TETRA TECH

240 Continental Drive, Suite 200
Newark, DE 19713
Tel: 302-738-7551
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Addendum No. 1

Delaware Heath & Social Services
Fire Pump & Domestic Water Booster Pump Replacement
Herman M. Holloway DHSS Campus
OMB/DFM/DHSS Contract No: MC3501000048/52

Tt Project No. 200-26912-16011

Addendum No. 1
to
Drawings and Project Manual

March 6, 2017

To: ALL BIDDERS

This ADDENDUM forms a part of the BIDDING AND CONTRACT DOCUMENTS and modifies the following documents:

Original DRAWINGS dated March 2, 2017
PROJECT MANUAL dated March 2, 2017 and

Acknowledge receipt of the ADDENDUM in the space provided on the FORM OF PROPOSAL

This ADDENDUM consists of two (2) pages and the following:

CHANGES TO PROJECT MANUAL

1.1 Spec Section 00 41 13: Bid Form

A. **DELETE** "Original Bid Form" in its entirety and **REPLACE** with "Revised Bid Form" attached to this addendum.

B. "Carpentry" Subcontractor was **CHANGED** to "General Building Trades".

C. "BAS Controls" Subcontractor was **DELETED.**

D. Allowance No's. 1 & 2 were **CHANGED** to Unit Prices No's. 1 & 2.

E. Allowance No's. 3 & 4 were **CHANGED** to Allowances No's 1 & 2.

1.2 **ADD** Spec Section 00 81 15; Interim Life Safety Measures, attached to this addendum in its entirety.

1.3 Spec Section 13 34 19: Metal Building Systems

A. **DELETE** "Original Metal Building Systems Spec" in its entirety and **REPLACE** with "Revised Metal Building Systems" Spec attached to this addendum.

END OF ADDENDUM 01

Attachments:

Pre-bid Meeting Report
Pre-bid sign in sheet
Bid register
00 41 13 Revised – Bid Form
00 81 15 Interim Life Safety Measures
13 34 19 Revised – Metal Building Systems

TETRA TECH

240 Continental Dr., Ste. 200
Newark, DE 19713

Pre-Bid Meeting Record

Meeting Date: Thursday, March 2, 2017 @ 9:00 a.m.

Publication Date: March 6, 2017

Prepared By: Scott D. Parlow, P.E.

Tt Project No.: 200-26912-16011

Regarding: DHSS Campus Fire Pump & Domestic Water Booster Pump Replacement
Herman M. Holloway DHSS Campus
New Castle, DE.
OMB/DFM/DHSS Contract No: MC3501000048/52

Attendees

J. Dean Seely	OMB/DFM/DHSS Project Manager	302-739-5644	joseph.seely@state,de.us
Dan Episcopo	DHSS Facilities Director	302-255-9335	daniel.epsicopo@state.de.us
Elliot Tatum	DHSS Maintenance Superintendent	302-223-1582	elliot.tatum@state.de.us
Tim Reed	DHSS Maintenance Superintendent	302-255-2700	tim.reed@state.de.us
Ken Vandegrift	C + D Contractors, Inc.	302-764-8013	kvandegrift.cd@verizon.net
Mary Clark	Schlosser & Associates, Inc.	302-738-7333	abakeras@hotmail.com
Ethel Pew	Bear Industries, Inc.	302-368-1311	cjohnston@bearindustries.com
Bill Booth	Commonwealth Construction Co., Inc.	302-654-6611	bbooth@itscommonwealth.com
Matt Bailey	Power Plus Electric, Inc.	302-736-5070	mattb337@gmail.com
Matt Celanta	Preferred Electric, Inc.	302-322-9568	mdcelanta@preferredinc.net
Joseph A. Cochran	Cochran & Sons Plumbing & Heating, Inc.	302-652-6160	joe@cochrancompanies.com
Paul D. Flannigan	Anaconda Protective Concept, Inc.	302-834-1125	apc.paul@comcast.net
Craig Yung	Merion Pump & Domestic Water	856-577-8724	craig.yung@merionpump.com
Kyle Donovan	Corrado, Inc.	302-669-6041	kdonovan@corrado.com
Jose Waubright	East Coast Plumbing & Heating, Inc.	302-266-0531	jose@ecph.net
Robert J. Cooper, PE	Tetra Tech, Inc.	302-738-7551	robert.cooper@tetratech,com
Scott D. Parlow, PE	Tetra Tech, Inc.	302-738-7551	scott.parlow@tetratech.com

Additional Distribution

Chuck Dobbs, AIA	Tetra Tech, Inc.	302-738-7551	chuck.dobbs@tetratech.com
Andy Coats, PE	Tetra Tech, Inc.	302-738-7551	andrew.coats@tetratech.com

Item Number	Item

1. A Mandatory Pre-Bid Meeting for the above referenced project was held in the Main Building Annex Maintenance Conference Room at the Herman M. Holloway DHSS Campus in New Castle, Delaware on Thursday, March 2, 2017 @ 9:00 a.m. Those in attendance are noted above.

