even coat with long brush strokes. Bleed out brush marks. Do not apply adhesive in a circular motion. Simultaneously apply adhesive to both mating surfaces in an approximate 0.025 to 0.030 inch wet film thickness, or other thickness as recommended by the roof membrane manufacturer's printed instructions.

Allow the splice adhesive to set-up in accordance with membrane manufacturer's printed instructions. Perform manufacturer recommended field check to test for adhesive readiness prior to closing seam. Apply a 1/8 inch to 1/4 inch bead of in-seam sealant approximately 1/2 inch from the inside edge of the lower membrane sheet prior to closing the seam.

Ensure the in-seam sealant does not extend onto the splice adhesive. Maintain the full adhered seam width required. Roll the top membrane onto the mating surface. Roll the seam area with a 2 inch to 3 inch wide, smooth silicone or steel hand roller. A minimum of 2 hours after joining sheets and when the lap edge is dry, clean the lap edge with membrane manufacturer's recommended cleaner and apply a 1/4 inch to 3/8 inch bead of lap sealant centered on the seam edge. With a feathering tool, immediately feather the lap sealant to completely cover the splice edge, leaving a mound of sealant over the seam edge. Apply lap sealant to all adhesive formed seams.

3.2.6 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.

3.2.7 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 angle greater than 4 degrees (1:12). Space fasteners a maximum of 12 inch on center, except where more frequent attachment is required to meet specified wind resistance or where recommended by the roof membrane manufacturer. Flash over fasteners with a fully adhered layer of material as recommended by the roof membrane manufacturer's printed data.

3.3 FLASHINGS

3.3.1 General

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.

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.

3.3.2 Membrane Flashing

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 EPDM 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.

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.

3.3.3 Flashing at Roof Drain

Provide a tapered insulation sump into the drain bowl area. Do not exceed tapered slope of 18 degrees for unreinforced membrane and 5 degrees for reinforced membrane. Provide tapered insulation with surface suitable for adhering membrane in the drain sump area. Avoid field seams running through or within 24 inch of roof drain, or as otherwise recommended by the roof membrane manufacturer. Adhere the membrane to the tapered in the drain sump area. Apply water block mastic and extend membrane sheets over edge of drain bowl opening at the roof drain deck flange in accordance with membrane manufacturer's printed application instructions. Insure membrane free of wrinkles and folds in the drain area. Securely clamp membrane in the flashing clamping ring. Ensure membrane is cut to within 3/4 inch of inside rim of clamping ring to maintain drainage capacity. Do not cut back to bolt holes. Retrofit roof drains must conform to ANSI/SPRI RD-1.

3.3.4 PRE-FABRICATED CURBS

Securely anchor prefabricated curbs to nailer or other base substrate and flashed with EPDM membrane flashing materials.

3.3.5 Set-On Accessories

Where pipe or conduit blocking, supports and similar roof accessories, or isolated paver block, are set on the membrane, adhere reinforced membrane or walkpad material, as recommended by the roof membrane manufacturer, to bottom of accessories prior to setting on roofing membrane. Specific method of installing set-on accessories must permit normal movement due to expansion, contraction, vibration, and similar occurrences without damaging roofing membrane. Do not mechanically secure set-on accessories through roofing membrane into roof deck substrate.

3.3.6 Lightning Protection

Flash lightning protection system components or attach to the roof membrane in a manner acceptable to the roof membrane manufacturer.

3.4 ROOF WALKPADS

Install walkpads at roof access points and where otherwise indicated for traffic areas and for access to mechanical equipment, in accordance with the roof membrane manufacturer's printed instructions. Provide minimum 6 inch separation between adjacent walkpads to accommodate drainage.

3.4.1 Elevated Metal Walkways and Platforms

Provide for protection of roof membrane by placing reinforced membrane or walkpad material, or other material approved by the Contracting Officer, at all surface bearing support locations.

3.4.2 Isolated Paver Blocks

Install paver blocks where indicated and as necessary to support surface bearing items traversing the roof area. Set paver block on a layer of reinforced membrane or walkpad applied over the completed roof membrane.

3.4.3 Ballast

Complete all membrane and membrane flashing work, including inspection and repair of all membrane and seams in the area of application prior to applying system. Install protection mat over roof membrane in accordance with roof membrane manufacturer's recommendations. Provide minimum 3 inch side laps and 6 inch end laps. Turn mat up vertical surfaces to extend 50 mm 2 inch above ballast. Immediately after placement of protection mat, apply

3.5 CORRECTION OF DEFICIENCIES

Where any form of deficiency is found, additional measures must be taken as deemed necessary by the Contracting Officer to determine the extent of the deficiency and corrective actions must be as directed by the Contracting Officer.

3.6 CLEAN UP

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

3.7 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.

3.7.1 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.

3.7.2 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.

3.7.3 Temporary Walkways, Runways, and Platforms

Do not permit storing, walking, wheeling, and trucking directly on applied roofing materials. Provide temporary walkways, runways, and platforms of smooth clean boards, mats or planks as necessary to avoid damage to applied roofing materials, and to distribute weight to conform to live load limits of roof construction. Use rubber-tired equipment for roofing work.

3.8 FIELD QUALITY CONTROL

3.8.1 Construction Monitoring

During progress of the roof work, Contractor must 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.

Nailers and blocking are provided where and as needed.

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

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

Materials comply with the specified requirements.

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

Membrane is allowed to relax prior to seaming. 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.

Membrane is properly overlapped.

Membrane seaming is as specified and seams are hand rolled to ensure full adhesion and bond width. In-seam sealant is applied when adhesive seams are used in the field of the roof. All seams are checked at the end of each work day.

Applied membrane is inspected and repaired as necessary prior to ballast installation.

Membrane is fully adhered without ridges, wrinkles, kinks, fishmouths.

Installer adheres to specified and detailed application parameters.

Associated flashings and sheet metal are installed in a timely manner in accord with the specified requirements.

Ballast is within the specified weight range.

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

3.8.2 Roof Drain Test

After completing roofing but prior to Government acceptance, perform the following test for watertightness. Plug roof drains and fill with water to edge of drain sump for 8 hours. Retrofit roof drains must conform to ANSI/SPRI RD-1. Do not plug secondary overflow drains at the same time as adjacent primary drain. To ensure some drainage from roof, do not test all drains at same time. Measure water at beginning and end of the test period. When precipitation occurs during test period, repeat test. When water level falls, remove water, thoroughly dry, and inspect installation; repair or replace roofing at drain to provide for a properly installed watertight flashing seal. Repeat test until there is no water leakage.

3.9 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.

3.10 INFORMATION CARD

For each roof, furnish a typewritten information card for facility records anda photoengraved 0.032 inch thick aluminum card for exterior display. Card must be 8-1/2 by 11 inch minimum. Information card must 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.

-- End of Section --

SECTION 07 54 19
POLYVINYL-CHLORIDE ROOFING
02/13

PART 1 GENERAL

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 Roofing Systems

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.24	(2014) Roofing - Safety Requirements of Low-Sloped Roofs

ASPHALT ROOFING MANUFACTURER'S ASSOCIATION (ARMA)

ARMA PMBRG98	(1998) Quality Control Guideline for the Application of Polymer Modified Bitumen Roofing

ASTM INTERNATIONAL (ASTM)

ASTM D4263	(1983; R 2012) Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM D4434/D 4434M	(2012) Poly(Vinyl Chloride) Sheet Roofing
ASTM D6754/D6754M	(2010) Standard Specification for Ketone Ethylene Ester Based 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 APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA 3740	(2005) The NRCA Waterproofing Manual
NRCA 3758	(2009) Guidelines for Roof-mounted Photovoltaic System Installation
NRCA 3760	Building Owners Guide to Roof-mounted Photovoltaic Systems

SINGLE PLY ROOFING INDUSTRY (SPRI)

ANSI/SPRI RD-1	(2009) Performance Standard for Retrofit Drains

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

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

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED BD+C	(2009; R 2010) Leadership in Energy and Environmental Design(tm) Building Design and Construction (LEED-NC)

UNDERWRITERS LABORATORIES (UL)

UL 790	(2004; Reprint Jul 2014) Standard Test Methods for Fire Tests of Roof Coverings

1.2 SUMMARY

Adhered, Mechanically fastened or Combination adhered polyvinyl-chloride (PVC) roof membrane system applied over insulation PVC membrane roofing manufacturer-accepted substrate. Incorporate air barrier in the roof assembly as specified in Section 07 22 00 ROOF AND DECK INSULATION.

1.3 ASSEMBLY REQUIREMENTS

Roofing membrane sheet widths shall be consistent with membrane attachment methods and wind uplift requirements, and shall be 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. Insulation shall be applied and weatherproofed on the same day.

1.3.1 Fire Resistance

Complete roof system assembly:

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

b. Be listed as Class I roof deck construction in FM APP GUIDE.

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

1.3.2 Wind Uplift Resistance

The complete roof system assembly shall be rated and installed to resist wind loads indicated 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 90 mph in accordance with ASCE 7 and other applicable building code requirements.

1.3.3 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).

1.4 SUSTAINABILITY REPORTING

Materials in this technical specification may contribute towards contract compliance with sustainability requirements. See Section 01 33 29 SUSTAINABILITY REPORTING for project LEED BD+C local/regional materials, and LEED documentation requirements.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings; G
Roof Plan; G

SD-03 Product Data

PVC Roofing Membrane; G
Bonding Adhesive
Flashing
Membrane Fasteners and Plates
Roof Insulation
Protection Mat
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

LEED Documentation
Warranty; G
Information Card; G
Instructions to Government Personnel; G

1.6 QUALITY ASSURANCE

1.6.1 Qualification of Manufacturer

Polyvinyl-Chloride sheet roofing system manufacturer must have a minimum of 5 years experience in manufacturing PVC roofing products.

1.6.2 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.

1.6.3 Qualifications of Photovoltaics (PV) Rooftop Applicator

The PV rooftop applicator must be approved, authorized, or certified by a Roof Integrated Solar Energy (RISE) Certified Solar Roofing Professional (CSRP), and comply with applicable codes, standards, and regulatory requirements to maintain the weatherproofing abilities of both the integrated roof system and photovoltaic system.

1.6.4 Qualification of Engineer of Record

1.6.5 Conformance and Compatibility

The entire roofing and flashing system shall be in accordance with

specified and indicated requirements, including fire and wind resistance.

1.6.6 Preroofing Conference

After approval of submittals and before performing roofing and insulation 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(ARMA PMBRG98) plan for the roof system installation;

f. Safety requirements.

Coordinate preroofing conference scheduling with the Contracting Officer. The conference shall 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 ASSE/SAFE 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.

1.7 DETAIL DRAWINGS

Submit roof plan depicting wind loads and boundaries of enhanced perimeter and corner attachments of roof system components, , spacing of perimeter, corner, and infield fasteners, as applicable. The drawing shall 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.

1.8 DELIVERY, STORAGE, AND HANDLING

1.8.1 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 shall 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.

1.8.2 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 and/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.

1.8.3 Handling

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

1.9 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.

1.10 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. Application of roofing shall 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.

1.11 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. Minimum manufacturer warranty shall have no dollar limit, cover full system water-tightness, and shall have a minimum duration of 20 years. Submit sample certificate.

1.11.1 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.

1.11.2 Roofing System Installer Warranty

The roof system installer shall 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.

1.11.3 Continuance of Warranty

Aprove repair or replacement work that becomes necessary within the warranty period 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.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 PVC Roof Membrane

Provide a minimum polymer thickness 0.080 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 clasification listings.

Submit Data as required by Section 07 22 00 ROOF AND DECK INSULATION together with requirements of this section. Data shall include 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. All warranted roof system components shall be 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. Card shall be 8 1/2 by 11 inches minimum. Information card shall 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.

2.1.2 Bonding Adhesive

Provide PVC membrane manufacturer's low volatile organic compound (VOC) membrane 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. Bonding adhesive shall not be used to bond membrane materials to each other.

2.1.3 Water Cutoff Mastic/Water Block

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

2.1.4 Membrane Flashing

Membrane flashing, including self-adhering membrane flashing, perimeter flashing, flashing around roof penetrations and prefabricated pipe seals, shall be minimum polymer thickness 0.072 inch reinforced PVC for 20year warranties, and shall be utilized as recommended and supplied by the roof membrane manufacturer or minimum 0.072 inch thick reinforced PVC roof membrane and flashing's for 20 year warranties. Submit certification from PVC membrane manufacturer that the proposed PVC membrane roofing product meets the minimum polymer thickness specified.

2.1.5 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.

2.1.5.1 Stress Plates, Bar or Rail for Fasteners

Corrosion-resistant stress plates as recommended by the roof membrane manufacturer's printed instructions and meeting the requirements of FM 4470 must be utilized and must be supplied by PVC roof membrane manufacturer. Stress plates shall be formed to prevent dishing or cupping. Manufacturer-supplied anchoring bar or rails may be utilized for high wind conditions.

2.1.5.2 Auxiliary Fasteners

Corrosion resistance screws, nails, or anchors must be suitable for intended attachment purpose and be recommended and supplied for use by the PVC roof membrane manufacturer.

2.1.6 Protection Mat

Minimum 6 ounce/square yard ultraviolet resistant polypropylene, non-woven, needle punched fabric for use as protection mat under ballast system or as recommended and supplied by the roof membrane manufacturer.

2.1.7 Pre-manufactured Accessories

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. Pre-fabricated Curbs shall be min gauge G90 galvanized with minimum 4 inch flange for attachment to roof nailers. Curbs shall provide minimum height of 10 inches above the finished roof membrane surface.

2.1.8 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.

2.1.9 Roof Insulation

Insulation system and facer material shall be compatible with membrane application specified and be approved and supplied by the PVC membrane roof manufacturerand as specified in Section 07 22 00 ROOF AND DECK INSULATION.

2.1.10 Wood Products

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

2.2 Reinforced, PVC Membrane

Reinforced polyvinyl chloride (PVC) membrane shall contain fibers or scrim, and shall comply with ASTM D4434/D 4434M, Type II, Grade I or Type III or

Type IV, fleece backed, or ASTM D6754/D6754M, and in all cases shall provide 0.080 inch minimum thickness for adhered, mechanically fastened or combination adhered/protected membrane application. Not withstanding the ASTM standards referenced, reinforced PVC roof membranes provided under this section shall have the minimum, labeled thickness specified. PVC membrane thickness specified herein is exclusive of backing material on the bottom of fleece-backed membrane. Principal polymer used in manufacture of the membrane sheet shall be PVC. Width and length of PVC membrane roofing sheet shall be consistent with membrane attachment methods and wind uplift requirements, and shall be 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.

2.3 PHOTOVOLTAIC (PV) SYSTEMS - RACK MOUNTED SYSTEMS

Adhere to NRCA 3758 and NRCA 3760

2.4 COOL ROOFS

Roof surface layer of the built up roofing system must meet current Energy Star qualifications for Cool Roof products. The minimum tested Solar Reflectance values is limited to the following: Low Slope: Initial Value >0.85; Three Years after Installation Value >0.70

PART 3 EXECUTION

3.1 CONCRETE SURFACE DRYNESS

Prior to installing any roof system on a concrete deck, including application of insulation or membrane materials, conduct a test for surface dryness in accordance with ASTM D4263. The deck is acceptable for roof system application when there is no visible moisture on underside of plastic sheet after 24 hours.

3.2 EXAMINATION

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

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

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

c. Substrate is sloped to provide positive drainage.

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

e. 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.

f. 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. Embedded nailers are flush with deck surfaces. Surface-applied nailers are the same thickness as the roof insulation.

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

h. Venting shall be provided if required by, and in accordance with the cellular lightweight concrete manufacturer's requirements and recommendations.

i. Exposed nail heads in wood substrates are properly set. Warped and split boards or sheets have been replaced. There are no cracks or end joints 1/4 inch in width or greater. Joints in plywood substrates are taped or otherwise sealed to prevent air leakage from the underside.

j. 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.

3.3 APPLICATION METHOD

Apply entire PVC membrane roofing utilizing adhered, mechanically fastened or combination adhered/protected membrane as indicated application methods. 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

3.3.1 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.

3.3.2 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. Only felt-backed membrane shall be placed directly on concrete deck or other hard surface which may otherwise damage the membrane, absent the felt backing. Non-felt-backed PVC membrane roofing sheet shall not be placed directly on concrete deck or other hard surface which may damage the membrane. Membrane shall be overlapped 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 shall allow water to flow over and not against the lap. Membrane joints shall be free of wrinkles and fishmouths. The entire length of hot-air-welded seams shall be probe-tested and corrected during the day of installation. Defective areas shall be re-welded. Wrinkles, fishmouths, or damaged areas shall be cut out and the area covered with membrane using a continuous hot-air-welded seam on all sides. Repairs shall be probe-tested for continuity. Hot-air-welded seams are to be accomplished in accordance with the PVC membrane roofing manufacturer's published requirements.

