County of Nevada
Information & General Services Department
Purchasing Division

ADDENDUM NO. 2 (Redesign)

McCourtney Road Transfer Station (MRTS) Improvement Project

BID OPENING – January 11, 2023
IMMEDIATELY AFTER 2:30:00 P.M.

This addendum consists of thirty-four (34) pages, including cover sheet and revised specifications for metal building.

Addendum Release date: December 23, 2022

Careful Note of This Addendum shall be taken by all parties of interest so that the proper allowance may be made in all computations, estimates and contracts, and all trades affected shall be fully advised in the performance of the work which will be required of them. **Failure to acknowledge this addendum will deem your bid non-responsive.**

Job Walk Sign in sheet- has been attached to Public Purchase as a separate document for reference

BID DATE:
The bid date **has not been changed,** and remains January 11, 2023. The time **remains unchanged** at 2:30:00 P.M. local time.

BID BOOK 1

1. Bidding Documents Project Manual Book 1 of 2: Bid Item List is revised and is attached herein to this Addendum. The Bid Item List shall be replaced with the prior version in its entirety. Contractors submitting a Bid for this project must use this revised Bid Item List. Failure to submit this Bid Item List shall deem your Bid as non-responsive.

BID BOOK 2

1. See attached Specification Section 13 34 19 Metal Building Systems for updates.

2. Specification section 34 78 13 Truck Scales,

   1.1 A. Section Includes is revised to read: Single-platform truck scales (4) for total truck weights at Entrance Plaza (two entering, two exiting).

   1.1 B. Qualifications is revised to read: Scale manufacturer shall have had same equipment as specified in operation at a solid waste facility matching the hourly throughput of this facility for a minimum of 3 years at a minimum of five different facilities.

   1.3 System Description, 4 Electronic Pitless Scales at Transfer Station is deleted in its entirety

3. Specification Section 01 22 00 Measurement and Payment, 15 BID/PAY TIEMS – GENERAL CONTRCT

   F. Item 6 is revised to read:

   Clearing, Stripping, Demolition, Excavation, and Rough Earthwork

   - Work under this item includes providing materials, equipment, labor and appurtenances necessary for the clearing, stripping, demo, excavation and rough earthwork and related efforts to prepare the site for earthwork and dynamic compaction activities. Costs shall include soil excavation and subgrade preparation, compacted fill where necessary, quality control testing, and all appurtenant work.

   - Payment: the Lump Sum price for this item will be full compensation for all clearing, stripping, demolition, excavation, and rough grading as required for the Contract, not included under other bid/pay items or contracts. Progress payment will be made on a percent complete basis.

Y. Item 25 – Chain Link Fencing and Gates

- Work under this item includes providing materials, equipment, and labor for installation of the chain link fencing and gates, complete in place as required for the Drawings and Specifications.

- Payment: Lump sum price for this item will be full compensation for installation of Chain Link Fencing and Gates complete in place as required for the Contract, not included under other bid/pay items or contracts. Progress payment will be made on a percent complete basis.

PLANS:

1. There are **no changes** to plans.
2. Plan page changes that were issued with Addendum No.1 have been added to Public Purchase as a separate file for reference and can be printed to a larger size if desired.

QUESTIONS

The following questions have been asked on Public Purchase or at the pre-bid walk. Because the responses may be beneficial to all prospective bidders, the responses are hereby provided as an addendum. In cases where this addendum may conflict with the original Bid documents, this addendum shall prevail.