2. Sealed bids for this project will be received by the State of Delaware, Office of Management & Budget, Division of Facilities Management, in the reception area of DFM at the Thomas Collins Building, 540 South DuPont Highway, Dover, Delaware, until 2:00 p.m. local time on Friday, March 17, 2017, at which time they will be publically opened, read aloud, and recorded. Bidders bear the risk of late delivery. Any bids received after the stated time will be returned unopened.

3. This is a mandatory Pre-Bid Meeting and Prime Bidders are limited to those in attendance.

4. An Additional Site Walk Through has been scheduled for Thursday, March 9, 2017 at 10:00 am, meet at the Maintenance Wing of the Main/Annex Building.

5. For further bidding information relating to the bid and signature forms, the Contractors are directed to contact J. Dean Seely, OMB/DFM/DHSS Project Manager at joseph.seely@state.de.us.

6. The Wage Rates for this project shall be as determined by the Delaware Department of Labor and Division of Industrial Affairs for New Castle County. A certified copy has been included in the Project Manual. However, Contractors are responsible to contact the Delaware Department of Labor to receive verification of the most current Wage Rate Scale.

7. A general review of the Project Manual was performed. The following specification sections were reviewed.

Section	Article	Title
00 11 13	--	Advertisement for Bids
00 21 13	1.1	Definitions
	1.10	Addenda
	2.0	Bidder's Representation
	2.1	Pre-Bid Meeting
	3.0	Bidding Documents
	3.1	Copies of Bid Documents
	3.2	Interpretation or Correction of Bidding Documents
	3.3	Substitutions
	3.4	Addenda
	4.0	Bidding Procedures
	4.1	Preparation of Bids
	4.2	Bid Security
	4.3	Subcontractor List
	4.5	Prevailing Wage Requirements
	4.6	Submission of Bids
	7.0	Performance Bond & Payment Bond
	7.1	Bond Requirements
00 22 13a	1.2	Qualification of Bidders
	1.4	Bid Form
	1.5	Contract Time
	1.6	Representation of Bidders
	1.7	Interpretations
	1.8	Substitutions

	1.9	Wage Rates
	1.10	Start of Work
00 30 00	--	Bid Form
00 41 13	--	Bid Bond Form
00 52 13	AIA 101-2007	Standard Form of Agreement Between Owner & Contractor
00 61 13.13	--	Performance Bond Form
00 61 13.16	--	Payment Bond Form
00 62 76	AIA G-701	Change Order Form
	AIA G-702	Application & Certification for Payment
	AIA G-703	Continuation Sheet
	AIA G-704	Certificate of Substantial Completion
	AIA G-706	Contractor's Affidavit of Payment of Debt and Claims
	AIA G-706A	Contractor's Affidavit of Release of Liens
	AIA G-707	Consent of Surety to Final Payment
00 72 13	AIA 201-2007	General Conditions for the Contract for Construction
00 73 13	1.0	Supplementary General Conditions A201-2007- General Provisions
	1.1	Basic Definitions
	3.5	Warranty
	3.11	Documents and Samples at the Site
	9.2	Schedule of Values
	9.3	Applications for Payment
00 73 14	1.0	Additional Supplementary General Conditions – General
	1.7	Time
00 73 46	--	State of Delaware Wage Rate Schedule
00 81 13	1.0	General Requirements – General
	3.0	Contractor
	3.1	Schedule of Values
	4.0	Administration of Contract
	4.1	Contract Surety
	4.1.1	Performance Bond and Labor and Material Payment Bonds
	5.0	Subcontractors
	5.1	Subcontracting Requirements
	7.0	Changes in the Work
	8.0	Employee Drug Testing Report Form
00 82 13	1.1	Additional General Contracting Requirements-General
	1.3	Work Included
	1.4	Work Not Included
	1.7	Drawings and Specifications
	1.8	Continuity of Services
	1.10	Responsibility of Damage and Care of State Property
	1.16	Guarantee
	1.17	As-Built Drawings
01 10 00	1.0	Summary General
	1.3	Project Information
	1.6	Work Covered by Contract Documents
01 21 00	1.0	Allowances – General
	3.3	Schedule of Allowances