3.3.2.1 Nailing

Membrane shall be fastened to nailers in accordance with the membrane manufacturer's approved instructions. Unless otherwise specified, nails shall be staggered on 4 inch centers maximum; screws for sheet metal shall be staggered on 8 inch centers maximum; and a row of fasteners shall be at least 1/2 inch from edges of sheet metal.

3.3.2.2 Flashing

Roof edges, projections through the roof and changes in roof planes shall be flashed. The seam shall be sealed a minimum of 3 inches beyond the fasteners which attach the membrane to nailers. The installed flashing's shall be secured at the top of the flashing a maximum of12 inches on centers under the counterflashing or cap. Where possible, prefabricated components shall be used for pipe seals and flashing accessories.

3.3.2.3 Expansion Joints

Expansion joints shall be covered using Prefabricated covers or elastomeric flashing in accordance with the recommendations of the manufacturer.

3.3.2.4 Cutoffs

If work is terminated prior to weatherproofing the entire roof, the membrane shall be sealed to the roof deck. Flutes in metal decking shall be sealed off along the cutoff edge. Membrane shall be pulled free or cut to expose the insulation when resuming work and cut insulation sheets used for fill-in shall be removed. Asphalt or coal-tar products shall not be used for sealing.

3.3.2.5 Walkways

Walkways shall be installed on a loose-laid pad of the membrane material extending at least 1 inch beyond the walkway material, and as specified by the manufacturer. Stone ballast shall not be placed below or above walkways.

3.3.3 Adhered Membrane Application

Layout membrane and side lap adjoining sheets in accordance with membrane manufacturer's printed installation instructions. Allow for sufficient membrane to form proper membrane terminations. Remove dusting agents and dirt from membrane and substrate areas where bonding adhesives are to be applied. Apply specified adhesive evenly and continuously to substrate and underside of sheets at rates recommended by the roof membrane manufacturer's printed application instructions. When adhesive is spray applied, roll with a paint roller to ensure proper contact and coverage. Do not apply bonding adhesive to surfaces of membrane in seam or lap areas. Allow adhesive to flash off or dry to consistency prescribed by manufacturer before adhering sheets to the substrate. When adhesive is peel & stick release paper-activated, follow manufacturer's printed instructions. Roll each sheet into adhesive slowly and evenly to avoid wrinkles; broom or roll the membrane to remove air pockets and fishmouths and to ensure adequately uniform bonding of sheet to substrate. Form field hot-air-welded laps or seams as specified and ensure that hot-air welded dimension is at width required by the membrane manufacturer's installation instructions. Check all seams and continuous hot-air-weld of all seams and lap seals.

3.3.4 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 and laps and/or coverstrips, as specified. Check all seams and ensure full/continuous lap seal.

3.3.5 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 shall be the same as the boundary required for additional perimeter mechanical fastening to meet wind resistance requirements.

3.3.6 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.

3.3.7 Pre-fabricated Curbs

Securely anchor prefabricated curbs to nailer or other base substrate and flashed with PVC membrane flashing materials.

3.3.7.1 Set-On Accessories

Where pipe or conduit blocking, supports and similar roof accessories, or isolated paver block, are set on the membrane, adhere reinforced membrane or walkpad material, as recommended by the roof membrane manufacturer, to bottom of accessories prior to setting on roofing membrane. Specific method of installing set-on accessories must permit normal movement due to expansion, contraction, vibration, and similar occurrences without damaging roofing membrane. Do not mechanically secure set-on accessories through roofing membrane into roof deck substrate.

3.3.8 Roof Walkways

Install walkways at roof access points and where otherwise indicated for traffic areas and for access to mechanical equipment, in accordance with the PVC membrane roof manufacturer's printed instructions. Provide minimum 6 inch separation between adjacent walkways to accommodate drainage.

3.3.9 Elevated Metal Walkways and Platforms

Install over completed roof system in accordance with Section 05 50 13 MISCELLANEOUS METAL FABRICATIONS. Provide for protection of roof membrane by placing reinforced membrane or walkpad material, or other material approved by the PVC membrane roof manufacturer and Contracting Officer, at all surface bearing support locations.

3.3.10 Isolated Paver Blocks

Install paver blocks where indicated and as necessary to support surface bearing items traversing the roof area. Set paver block on a layer of reinforced PVC membrane or walkway applied over the completed PVC roof membrane.

3.4 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.

3.4.1 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.

3.4.2 Membrane Flashing

3.4.2.1 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.

3.4.2.2 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.

3.4.3 Flashing at Roof Drain

Provide a tapered insulation sump into the drain bowl area. Do not exceed tapered slope of 18 degrees for unreinforced membrane and 5 degrees for reinforced membrane. Provide tapered insulation with surface suitable for adhering membrane in the drain sump area. Avoid field seams running through or within 24 inch of roof drain, or as otherwise recommended by the roof membrane manufacturer. Adhere the membrane to the tapered in the drain sump area. Apply water block mastic and extend membrane sheets over edge of drain bowl opening at the roof drain deck flange in accordance with membrane manufacturer's printed application instructions. Insure membrane free of wrinkles and folds in the drain area. Securely clamp membrane in the flashing clamping ring. Ensure membrane is cut to within 3/4 inch of inside rim of clamping ring to maintain drainage capacity. Do not cut back to bolt holes. Retrofit roof drains shall conform to ANSI/SPRI RD-1.

3.5 ROOF WALKPADS

Install walkpads at roof access points and where otherwise indicated for

traffic areas and for access to mechanical equipment, in accordance with the roof membrane manufacturer's printed instructions. Provide minimum 6 inch separation between adjacent walkpads to accommodate drainage.

3.5.1 Elevated Metal Walkways and Platforms

Provide for protection of roof membrane by placing reinforced membrane or walkpad material, or other material approved by the Contracting Officer, at all surface bearing support locations.

3.6 CORRECTION OF DEFICIENCES

Where any form of deficiency is found, additional measures must be taken 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.

3.7 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.

3.7.1 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.

3.7.2 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.

3.7.3 Temporary Walkways, Runways, and Platforms

Do not permit storing, walking, wheeling, and trucking directly on applied roofing system. Provide temporary walkways, runways, and platforms of smooth clean boards, mats or planks as necessary to avoid damage to applied roofing materials, and to distribute weight to conform to live load limits of roof construction. Use rubber-tired equipment for roofing work.

3.8 FIELD QUALITY CONTROL

3.8.1 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.

3.9 CLEAN UP

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

3.10 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 Material Safety Data Sheets for maintenance/repair materials.

3.11 ROOF DRAIN TEST

After completing roofing but prior to Government acceptance, perform the

following test for watertightness. Plug roof drains and fill with water to edge of drain sump for 8 hours. Do not plug secondary overflow drains at the same time as adjacent primary drain. To ensure some drainage from roof, do not test all drains at same time. Measure water at beginning and end of the test period. When precipitation occurs during test period, repeat test. When water level falls, remove water, thoroughly dry, and inspect installation; repair or replace roofing at drain to provide for a properly installed watertight flashing seal. Repeat test until there is no water leakage.

-- End of Section --

SECTION 07 60 00

FLASHING AND SHEET METAL
08/08

PART 1 GENERAL

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 WELDING SOCIETY (AWS)

AWS D1.2/D1.2M	(2014) Structural Welding Code - Aluminum

ASTM INTERNATIONAL (ASTM)

ASTM A167	(2011) Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A308/A308M	(2010) Standard Specification for Steel Sheet, Terne (Lead-Tin Alloy) Coated by the Hot Dip Process
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B101	(2012) Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction
ASTM B32	(2008; R 2014) Standard Specification for Solder Metal
ASTM B370	(2012) Standard Specification for Copper Sheet and Strip for Building Construction
ASTM B69	(2013) Standard Specification for Rolled Zinc
ASTM D1784	(2011) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D226/D226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D41/D41M	(2011) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing

ASTM D4586/D4586M	(2007; E 2012; R 2012) Asphalt Roof Cement, Asbestos-Free

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

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition

SINGLE PLY ROOFING INDUSTRY (SPRI)

ANSI/SPRI RD-1	(2009) Performance Standard for Retrofit Drains

1.2 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.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Covering on flat, sloped, or curved surfaces; G

Gutters; G

Downspouts; G

Expansion joints; 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 Drip

edge; G

Conductor heads

Open valley flashing; G

Eave flashing; G

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-11 Closeout Submittals

Quality Control Plan

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

1.4 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.

PART 2 PRODUCTS

2.1 MATERIALS

Do not use lead, lead-coated metal, or galvanized steel. 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, thickness, or weight 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 Copper, Sheet and Strip

ASTM B370, cold-rolled temper, H 00 (standard).

2.1.4 Lead-Coated Copper Sheet

ASTM B101.

2.1.5 Lead Sheet

Minimum weight 4 pounds per square foot.

2.1.6 Steel Sheet, Zinc-Coated (Galvanized)

ASTM A653/A653M.

2.1.6.1 Finish

Exposed exterior items of zinc-coated steel sheet must have a baked-on, factory-applied color coating of polyvinylidene fluoride or other equivalent fluorocarbon coating applied after metal substrates have been cleaned and pretreated. Provide finish coating dry-film thickness of 0.8 to 1.3 mils and color of as indicated.

2.1.7 Zinc Sheet and Strip

ASTM B69, Type I, a minimum of 0.024 inch thick.

2.1.8 Stainless Steel

ASTM A167, Type 302 or 304, 2D Finish, fully annealed, dead-soft temper.

2.1.9 Terne-Coated Steel

Minimum of 14 by 20 inch with minimum of 40 pound coating per double base box. ASTM A308/A308M.

2.1.10 Aluminum Alloy Sheet and Plate

ASTM B209 anodized color as indicated form alloy, and temper appropriate for use.

2.1.10.1 Alclad

When fabricated of aluminum, fabricate the items Alclad 3003, Alclad 3004, Alclad 3005, clad on one side both sides unless otherwise indicated.

a. Gutters, downspouts, and hangers

b. Gravel stops and fascias

c. Flashing

2.1.10.2 Finish

Exposed exterior sheet metal items of aluminum must have a baked-on, factory-applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating applied after metal substrates have been cleaned and pretreated. Provide finish coating dry-film thickness of 0.8 to 1.3 mils and color of as indicated.

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

ASTM B221.

2.1.12 Solder

ASTM B32, 95-5 tin-antimony.

2.1.13 Polyvinyl Chloride Reglet

ASTM D1784, Type II, Grade 1, Class 14333-D, 0.075 inch minimum thickness.

2.1.14 Bituminous Plastic Cement

ASTM D4586/D4586M, Type I.

2.1.15 Roofing Felt

ASTM D226/D226M Type II.

2.1.16 Asphalt Primer

ASTM D41/D41M.

2.1.17 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

3.1.1 Metal Roofing

3.1.1.1 Standing-seam Method

Make standing seams parallel with slope of roof. Fabricate sheets into long lengths at shop by locking short dimensions together and thoroughly soldering joints thus formed. In applying metal, turn up one edge of course at each side seam at right angles 1.5 inch. Then install 2 by 3 inch cleats spaced 12 inch apart by fastening one end of each cleat to roof with two one inch long nails and folding roof end back over nail heads. Turn end adjoining turned-up side seam up over upstanding edge of course. Turn up adjoining edge of next course 1.75 inch and abutting upstanding edges locked, turned over, and flattened against one side of standing seam. Make standing seams straight, rounded neatly at the top edges, and stand about one inch above roof deck. All sheets must be same length, except as required to complete run or maintain pattern. Locate transverse

joints of each panel half way between joints in adjacent sheets. Align joints of alternate sheets horizontally to produce uniform pattern, as shown in SMACNA Arch. Manual.

3.1.2 Workmanship

Make lines and angles sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a 1/2 inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction.

Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA 1793, Architectural Sheet Metal Manual. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight. Join sheet metal items together as shown in Table II.

3.1.3 Nailing

Confine nailing of sheet metal generally to sheet metal having a maximum width of 18 inch. Confine nailing of flashing to one edge only. Space nails evenly not over 3 inch on center and approximately 1/2 inch from edge unless otherwise specified or indicated. Face nailing will not be permitted. Where sheet metal is applied to other than wood surfaces, include in shop drawings, the locations for sleepers and nailing strips required to secure the work.

3.1.4 Cleats

Provide cleats for sheet metal 18 inch and over in width. Space cleats evenly not over 12 inch on center unless otherwise specified or indicated. Unless otherwise specified, provide cleats of 2 inch wide by 3 inch long and of the same material and thickness as the sheet metal being installed. Secure one end of the cleat with two nails and the cleat folded back over the nailheads. Lock the other end into the seam. Where the fastening is to be made to concrete or masonry, use screws and drive in expansion shields set in concrete or masonry. Pretin cleats for soldered seams.

3.1.5 Bolts, Rivets, and Screws

Install bolts, rivets, and screws where indicated or required. Provide compatible washers where required to protect surface of sheet metal and to provide a watertight connection. Provide mechanically formed joints in aluminum sheets 0.040 inch or less in thickness.

3.1.6 Seams

Straight and uniform in width and height with no solder showing on the face.

3.1.6.1 Flat-lock Seams

Finish not less than 3/4 inch wide.

3.1.6.2 Lap Seams

Finish soldered seams not less than one inch wide. Overlap seams not

soldered, not less than 3 inch.

3.1.6.3 Loose-Lock Expansion Seams

Not less than 3 inch wide; provide minimum one inch movement within the joint. Completely fill the joints with the specified sealant, applied at not less than 1/8 inch thick bed.

3.1.6.4 Standing Seams

Not less than one inch high, double locked without solder.

3.1.6.5 Flat Seams

Make seams in the direction of the flow.

3.1.7 Soldering

Where soldering is specified, apply to copper, terne-coated stainless steel, zinc-coated steel, and stainless steel items. Pretin edges of sheet metal before soldering is begun. Seal the joints in aluminum sheets of 0.040 inch or less in thickness with specified sealants. Do not solder aluminum.

3.1.7.1 Edges

Scrape or wire-brush the edges of lead-coated material to be soldered to produce a bright surface. Flux brush the seams in before soldering. Treat with soldering acid flux the edges of stainless steel to be pretinned. Seal the joints in aluminum sheets of 0.040 inch or less in thickness with specified sealants. Do not solder aluminum.

3.1.8 Welding and Mechanical Fastening

Use welding for aluminum of thickness greater than 0.040 inch. Aluminum 0.040 inch or less in thickness must be butted and the space backed with formed flashing plate; or lock joined, mechanically fastened, and filled with sealant as recommended by the aluminum manufacturer.

3.1.8.1 Welding of Aluminum

Use welding of the inert gas, shield-arc type. For procedures, appearance and quality of welds, and the methods used in correcting welding work, conform to AWS D1.2/D1.2M.

3.1.8.2 Mechanical Fastening of Aluminum

Use No. 12, aluminum alloy, sheet metal screws or other suitable aluminum alloy or stainless steel fasteners. Drive fasteners in holes made with a No. 26 drill in securing side laps, end laps, and flashings. Space fasteners 12 inch maximum on center. Where end lap fasteners are required to improve closure, locate the end lap fasteners not more than 2 inch from the end of the overlapping sheet.

3.1.9 Protection from Contact with Dissimilar Materials

3.1.9.1 Copper or Copper-bearing Alloys

Paint with heavy-bodied bituminous paint surfaces in contact with

dissimilar metal, or separate the surfaces by means of moistureproof building felts.

3.1.9.2 Aluminum

Do not allow aluminum surfaces in direct contact with other metals except stainless steel, zinc, or zinc coating. Where aluminum contacts another metal, paint the dissimilar metal with a primer followed by two coats of aluminum paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

3.1.9.3 Metal Surfaces

Paint surfaces in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

3.1.9.4 Wood or Other Absorptive Materials

Paint surfaces that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

3.1.10 Expansion and Contraction

Provide expansion and contraction joints at not more than 32 foot intervals for aluminum and at not more than 40 foot intervals for other metals. Provide an additional joint where the distance between the last expansion joint and the end of the continuous run is more than half the required interval. Space joints evenly. Join extruded aluminum gravel stops and fascias by expansion and contraction joints spaced not more than 12 feet apart.

3.1.11 Base Flashing

Lay the base flashings with each course of the roof covering, shingle fashion, where practicable, where sloped roofs abut chimneys, curbs, walls, or other vertical surfaces. Extend up vertical surfaces of the flashing not less than 8 inch and not less than 4 inch under the roof covering. Where finish wall coverings form a counterflashing, extend the vertical leg of the flashing up behind the applied wall covering not less than 6 inch. Overlap the flashing strips with the previously laid flashing not less than 3 inch. Fasten the strips at their upper edge to the deck. Horizontal flashing at vertical surfaces must extend vertically above the roof surface and fastened at their upper edge to the deck a minimum of 6 inch on center with hex headed, galvanized shielded screws a minimum of 2-inch lap of any surface. Solder end laps and provide for expansion and contraction. Extend the metal flashing over crickets at the up-slope side of chimneys, curbs, and similar vertical surfaces extending through sloping roofs, the metal flashings. Extend the metal flashings onto the roof covering not less than 4.5 inch at the lower side of dormer walls, chimneys, and similar vertical surfaces extending through the roof decks. Install and fit the flashings so as to be completely weathertight. Provide factory-fabricated base flashing for interior and exterior corners. Do not use metal base flashing on built-up roofing.