	QUESTION	ANSWER
1.	What is the new engineered estimate & contract time for this redesigned project?	The new Engineers Estimate for this redesigned project is $21,821,000.00. The Contract Timeline can be found on page 5 of the MRTS Project Manual 1 of 2 Bid Documents.
2.	Reference drawing 02A103 Key Note 9, indicates 9 splash blocks / drawing 02A104 KeyNote 6 indicates 2 down-spouts. Q - Are splash blocks required at locations other than at the down-spouts?	These are typical. Locations for splash blocks are best derived from 02A103. Note that there are two unreferenced symbols for splash blocks at GL J1 and GL J3. Also see Sheet 02A401 for 2 unreferenced symbols on the floor plan, on exterior west wall.
3.	Reference Section 13 34 19; 2.10 Accessories J.5.b Snow Retention Systems Q- Is the meaning of this specification to have a row of snow guards starting at 2' from the edge and having a row at every 16" OC up the entire rake of the roof line? The rake is approximately 84', this would require 64 rows of snow bars	Section 13 34 19; 2.10 Accessories J.5.b. has been modified to “install snow guards starting 2 FT from the eave edge of the roof as shown on Sheet 02A104 Keynote 7. Install 16 inches on center.”
4.	The specs call out Butlerrib II for the roof panel which is a thur-fastener panel. The drawings call out standing seam. The specs required a 25 year weather tight warranty, Butlerid II is only a 10 year. Q- Please clarify.	Section 13 34 19; 2.6 Roof Panel System has been updated..

	QUESTION	ANSWER
5.	The drawings (03S103) indicate that the Scale House Canopies are structural steel, HSS columns, girders & beams. Is it the intent of the Owner to have the pre-engineered metal building manufacturer design & supply these buildings? Or will the Owner give the sizes of the HSS structural steel so that we can have these fabricated by steel fabricators?	Yes, the pre-engineered metal building manufacturer design & supply these structures.
6.	See Section 13 34 19; 2.5.A.6.b.2 says paint in accordance with Specification Section 09 96 00 but Section 13 34 19; 2.5.G.2.a;b;c indicted 1 mil primer. Q - Please clarify the required painting for the PEMB and the Scale Plaza structural steel.	The conflict in Section 13 34 19 has been changed to reference 09 96 00 unless otherwise noted in Subsection G of 13 34 19.
7.	1) Door 101 A calls for Frame Type Y, but it also calls out for a transom. I do not see that this needs a transom. Confirm that no transom is needed at door number 101A. 2) Confirm Schlage locksets & latchsets is an acceptable manufacturer for finish hardware. Von Duprin & LCN by Allegion PLC are already acceptable for exit devices & closers. Schlage is also by Allegion PLC as well. 3) Door 105A -Confirm this is an exterior door & you want a passage latch (non-locking) on this door. This door calls for Hardware Group HW-4. 4) Will Section 08 70 00 -Finish Hardware -supply the hardware for Section 13 34 33 -Modular Shelters -or will Section 13 34 33 supply the door hardware? It looks like Section 13 34 33 will already be supplying the hollow metal doors & frames. Provide clarification.	1. Transom detail reference for this door shall be replaced with “no transom”. 2. Schlage shall be added to list of acceptable manufacturers for locks and latchsets. Spec section 08 70 00 Part 2, 2.1 Manufacturers A.2.c. 3. Next to this door there are several vehicle openings that have no means to close them, defeating the purpose of a lockset to secure this door. Passage hardware was intended. HW 4 is confirmed as “passage”. 4. Sections 08 70 00 and 08 11 00 apply whether provided by vendor or provided by general contractor. General contractor can make decision on who provides and installs as part of “means and methods.”
8.	Fencing: Spec.-section 32 31 13,3.1, I, notes top rail. However, drawings A85/A86 only show top & bottom tension wire. Even though barb arms are showing on A86 there is no barb wire, correct? Are there any dimensions for the members of the dual swing chain link gate at the entrance per detail 1 on 01C503?	1. Drawing A85 shows horizontal bracing at certain locations. There is no barb wire for this fence, so the top bar isn’t required. 2. There is no bar wire. 3. The dimensions for this entrance gate are “per site plan” see coordinates on sheet C101 or edge posts. The overall gate width is approximately 56’. Individual member dimensions should be verified with a gate manufacturer.
9.	HDR’s section 31 23 00, 3.5 B 3a (earthwork) says “if undesirable material and obstructions are encountered during excavation, remove material and replace as directed by Geotechnical Engineer.” If these “undesirable materials” are encountered below the 2ft or 4ft over-x specifications of NV5’s soils report, will these be considered an extra charge to the contract bid amount?	The geotechnical engineer will determine what materials are ‘undesirable’ and necessitate removal from the site. Those materials that require removal/disposal off-site will be an extra charge to the contract bid amount.