01 31 00	1.0	Project Management and Coordination – General
	1.5	Project Meetings
01 31 20	1.0	Payroll Reports-General
	1.4	Payroll Reports
01 33 00	1.1	Submittal Procedures – General
	1.4	Submittal Schedule
	2.2	Electronic Submittal Procedures
01 74 19	1.0	Construction Waste Management – General
	1.3	Submittals
	1.6	Waste Management Plan
01 77 00	1.0	Closeout Procedures-General
	1.3	Substantial Completion
	1.4	Final Completion
	1.5	List of Incomplete Items (Punch List)
	1.6	Project Record Drawings
	3.3	Summary of Closeout Documents
01 80 00	1.0	Schedule of Special Inspections – General
13 34 19	1.0	Metal Building System – General
	2.5	Metal Roof Panels
	2.6	Metal Wall Panels
21 13 13	1.0	Wet-Pipe Sprinkler Systems – General
	1.5	Information Submittals
21 31 16	1.0	Diesel-Drive Centrifugal Fire-Pump – General
	2.3	Single-Stage, Split-Cast Fire Pump
21 34 00	1.0	Pressure Maintenance Pumps – General
	2.1	Vertical, Multi-Stage Centrifugal, Pressure Maintenance Pumps
22 11 23	1.0	Domestic Water Pumps – General
	2.1	Horizontally Mounted, End Suction, Split-Coupled Centrifugal Pumps
26 29 23	1.0	Variable Frequency Motor Controller – General
	2.1	Manufacture's
26 29 33	1.0	Controllers for Fire Pump System
	2.2	Controller for Diesel-Drive Fire Pumps

8. Only plan holders who purchased bid document sets from Tetra Tech will receive ADDENDA.

9. The following items were discussed in greater detail.

   A. Contractors may copy the Bid Form; submit in triplicate (three (3) copies).

   B. Only one (1) copy of the Drug Testing Affidavit from each Contractor or Subcontractor is required.

   C. Contractors shall identify the time of construction in their Bid Form. This will be the time duration of their contract.

   D. All discrepancies, questions or requests for clarifications or interpretations must be submitted to the Engineers office at least seven (7) days prior to bid due date (Thursday, March 9, 2017 by COB).

   E. Requests for Substitutions must be submitted to the Engineer's Office at least ten (10) days prior to the bid due date (Wednesday, March 7, 2017 COB)

   F. Contractor must list themselves as the Subcontractor for all work which they propose to

accomplish.

G. It was noted that for this Public Works Contracts, the Prime Contractor must perform at least 10% of the total bid price with their own forces, exclusive of administrative costs, purchasing of equipment, overhead or profit.

H. A Bid Security, in the amount of ten percent (10%) of the total amount of the Base Bid plus all additive alternates is required. As of now, there are no Alternates.

I. Temporary Domestic Booster Pump Water Equipment is required on this project. Contractor shall provide a temporary Domestic Water Booster Pump when that part of the project is in Construction. Unit to be located outside of the building as discussed.

J. Facility restrooms are not available. Provide Port-o-Sans.

K. Normal working hours are between 7:00 a.m. to 4:00 p.m., Monday thru Friday. Additional hours must be arranged in advance.

L. Gang boxes will be allowed to be stored in designated areas at the job site.

M. Proper construction clothing is required. Short pants, open-toed shoes, and/or bare chests are not permitted.

N. No dumping will be allowed on the project site. Trash, debris and waste must be removed from the compound daily and from the site as required or directed. Dumpster location to be coordinated at the Pre-Construction Meeting. The Owner has a re-cycling program and first right of refusal. The Diesel Pump, Domestic Water Booster Pumps & Piping shall be deposited on Campus by the Contractor as directed by the Owner.

O. The successful Contractor must submit certified weekly payroll receipts directly to the Delaware Department of Labor as required.

P. The State of Delaware Front End Specifications requires a two (2) year Warranty and Guarantee Period after acceptance by the Owner.

Q. Under the State of Delaware Front End Specifications, the Performance and Labor & Material Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment.

R. Contractors are responsible for all permits.

S. The successful Contractor must read and sign the DHSS “Interim Life Safety Measures”. A copy has been attached to this Addendum.

10. The Project Manual was reviewed in further detail. The following items were discussed:

A. No Addenda will be issued later than four (4) days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of bids.

B. Each Bidder shall ascertain prior to submitting their Bid that they have received all Addenda issued, and shall acknowledge their receipt in the Bid in the appropriate space.

C. The Schedule of Values shall include a line item for the submission of the Project Closeout Documents. The value of this item shall be no less than 1% of the initial contract amount.

D. All utility shutdowns must be coordinated with DHSS Maintenance. Provide two (2) weeks’ notice in advance of all Shutdowns.

E. The Dollar Amount for the BAS Allowance will be included in the next addendum.

11. The drawings were generally reviewed to present the intent of the Contract Documents. The following items were discussed in greater detail:

A. All sheets were reviewed and briefly discussed.

B. Existing Fire Alarm Control Panel and Exterior AV devices are being re-used.

12. A Site Review of the work area was performed.
    A. An additional site visit has been scheduled for Thursday, March 9, 2017 at 10:00 am.
13. Job Site Requirements
    A. All sheets were reviewed and briefly discussed.
    B. A temporary Domestic Water Booster Pump is required during that phase of construction.
    C. Duffield and Associates will be performing the Construction Inspections including Concrete, Soil and Steel.