3.1.12 Counterflashing

Except where indicated or specified otherwise, insert counterflashing in reglets located from 9 to 10 inch above roof decks, extend down vertical surfaces over upturned vertical leg of base flashings not less than 3 inch.

Fold the exposed edges of counterflashings 1/2 inch. Where stepped counterflashings are required, they may be installed in short lengths a minimum 8 inch by 10 inch or may be of the preformed one-piece type. Provide end laps in counterflashings not less than 3 inch and make it weathertight with plastic cement. Do not make lengths of metal counterflashings exceed 10 feet. Form the flashings to the required shapes before installation. Factory-form the corners not less than 12 inch from the angle. Secure the flashings in the reglets with lead wedges and space not more than 18 inch apart; on chimneys and stair/elevator towers short runs, place wedges closer together. Fill caulked-type reglets or raked joints which receive counterflashing with caulking compound. Turn up the concealed edge of counterflashings built into masonry or concrete walls not less than 1/4 inch and extend not less than 2 inch into the walls. Install counterflashing to provide a spring action against base flashing. Where bituminous base flashings are provided, extend down the counter flashing as close as practicable to the top of the cant strip. Factory form counter flashing to provide spring action against the base flashing.

3.1.13 Metal Reglets

Provide factory fabricated caulked type or friction type reglets with a minimum opening of 1/4 inch and a depth of 1 1/4 inch, as approved.

3.1.13.1 Caulked Reglets

Provide with rounded edges and metal strap brackets or other anchors for securing to the concrete forms. Provide reglets with a core to protect them from injury during the installation. Provide built-up mitered corner pieces for internal and external angles. Wedge the flashing in the reglets with lead wedges every 18 inch, caulked full and solid with an approved compound.

3.1.13.2 Friction Reglets

Provide with flashing receiving slots not less than 5/8 inch deep, one inch jointing tongues, and upper and lower anchoring flanges installed at 24 inch maximum snaplock receiver. Insert the flashing the full depth of the slot and lock by indentations made with a dull-pointed tool, wedges, and filled with a sealant. For friction reglets, install flashing snaplock receivers at 24 inch on center maximum. When the flashing has been inserted the full depth, caulk the slot and lock and fill with sealant.

3.1.14 Polyvinyl Chloride Reglets

Rigid polyvinyl chloride reglets ASTM D1784, Type II, Grade 1, Class 14333-D, 0.075 inch minimum thickness may be provided in lieu of metal reglets for temporary construction.

3.1.15 Gravel Stops and Fascias

Prefabricate in the shapes and sizes indicated and in lengths not less that 8 feet. Extend flange at least 4 inch onto roofing. Provide prefabricated, mitered corners internal and external corners. Install gravel stops and fascias after all plies of the roofing membrane have been applied, but before the flood coat of bitumen is applied. Prime roof flange of gravel stops and fascias on both sides with an asphalt primer. After primer has dried, set flange on roofing membrane and strip-in.Nail flange securely to wood nailer with large-head, barbed-shank roofing nails 1.5 inch long spaced not more than 3 inch on center, in two staggered rows.

3.1.15.1 Edge Strip

Hook the lower edge of fascias at least 3/4 inch over a continuous strip of the same material bent outward at an angle not more than 45 degrees to form a drip. Nail hook strip to a wood nailer at 6 inchmaximum on center. Where fastening is made to concrete or masonry, use screws spaced 12 inch on center driven in expansion shields set in the concrete or masonry. Where horizontal wood nailers are slotted to provide for insulation venting, install strips to prevent obstruction of vent slots. Where necessary, install strips over 1/16 inch thick compatible spacer or washers.

3.1.15.2 Joints

Leave open the section ends of gravel stops and fascias 1/4 inch and backed with a formed flashing plate, mechanically fastened in place and lapping each section end a minimum of 4 inch set laps in plastic cement. Face nailing will not be permitted. Install prefabricated aluminum gravel stops and fascias in accordance with the manufacturer's printed instructions and details.

3.1.16 Metal Drip Edge

Provide a metal drip edge, designed to allow water run-off to drip free of underlying construction, at eaves and rakes prior to the application of roofing shingles. Apply directly on the wood deck at the eaves and over the underlay along the rakes. Extend back from the edge of the deck not more than 3 inch and secure with compatible nails spaced not more than 10 inch on center along upper edge.

3.1.17 Gutters

The hung type of shape indicated and supported on underside by brackets that permit free thermal movement of the gutter. Provide gutters in sizes indicated complete with mitered corners, end caps, outlets, brackets, and other accessories necessary for installation. Bead with hemmed edge or reinforce the outer edge of gutter with a stiffening bar not less than 3/4 by 3/16 inch of material compatible with gutter. Fabricate gutters in sections not less than 8 feet. Lap the sections a minimum of one inch in the direction of flow or provide with concealed splice plate 6 inch minimum. Join the gutters, other than aluminum, by riveted and soldered joints. Join aluminum gutters with riveted sealed joints. Provide expansion-type slip joints midway between outlets. Install gutters below slope line of the roof so that snow and ice can slide clear. Support gutters on adjustable hangers spaced not more than 30 inch on center . Adjust gutters to slope uniformly to outlets, with high points occurring midway between outlets. Fabricate hangers and fastenings from metals.

3.1.18 Downspouts

Space supports for downspouts according to the manufacturer's recommendation for the wood masonry or steel substrate. Types, shapes and sizes are indicated. Provide complete including elbows and offsets. Provide downspouts in approximately 10 foot lengths. Provide end joints to telescope not less than 1/2 inch and lock longitudinal joints. Provide gutter outlets with wire ball strainers for each outlet. Provide strainers to fit tightly into outlets and be of the same material used for gutters. Keep downspouts not less than one inch away from walls. Fasten to the walls at top, bottom, and at an intermediate point not to exceed 5 feet on

center with leader straps or concealed rack-and-pin type fasteners. Form straps and fasteners of metal compatible with the downspouts.

3.1.18.1 Terminations

Neatly fit into the drainage connection the downspouts terminating in drainage lines and fill the joints with a portland cement mortar cap sloped away from the downspout. Provide downspouts terminating in splash blocks with elbow-type fittings. Provide splash pans as specified.

3.1.19 Flashing for Roof Drains

Provide a 30 inch square sheet indicated. Taper insulation to drain from 24 inch out. Set flashing on finished felts in a full bed of asphalt roof cement, ASTM D4586/D4586M. Heavily coat the drain flashing ring with asphalt roof cement. Clamp the roof membrane, flashing sheet, and stripping felt in the drain clamping ring. Secure clamps so that felts and drain flashing are free of wrinkles and folds. Retrofit roof drains must conform to ANSI/SPRI RD-1.

3.1.20 Scuppers

Line interior of scupper openings with sheet metal. Extend the lining through and project outside of the wall to form a drip on the bottom edge and form to return not less than one inch against the face of the outside wall at the top and sides. Fold outside edges under 1/2 inch on all sides. Provide the perimeter of the lining approximately 1/2 inch less than the perimeter of the scupper. Join the top and sides of the lining on the roof deck side to a closure flange by a locked and soldered joint. Join the bottom edge by a locked and soldered joint to the closure flange, where required, form with a ridge to act as a gravel stop around the scupper inlet. Provide surfaces to receive the scupper lining and coat with bituminous plastic cement.

3.1.21 Conductor Heads

Type indicated and fabricated of the same material as the downspouts. Set the depth of top opening equal to two-thirds of the width. Provide outlet tubes not less than 4 inch long. Flat-lock solder the seams. Where conductor heads are used in conjunction with scuppers, set the conductor a minimum of 2 inch wider than the scupper. Attach conductor heads to the wall with masonry fasteners, and loose-lock to provide conductor heads with screens of the same material. Securely fasten screens to the heads.

3.1.22 Splash Pans

Install splash pans where downspouts discharge on roof surfaces and at other locations as indicated. Unless otherwise shown, provide pans not less than 24 inch long by 18 inch wide with metal ribs across the bottom of the pan. Form the sides of the pan with vertical baffles not less than one inch high in the front, and 4 inch high in the back doubled over and formed continuous with horizontal roof flanges not less than 4 inch wide. Bend the rear flange of the pan to contour of cant strip and extend up 6 inch under the side wall covering or to height of base flashing under counterflashing. Bed the pans and roof flanges in plastic bituminous cement and strip-flash as specified.

3.1.23 Open Valley Flashing

Provide valley flashing free of longitudinal seams, of width sufficient to extend not less than 6 inch under the roof covering on each side. Provide a 1/2 inch fold on each side of the valley flashing. Lap the sheets not less than 6 inch in the direction of flow and secure to roofing construction with cleats attached to the fold on each side. Nail the tops of sheets to roof sheathing. Space the cleats not more than 12 inch on center. Provide exposed flashing not less than 4 inch in width at the top and increase one inch in width for each additional 8 feet in length. Where the slope of the valley is 4.5 inch or less per foot, or the intersecting roofs are on different slopes, provide an inverted V-joint, one inch high, along the centerline of the valley; and extend the edge of the valley sheets 8 inch under the roof covering on each side.

Valley flashing for asphalt shingle roofs is specified in section 07 31 13 ASPHALT SHINGLES.

3.1.24 Eave Flashing

One piece in width, applied in 8 to 10 foot lengths with expansion joints spaced as specified in paragraph entitled "Expansion and Contraction." Provide a 3/4 inch continuous fold in the upper edge of the sheet to engage cleats spaced not more than 10 inch on center. Locate the upper edge of flashing not less than 18 inch from the outside face of the building, measured along the roof slope. Fold lower edge of the flashing over and loose-lock into a continuous edge strip on the fascia. Where eave flashing intersects metal valley flashing, secure with one inch flat locked joints with cleats that are 10 inch on center.

3.1.25 Sheet Metal Covering on Flat, Sloped, or Curved Surfaces

Except as specified or indicated otherwise, cover and flash all minor flat, sloped, or curved surfaces such as crickets, bulkheads, dormers and small decks with metal sheets of the material used for flashing; maximum size of sheets, 16 by 18 inch. Fasten sheets to sheathing with metal cleats. Lock seams and solder. Lock aluminum seams as recommended by aluminum manufacturer. Provide an underlayment of roofing felt for all sheet metal covering.

3.1.26 Expansion Joints

Provide expansion joints for roofs, walls, and floors as indicated. Provide expansion joints in continuous sheet metal at , aluminum gravel stops and fascias which must have expansion joints at not more than 12 foot spacing. Provide evenly spaced joints. Provide an additional joint where the distance between the last expansion joint and the end of the continuous run is more than half the required interval spacing. Conform to the requirements of Table I.

3.1.26.1 Roof Expansion Joints

Consist of curb with wood nailing members on each side of joint, bituminous base flashing, metal counterflashing, and metal joint cover. Bituminous base flashing is specified in Roofing Section. Provide counterflashing as specified in paragraph "Counterflashing," except as follows: Provide counterflashing with vertical leg of suitable depth to enable forming into a horizontal continuous cleat. Secure the inner edge to the nailing member. Make the outer edge projection not less than one inch for flashing

on one side of the expansion joint and be less than the width of the expansion joint plus one inch for flashing on the other side of the joint. Hook the expansion joint cover over the projecting outer edges of counterflashing. Provide roof joint with a joint cover of the width indicated. Hook and lock one edge of the joint cover over the shorter projecting flange of the continuous cleat, and the other edge hooked over and loose locked with the longer projecting flange. Joints are specified in Table II.

3.1.26.2 Floor and Wall Expansion Joints

Provide U-shape with extended flanges for expansion joints in concrete and masonry walls and in floor slabs.

3.1.27 Flashing at Roof Penetrations and Equipment Supports

Provide metal flashing for all pipes, ducts, and conduits projecting through the roof surface and for equipment supports, guy wire anchors, and similar items supported by or attached to the roof deck. Goose-necks, rainhoods, power roof ventilators, are specified in other parts of of this contract.

3.1.28 Single Pipe Vents

See Table I, footnote (d). Set flange of sleeve in bituminous plastic cement and nail 3 inch on center. Bend the top of sleeve over and extend down into the vent pipe a minimum of 2 inch. For long runs or long rises above the deck, where it is impractical to cover the vent pipe with lead, use a two-piece formed metal housing. Set metal housing with a metal sleeve having a 4 inch roof flange in bituminous plastic cement and nailed 3 inch on center. Extend sleeve a minimum of8 inch above the roof deck and lapped a minimum of 3 inch by a metal hood secured to the vent pipe by a draw band. Seal the area of hood in contact with vent pipe with an approved sealant.

3.1.29 Stepped Flashing

Stepped flashing shall be installed where sloping roofs surfaced with shingles abut vertical surfaces. Separate pieces of base flashing shall be placed in alternate shingle courses.

3.1.30 Copings

Provide coping using copper sheets 8 or 10 feet long joined by a 3/4 inch locked and soldered seam. Terminate outer edges in edge strips. Install with sealed lap joints cover plate joints standing seam joints as indicated.

3.2 PAINTING

Field-paint sheet metal for separation of dissimilar materials.

3.3 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.

3.4 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.

-- End of Section --

SECTION 07 61 14.00 20

STEEL STANDING SEAM ROOFING
05/11

PART 1 GENERAL

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 IRON AND STEEL INSTITUTE (AISI)

AISI SG03-3	(2002; Suppl 2001-2004; R 2008) Cold-Formed Steel Design Manual Set

ASTM INTERNATIONAL (ASTM)

ASTM A1008/A1008M	(2015) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened
ASTM A1011/A1011M	(2014) Standard Specification for Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength
ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A792/A792M	(2010) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM B117	(2011) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM D1654	(2008) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D2244	(2015) Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
ASTM D2247	(2011) Testing Water Resistance of Coatings in 100% Relative Humidity

ASTM D226/D226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D4214	(2007) Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D522/D522M	(2014) Mandrel Bend Test of Attached Organic Coatings
ASTM D523	(2014) Standard Test Method for Specular Gloss
ASTM D714	(2002; R 2009) Evaluating Degree of Blistering of Paints
ASTM D968	(2005; R 2010) Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM E1592	(2005; R 2012) Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
ASTM E84	(2015a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G152	(2013) Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G153	(2013) Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

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

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition

1.2 DEFINITIONS

1.2.1 Field-Formed Seam

Seams of panels so configured that when adjacent sheets are installed the seam is sealed utilizing mechanical or hand seamers. Crimped (45 degree bend), roll formed (180 degree bend), double roll formed (2 - 180 degree bends), and roll and lock systems are types of field-formed seam systems.

1.2.2 Snap Together Seam

Panels so configured that the male and female portions of the seam interlock through the application of foot pressure or tamping with a mallet. Snap-on cap configurations are a type of snap together system.

1.2.3 Pre-Formed

Formed to the final, less field-formed seam, profile and configuration in the factory.

1.2.4 Field-Formed

Formed to the final, less field-formed seam, profile and configuration at the site of work prior to installation.

1.2.5 Roofing System

The roofing system is defined as the assembly of roofing components, including roofing panels, flashing, fasteners, and accessories which, when assembled properly result in a watertight installation.

1.3 SYSTEM DESCRIPTION

1.3.1 Design Requirements

a. Panels shall be continuous lengths up to manufacturer's standard longest lengths, with no joints or seams, except where indicated or specified. Ribs of adjoining sheets shall be in continuous contact from eave to ridge. Individual panels of snap together type systems shall be removable for replacement of damaged material.

b. There shall be no exposed or penetrating fasteners except where shown on approved shop drawings. Fasteners into steel shall be stainless steel, zinc cast head, or cadmium plated steel screws inserted into predrilled holes. There shall be a minimum of two fasteners per clip. Single fasteners will be allowed when supporting structural members are prepunched or predrilled.

c. Snap together type systems shall have a capillary break and a positive side lap locking device. Field-formed seam type systems shall be mechanically locked closed by the manufacturer's locking tool. The seam shall include a continuous factory applied sealant when required by the manufacturer to withstand the wind loads specified.

d. Roof panel anchor clips shall be concealed and designed to allow for longitudinal thermal movement of the panels, except where specific fixed points are indicated. Provide for lateral thermal movement in panel configuration or with clips designed for lateral and longitudinal movement.

1.3.2 Design Conditions

The system shall be designed to resist positive and negative loads specified herein in accordance with the AISI SG03-3. Panels shall support walking loads without permanent distortion or telegraphing of the structural supports.

1.3.2.1 Wind Uplift

The design uplift pressures for the roof system shall be computed and applied using a basic wind speed of 90 miles per hour (mph). Roof system and attachments shall resist the following wind loads, in pounds per square foot (psf):

	Negative
a. At eaves	90
b. At rakes	90
c. At ridge	90
d. At building corners	90
e. At central areas	90

The design uplift force for each connection assembly shall be that pressure given for the area under consideration, multiplied by the tributary load area of the connection assembly, and multiplied by the appropriate factor of safety, as follows:

a. Single fastener in a connection: 3.0

b. Two or more fasteners in each connection: 2.25

1.3.2.2 Roof Live Loads

Loads shall be applied on the horizontal projection of the roof structure. The minimum roof design live load shall be 20 psf.

1.3.2.3 Thermal Movement

System shall be capable of withstanding thermal movement based on a temperature range of 10 degrees F below 0 degrees F and 180 degrees F.

1.3.2.4 Deflection

Panels shall be capable of supporting design loads between unsupported spans with deflection of not greater than L/180 of the span.

1.3.3 Structural Performance

The structural performance test methods and requirements of the Standing Seam Roofing Systems (SSRS) shall be in accordance with ASTM E1592.

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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Roofing; G

Submit roofing drawings to supplement the instructions and diagrams. Drawings shall include design and erection drawings containing an isometric view of the roof showing the design uplift pressures and dimensions of edge, ridge and corner zones; and show

typical and special conditions including flashings, materials and thickness, dimensions, fixing lines, anchoring methods, sealant locations, sealant tape locations, fastener layout, sizes, and spacing, terminations, penetrations, attachments, and provisions for thermal movement. Details of installation shall be in accordance with the manufacturer's Standard Instructions and details or the SMACNA 1793. Prior to submitting shop drawings, have drawings reviewed and approved by the manufacturer's technical engineering department.

SD-03 Product Data

Roofing panels; G

Attachment clips

Closures

Accessories

Fasteners

Sealants

Insulation, including joint sealing measures for vapor barrier facing

Sample warranty certificate; G

Submit for materials to be provided. Submit data sufficient to indicate conformance to specified requirements.

SD-04 Samples

Roofing panel

Submit a 12 inch long by full width section of typical panel.

For color selection, submit 2 by 4 inch metal samples in color, finish and texture selected. When colors are not indicated, submit samples of not less than six different manufacturer's standard colors for selection.

Accessories

Submit each type of accessory item used in the project including, but not limited to each type of anchor clip, closure, fastener, and leg clamp.

Sealants

Intermediate Support Section

Submit full size samples of each intermediate support section, 12 inches long.

SD-05 Design Data

Design calculations

SD-06 Test Reports

Field Inspection; G

Submit manufacturer's technical representative's field inspection reports as specified in paragraph entitled "Manufacturer's Field Inspection."

Structural performance tests

Finish tests

SD-07 Certificates

Manufacturer's Technical Representative's Qualifications

Statement of Installer's Qualifications

Submit documentation from roofing manufacturer proving the manufacturer's technical representative meets below specified requirements. Include name, address, telephone number, and experience record.

Submit documentation proving the installer is factory-trained, has the specified experience, and authorized by the manufacturer to install the products specified.

SD-08 Manufacturer's Instructions

Installation manual; G

Submit manufacturers printed installation manual, instructions, and standard details.

SD-11 Closeout Submittals

Information card

For each roofing installation, submit a typewritten card or photoengraved aluminum card containing the information listed on Form 1 located at the end of this section.

1.5 DESIGN CALCULATIONS

Provide design calculations prepared by a professional engineer specializing in structural engineering verifying that system supplied and any additional framing meets design load criteria indicated. Coordinate calculations with manufacturer's test results. Include calculations for:

Windload uplift design pressure at roof locations specified in paragraph entitled "Wind Uplift."

Clip spacing and allowable load per clip.

Fastening of clips to structure or intermediate supports.

Intermediate support spacing and framing and fastening to structure when required.

Allowable panel span at anchorage spacing indicated.

Safety factor used in design loading.

Governing code requirements or criteria.

Edge and termination details.

1.6 QUALITY ASSURANCE

1.6.1 Preroofing Conference

After submittals are received and approved but before roofing and insulation work, including associated work, is preformed, the Contracting Officer will hold a preroofing conference to review the following:

a. The drawings and specifications

b. Procedure for on site inspection and acceptance of the roofing substrate and pertinent structural details relating to the roofing system

c. 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

d. Safety requirements

The preroofing conference shall be attended by the Contractor and personnel directly responsible for the roofing and insulation installation, , and the roofing manufacturer's technical representative. Conflicts among those attending the preroofing conference shall be resolved and confirmed in writing before roofing work, including associated work, is begun. Prepare written minutes of the preroofing conference and submit to the Contracting Officer.

1.6.2 Manufacturer

The SSMRS shall be the product of a metal roofing industry - recognized manufacturer who has been in the practice of manufacturing SSMRS for a period of not less than 5 years and who has been involved in at least 5 projects similar in size and complexity to this project.

1.6.3 Manufacturer's Technical Representative

The representative shall have authorization from manufacturer to approve field changes and be thoroughly familiar with the products and with installations in the geographical area where construction will take place. The manufacturer's representative shall be an employee of the manufacturer with at least 5 years experience in installing the roof system. The representative shall be available to perform field inspections and attend meetings as required herein, and as requested by the Contracting Officer.

1.6.4 Installer's Qualifications

The roofing system installer shall be factory-trained, approved by the metal roofing system manufacturer to install the system, and shall have a minimum of three years experience as an approved applicator with that

manufacturer. The applicator shall have applied five installations of similar size and scope as this project within the previous 3 years.

1.6.5 Single Source

Roofing panels, clips, closures, and other accessories shall be standard products of the same manufacturer; shall be the latest design by the manufacturer; and shall have been designed by the manufacturer to operate as a complete system for the intended use.

1.6.6 Laboratory Tests For Panel Finish

The term "appearance of base metal" refers to the metal coating on steel. Panels shall meet the following test requirements:

a. Formability Test: When subjected to a 180 degree bend over a 1/8 inch diameter mandrel in accordance with ASTM D522/D522M, exterior coating film shall show only slight microchecking and no loss of adhesion.

b. Accelerated Weathering Test: Withstand a weathering test for a minimum of 2000 hours in accordance with ASTM G152 and ASTM G153, Method 1 without cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal. Protective coating that can be readily removed from the base metal with a penknife blade or similar instrument shall be considered to indicate loss of adhesion.

c. Chalking Resistance: After the 2000-hour weatherometer test, exterior coating shall not chalk greater than No. 8 rating when measured in accordance with ASTM D4214 test procedures.

d. Color Change Test:

After the 2000 -hour weatherometer test, exterior coating color change shall not exceed 2 NBS units when measured in accordance with ASTM D2244 test procedure.

e. Salt Spray Test: Withstand a salt spray test for a minimum of 1000 hours in accordance with ASTM B117, including the scribe requirement in the test. Immediately upon removal of the panel from the test, the coating shall receive a rating of 10, no blisters in field as determined by ASTM D714; and an average rating of 7, 1/16 inch failure at scribe, as determined by ASTM D1654. Rating Schedule No. 1.

f. Abrasion Resistance Test for Color Coating: When subjected to the falling sand test in accordance with ASTM D968, coating system shall withstand a minimum of 50 liters of sand per mil thickness before appearance of base metal.

g. Humidity Test: When subjected to a humidity cabinet test in accordance with ASTM D2247 for 1000 hours, a scored panel shall show no signs of blistering, cracking, creepage, or corrosion.

h. Gloss Test: The gloss of the finish shall be 30 plus or minus 5 at an angle of 60 degrees, when measured in accordance with ASTM D523.

i. Glare Resistance Test:

Surfaces of panels that will be exposed to the exterior shall have a specular reflectance of not more than 10 when measured in accordance

with ASTM D523 at an angle of 85 degrees. Specular reflectance may be obtained with striations or embossing. Requirements specified under "Formability Test" will be waived if necessary to conform to this requirement.

1.7 WARRANTY

Furnish manufacturer's no-dollar-limit materials and workmanship warranty for the roofing system. The warranty period shall be not less than 20 years from the date of Government acceptance of the work. The warranty shall be issued directly to the Government. The warranty shall provide that if within the warranty period the metal roofing system becomes non-watertight or shows evidence of corrosion, perforation, rupture or excess weathering due to deterioration of the roofing system resulting from defective materials or installed workmanship the repair or replacement of the defective materials and correction of the defective workmanship shall be the responsibility of the roofing system manufacturer. Repairs that become necessary because of defective materials and workmanship while roofing is under warranty shall be performed within 7 days after notification, unless additional time is approved by the Contracting Officer. Failure to perform repairs within the specified period of time will constitute grounds for having the repairs performed by others and the cost billed to the manufacturer. The Contractor shall also provide a 2 year contractor installation warranty.

1.8 DELIVERY, STORAGE AND HANDLING

Deliver, store, and handle preformed panels, bulk roofing products and other manufactured items in a manner to prevent damage or deformation.

1.8.1 Delivery

Provide adequate packaging to protect materials during shipment. Crated materials shall not be uncrated until ready for use, except for inspection. Immediately upon arrival of materials at the jobsite, inspect materials for damage, dampness, and staining. Damaged or permanently stained materials that cannot be restored to like-new condition shall be replaced with satisfactory material. If materials are wet, remove the moisture and re-stack and protect the panels until used.

1.8.2 Storage

Stack materials on platforms or pallets and cover with tarpaulins or other suitable weathertight covering which prevents water trapping or condensation. Store materials so that water which might have accumulated during transit or storage will drain off. Do not store the panels in contact with materials that might cause staining, such as mud, lime, cement, fresh concrete or chemicals. Protect stored panels from wind damage.

1.8.3 Handling

Handle material carefully to avoid damage to surfaces, edges and ends.

PART 2 PRODUCTS

2.1 ROOFING PANELS

Panels shall have interlocking ribs for securing adjacent sheets. System

for securing the roof covering to structural framing members shall be concealed clip fastening system with no fasteners penetrating the panels except at the ridge or eave, rakes, penetrations, and end laps. Backing plates and ends of panels at end laps shall be predrilled or prepunched; factory prepare ends of panels to be lapped by trimming part of seam, die-setting or swaging ends of panels. Length of sheets shall be sufficient to cover the entire length of any unbroken roof slope when such slope is 30 feet or less. When length of run exceeds 30 feet, each sheet in the run shall extend over two or more spans. Sheets longer than 30 feet may be furnished if approved by the Contracting Officer. Width of sheets shall provide not less than 12 inches of coverage in place. Height of corrugations of adjacent roof sheets shall be not less than 2.25 inches (nominal). Make provisions for expansion and contraction at either ridge or eave, consistent with the type of system to be used. Panels from coil stock shall be formed without warping, waviness or ripples not part of the panel profile and shall be free of damage to the finish coating system.

2.1.1 Material

Zinc-coated steel conforming to ASTM A653/A653M, G90coating designation or aluminum-zinc alloy coated steel conforming to ASTM A792/A792M, AZ 55 coating. Minimum thickness to be 0.023 inch thick (24 gage) minimum except when mid field of roof is subject to design wind uplift pressures of 60 psf or greater, entire roof system shall have a minimum thickness of 0.030 inch (22 gage).

2.1.2 Texture

Smooth with raised intermediate ribs for added stiffness.

2.1.3 Finish

Factory color finish.

2.1.3.1 Factory Color Finish

Provide factory applied, thermally cured coating to exterior and interior of metal roof and wall panels and metal accessories. Provide exterior finish top coat of 70 percent resin polyvinylidene fluoride with not less than 0.8 mil dry film thickness. Provide exterior primer standard with panel manufacturer with not less than 0.8 mil dry film thickness. Interior finish shall consist of the same coating and dry film thickness as the exterior coating. Provide exterior and interior coating meeting test requirements specified below. Tests shall have been performed on the same factory finish and thickness provided. Provide clear factory edge coating on all factory cut or unfinished edges.

2.2 INTERMEDIATE SUPPORTS

Fabricate panel subgirts, subpurlins, T-bars, Z-bars and tracks from galvanized steel conforming to ASTM A653/A653M, G90, Grade D (16 gage and heavier), Grade A (18 gage and lighter); or steel conforming to ASTM A36/A36M, ASTM A1011/A1011M , or ASTM A1008/A1008M prime painted with zinc-rich primer. Size, shape, thickness and capacity as required to meet the load, insulation thickness and deflection criteria specified.

2.3 ATTACHMENT CLIPS

Fabricate clips from ASTM A1011/A1011M, or ASTM A1008/A1008M steel hot-dip

galvanized in accordance with ASTM A653/A653M, G 90, or Series 300 stainless steel. Size, shape, thickness and capacity as required to meet the load, insulation thickness and deflection criteria specified.

2.4 ACCESSORIES

Sheet metal flashings, gutters, downspouts, trim, moldings, closure strips, pre-formed crickets, caps, equipment curbs, and other similar sheet metal accessories used in conjunction with preformed metal panels shall be of the same material as used for the panels. Provide metal accessories with a factory color finish to match the roofing panels, except that such items which will be concealed after installation may be provided without the finish if they are stainless steel. Metal shall be of a thickness not less than that used for the panels. Thermal spacer blocks and other thermal barriers at concealed clip fasteners shall be as recommended by the manufacturer except that wood spacer blocks are not allowed.

2.4.1 Closures

2.4.1.1 Rib Closures

Corrosion resisting steel, closed-cell or solid-cell synthetic rubber, neoprene or polyvinyl chloride pre-molded to match configuration of rib opening. Material for closures shall not absorb water.

2.4.1.2 Ridge Closures

Metal-clad foam or metal closure with foam secondary closure matching panel configuration for installation on surface of roof panel between panel ribs at ridge and headwall roof panel flashing conditions and terminations. Foam material shall not absorb water.

2.4.2 Fasteners

Zinc-coated steel, corrosion resisting steel, zinc cast head, or nylon capped steel, type and size specified below or as otherwise approved for the applicable requirements. Design the fastening system to withstand the design loads specified. Exposed fasteners shall be gasketed or have gasketed washers on the exterior side of the covering to waterproof the penetration. Washer material shall be compatible with the covering; have a minimum diameter of 3/8 inch for structural connections; and gasketed portion of fasteners or washers shall be neoprene or other equally durable elastomeric material approximately 1/8 inch thick.

2.4.2.1 Screws

Not smaller than No. 14 diameter if self-tapping type and not smaller than No. 12 diameter if self-drilling and self-tapping.

2.4.2.2 Bolts

Not smaller than 1/4 inch diameter, shouldered or plain shank as required, with proper nuts.

2.4.2.3 Automatic End-Welded Studs

Automatic end-welded studs shall be shouldered type with a shank diameter of not smaller than 3/16 inch and cap or nut for holding covering against the shoulder.

2.4.2.4 Explosive Driven Fasteners

Fasteners for use with explosive actuated tools shall have a shank diameter of not smaller than 0.145 inch with a shank length of not smaller than 1/2 inch for fastening to steel and not smaller than one inch for fastening to concrete.

2.4.2.5 Rivets

Blind rivets shall be stainless steel with 1/8 inch nominal diameter shank. Rivets shall be threaded stem type if used for other than the fastening of trim. Rivets with hollow stems shall have closed ends.

2.4.3 Sealants

Elastomeric type containing no oil or asphalt. Exposed sealant shall cure to a rubberlike consistency. Concealed sealant shall be the non-hardening type. Seam sealant shall be factory-applied, non-skinning, non-drying, and shall conform to the roofing manufacturer's recommendations. Silicone-based sealants shall not be used in contact with finished metal panels and components unless approved otherwise by the Contracting Officer.

2.4.4 GASKETS AND INSULATING COMPOUNDS

Nonabsorptive and suitable for insulating contact points of incompatible materials. Insulating compounds shall be nonrunning after drying.

2.5 THERMAL INSULATION

Flexible blanket, rigid, or semi-rigid faced with a flexible vapor retarder. Insulation and facing shall have a flame-spread rating of 50 or less in accordance with ASTM E84. Vapor retarder facing shall have a permeance rating of 0.05 perm or less. Provide a thermal resistance "R" value of 20 or more. Facings and finishes shall be factory-applied.

2.6 UNDERLAYMENT FOR WOOD SUBSTRATES

ASTM D226/D226M, Type I perforated, covered by water-resistant rosin sized building paper.

2.7 LINER PANELS

Fabricate liner panels of the same material as roof panels, and formed or patterned to prevent waviness and distortion. Liner panels shall have a factory applied, one mil thick minimum painted coating on the inside face and a prime coat on the liner side.

PART 3 EXECUTION

3.1 EXAMINATION

Examine surfaces to receive standing seam metal roofing and flashing. Ensure that surfaces are plumb and true, clean, even, smooth, as dry and free from defects and projections which might affect the installation.

3.2 PROTECTION FROM CONTACT WITH DISSIMILAR MATERIALS

3.2.1 Cementitious Materials

Paint metal surfaces which will be in contact with mortar, concrete, or other masonry materials with one coat of alkali-resistant coating such as heavy-bodied bituminous paint.