End of Pre-Bid Meeting Report

J:\IER\26912\200-26912-16011\ProjMgmt\Meetings\200-26912-16011 DHSS Campus Fire & Booster Pump Prebid Meeting Report.doc

TETRA TECH

240 Continental Drive, Suite 200, **Newark**, Delaware 19713

PRE-BID MEETING SIGN-IN SHEET

DHSS Holloway Campus
Fire & Domestic Water Booster Pump Replacement

Tt PROJECT NO.: 26912-16011
DATE: March 2, 2017

	Name	Company	Physical Address	Telephone	Fax	e-mail
1	Dean Seely	OMB/DFM				joseph.seely@state.de.us
2	Elliott Tatum	Fac Ops				ElliottTatum@state.de.us
3	Joseph A Cochran	Cochran+Sn	502 LAMBSON LANE	302-652-6628	302-652-6660	Joe@cochransandscaping.com
4	PAUL FLANNIGAN	ANACONDA	210 EXECUTIVE DR. SUITE 6	834-1125	834-1159	apc.paul@comcast.net
5	BILL BOOTH	COMMONWEALTH CONST. CO.	2317 PENNSYLVANIA AVE - WILM. DE	302-654-6611	302-654-2606	bbooth@its commonwealth.com
6	Craig Yung	Merion Pump Domestic Water	Havertown Pa.	856-577-8724	610-625-5080	craig.yung@merionpumps.com
7	KYLE DONOVAN	CORRADO	200 MARSH LANE NEW CASTLE	302-669-6041		K-DONOVAN@CORRADO.com
8	Matt Bailey	Power Plus Electric	10 Jenny Drive Dover	302 736-5070	302 736-5120	Matt3337@gmail.com
9						
10						
11						
12						
13						
14						

	Name	Company	Physical Address	Telephone	Fax	e-mail
15	Ethel Pew	Bear Industries	15 Albe Dr. Newark DE 19702	302 368-1311	302 368-9217	cjohnston@bearindustries.com
16	Mary Clark	Schlosser + Associates	2047 Sunset Lake Rd Newark, DE 19702	302-738-7333	302-738-5692	abakersa@hotmail.com
17	Robert Cooper	Tetra Tech	Newark, DE	283-2254		robert.cooper@tetratech.com
18	Ken Vandegrift	C+D	14 E 40th St Wilm DE 19802	302 764 2020	764 7585	KVandegrift.cd@verizon.net
19	Jose Wambright	East Coast HVAC	26 Brookhill Drive Newark, DE 19702	302-266-0530	302-266-0532	JOSE@ECHH.NET
20	Matt Celata	Preferred Electric	505 Churchmans Rd New Castle, DE 19720	302-322-9568		mdcelata@preferredinc.net
21	Danny Episcopo	DHSS		255-9238		Danny.Episcopo@state.de.us
22						
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Delaware Health & Social Services **26912-16011**
Holloway Campus - Fire & Domestic Water Pump Replacement

Bids Due: **2:00 p.m., March 17, 2017 at**
Office of Management and Budget
Division of Facilities Management
Thomas Collins Building
540 S. Dupont Hwy., Suite 1 (Third Floor)
Dover, DE 19901

REGISTER OF BID DOCUMENTS
PLEASE PRINT CLEARLY

$ 100.00 per set

#01	Name of Company: Tetra Tech		YES	NO
	Physical Address:			
	City, State:			
	Contact:	GC:	☐	☐
	Phone:			
	Fax:	Date:		
	E-Mail:			
#02	Name of Company: DFM State of Delaware		YES	NO
	Physical Address:			
	City, State:			
	Contact:	GC:	☐	☐
	Phone:			
	Fax:	Date:		
	E-Mail:			
#03	Name of Company: DHSS		YES	NO
	Physical Address:			
	City, State:			
	Contact:	GC:	☐	☐
	Phone:			
	Fax:	Date:		
	E-Mail:			

Delaware Health & Social Services 26912-16011
Holloway Campus - Fire & Domestic Water Pump Replacement

Bids Due: **2:00 p.m., March 17, 2017 at**
Office of Management and Budget
Division of Facilities Management
Thomas Collins Building
540 S. Dupont Hwy., Suite 1 (Third Floor)
Dover, DE 19901