3.2.2 Contact with Wood

Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.3 INSTALLATION

Install in accordance with the approved manufacturer's erection instructions, shop drawings, and diagrams. Panels shall be in full and firm contact with attachment clips. Where prefinished panels are cut in the field, or where any of the factory applied coverings or coatings are abraded or damaged in handling or installation, they shall, after necessary repairs have been made with material of the same color as the weather coating, be approved before being installed. Seal completely openings through panels. Correct defects or errors in the materials. Replace materials which cannot be corrected in an approved manner with nondefective materials. Provide molded closure strips where indicated and where necessary to provide weathertight construction. Use shims as required to ensure attachment clip line is true. Use a spacing gage at each row of panels to ensure that panel width is not stretched or shortened.

3.3.1 Roof Panels

Apply roofing panels with the standing seams parallel to the slope of the roof. Provide roofing panels in longest practical lengths from ridge to eaves (top to eaves on shed roofs), with no transverse joints except at the junction of ventilators, curbs, skylights, chimneys, and similar openings. Install flashing to assure positive water drainage away from roof penetrations. Locate panel end laps such that fasteners do not engage supports or otherwise restrain the longitudinal thermal movement of panels. Form field-formed seam type system seams in the field with an automatic mechanical seamer approved by the manufacturer. Attach panels to the structure with concealed clips incorporated into panel seams. Clip attachment shall allow roof to move independently of the structure, except at fixed points as indicated.

3.3.2 Insulation Installation

Insulation shall be installed between covering and supporting members to present a neat appearance. Fold and staple and tape seams unless approved otherwise by the Contracting Officer.

3.3.2.1 Rigid or Semi-Rigid Insulation

Install in areas where insulation is exposed to view. Fasten securely without loose joints or unsightly sags.

3.3.2.2 Blanket Insulation

May be used in concealed locations. Lap facing at joints and fasten in a

manner that will provide tight joints.

3.3.3 Flashings

Provide flashing, related closures and accessories as indicated and as necessary to provide a weathertight installation. Install flashing to ensure positive water drainage away from roof penetrations. Flash and seal the roof at the ridge, eaves and rakes, and projections through the roof. Place closure strips, flashing, and sealing material in an approved manner that will assure complete weathertightness. Details of installation which are not indicated shall be in accordance with the SMACNA 1793, panel manufacturer's approved printed instructions and details, or the approved shop drawings. Allow for expansion and contraction of flashing.

3.3.4 Flashing Fasteners

Fastener spacings shall be in accordance with the panel manufacturer's recommendations and as necessary to withstand the design loads indicated. Install fasteners in roof valleys as recommended by the manufacturer of the panels. Install fasteners in straight lines within a tolerance of 1/2 inch in the length of a bay. Drive exposed penetrating type fasteners normal to the surface and to a uniform depth to seat gasketed washers properly and drive so as not to damage factory applied coating. Exercise extreme care in drilling pilot holes for fastenings to keep drills perpendicular and centered. Do not drill through sealant tape. After drilling, remove metal filings and burrs from holes prior to installing fasteners and washers. Torque used in applying fasteners shall not exceed that recommended by the manufacturer. Remove panels deformed or otherwise damaged by over-torqued fastenings, and provide new panels.

3.3.5 Rib and Ridge Closure/Closure Strips

Set closure/closure strips in joint sealant material and apply sealant to mating surfaces prior to adding panel.

3.4 PROTECTION OF APPLIED ROOFING

Do not permit storing, walking, wheeling, and trucking directly on applied roofing materials. Provide temporary walkways, runways, and platforms of smooth clean boards or planks as necessary to avoid damage to applied roofing materials, and to distribute weight to conform to indicated live load limits of roof construction.

3.5 CLEANING

Clean exposed sheet metal work at completion of installation. Remove metal shavings, filings, nails, bolts, and wires from roofs. Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean. Exposed metal surfaces shall be free of dents, creases, waves, scratch marks, solder or weld marks and damage to the finish coating.

3.6 MANUFACTURER'S FIELD INSPECTION

Manufacturer's technical representative shall visit the site as necessary during the installation process to assure panels, flashings, and other components are being installed in a satisfactory manner. Manufacturer's technical representative shall perform a field inspection during the first 20 squares of roof panel installation and at substantial completion prior

to issuance of warranty, as a minimum, and as otherwise requested by the Contracting Officer. Additional inspections shall not exceed one for 100 squares of total roof area with the exception that follow-up inspections of previously noted deficiencies or application errors shall be performed as requested by the Contracting Officer. Each inspection visit shall include a review of the entire installation to date. After each inspection, a report, signed by the manufacturer's technical representative, shall be submitted to the Contracting Officer noting the overall quality of work, deficiencies and any other concerns, and recommended corrective actions in detail. Notify Contracting Officer a minimum of 2 working days prior to site visit by manufacturer's technical representative.

3.7 COMPLETED WORK

Completed work shall be plumb and true without oil canning, dents, ripples, abrasion, rust, staining, or other damage detrimental to the performance or aesthetics of the completed roof assembly.

3.8 INFORMATION CARD

For each roof, provide a typewritten card, laminated in plastic and framed for interior display or a photoengraved 0.032 inch thick aluminum card for exterior display. Card to be 8 1/2 by 11 inches minimum and contain the information listed on Form 1 at end of this section. Install card near point of access to roof, or where indicated. Send a photostatic paper copy to .

3.9 FORM ONE

FORM 1 - PREFORMED STEEL STANDING SEAM ROOFING SYSTEM COMPONENTS

1. Contract Number:

2. Building Number & Location:

3. NAVFAC Specification Number:

4. Deck/Substrate Type:

5. Slopes of Deck/Roof Structure:

6. Insulation Type & Thickness:

7. Insulation Manufacturer:

8. Vapor Retarder: ( )Yes ( )No

9. Vapor Retarder Type:

10. Preformed Steel Standing Seam Roofing Description:

a. Manufacturer (Name, Address, & Phone No.):
b. Product Name: c. Width: d. Gage:
e. Base Metal: f. Method of Attachment:

11. Repair of Color Coating:

a. Coating Manufacturer (Name, Address & Phone No.):
b. Product Name:
c. Surface Preparation:
d. Recoating Formula:
e. Application Method:

12. Statement of Compliance or Exception:_____
_____
_____

13. Date Roof Completed:

14. Warranty Period: From_____ To_____

15. Roofing Contractor (Name & Address):

16. Prime Contractor (Name & Address):

Contractor's Signature _____ Date:

Inspector's Signature _____ Date:

-- End of Section --

SECTION 07 72 20

GRAVITY-TYPE ROOF VENTILATORS
08/09

PART 1 GENERAL

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 SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

ASTM INTERNATIONAL (ASTM)

ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

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

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition

1.2 DESIGN REQUIREMENTS

Design ventilators for use with the specific type of project roofing system, and to provide uniform and continuous air flow. Ventilator design shall provide protection against rain and snow, and shall be provided with a continuous weep along the bottom of both sides of wind band. Units shall be self-cleaning by the action of the elements, and shall have provisions for carrying water and normal wind-transported soil matter to the outside. Design units for windspeeds of not less than 90 mph in accordance with ASCE 7. Ventilators shall be free of internal obstructions or moving parts which will require maintenance, and shall be complete with type of mounting indicated on drawings.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Roof Ventilators; G

1.4 QUALITY ASSURANCE

Manufacturer shall specialize in design and manufacture of the type of roof ventilators specified in this section, and shall have a minimum of 3 years of documented successful experience. Provide a ventilator installer experienced in the installation of ventilator types specified.

1.5 DELIVERY, STORAGE, AND HANDLING

Roof ventilators shall be cartoned or crated prior to shipment. Protect ventilators from moisture and damage. Remove damaged items from the site.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Aluminum Extrusions

Aluminum extrusions shall be alloy 6063, temper T5 in compliance with ASTM B221.

2.1.2 Aluminum Sheets

Aluminum sheets shall be alloy 5005, temper H15 or alloy 3003, temper H14 in compliance with ASTM B209.

2.1.3 Galvanized Steel Sheets

Steel sheets shall be commercial quality, zinc-coated steel (hot-dip galvanized) of quality established by ASTM A653/A653M, minimum G90 coating thickness.

2.2 RIDGE VENTILATORS

Provide roof ridge ventilators fabricated of galvanized steel or aluminum, and assembled to any desired length. Continuous-run ridge ventilators shall be connected with splice plates of type which will telescope together and not require fasteners, soldering or welding. Provide ventilators with UL labeled fire-actuated damper system complete with accessories to meet building code requirements. Dampers and airshafts shall be complete with urethane gasketing for extra-tight enclosures. Provide metal closure strips, which match the panel roof rib contours, to close out weather and provide a secure seat for ventilators. Insect and Bird screens shall be provided.

2.3 STATIONARY VENTILATORS

Provide stationary roof ventilators fabricated of galvanized steel or aluminum with seamless spun conical-shaped weathercap, and having straight-through drainage for eliminating the possibility of air-borne debris collecting in the ventilator openings. Insect and Bird screens shall be provided.

2.4 TURBINE VENTILATORS

Provide turbine ventilators fabricated of galvanized steel or aluminum sheets, complete with sensitive ball-bearing action to enable the slightest motion of air to move the rotor head where suction is maintained at low

wind velocities. Ventilators shall have 360 degree operating surface to assure access of wind currents regardless of wind velocities. Rotor head shall be anchored to prevent head from lifting or jumping off the rotor in high winds. Rotor crown plate shall be seamless. Bird and Insect screens shall be provided.

2.4.1 Dampers

Turbine ventilators shall be provided with dampers manually-operated with direct pull-chain or rack and pinion when required by the task order.

2.4.2 Rotor Shaft

Rotor shaft bearings shall be entirely shielded in corrosion-resistant aluminum casing. Bearings shall be pre-lubricated and shall have life-time warranty. Bearings shall be at top and bottom to assure accurate alignment. Shaft and bearings shall be easily replaceable as a unit. Rotor collar shall be rolled and welded.

2.5 FABRICATION

Ventilators shall be fabricated in accordance with approved shop drawings. Welds, soldered seams, rivets and fasteners shall be clean, secure, watertight, and smooth. Edges shall be wired or beaded, where necessary, to ensure rigidity. Joints between sections shall be watertight and shall allow for expansion and contraction. Galvanic action between different metals in direct contact shall be prevented by nonconductive separators.

2.6 CURB BASES

Ventilator bases for curb-mounted installations shall be of size indicated on drawings, and shall be designed specifically for the type of ventilator and roofing system approved for this project. Curb bases shall be factory-formed and flashed for a watertight installation. Curb bases shall be fabricated of material and finish to match the ventilator.

2.7 SCREENS

Screens shall be furnished by ventilator manufacturer as part of ventilator assembly. Screen (with frames) shall be manufactured of material to match ventilators, and shall be designed to be easily removed for cleaning purposes.

2.8 FINISH

2.8.1 Galvanized Steel Finish

Galvanized steel roof ventilators shall be factory-coated with rust-resistant primer and baked-on finish coats of acrylic finish coats to match metal roof panels two-coat high-performance coating system field-painted in accordance with Section 09 90 00 PAINTS AND COATINGS .

2.8.2 Aluminum Finish

Aluminum roof ventilators shall be factory-finished to match metal roof finish and color with two-coat fluoropolymer high-performance coating system .

2.8.3 Color

Color shall be in accordance with Section 09 06 90 COLOR SCHEDULE .

PART 3 EXECUTION

3.1 PREPARATION

Prepare rough openings and other roof conditions in accordance with approved shop drawings and manufacturer's recommendations. Rough openings shall be field-measured and recorded on shop drawings prior to fabrication of roof ventilators. Before starting the ventilator work, protect surrounding roof surfaces from damage. Coordinate fabrication with construction schedule. Submit dimensioned drawings indicating location of each type of ventilator including details of construction, gauges of metal, and methods of operation of dampers and controls.

3.2 INSTALLATION

Coordinate roof ventilator installation with roofing work, and in accordance with approved shop drawings, manufacturer's published instructions, and chapter 8 of SMACNA 1793. The ventilator installation shall be watertight and free of vibration noise. Protect aluminum surfaces from direct contact with incompatible materials. Aluminum surfaces which will be in contact with sealant shall not be coated with a protective material. Aluminum shall not be used with copper or with water which flows over copper surfaces. Clean roof ventilators in accordance with ventilator manufacturer's recommendations.

3.3 PROTECTION

Protect exposed ventilator finish surfaces against the accumulation of paint, grime, mastic, disfigurement, discoloration and damage for duration of construction activities.

-- End of Section --

SECTION 09 90 00

PAINTS AND COATINGS
05/11

PART 1 GENERAL

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 CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH 0100	(2001; Supplements 2002-2008) Documentation of the Threshold Limit Values and Biological Exposure Indices

ASTM INTERNATIONAL (ASTM)

ASTM C920	(2014a) Standard Specification for Elastomeric Joint Sealants
ASTM D235	(2002; R 2012) Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
ASTM D2824/D2824M	(2013) Aluminum-Pigmented Asphalt Roof Coatings, Non-Fibered, Asbestos Fibered, and Fibered without Asbestos
ASTM D4214	(2007) Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D4263	(1983; R 2012) Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM D4444	(2013) Use and Calibration of Hand-Held Moisture Meters
ASTM D523	(2014) Standard Test Method for Specular Gloss
ASTM D6386	(2010) Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
ASTM E2129	(2010) Standard Practice for Data Collection for Sustainability Assessment of Building Products
ASTM F1869	(2011) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

MASTER PAINTERS INSTITUTE (MPI)

MPI 1	(Oct 2009) Aluminum Paint
MPI 10	(Oct 2009) Exterior Latex, Flat, MPI Gloss Level 1
MPI 101	(Oct 2009) Epoxy Anti-Corrosive Metal Primer
MPI 107	(Oct 2009) Rust Inhibitive Primer (Water-Based)
MPI 108	(Oct 2009) High Build Epoxy Coating, Low Gloss
MPI 11	(Oct 2009) Exterior Latex, Semi-Gloss, MPI Gloss Level 5
MPI 113	(Oct 2009) Exterior Pigmented Elastomeric Coating (Water Based)
MPI 119	(Oct 2009) Exterior Latex, Gloss
MPI 134	(Oct 2009) Galvanized Primer (Waterbased)
MPI 16	(Oct 2009) Exterior Latex-Based Solid Hide Stain
MPI 163	(Oct 2009) Exterior W.B. Light Industrial Coating, Semi-Gloss, MPI Gloss Level 5
MPI 164	(Oct 2009) Exterior W.B. Light Industrial Coating, Gloss, MPI Gloss Level 6
MPI 22	(Oct 2009) Aluminum Paint, High Heat (up to 590 degrees C and 1100 degrees F.
MPI 23	(Oct 2009) Surface Tolerant Metal Primer
MPI 26	(Oct 2009) Cementitious Galvanized Metal Primer
MPI 27	(Oct 2009) Exterior / Interior Alkyd Floor Enamel, Gloss
MPI 4	(Oct 2009) Interior/Exterior Latex Block Filler
MPI 42	(Oct 2009) Latex Stucco and Masonry Textured Coating
MPI 5	(Oct 2009) Exterior Alkyd Wood Primer
MPI 6	(Oct 2009) Exterior Latex Wood Primer
MPI 68	(Oct 2009) Interior/Exterior Latex Floor Enamel, Gloss

MPI 7	(Oct 2009) Exterior Oil Wood Primer
MPI 72	(Oct 2009) Polyurethane, Two Component, Pigmented, Gloss
MPI 79	(Oct 2009) Alkyd Anti-Corrosive Metal Primer
MPI 8	(Oct 2009) Exterior Alkyd, Flat, MPI Gloss Level I
MPI 9	(Oct 2009) Exterior Alkyd, Gloss, MPI Gloss Level 6
MPI 94	(Oct 2009) Exterior Alkyd, Semi-Gloss, MPI Gloss Level 5
MPI 95	(Oct 2009) Quick Drying Primer for Aluminum

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS SP-01	(2000) Environmentally Preferable Product Specification for Architectural and Anti-Corrosive Paints

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC 7/NACE No.4	(2007; E 2004) Brush-Off Blast Cleaning
SSPC Guide 6	(2004) Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations
SSPC Guide 7	(2004; E 2004) Guide to the Disposal of Lead-Contaminated Surface Preparation Debris
SSPC PA 1	(2000; E 2004) Shop, Field, and Maintenance Painting of Steel
SSPC PA Guide 3	(1982; E 1995) A Guide to Safety in Paint Application
SSPC Paint 18	(1982; E 2004) Chlorinated Rubber Intermediate Coat Paint
SSPC SP 1	(2015) Solvent Cleaning
SSPC SP 10/NACE No. 2	(2007) Near-White Blast Cleaning
SSPC SP 12/NACE No.5	(2002) Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating
SSPC SP 2	(1982; E 2000; E 2004) Hand Tool Cleaning
SSPC SP 3	(1982; E 2004) Power Tool Cleaning
SSPC SP 6/NACE No.3	(2007) Commercial Blast Cleaning

SSPC VIS 1	(2002; E 2004) Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
SSPC VIS 3	(2004) Guide and Reference Photographs for Steel Surfaces Prepared by Hand and Power Tool Cleaning
SSPC VIS 4/NACE VIS 7	(1998; E 2000; E 2004) Guide and Reference Photographs for Steel Surfaces Prepared by Waterjetting

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FED-STD-313	(2014; Rev E) Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

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

29 CFR 1910.1000	Air Contaminants
29 CFR 1910.1001	Asbestos
29 CFR 1910.1025	Lead
29 CFR 1926.62	Lead

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Samples of specified materials may be taken and tested for compliance with

specification requirements.

In keeping with the intent of Executive Order 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition", products certified by SCS as meeting SCS SP-01 shall be given preferential consideration over registered products. Products that are registered shall be given preferential consideration over products not carrying any EPP designation.

SD-02 Shop Drawings

Piping identification

Submit color stencil codes

SD-03 Product Data

Materials; (LEED NC)

Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

Coating; G

Manufacturer's Technical Data Sheets; (LEED)

Indicate VOC content.

SD-04 Samples

Color; G

Submit manufacturer's samples of paint colors. Cross reference color samples to color scheme as indicated.

Textured Wall Coating System; G

Sample Textured Wall Coating System Mock-Up; G

SD-07 Certificates

Applicator's qualifications

Qualification Testing laboratory for coatings; G

SD-08 Manufacturer's Instructions

Application instructions

Mixing

Detailed mixing instructions, minimum and maximum application

temperature and humidity, potlife, and curing and drying times between coats.

Manufacturer's Material Safety Data Sheets

Submit manufacturer's Material Safety Data Sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

SD-10 Operation and Maintenance Data

Coatings:; G

Preprinted cleaning and maintenance instructions for all coating systems shall be provided.

SD-11 Closeout Submittals

1.3 APPLICATOR'S QUALIFICATIONS

1.3.1 Contractor Qualification

Submit the name, address, telephone number, FAX number, and e-mail address of the contractor that will be performing all surface preparation and coating application. Submit evidence that key personnel have successfully performed surface preparation and application of coatings on roofs on a minimum of three similar projects within the past three years. List information by individual and include the following:

a. Name of individual and proposed position for this work.

b. Information about each previous assignment including:

Position or responsibility

Employer (if other than the Contractor)

Name of facility owner

Mailing address, telephone number, and telex number (if non-US) of facility owner

Name of individual in facility owner's organization who can be contacted as a reference

Location, size and description of structure

Dates work was carried out

Description of work carried out on structure

1.4 QUALITY ASSURANCE

1.4.1 Field Samples and Tests

The Contracting Officer may choose up to two coatings that have been delivered to the site to be tested at no cost to the Government. Take samples of each chosen product as specified in the paragraph "Sampling Procedures." Test each chosen product as specified in the paragraph "Testing Procedure." Products which do not conform, shall be removed from the job site and replaced with new products that conform to the referenced specification. Testing of replacement products that failed initial testing shall be at no cost to the Government.

Another required testing is Batch Quality Conformance Testing to prove conformance of the manufacturer's paint to the specified MPI standard. This testing is accomplished before the materials are delivered to the job site. Provide testing for each paint products. Test paint products as specified in the paragraph "Testing Procedure".

1.4.1.1 Sampling Procedure

The Contracting Officer will select paint at random from the products that have been delivered to the job site for sample testing. The Contractor shall provide one quart samples of the selected paint materials. The samples shall be taken in the presence of the Contracting Officer, and labeled, identifying each sample. Provide labels in accordance with the paragraph "Packaging, Labeling, and Storage" of this specification.

1.4.1.2 Testing Procedure

Provide Batch Quality Conformance Testing for specified products, as defined by and performed by MPI. As an alternative to Batch Quality Conformance Testing, the Contractor may provide Qualification Testing for specified products above to the appropriate MPI product specification, using the third-party laboratory approved under the paragraph "Qualification Testing" laboratory for coatings. The qualification testing lab report shall include the backup data and summary of the test results. The summary shall list all of the reference specification requirements and the result of each test. The summary shall clearly indicate whether the tested paint meets each test requirement. Note that Qualification Testing may take 4 to 6 weeks to perform, due to the extent of testing required.

Submit name, address, telephone number, FAX number, and e-mail address of the independent third party laboratory selected to perform testing of coating samples for compliance with specification requirements. Submit documentation that laboratory is regularly engaged in testing of paint samples for conformance with specifications, and that employees performing testing are qualified. If the Contractor chooses MPI to perform the Batch Quality Conformance testing, the above submittal information is not required, only a letter is required from the Contractor stating that MPI will perform the testing.

1.4.2 Textured Wall Coating System

Three complete samples of each indicated type, pattern, and color of textured wall coating system applied to a panel of the same material as that on which the coating system will be applied in the work. Samples of wall coating systems shall be minimum 5 by 7 inches and of sufficient size to show pattern repeat and texture.

1.4.3 Sample Textured Wall Coating System Mock-Up

After coating samples are approved, and prior to starting installation, a minimum 8 foot by 8 foot mock-up shall be provided for each substrate and for each color and type of textured wall coating, using the actual substrate materials. Once approved the mock-up samples shall be used as a standard of workmanship for installation within the facility. At least 48 hours prior to mock-up installation, the Contractor shall submit written notification to the Contracting Officer's Representative.

1.5 REGULATORY REQUIREMENTS

1.5.1 Environmental Protection

In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the local Air Pollution Control District and regional jurisdiction. Notify Contracting Officer of any paint specified herein which fails to conform.

1.5.2 Lead Content

Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

1.5.3 Chromate Content

Do not use coatings containing zinc-chromate or strontium-chromate.

1.5.4 Asbestos Content

Materials shall not contain asbestos.

1.5.5 Mercury Content

Materials shall not contain mercury or mercury compounds.

1.5.6 Silica

Abrasive blast media shall not contain free crystalline silica.

1.5.7 Human Carcinogens

Materials shall not contain ACGIH 0100 confirmed human carcinogens (A1) or suspected human carcinogens (A2).

1.6 PACKAGING, LABELING, AND STORAGE

Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F. Do not store paint, polyurethane,

varnish, or wood stain products with materials that have a high capacity to adsorb VOC emissions, . Do not store paint, polyurethane, varnish, or wood stain products in occupied spaces.

1.7 SAFETY AND HEALTH

Apply coating materials using safety methods and equipment in accordance with the following:

Work shall comply with applicable Federal, State, and local laws and regulations, and with the ACCIDENT PREVENTION PLAN, including the Activity Hazard Analysis as specified in Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS and in Appendix A of EM 385-1-1. The Activity Hazard Analysis shall include analyses of the potential impact of painting operations on painting personnel and on others involved in and adjacent to the work zone.

1.7.1 Safety Methods Used During Coating Application

Comply with the requirements of SSPC PA Guide 3.

1.7.2 Toxic Materials

To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:

a. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.

b. 29 CFR 1910.1000.

c. ACGIH 0100, threshold limit values.

d. The appropriate OSHA standard in 29 CFR 1910.1025 and 29 CFR 1926.62 for surface preparation on painted surfaces containing lead. Removal and disposal of coatings which contain lead is specified in Section 02 83 13.00 20 LEAD IN CONSTRUCTION." Additional guidance is given in SSPC Guide 6 and SSPC Guide 7. Refer to drawings for list of hazardous materials located on this project. Contractor to coordinate paint preparation activities with this specification section.

e. The appropriate OSHA standards in 29 CFR 1910.1001 for surface preparation of painted surfaces containing asbestos. Removal and disposal of coatings which contain asbestos materials is specified in Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS. Refer to drawings for list of hazardous materials located on this project. Contractor to coordinate paint preparation activities with this specification section.

1.8 ENVIRONMENTAL CONDITIONS

Comply, at minimum, with manufacturer recommendations for space ventilation during and after installation. Isolate area of application from rest of building when applying high-emission paints or coatings.

1.8.1 Coatings

Do not apply coating when air or substrate conditions are:

a. Less than 5 degrees F above dew point;

b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

1.8.2 Post-Application

Vacate space for as long as possible after application. Wait a minimum of 48 hours before occupying freshly painted rooms. Maintain one of the following ventilation conditions during the curing period, or for 72 hours after application:

a. Supply 100 percent outside air 24 hours a day.

b. Supply airflow at a rate of 6 air changes per hour, when outside temperatures are between 55 degrees F and 85 degrees F and humidity is between 30 percent and 60 percent.

c. Supply airflow at a rate of 1.5 air changes per hour, when outside air conditions are not within the range stipulated above.

1.9 SUSTAINABLE DESIGN REQUIREMENTS

1.9.1 Local/Regional Materials

See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Paint and coating materials may be locally available.

1.9.2 Environmental Data

Submit Table 1 of ASTM E2129 for the following products: paint.

1.10 SCHEDULING

Allow paint, polyurethane, varnish, and wood stain installations to cure prior to the installation of materials that adsorb VOCs, including gypsum.

1.11 COLOR SELECTION

Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Contracting Officer. Manufacturers' names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

Tint each coat progressively darker to enable confirmation of the number of coats.

Color, texture, and pattern of wall coating systems shall be as indicated .

1.12 LOCATION AND SURFACE TYPE TO BE PAINTED

1.12.1 Painting Included

Where a space or surface is indicated to be painted, include the following

unless indicated otherwise.

a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.

b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.

c. Existing coated surfaces that are damaged during performance of the work.

1.12.1.1 Exterior Painting

Includes new surfaces, existing coated surfaces, and existing uncoated surfaces, of the buildings and appurtenances. Also included are existing coated surfaces made bare by cleaning operations.

1.12.1.2 Interior Painting

Includes new surfaces, existing uncoated surfaces, and existing coated surfaces of the buildings and appurtenances as indicated and existing coated surfaces made bare by cleaning operations. Where a space or surface is indicated to be painted, include the following items, unless indicated otherwise.

a. Exposed columns, girders, beams, joists, and metal deck; and

b. Other contiguous surfaces.

1.12.2 Painting Excluded

Do not paint the following unless indicated otherwise.

a. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.

b. Surfaces in concealed spaces. Concealed spaces are defined as enclosed spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, elevator shafts and chases.

c. Steel to be embedded in concrete.

d. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.

e. Hardware, fittings, and other factory finished items.

1.12.3 Mechanical and Electrical Painting

Includes field coating of interior and exterior new and existing surfaces.

a. Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.

(1) Exposed piping, conduit, and ductwork;

(2) Supports, hangers, air grilles, and registers;

(3) Miscellaneous metalwork and insulation coverings.

1.12.4 MISCELLANEOUS PAINTING

Lettering Building Room Number(s)

Lettering shall be provided as scheduled on the drawings, shall be block type, and shall be water-type decalcomania, finished with a protective coating of spar varnish. Samples shall be approved before application.

1.12.5 Definitions and Abbreviations

1.12.5.1 Qualification Testing

Qualification testing is the performance of all test requirements listed in the product specification. This testing is accomplished by MPI to qualify each product for the MPI Approved Product List, and may also be accomplished by Contractor's third party testing lab if an alternative to Batch Quality Conformance Testing by MPI is desired.

1.12.5.2 Batch Quality Conformance Testing

Batch quality conformance testing determines that the product provided is the same as the product qualified to the appropriate product specification. This testing shall only be accomplished by MPI testing lab.

1.12.5.3 Coating

A film or thin layer applied to a base material called a substrate. A coating may be a metal, alloy, paint, or solid/liquid suspensions on various substrates (metals, plastics, wood, paper, leather, cloth, etc.). They may be applied by electrolysis, vapor deposition, vacuum, or mechanical means such as brushing, spraying, calendaring, and roller coating. A coating may be applied for aesthetic or protective purposes or both. The term "coating" as used herein includes emulsions, enamels, stains, varnishes, sealers, epoxies, and other coatings, whether used as primer, intermediate, or finish coat. The terms paint and coating are used interchangeably.

1.12.5.4 DFT or dft

Dry film thickness, the film thickness of the fully cured, dry paint or coating.

1.12.5.5 DSD

Degree of Surface Degradation, the MPI system of defining degree of surface degradation. Five (5) levels are generically defined under the Assessment sections in the MPI Maintenance Repainting Manual.

1.12.5.6 EPP

Environmentally Preferred Products, a standard for determining environmental preferability in support of Executive Order 13101.

1.12.5.7 EXT

MPI short term designation for an exterior coating system.

1.12.5.8 INT

MPI short term designation for an interior coating system.

1.12.5.9 micron / microns

The metric measurement for 0.001 mm or one/one-thousandth of a millimeter.

1.12.5.10 mil / mils

The English measurement for 0.001 in or one/one-thousandth of an inch, equal to 25.4 microns or 0.0254 mm.

1.12.5.11 mm

The metric measurement for millimeter, 0.001 meter or one/one-thousandth of a meter.

1.12.5.12 MPI Gloss Levels

MPI system of defining gloss. Seven (7) gloss levels (G1 to G7) are generically defined under the Evaluation sections of the MPI Manuals. Traditionally, Flat refers to G1/G2, Eggshell refers to G3, Semigloss refers to G5, and Gloss refers to G6.

Gloss levels are defined by MPI as follows:

Gloss Level	Description	Units at 60 degrees	Units at 85 degrees
G1	Matte or Flat	0 to 5	10 max
G2	Velvet	0 to 10	10 to 35
G3	Eggshell	10 to 25	10 to 35
G4	Satin	20 to 35	35 min
G5	Semi-Gloss	35 to 70	
G6	Gloss	70 to 85	
G7	High Gloss		

Gloss is tested in accordance with ASTM D523. Historically, the Government has used Flat (G1 / G2), Eggshell (G3), Semi-Gloss (G5), and Gloss (G6).

1.12.5.13 MPI System Number

The MPI coating system number in each Division found in either the MPI Architectural Painting Specification Manual or the Maintenance Repainting Manual and defined as an exterior (EXT/REX) or interior system (INT/RIN). The Division number follows the CSI Master Format.

1.12.5.14 Paint

See Coating definition.

1.12.5.15 REX

MPI short term designation for an exterior coating system used in repainting projects or over existing coating systems.

1.12.5.16 RIN

MPI short term designation for an interior coating system used in repainting projects or over existing coating systems.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coatings and solvents. Comply with applicable regulations regarding toxic and hazardous materials.

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED

Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.2 REPUTTYING AND REGLAZING

Remove cracked, loose, and defective putty or glazing compound on glazed sash and provide new putty or glazing compound. Where defective putty or glazing compound constitutes 30 percent or more of the putty at any one light, remove the glass and putty or glazing compound and reset the glass. Remove putty or glazing compound without damaging sash or glass. Clean rabbets to bare wood or metal and prime prior to reglazing. Putty for wood sash shall be a linseed oil putty. Patch surfaces to provide smooth transition between existing and new surfaces. Finish putty or glazing compound to a neat and true bead. Allow glazing compound time to cure, in accordance with manufacturer's recommendation, prior to coating application. Allow putty to set one week prior to coating application.

3.3 RESEALING OF EXISTING EXTERIOR JOINTS

3.3.1 Surface Condition

Surfaces shall be clean, dry to the touch, and free from frost and moisture; remove grease, oil, wax, lacquer, paint, defective backstop, or other foreign matter that would prevent or impair adhesion. Where adequate grooves have not been provided, clean out to a depth of 1/2 inch and grind to a minimum width of 1/4 inch without damage to adjoining work. Grinding shall not be required on metal surfaces.

3.3.2 Backstops

In joints more than 1/2 inch deep, install glass fiber roving or neoprene, butyl, polyurethane, or polyethylene foams free of oil or other staining elements as recommended by sealant manufacturer. Backstop material shall be compatible with sealant. Do not use oakum and other types of absorptive materials as backstops.

3.3.3 Primer and Bond Breaker

Install the type recommended by the sealant manufacturer.

3.3.4 Ambient Temperature

Between 38 degrees F and 95 degrees F when applying sealant.

3.3.5 Exterior Sealant

For joints in vertical surfaces, provide ASTM C920, Type S or M, Grade NS, Class 25, Use NT. For joints in horizontal surfaces, provide ASTM C920, Type S or M, Grade P, Class 25, Use T. Color(s) shall be selected by the Contracting Officer. Apply the sealant in accordance with the manufacturer's printed instructions. Force sealant into joints with sufficient pressure to fill the joints solidly. Sealant shall be uniformly smooth and free of wrinkles.

3.3.6 Cleaning

Immediately remove fresh sealant from adjacent areas using a solvent recommended by the sealant manufacturer. Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean condition. Allow sealant time to cure, in accordance with manufacturer's recommendations, prior to coating.