REGISTER OF BID DOCUMENTS
PLEASE PRINT CLEARLY

$ 100.00 per set

#04	Name of Company: Joseph A. Cochran Physical Address: 1483 Red Lion Rd City, State: Bear, DE 19701 Contact: Joseph Cochran GC: YES ☐ NO ☐ Phone: 302-652-6660 Fax: Date: 3/2/17 E-Mail: joe@cochrancompanies.com		
#05	Name of Company: ANACONDA PROTECTIVE CONCEPTS Physical Address: 210 EXECUTIVE DRIVE SUITE 6 City, State: NEWARK, DE 19720 Contact: PAUL FLANNIGAN GC: YES ☐ NO ☒ Phone: 302-834-1125 Fax: 302-834-1159 Date: 3-3-17 E-Mail: qpc.paul@comcast.net		
#06	Name of Company: Physical Address: City, State: Contact: GC: YES ☐ NO ☐ Phone: Fax: Date: E-Mail:		

CAMPUS FIRE & DOMESTIC WATER BOOSTER PUMP REPLACEMENTS
AT
HERMAN M. HOLLOWAY SR.
DELAWARE HEALTH & SOCIAL SERVICES CAMPUS
NEW CASTLE, DELAWARE
OMB/DFM/DHSS Contract No.: MC3501000048

BID FORM

For Bids Due: March 17, 2017

To: State of Delaware
Office of Management and Budget/
Division of Facilities Management
Thomas Collins Building, 3rd Floor, Suite 1
540 S. DuPont Highway, Dover, DE 19901
Phone: 302-739-5644 Fax: 302-739-6148

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.: ( ) _____ - _____**

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

PROJECT BASE BID

Description: Replacement of existing Campus Fire & Domestic Water Booster Pumps, Building Expansion and Sitework.

$ _____

ALLOWANCE CERTIFICATION

Allowance # 1: Certification

We/I confirm that an allowance in the amount of $_____ has been included for the BAS Controls in the Contractor's Base Bid price.

$ _____(Date and Initial)

CAMPUS FIRE & DOMESTIC WATER BOOSTER PUMP REPLACEMENTS
AT
HERMAN M. HOLLOWAY SR.
DELAWARE HEALTH & SOCIAL SERVICES CAMPUS
NEW CASTLE, DELAWARE
OMB/DFM/DHSS Contract No.: MC3501000048

BID FORM

Allowance # 2: Certification

We/I confirm that an allowance in the amount of $ 25,000.00 has been included in the Contractor's Base Bid price for contingency items at the owners' discretion.

$ _____(Date and Initial)

UNIT PRICE

Unit prices conform to applicable project specification section. Refer to the specification for a complete description of the following Unit Prices:

Unit Price # 1: Earth Moving; 2000 CY of unsatisfactory earth disposal off-site plus 2000 CY of satisfactory soil replacement.

$ _____(Date and Initial)

Unit Price # 2: Earth moving 1000 CY of rock removal plus acceptable soil replacement.

$ _____(Date and Initial)

CAMPUS FIRE & DOMESTIC WATER BOOSTER PUMP REPLACEMENTS
AT
HERMAN M. HOLLOWAY SR.
DELAWARE HEALTH & SOCIAL SERVICES CAMPUS
NEW CASTLE, DELAWARE
OMB/DFM/DHSS Contract No.: MC3501000048

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Affidavit(s) of Employee Drug Testing Program
Bid Security
(Others as Required by Project Manuals)

CAMPUS FIRE & DOMESTIC WATER BOOSTER PUMP REPLACEMENTS
AT
HERMAN M. HOLLOWAY SR.
DELAWARE HEALTH & SOCIAL SERVICES CAMPUS
NEW CASTLE, DELAWARE
OMB/DFM/DHSS Contract No.: MC3501000048

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.** This form must be filled out completely with no additions or deletions. **Note that all subcontractors listed below must have a signed Affidavit of Employee Drug Testing Program included with this bid.**

Subcontractor Category		Subcontractor	Address (City & State)	Subcontractors tax payer ID # or Delaware Business license #
1.	Fire Protection			
2.	Site			
3.	Electrical			
4.	Mechanical			
5.	Plumbing			
6.	Environmental Services Contractor			
7.	General Building Trades			
8.	Concrete Work			

CAMPUS FIRE & DOMESTIC WATER BOOSTER PUMP REPLACEMENTS
AT
HERMAN M. HOLLOWAY SR.
DELAWARE HEALTH & SOCIAL SERVICES CAMPUS
NEW CASTLE, DELAWARE
OMB/DFM/DHSS Contract No.: MC3501000048

BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date *(to the Office of Management and Budget, Division of Facilities Management)*.

All the terms and conditions of *(Project or Contract Number)* have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

INTERIM LIFE SAFETY MEASURES

The Herman Holloway Campus is a non-smoking campus that houses 2 resident mental patient areas: Kent/Sussex and Mitchell buildings. Clients may be on the grounds or in any of the campus buildings. Please implement the following Interim Life Safety Measures:

I. Ensure that anyone working on the Herman Holloway site is aware that clients are **not** in uniforms and that the utmost care must be taken in not giving our clients any lighters, rides or money.