3.4 SURFACE PREPARATION

Remove dirt, splinters, loose particles, grease, oil, disintegrated coatings, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

3.4.1 Additional Requirements for Preparation of Surfaces With Existing Coatings

Before application of coatings, perform the following on surfaces covered by soundly-adhered coatings, defined as those which cannot be removed with a putty knife:

a. Test existing finishes for lead before sanding, scraping, or removing. If lead is present, refer to paragraph Toxic Materials.

b. Wipe previously painted surfaces to receive solvent-based coatings, except stucco and similarly rough surfaces clean with a clean, dry cloth saturated with mineral spirits, ASTM D235. Allow surface to dry. Wiping shall immediately precede the application of the first coat of any coating, unless specified otherwise.

c. Sand existing glossy surfaces to be painted to reduce gloss. Brush, and wipe clean with a damp cloth to remove dust.

d. The requirements specified are minimum. Comply also with the application instructions of the paint manufacturer.

e. Previously painted surfaces specified to be repainted and damaged during construction shall be thoroughly cleaned of all grease, dirt, dust or other foreign matter.

f. Blistering, cracking, flaking and peeling or other deteriorated coatings shall be removed.

g. Chalk shall be removed so that when tested in accordance with ASTM D4214, the chalk resistance rating is no less than 8.

h. Slick surfaces shall be roughened. Damaged areas such as, but not limited to, nail holes, cracks, chips, and spalls shall be repaired with suitable material to match adjacent undamaged areas.

i. Edges of chipped paint shall be feather edged and sanded smooth.

j. Rusty metal surfaces shall be cleaned as per SSPC requirements. Solvent, mechanical, or chemical cleaning methods shall be used to provide surfaces suitable for painting.

k. New, proposed coatings shall be compatible with existing coatings.

3.4.2 Existing Coated Surfaces with Minor Defects

Sand, spackle, and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligatoring, chalking, and irregularities due to partial peeling of previous coatings.

3.4.3 Removal of Existing Coatings

Remove existing coatings from the following surfaces:

a. Surfaces containing large areas of minor defects;

b. Surfaces containing more than 20 percent peeling area; and

c. Surfaces designated by the Contracting Officer, such as surfaces where rust shows through existing coatings.

3.4.4 Substrate Repair

a. Repair substrate surface damaged during coating removal;

b. Sand edges of adjacent soundly-adhered existing coatings so they are tapered as smooth as practical to areas involved with coating removal; and

c. Clean and prime the substrate as specified.

3.5 PREPARATION OF METAL SURFACES

3.5.1 Existing and New Ferrous Surfaces

a. Ferrous Surfaces including Shop-coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances: detergent wash

in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to , , , or SSPC SP 10/NACE No. 2. Brush-off blast remaining surface in accordance with SSPC 7/NACE No.4; Water jetting to SSPC SP 12/NACE No.5 WJ-4 may be used to remove loose coating and other loose materials. Use inhibitor as recommended by coating manufacturer to prevent premature rusting. Shop-coated ferrous surfaces shall be protected from corrosion by treating and touching up corroded areas immediately upon detection.

b. Surfaces With More Than 20 Percent Rust, Mill Scale, and Other Foreign Substances: Clean entire surface in accordance with SSPC SP 10/NACE No. 2/SSPC SP 12/NACE No.5 WJ-2.

3.5.2 Final Ferrous Surface Condition:

For tool cleaned surfaces, the requirements are stated in SSPC SP 2 and SSPC SP 3. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 3.

For abrasive blast cleaned surfaces, the requirements are stated in SSPC 7/NACE No.4, SSPC SP 6/NACE No.3, and SSPC SP 10/NACE No. 2. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 1.

For waterjet cleaned surfaces, the requirements are stated in SSPC SP 12/NACE No.5. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 4/NACE VIS 7.

3.5.3 Galvanized Surfaces

a. New or Existing Galvanized Surfaces With Only Dirt and Zinc Oxidation Products: Clean with steam, or non-alkaline detergent solution in accordance with SSPC SP 1. If the galvanized metal has been passivated or stabilized, the coating shall be completely removed by brush-off abrasive blast. New galvanized steel to be coated shall not be "passivated" or "stabilized" If the absence of hexavalent stain inhibitors is not documented, test as described in ASTM D6386, Appendix X2, and remove by one of the methods described therein.

b. Galvanized with Slight Coating Deterioration or with Little or No Rusting: Water jetting to SSPC SP 12/NACE No.5 WJ3 to remove loose coating from surfaces with less than 20 percent coating deterioration and no blistering, peeling, or cracking. Use inhibitor as recommended by the coating manufacturer to prevent rusting.

c. Galvanized With Severe Deteriorated Coating or Severe Rusting: Water jet to SSPC SP 12/NACE No.5 WJ3 degree of cleanliness.

3.5.4 Non-Ferrous Metallic Surfaces

Aluminum and aluminum-alloy, lead, copper, and other nonferrous metal surfaces.

Surface Cleaning: Solvent clean in accordance with SSPC SP 1 and wash with mild non-alkaline detergent to remove dirt and water soluble contaminants.

3.5.5 Terne-Coated Metal Surfaces

Solvent clean surfaces with mineral spirits, ASTM D235. Wipe dry with

clean, dry cloths.

3.5.6 Existing Surfaces with a Bituminous or Mastic-Type Coating

Remove chalk, mildew, and other loose material by washing with a solution of 1/2 cup trisodium phosphate, 1/4 cup household detergent, one quart 5 percent sodium hypochlorite solution and 3 quarts of warm water.

3.6 PREPARATION OF CONCRETE AND CEMENTITIOUS SURFACE

3.6.1 Concrete and Masonry

a. Curing: Concrete, stucco and masonry surfaces shall be allowed to cure at least 30 days before painting, except concrete slab on grade, which shall be allowed to cure 90 days before painting.

b. Surface Cleaning: Remove the following deleterious substances.

(1) Dirt, Chalking, Grease, and Oil: Wash new and existing uncoated surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cuphousehold detergent, and 4 quarts of warm water. Then rinse thoroughly with fresh water. Wash existing coated surfaces with a suitable detergent and rinse thoroughly. For large areas, water blasting may be used.

(2) Fungus and Mold: Wash new , existing coated, and existing uncoated surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cup household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.

(3) Paint and Loose Particles: Remove by wire brushing.

(4) Efflorescence: Remove by scraping or wire brushing followed by washing with a 5 to 10 percent by weight aqueous solution of hydrochloric (muriatic) acid. Do not allow acid to remain on the surface for more than five minutes before rinsing with fresh water. Do not acid clean more than 4 square feet of surface, per workman, at one time.

(5) Removal of Existing Coatings: For surfaces to receive textured coating MPI 42, remove existing coatings including soundly adhered coatings if recommended by textured coating manufacturer.

c. Cosmetic Repair of Minor Defects: Repair or fill mortar joints and minor defects, including but not limited to spalls, in accordance with manufacturer's recommendations and prior to coating application.

d. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not to surfaces with droplets of water. Do not apply epoxies to damp vertical surfaces as determined by ASTM D4263 or horizontal surfaces that exceed 3 lbs of moisture per 1000 square feet in 24 hours as determined by ASTM F1869. In all cases follow manufacturers recommendations. Allow surfaces to cure a minimum of 30 days before painting.

3.6.2 Gypsum Board, Plaster, and Stucco

a. Surface Cleaning: Plaster and stucco shall be clean and free from

loose matter; gypsum board shall be dry. Remove loose dirt and dust by brushing with a soft brush, rubbing with a dry cloth, or vacuum-cleaning prior to application of the first coat material. A damp cloth or sponge may be used if paint will be water-based.

b. Repair of Minor Defects: Prior to painting, repair joints, cracks, holes, surface irregularities, and other minor defects with patching plaster or spackling compound and sand smooth.

c. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not surfaces with droplets of water. Do not apply epoxies to damp surfaces as determined by ASTM D4263. New plaster to be coated shall have a maximum moisture content of 8 percent, when measured in accordance with ASTM D4444, Method A, unless otherwise authorized. In addition to moisture content requirements, allow new plaster to age a minimum of 30 days before preparation for painting.

3.6.3 Existing Asbestos Cement Surfaces

Remove oily stains by solvent cleaning with mineral spirits, ASTM D235. Remove loose dirt, dust, and other deleterious substances by brushing with a soft brush or rubbing with a dry cloth prior to application of the first coat material. Do not wire brush or clean using other abrasive methods. Surfaces shall be dry and clean prior to application of the coating.

3.7 PREPARATION OF WOOD AND PLYWOOD SURFACES

3.7.1 New , Existing Uncoated, and Existing Coated Plywood and Wood Surfaces, Except Floors:

a. Wood surfaces shall be cleaned of foreign matter.

Surface Cleaning: Surfaces shall be free from dust and other deleterious substances and in a condition approved by the Contracting Officer prior to receiving paint or other finish. Do not use water to clean uncoated wood.

c. Moisture content of the wood shall not exceed 12 percent as measured by a moisture meter in accordance with ASTM D4444, Method A, unless otherwise authorized.

d. Wood surfaces adjacent to surfaces to receive water-thinned paints shall be primed and/or touched up before applying water-thinned paints.

e. Cracks and Nailheads: Set and putty stop nailheads and putty cracks after the prime coat has dried.

f. Cosmetic Repair of Minor Defects:

(1) Knots and Resinous Wood : Prior to application of coating, cover knots and stains with two or more coats of 3-pound-cut shellac varnish, plasticized with 5 ounces of castor oil per gallon. Scrape away existing coatings from knotty areas, and sand before treating. Prime before applying any putty over shellacked area.

(2) Open Joints and Other Openings: Fill with whiting putty, linseed oil putty. Sand smooth after putty has dried.

(3) Checking: Where checking of the wood is present, sand the

surface, wipe and apply a coat of pigmented orange shellac. Allow to dry before paint is applied.

g. Prime Coat For New Exterior Surfaces: Prime coat before wood becomes dirty, warped, or weathered.

3.7.2 Wood Floor Surfaces, Natural Finish

a. Initial Surface Cleaning: As specified in paragraph entitled "Surface Preparation."

b. Existing Loose Boards and Shoe Molding: Before sanding, renail loose boards. Countersink nails and fill with an approved wood filler. Remove shoe molding before sanding and reinstall after completing other work. At Contractor's option, new shoe molding may be provided in lieu of reinstalling old. New wood molding shall be same size, wood species, and finish as the existing.

c. Sanding and Scraping: Sanding of wood floors is specified in Section . Floors of oak or similar open-grain wood shall be filled with wood filler recommended by the finish manufacturer and the excess filler removed.

d. Final Cleaning: After sanding, sweep and vacuum floors clean. Do not walk on floors thereafter until specified sealer has been applied and is dry.

3.7.3 Interior Wood Surfaces, Stain Finish

Interior wood surfaces to receive stain shall be sanded. Oak and other open-grain wood to receive stain shall be given a coat of wood filler not less than 8 hours before the application of stain; excess filler shall be removed and the surface sanded smooth.

3.7.4 Water Blasting of Existing Coated Wood Surfaces:

Water blasting shall be provided for the following surfaces: metal siding.

a. Sample Panel: Prior to the initial surface cleaning, water blast a representative surface designated by the Contracting Officer. Final surface condition of remaining work shall be similar to sample panel approved by the Contracting Officer.

b. Initial Surface Cleaning: Water blasting shall consist of washing surfaces to receive paint with a high pressure spray, to remove loose paint, dirt, and other foreign or deleterious materials. The working pressure shall be between 400 and 700 pounds per square inch gage (psig) at a nozzle operating rate of a minimum 20 gallons per minute (g/min.). Do not flood vents or damage windows and floors. If the pressure specified will cause damage to existing wood, advise the Contracting Officer and obtain permission to vary the pressure. Direct the wash nozzle at the surface at an angle of approximately 75 degrees with the surface and at a distance not greater than 5 feet to apply water pressure required to remove loose paint, dirt, chalking, and other foreign matter.

c. Final Surface Cleaning: After allowing the surfaces to dry for a minimum of 24 hours, remove remaining dirt, splinters, loose particles, disintegrated and loose paint, grease, oil, and other foreign matter

from the surface.

3.8 APPLICATION

3.8.1 Coating Application

Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates, except as modified herein.

At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.

Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Use trigger operated spray nozzles for water hoses. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated. Wear protective clothing and respirators when applying oil-based paints or using spray equipment with any paints.

Paints, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.

Thoroughly work coating materials into joints, crevices, and open spaces. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.

Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete.

Touch up damaged coatings before applying subsequent coats.

a. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.

b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.

c. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

d. Thermosetting Paints: Topcoats over thermosetting paints (epoxies and urethanes) should be applied within the overcoating window recommended by the manufacturer.

e. Floors:

3.8.2 Mixing and Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory to suit surface, temperature, weather conditions, application methods, or for the type of paint being used. Obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

When thinning is allowed, paints shall be thinned immediately prior to application with not more than of suitable thinner per The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

3.8.3 Two-Component Systems

Two-component systems shall be mixed in accordance with manufacturer's instructions. Any thinning of the first coat to ensure proper penetration and sealing shall be as recommended by the manufacturer for each type of substrate.

3.8.4 Coating Systems

a. Systems by Substrates: Apply coatings that conform to the respective specifications listed in the following Tables:

Table

Division 3. Exterior Concrete Paint Table
Division 4. Exterior Concrete Masonry Units Paint Table
Division 5. Exterior Metal, Ferrous and Non-Ferrous Paint Table
Division 6. Exterior Wood; Dressed Lumber, Paneling, Decking, Shingles Paint Table
Division 9: Exterior Stucco Paint Table
Division 10. Exterior Cloth Coverings and Bituminous Coated Surfaces Paint Table

Division 3. Interior Concrete Paint Table
Division 4. Interior Concrete Masonry Units Paint Table
Division 5. Interior Metal, Ferrous and Non-Ferrous Paint Table
Division 6. Interior Wood Paint Table
Division 9: Interior Plaster, Gypsum Board, Textured Surfaces Paint Table

b. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.

c. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

d. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:

(1) One coat of primer.

(2) One coat of undercoat or intermediate coat.

(3) One topcoat to match adjacent surfaces.

e. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers and fillers need not be provided on surfaces where existing coatings are soundly adhered and in good condition. Do not omit undercoats or primers.

3.9 COATING SYSTEMS FOR METAL

Apply coatings of Tables in Division 5 for Exterior and Interior.

a. Apply specified ferrous metal primer on the same day that surface is cleaned, to surfaces that meet all specified surface preparation requirements at time of application.

b. Inaccessible Surfaces: Prior to erection, use one coat of specified primer on metal surfaces that will be inaccessible after erection.

c. Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.

d. Surface Previously Coated with Epoxy or Urethane: Apply MPI 101, 1.5 mils DFT immediately prior to application of epoxy or urethane coatings.

e. Pipes and Tubing: The semitransparent film applied to some pipes and tubing at the mill is not to be considered a shop coat, but shall be overcoated with the specified ferrous-metal primer prior to application of finish coats.

f. Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces. On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer MPI 107.

3.10 COATING SYSTEMS FOR CONCRETE AND CEMENTITIOUS SUBSTRATES

Apply coatings of Tables in Division 3, 4 and 9 for Exterior and Interior.

3.11 COATING SYSTEMS FOR WOOD AND PLYWOOD

a. Apply coatings of Tables in Division 6 for Exterior and Interior.

b. Prior to erection, apply two coats of specified primer to treat and prime wood surfaces which will be inaccessible after erection.

c. Apply stains in accordance with manufacturer's printed instructions.

d. Wood Floors to Receive Natural Finish: Thin first coat 2 to 1 using thinner recommended by coating manufacturer. Apply all coatings at rate of 300 to 350 square feet per gallon. Apply second coat not less than 2 hours and not over 24 hours after first coat has been applied. Apply with lambs wool applicators or roller as recommended by coating manufacturer. Buff or lightly sand between intermediate coats as recommended by coating manufacturer's printed instructions.

3.12 PIPING IDENTIFICATION

Piping Identification, Including Surfaces In Concealed Spaces: Provide in accordance with . Place stenciling in clearly visible locations. On piping not covered by , stencil approved names or code letters, in letters a minimum of 1/2 inch high for piping and a minimum of 2 inches high elsewhere. Stencil arrow-shaped markings on piping to indicate direction of flow using black stencil paint.

3.13 INSPECTION AND ACCEPTANCE

In addition to meeting previously specified requirements, demonstrate mobility of moving components, including swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Contracting Officer. Perform this demonstration after appropriate curing and drying times of coatings have elapsed and prior to invoicing for final payment.

3.14 WASTE MANAGEMENT

As specified in the Waste Management Plan and as follows. Do not use kerosene or any such organic solvents to clean up water based paints. Properly dispose of paints or solvents in designated containers. Close and seal partially used containers of paint to maintain quality as necessary for reuse. Store in protected, well-ventilated, fire-safe area at moderate temperature. Place materials defined as hazardous or toxic waste in designated containers.

3.15 PAINT TABLES

All DFT's are minimum values. Use only interior paints and coatings that meet VOC requirements of LEED low emitting materials credit. Acceptable products are listed in the MPI Green Approved Products List, available at http://www.specifygreen.com/APL/ProductIdxByMPInum.asp.