II. Ensure that all tools and equipment are secure from client access.

III. Ensure free and unobstructed exits. Personnel receive additional training when alternative exits are designated. Buildings or areas under construction must maintain escape routes for construction workers at all times. Means of exiting construction areas are inspected daily.

IV. Ensure free and unobstructed access to emergency services and for fire, police, and other emergency forces.

V. Ensure fire alarm, detection, and suppression systems are in good working order. A temporary but equivalent system shall be provided when any fire system is impaired. Temporary systems must be inspected and tested monthly.

VI. Ensure temporary construction partitions are smoke tight and built of noncombustible or limited combustible materials that will not contribute to the development or spread of fire.

VII. Provide additional fire-fighting equipment and training personnel in its use.

VIII. Prohibit smoking according to EC/5 throughout the organization's buildings, and in and adjacent to construction areas.

IX. Develop and enforce storage, housekeeping, and debris removal packages that reduce the building's flammable and combustible fire load to the lowest feasible level.

X. Conduct a minimum of two fire drills per shift per quarter.

XI. Increase hazard surveillance of buildings, grounds, and equipment, with special attention to excavations, construction areas, construction storage, and field offices.

XII. Train personnel to compensate for impaired structural or compartmentalization features of fire safety.

XIII. Conduct organization wide safety education programs to promote awareness of LSC deficiencies, construction hazards, and ILSM.

If you are experiencing any problems or need help, please contact the maintenance office for assistance. Maintenance Phone number is (302) 255-9325.

Company: _____

Date: _____

Principal: _____

SECTION 13 34 19 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Thermal insulation.
5. Accessories.

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.4 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 03 30 00 "Cast-in-Place Concrete."

B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of metal building system component.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Metal roof panels.
b. Metal wall panels.
c. Thermal insulation and vapor-retarder facings.
d. Louvers.

B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:

1. Anchor-Rod Plans: Submit anchor-rod plans. Include location, diameter, and minimum required projection and embedment of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.

2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.

3. Metal Roof and Wall Panel Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
   a. Show wall-mounted items including louvers, piping penetrations, signage, and lighting fixtures.

4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:

   a. Flashing and trim.
   b. Gutters.
   c. Downspouts.

C. Delegated-Design Submittal: For metal building systems.

1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For erector and manufacturer.

B. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

1. Name and location of Project.
2. Order number.
3. Name of manufacturer.
4. Name of Contractor.
5. Building dimensions including width, length, height, and roof slope.
6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
7. Governing building code and year of edition.
8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).

9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
10. Building-Use Category: Indicate category of building use and its effect on load importance factors.

C. As-Built Survey as required by the New Castle County Land Use Department and the State of Delaware.

D. Sample Warranties: For special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."

2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weather tightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

B. Primary-Frame Type:

1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.

C. End-Wall Framing: Engineer end walls to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.

D. Secondary-Frame Type: Manufacturer's standard purlins and girts, as required to match existing.

E. Eave Height: as indicated by nominal height on Drawings to match existing conditions.

F. Bay Spacing: As indicated on Drawings.

G. Roof Slope: As required to match existing conditions.

H. Roof System: Manufacturer's standard standing-seam, trapezoidal-rib, metal roof panels as required to match existing.

I. Exterior Wall System: Manufacturer's standard concealed-fastener, flush-profile, metal wall panels as required to match existing.

1. Liner Panels: Tapered rib as required to match existing.

2.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified State of Delaware professional engineer to design metal building system.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings.

C. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.

D. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 at the following test-pressure difference:

E. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C 1363 or ASTM C 518:

1. Metal Building Requirements form IECC Table C402.1.3

a. Roof:

1) International Energy Conservation Code (IECC) –"Prescriptive method:" R-Value: Actual: R-19 + R-11 LS (Liner System – see section 2.7).

b. Walls:

1) IECC – U-Factor Method – U-0.052 or R- 32.5 (Basis of Design - Liner System – see section 2.7).

2.4 STRUCTURAL-STEEL FRAMING

A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

    a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
3. Frame Configuration: One-directional, sloped.

E. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch-wide flanges.

    a. Depth: As indicated on Drawings.

2. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch-wide flanges.

    a. Depth: As indicated on Drawings.

3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch-diameter, cold-formed structural tubing to stiffen primary-frame flanges.
5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
6. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch, fabricated from zinc-coated (galvanized) steel sheet.
7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
8. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head, jamb, and sill of louvers and other openings.
9. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

F. Bracing: Provide adjustable wind bracing as follows:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50; or ASTM A 529/A 529M, Grade 50; minimum 1/2-inch-diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
2. Cable: ASTM A 475, minimum 1/4-inch-diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.

G. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.

H. Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55, or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or HSLAS, Grades 45 through 70.
7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G60 coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G90 coating designation.
    b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, SS, Grade 50 or 80; with Class AZ50 coating.
9. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.

    a. Finish: Plain / Standard Shop base paint coating.

10. Structural Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

    a. Finish: Plain / Standard Shop base paint coating.

    b. Retain option in "High-Strength Bolts, Nuts, Washers" Subparagraph below if applicable. Indicate locations if using bolts below for some connections and ASTM A 325 (ASTM A 325M) bolts in "Structural Bolts, Nuts, and Washers" Subparagraph above for others.

11. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers, plain.
12. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.

    a. Finish: Plain / Standard Shop base paint coating.

13. Unheaded Anchor Rods: ASTM F 1554, Grade 36

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Plain

14. Headed Anchor Rods: ASTM F 1554, Grade 36.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Plain.

15. Threaded Rods: ASTM A 193/A 193M

    a. Nuts: ASTM A 563hex carbon steel.
    b. Washers: ASTM F 436 hardened carbon steel.
    c. Finish: Plain.

I. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Clean and prepare in accordance with SSPC-SP2.
2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.

    a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.

2.5 METAL ROOF PANELS

A. Standing-Seam, Trapezoidal-Rib, Metal Roof Panels as required to match existing: Formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Two-coat fluoropolymer.
b. Color: As required to match existing which shall be as selected by Architect from manufacturer's full range.

2. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Two-coat fluoropolymer
b. Color: Match existing panels

B. Finishes:

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.6 METAL WALL PANELS

A. Concealed-Fastener, Flush-Profile, Metal Wall Panels as required to match existing: Formed with vertical panel edges and flush surface; with flush joint between panels; with 1-inch-wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Fluoropolymer.
b. Color: match existing.

B. Tapered-Rib, Metal Liner Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Siliconized polyester or Acrylic enamel.
b. Color: match existing panels.

2.7 THERMAL INSULATION

A. Wall & Roof Insulation Type:

1. The insulation for both Roofing and Wall systems shall be Liner Systems – Provide the following Basis of Design or approved equal: Thermal Design, Inc., Model – "Simple Saver System." P.O. Box 468, 601 N. Main Street, Madison, NE 68748. ASD. Tel: (800) 255-0776 or (402) 454-6591. Fax: (402) 454-2708. Email: sales@thermaldesign.com, www.thermaldesign.com.

2. Simple Saver System consists of Batt Insulation, Roof Insulation, Wall Insulation, Vapor Barrier Liner Fabric, Thermal Breaks, Straps, and other devices and components in a proprietary insulation system as follows:

a. Batt Insulation: ASTM C 991 Type 1, ASTM E 136 and ASTM E 84, Unfaced, preformed formaldehyde-free glass fiber batt conforming to the Thermal Requirements stated in Section 2.3, Batt Size: Equal to purlin/girt spacing by manufacturer's standard lengths.

b. Vapor Barrier Liner Fabric: Syseal® type woven, reinforced, high-density polyethylene yarns coated on both sides with a continuous white or colored polyethylene coatings, as follows:

1) Product complies with ASTM C 1136, Types I through Type VI.
2) Perm rating: 0.02 for fabric and for seams in accordance with ASTM E 96.
3) Flame/Smoke Properties: 25/50 in accordance with ASTM E 84, Self-extinguishes with field test using matches or butane lighter.
4) Ultra violet radiation inhibitor to minimum UVMAX® rating of 8.
5) Size and seaming: Manufactured in large custom pieces by extrusion welding from roll goods, and fabricated to substantially fit defined building area with minimum practicable job site sealing.
6) Provide with factory triple, extrusion welded seams. Stapled seams or heat-melted seams are not acceptable due to degradation of fabric.
7) Factory-folded to allow for rapid installation.
8) Color – White Vapor Barrier Liner Fabric: Syseal® type woven, reinforced, high-density polyethylene yarns coated on both sides with a continuous white or colored polyethylene coatings, as follows:

c. Vapor Barrier Lap Sealant: Solvent-based, Simple Saver polyethylene fabric adhesive.

d. Thermal Breaks:

1) 3/16 inch (4.7 mm) thick by 3 inch (76 mm) wide white, closed-cell polyethylene foam with pre-applied adhesive film and peel-off backing.
2) Polystyrene Snap-R snap-on thermal blocks.

e. Straps:

1) 100 KSI minimum yield tempered, high-tensile-strength steel.
2) Size: Not less than 0.020 inch (0.50 mm) thick by 1 inch (25 mm) by continuous length.
3) Galvanized, primed, and painted to match specified finish color on the exposed side.
4) Color: White.
5) Primed and painted to match specified finish color on the exposed side.
   a) Color: Black.
6) High-tensile-strength stainless steel.
7) Woven polyester plastic. Color as selected.

f. Fasteners:

1) For light gage steel: #12 by 3/4 (19 mm) inch plated Tek 2 type screws with sealing washer, painted to match specified color.
2) For heavy gage steel: #12 by 1-1/2 inch (38 mm) plated Tek 4 type screws with sealing washer, painted to match specified color
3) Wall Insulation Hangers: Fast-R preformed rigid hangers, 32 inch (813 mm) long galvanized steel strips with barbed arrows every 8 inches (203 mm) along its length.

B. Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I (foil facing), Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core. Provide units tested for interior exposure without an approved thermal barrier.

C. Retainer Strips: For securing insulation between supports, 0.025-inch nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.

D. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm when tested according to ASTM E 96/E 96M, Desiccant Method.
1. Composition: White polypropylene or vinyl film facing, fiberglass scrim reinforcement, and metallized-polyester film backing.
2. Composition: White polypropylene film facing and fiberglass-polyester-blend fabric backing.

E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.8 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. 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.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fascia, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch standoff; fabricated from extruded polystyrene.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.

E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."

1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot-long sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

H. Materials:

1. Fasteners: Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2. Metal Panel Sealants:

a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
b. Joint Sealant: ASTM C 920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.9 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.
2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.10 SOURCE QUALITY CONTROL

A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.

1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.

a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written instructions and drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.

a. Joint Type: Snug tightened or pretensioned as required by manufacturer.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as doors and windows.
3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

D. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.

a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.

2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

E. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

F. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at peaks, rake edges, rake walls, and each side of ridge caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.6 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.

11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

3.7 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.

1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Installation – General

1. Install pre-engineered building insulation system in accordance with manufacturer's installation instructions and the approved shop drawings.
2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
3. Install in exterior spaces without gaps or voids. Do not compress insulation.
4. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
5. Fit insulation tight in spaces and tight to exterior side of the sealed liner fabric and around mechanical and electrical services within plane of insulation.

C. Roof Insulation Installation

1. Straps:

   a. Cut straps to length and install in the pattern and spacing’s indicated on shop drawings.
   b. Tension straps to required value.

2. Vapor Barrier Fabric:

   a. Install vapor barrier fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.
   b. Position pre-folded fabric on the strap platform along one eave purlin.
   c. Clamp the two bottom corners at the eave and also centered on the bay.
   d. Pull the other end of the pleat-folded fabric across the building width on the strap platform, pausing only at the ridge to fasten the straps and fabric in position where plane of roof changes and to release temporary fasteners on the opposite ridge purlins.
   e. Once positioned, install fasteners from the bottom side at each strap/purlins intersection.

f. Trim edges and seal along the rafters.
g. All seams must be completely sealed and stapled seams not acceptable.

3. Insulation:

a. Unpack, and shake to a thickness exceeding the specified thickness.
b. Ensure that cavities are filled completely with insulation.
c. Place on the vapor barrier liner fabric without voids or gaps.
d. Place top layer of insulation over and perpendicular to the purlins without voids or gaps, as roof sheathing is applied.
e. Place thermal block on top of purlins or bottom of purlins for retrofit work, if no other thermal break exists.
f. Place new insulation between purlins at the required thickness for the R-value specified.
g. Seal vapor barrier fabric to the wall fabric and elsewhere as required to provide a continuous vapor barrier.

D. Wall Insulation Installation:

1. Insulation:
a. Install thermal break to exterior surface of girts as wall sheathing is applied.
b. (Optional) Install self-sticking foam thermal break to interior surface of girts prior to installation of insulation.
c. Position and secure Fast-R hangers to girts on the inside face of the wall sheathing.
d. Cut insulation to required lengths to fit vertically between girts.
e. Fluff the insulation to the full-specified thickness.
f. Neatly position in place and secure to Fast-R hangers.
g. Ensure that cavities are filled completely with insulation.

2. Vapor Barrier Fabric:
a. Install vapor barrier fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.
b. Apply the vapor barrier fabric by clamping it in position over eave strap and installing fasteners through the eave strap into each roof strap, permanently clamping the wall fabric between them.
c. Once in position, draw the vapor barrier fabric down over the column flanges to the base angle and install vertical straps along each column and 5 feet 0 inches on center, maximum, fastening to each girt to retain system permanently in place.
d. All seams must be completely sealed and stapled seams not acceptable.

3. Seal wall fabric to the roof fabric, to the base angle and up the columns to provide a continuous vapor barrier.

3.8 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.

E. Louvers: Locate and place louver units level, plumb, and at indicated alignment with adjacent work.

1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of corrosion-resistant paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
4. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 07 92 00 "Joint Sealants" for sealants applied during louver installation.

F. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.9 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.10 CLEANING:

A. Clean dirt or exposed sealant from the exposed vapor barrier fabric.

B. Remove scraps and debris from the site.

3.11 PROTECTION:

A. Protect system products until completion of installation.

B. Repair or replace damaged products before completion of insulation system installation.

END OF SECTION 13 34 19