3.15.1 EXTERIOR PAINT TABLES

DIVISION 3: EXTERIOR CONCRETE PAINT TABLE

A. New and uncoated existing and Existing, previously painted concrete; vertical surfaces, including undersides of balconies and soffits but excluding tops of slabs:

1. Latex
   New; MPI EXT 3.1A-G2 (Flat) / Existing; MPI REX 3.1A-G2 (Flat)

Primer:	Intermediate:	Topcoat:
MPI 10	MPI 10	MPI 10

   System DFT: 3.5 mils

Primer as recommended by manufacturer. Topcoat: Coating to match adjacent surfaces.

B. New and uncoated existing and Existing, previously painted concrete, textured system; vertical surfaces, including undersides of balconies and

DIVISION 3: EXTERIOR CONCRETE PAINT TABLE
soffits but excluding tops of slabs:

1. Latex Aggregate
   New; MPI EXT 3.1B-G2 (Flat) / Existing; MPI REX 3.1B-G2 (Flat)

Primer:	Intermediate:	Topcoat:
MPI 42	MPI 10	MPI 10

   System DFT: Per Manufacturer

   New; MPI EXT 3.1B-G5 (Semigloss) / Existing; MPI REX 3.1B-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 42	MPI 11	MPI 11

   System DFT: Per Manufacturer

   New; MPI EXT 3.1B-G6 (Gloss) / Existing; MPI REX 3.1B-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 42	MPI 119	MPI 119

   System DFT: Per Manufacturer

   Texture - Fine Medium Coarse . Surface preparation and number of coats in accordance with manufacturer's instructions. Topcoat: Coating to match adjacent surfaces.

C. New and uncoated existing and Existing, previously painted concrete, elastomeric System; vertical surfaces, including undersides of balconies and soffits but excluding tops of slabs:

1. Elastomeric Coating
   New; MPI EXT 3.1F / Existing; MPI REX 3.1F

Primer:	Intermediate:	Topcoat:
Per Manufacturer	MPI 113	MPI 113

   System DFT: 16 mils

   Primer as recommended by manufacturer. Topcoat: Coating to match adjacent surfaces. Surface preparation and number of coats in accordance with manufacturer's instructions.

NOTE: Apply sufficient coats of MPI 113 to achieve a minimum dry film thickness of 16 mils.

D. New and uncoated existing and Existing, previously painted concrete: walls and bottom of swimming pools.

1. Chlorinated Rubber
   New; / Existing;

Primer:	Intermediate:	Topcoat:
SSPC Paint 18	SSPC Paint 18	SSPC Paint 18

   System DFT: Per Manufacturer

NOTE: Thin first coat (primer) with 1 part of approved thinner to 4 parts of paint by volume.

E. New and Existing Cementitious composition board (including Asbestos cement board):

1. Latex

DIVISION 3: EXTERIOR CONCRETE PAINT TABLE

New; MPI EXT 3.3A-G6 (Gloss) / Existing; MPI REX 3.3A-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 119	MPI 119	MPI 119

System DFT: 4.5 mils

Topcoat: Coating to match adjacent surfaces.

DIVISION 4: EXTERIOR CONCRETE MASONRY UNITS PAINT TABLE

A. New and Existing concrete masonry on uncoated surface:

1. Latex

New; MPI EXT 4.2A-G1 (Flat) / Existing; MPI REX 4.2A-G1 (Flat)

Block Filler:	Primer:	Intermediate:	Topcoat:
MPI 4	N/A	MPI 10	MPI 10

System DFT: 11 mils

New; MPI EXT 4.2A-G5 (Semigloss) / Existing; MPI REX 4.2A-G5 (Semigloss)

Block Filler:	Primer:	Intermediate:	Topcoat:
MPI 4	N/A	MPI 11	MPI 11

System DFT: 11 mils

New; MPI EXT 4.2A-G6 (Gloss) / Existing; MPI REX 4.2A-G6 (Gloss)

Block Filler:	Primer:	Intermediate:	Topcoat:
MPI 4	N/A	MPI 119	MPI 119

System DFT: 11 mils

Topcoat: Coating to match adjacent surfaces.

B. and Existing concrete masonry, textured system; on uncoated surface:

1.

C. New and Existing concrete masonry, elastomeric system; on uncoated surface:

1. Elastomeric Coating

New; MPI EXT 4.2D / Existing; MPI REX 4.2D

Primer:	Intermediate:	Topcoat:
Per Manufacturer	MPI 113	MPI 113

System DFT: 16 mils

Primer as recommended by manufacturer. Topcoat: Coating to match adjacent surfaces. Surface preparation and number of coats in accordance with manufacturer's instructions.

DIVISION 4: EXTERIOR CONCRETE MASONRY UNITS PAINT TABLE

NOTE: Apply sufficient coats of MPI 113 to achieve a minimum dry film thickness of 16 mils.

DIVISION 5: EXTERIOR METAL, FERROUS AND NON-FERROUS PAINT TABLE

STEEL / FERROUS SURFACES

A. New Steel that has been hand or power tool cleaned to SSPC SP 2 or SSPC SP 3

1. Alkyd
New; MPI EXT 5.1Q-G5 (Semigloss) Existing; MPI REX 5.1D-G5
Primer: Intermediate: Topcoat:
MPI 23 MPI 94 MPI 94
System DFT: 5.25 mils

New; MPI EXT 5.1Q-G6 (Gloss) / Existing; MPI REX 5.1D-G6
Primer: Intermediate: Topcoat:
MPI 23 MPI 9 MPI 9
System DFT: 5.25 mils

B. New Steel that has been blast-cleaned to SSPC SP 6/NACE No.3:

2. Alkyd
New; MPI EXT 5.1D-G5 (Semigloss) / Existing; MPI REX 5.1D-G5
Primer: Intermediate: Topcoat:
MPI 79 MPI 94 MPI 94
System DFT: 5.25 mils

New; MPI EXT 5.1D-G6 (Gloss) / Existing; MPI REX 5.1D-G6
Primer: Intermediate: Topcoat:
MPI 79 MPI 9 MPI 9
System DFT: 5.25 mils

C. Existing steel that has been spot-blasted to SSPC SP 6/NACE No.3:

1. Surface previously coated with alkyd or latex:

Waterborne Light Industrial Coating
MPI REX 5.1C-G5 (Semigloss)
Spot Primer: Intermediate: Topcoat:
MPI 79 MPI 163 MPI 163
System DFT: 5 mils

MPI REX 5.1C-G6 (Gloss)
Spot Primer: Intermediate: Topcoat:
MPI 79 MPI 164 MPI 164
System DFT: 5 mils

2. Surface previously coated with epoxy:

Waterborne Light Industrial
a. MPI REX 5.1L-G5 (Semigloss)
Spot Primer: Intermediate: Topcoat:
MPI 101 MPI 163 MPI 163
System DFT: 5 mils

STEEL / FERROUS SURFACES

MPI REX 5.1L-G6 (Gloss)
Spot Primer: Intermediate: Topcoat:
MPI 101 MPI 164 MPI 164
System DFT: 5 mils

Pigmented Polyurethane
b. MPI REX 5.1H-G6 (Gloss)
Spot Primer: Intermediate: Topcoat:
MPI 101 MPI 108 MPI 72
System DFT: 8.5 mils

D. New and existing steel blast cleaned to SSPC SP 10/NACE No. 2:

1. Waterborne Light Industrial
MPI EXT 5.1R-G5 (Semigloss)
Primer: Intermediate: Topcoat:
MPI 101 MPI 108 MPI 163
System DFT: 8.5 mils

MPI EXT 5.1R-G6 (Gloss)
Primer: Intermediate: Topcoat:
MPI 101 MPI 108 MPI 164
System DFT: 8.5 mils

2. Pigmented Polyurethane
MPI EXT 5.1J-G6 (Gloss)
Primer: Intermediate: Topcoat:
MPI 101 MPI 108 MPI 72
System DFT: 8.5 mils

E. Metal floors (non-shop-primed surfaces or non-slip deck surfaces) with non-skid additive (NSA), load at manufacturer's recommendations.:

1. Alkyd Floor Enamel
MPI EXT 5.1S-G6 (Gloss)
Primer: Intermediate: Topcoat:
MPI 79 MPI 27 MPI 27 (plus NSA)
System DFT: 5.25 mils

EXTERIOR GALVANIZED SURFACES

F. New Galvanized surfaces:

1. Cementitious primer / Latex
MPI EXT 5.3A-G1 (Flat)
Primer: Intermediate: Topcoat:
MPI 26 MPI 10 MPI 10
System DFT: 4.5 mils

MPI EXT 5.3A-G5 (Semigloss)
Primer: Intermediate: Topcoat:
MPI 26 MPI 11 MPI 11
System DFT: 4.5 mils

MPI EXT 5.3A-G6 (Gloss)
Primer: Intermediate: Topcoat:
MPI 26 MPI 119 MPI 119

EXTERIOR GALVANIZED SURFACES
System DFT: 4.5 mils

2. Waterborne Primer / Latex
MPI EXT 5.3H-G1 (Flat)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 10	MPI 10

System DFT: 4.5 mils

MPI EXT 5.3H-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 11	MPI 11

System DFT: 4.5 mils

MPI EXT 5.3H-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 119	MPI 119

System DFT: 4.5 mils

3. Waterborne Primer / Waterborne Light Industrial Coating
MPI EXT 5.3J-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 163	MPI 163

System DFT: 4.5 mils

MPI EXT 5.3J-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 164	MPI 164

System DFT: 4.5 mils

4. Epoxy Primer / Waterborne Light Industrial Coating
MPI EXT 5.3K-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 101	MPI 163	MPI 163

System DFT: 5 mils

MPI EXT 5.3K-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 101	MPI 164	MPI 164

System DFT: 5 mils

5. Pigmented Polyurethane
MPI EXT 5.3L-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 101	N/A	MPI 72

System DFT: 5 mils

G. Galvanized surfaces with slight coating deterioration; little or no rusting:

1. Waterborne Light Industrial Coating
MPI REX 5.3J-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 134	N/A	MPI 163

System DFT: 4.5 mils

2. Pigmented Polyurethane
MPI REX 5.3D-G6 (Gloss)

Primer:	Intermediate:	Topcoat:

EXTERIOR GALVANIZED SURFACES

MPI 101	N/A	MPI 72

System DFT: 5 mils

H. Galvanized surfaces with severely deteriorated coating or rusting:

1. Waterborne Light Industrial Coating

MPI REX 5.3L-G5(Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 101	MPI 108	MPI 163

System DFT: 8.5 mils

MPI REX 5.3L-G6(Gloss)

Primer:	Intermediate:	Topcoat:
MPI 101	MPI 108	MPI 164

System DFT: 8.5 mils

2. Pigmented Polyurethane

MPI REX 5.3K-G6(Gloss)

Primer:	Intermediate:	Topcoat:
MPI 101	MPI 108	MPI 72

System DFT: 5 mils

EXTERIOR SURFACES, OTHER METALS (NON-FERROUS)

I. Aluminum, aluminum alloy and other miscellaneous non-ferrous metal items not otherwise specified except hot metal surfaces, roof surfaces, and new prefinished equipment. Match surrounding finish:

1. Alkyd

MPI EXT 5.4F-G1 (Flat)

Primer:	Intermediate:	Topcoat:
MPI 95	MPI 8	MPI 8

System DFT: 5 mils

MPI EXT 5.4F-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 95	MPI 94	MPI 94

System DFT: 5 mils

MPI EXT 5.4F-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 95	MPI 9	MPI 9

System DFT: 5 mils

2. Waterborne Light Industrial Coating

MPI EXT 5.4G-G6(Gloss)

Primer:	Intermediate:	Topcoat:
MPI 95	MPI 164	MPI 164

System DFT: 5 mils

I. Existing roof surfaces previously coated:

1. Aluminum Pigmented Asphalt Roof Coating

ASTM D2824/D2824M: Sufficient coats to provide not less than 8 mils

EXTERIOR SURFACES, OTHER METALS (NON-FERROUS)
of finished coating system (without asbestos fibers).

2. Aluminum Paint
MPI REX 10.2D

Primer:	Intermediate:	Topcoat:
MPI 107	MPI 1	MPI 1

System DFT: 3.5 mils

J. Surfaces adjacent to painted surfaces;
and miscellaneous metal items not otherwise specified except floors, hot metal surfaces, and new prefinished equipment. Match surrounding finish:

1. Alkyd
MPI EXT 5.1D-G1 (Flat)

Primer:	Intermediate:	Topcoat:
MPI 79	MPI 8	MPI 8

System DFT: 5.25 mils

MPI EXT 5.1D-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 79	MPI 94	MPI 94

System DFT: 5.25 mils

2.

K. Hot metal surfaces subject to temperatures up to 400 degrees F:

1.

L. Ferrous metal subject to high temperature, up to 750 degrees F:

1.

2.

M. Existing surfaces made bare cleaning to SSPC SP 10/NACE No. 2
subject to temperatures up to 593 degrees C (1100 degrees F):

1. Heat Resistant Coating
MPI EXT 5.2D

EXTERIOR SURFACES, OTHER METALS (NON-FERROUS)

Primer:	Intermediate:	Topcoat:
MPI 22	Surface preparation and number of coats per manufacturer's instructions.	

System DFT: Per Manufacturer

DIVISION 6: EXTERIOR WOOD; DRESSED LUMBER, PANELING, DECKING, SHINGLES PAINT TABLE

A. New and Existing, uncoated Dressed lumber, Wood and plywood, trim, not otherwise specified:

1.

2. Latex

MPI EXT 6.3A-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 7	MPI 119	MPI 119

System DFT: 5 mils

3. Waterborne Solid Color Stain

MPI EXT 6.3K

Primer:	Intermediate:	Topcoat:
MPI 7	MPI 16	MPI 16

System DFT: 4.25 mils

B. Existing, dressed lumber, Wood and plywood, trim, previously coated with an alkyd / oil based finish coat not otherwise specified:

1.

2. Latex

MPI REX 6.3A-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 5	MPI 119	MPI 119

System DFT: 5 mils

C. Existing, dressed lumber, Wood and plywood, trim, previously coated with a latex / waterborne finish coat not otherwise specified:

1. Latex

DIVISION 6: EXTERIOR WOOD; DRESSED LUMBER, PANELING, DECKING, SHINGLES PAINT TABLE

MPI REX 6.3L-G6 (Gloss)

Spot Primer:	Intermediate:	Topcoat:
MPI 6	MPI 119	MPI 119

System DFT: 4.5 mils

2. Waterborne Solid Color Stain

MPI REX 6.3K (Stain)

Spot Primer:	Intermediate:	Topcoat:
MPI 6	MPI 16	MPI 16

System DFT: 4 mils

D. New, Uncoated wood siding:

1.

E. Existing, previously stained wood siding:

1. Latex

MPI REX 6.2K-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 5	MPI 11	MPI 11

System DFT: 4.5 mils

F. Existing Uncoated or previously semitransparent stained wood siding:

1.

G. Wood: Steps, platforms, , and with non-skid additive (NSA), load at manufacturer's recommendations. :

1. Latex Floor Paint

MPI EXT 6.5A-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 5	MPI 68 plus NSA	MPI 68 plus NSA

System DFT: 4.5 mils

2.

DIVISION 9: EXTERIOR STUCCO PAINT TABLE

A. New and Existing stucco:

1. Latex

New; MPI EXT 9.1A-G1 (Flat) / Existing; MPI REX 9.1A-G2 (Flat)

DIVISION 9: EXTERIOR STUCCO PAINT TABLE

Primer:	Intermediate:	Topcoat:
MPI 10	MPI 10	MPI 10

System DFT: 4.5 mils

New; MPI EXT 9.1A-G5 (Semigloss) / Existing; MPI REX 9.1A-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 11	MPI 11	MPI 11

System DFT: 4.5 mils

Primer as recommended by manufacturer. Topcoat: Coating to match adjacent surfaces. On existing stucco, apply primer based on surface condition.

B. New and Existing stucco, elastomeric system:

1. Elastomeric Coating

New; MPI EXT 9.1C / Existing; MPI REX 9.1C

Primer:	Intermediate:	Topcoat:
N/A	MPI 113	MPI 113

System DFT: 16 mils

Primer as recommended by manufacturer. Topcoat: Coating to match adjacent surfaces. Surface preparation and number of coats in accordance with manufacturer's instructions).

NOTE: Apply sufficient coats of MPI 113 to achieve a minimum dry film thickness of 16 mils.

DIVISION 10: EXTERIOR CLOTH COVERINGS AND BITUMINOUS COATED SURFACES PAINT TABLE

A. Insulation and surfaces of insulation coverings (canvas, cloth, paper): (Interior and Exterior Applications)

1. Latex

MPI EXT 10.1A-G1 (Flat)

Primer:	Intermediate:	Topcoat:
N/A	MPI 10	MPI 10

System DFT: 3.2 mils

MPI EXT 10.1A-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
N/A	MPI 11	MPI 11

System DFT: 3.2 mils

Topcoat: Coating to match adjacent surfaces.

-- End of Section --