	QUESTION	ANSWER
10.	Contaminated soil was not encountered in the Geotechnical engineering report. If contamination or waste is encountered, how will it be paid?	See #9 above.
11.	Expansive soil was not encountered in the Geotechnical engineering report. If encountered, how will it be paid for?	See # 9 above.
12.	Due to the very specific requirements on the imported fill, there would be few local borrow sites that would meet the specifications, other than processed aggregate materials. Would the County be open to any flexibility of the import specifications?	The County is open to flexibility of the import specifications. The Contractor is advised to submit alternatives for approval.
13.	See section 13 34 33 Modular Shelters The spec is unclear on the fire pump house and the water pump house? Are both included in the scope of work? 1.1 SUMMARY A. Furnish labor, materials, tools, equipment, and services for Modular Shelters, as indicated, in accordance with provisions of Contract Documents. B. This section applies to the fire pump house, and the two scale houses. C. Completely coordinate with work of other trades. D. Buildings listed below are included in the modular shelters contractor scope. Locations for buildings on-site can be found on civil drawings. 1. Outbound Scale House 2. Inbound Scale House 3. Water Pump House Building	"Water pump house" is synonymous with "fire pump house."
14	Per specification 09 91 10 3.1 ITEMS TO BE PAINTED: A. 4 & 6 indicate that galvanized steel railings, bollards, embed plates, and items specifically noted to be painted are to be painted, and 3.2 ITEMS NOT TO BE PAINTED indicates that galvanized is not to be painted unless specified. If the Pre Engineered buildings are supplied with Galvanized framing, girts, purlins, and decking, will this be required to be painted?	Finishes are called out in Section 13 34 19 and should all be shop applied. Galvanized finish may be considered a shop applied finish. Care should be given in reading 13 34 19 carefully as most items including primary framing are to be finished with shop applied primer and paint. Girts are listed as galvanized.
15.	Does the fire pump house fall under Section 13 34 33?	Yes.
16.	Drawings 00G006 and 00G007 are missing from the set, Electrical Legends are doubled up.	Dwg 00G006 and 00G007 are Mechanical and Plumbing legends and are missing. From the plan set, duplicate dwgs 00G006 and 00G007 electrical legend 1 and 2 should be removed and replaced by 00G006 and 00G007.

	QUESTION	ANSWER
17.	Pursuant Drawing 01C506, Detail 2, Typical Trenching Detail, is slurry cement backfill only required along and across paved roads? Also, please confirm the depth of the slurry? Note 3, C = 2-1/2' above 4000', project is below 4000'?	1. Per the detail the slurry cement is only under a paved surface. 2. The depth of slurry is the total backfill, so it's to the top of pipe. 3, C minimum can still be 2.5' below 4000'.
18.	Pursuant Drawing 01C104, Pipe Table, please clarify location of pipe runs SDA-P14, SDA-P15 and SDA-P16?	The pipes SDA-P14,15,16 are the short pipes connecting SDA-PC1,2,3 (notes 11) to the 144" precast manhole (note 6).
19.	Pursuant Drawing 02S502, please clarify if the Base Plate and Anchor Bolt Schedule correlate to the right-hand details? Mark numbers, Anchor Bolt quantities, and Detail numbers do not match.	Details 1 thru 4 on Sheet 02S502 are typical details and typically show minimum requirements. Column sections and shapes are selected and designed by PEMB manufacturer; thus, MARKs AB-1 thru AB-3 do not necessarily correlate with detail numbers on this Sheet. See column REMARK in anchor bolt schedule for where each anchor bolt combination (AB-1 thru AB-3) is applied.
20.	In conjunction with Addendum No. 1, please revise the bid schedule accordingly. For instance, Bid Item 22 Site Concrete Paving (8" PCC/6" AB), Complete. This area has been changed to be included in Bid Item 21 Site Paving Non-Vehicular (3" AC/6"AB). Quantities and units to be adjusted also.	The Bid Form and related quantities were prepared in expectation of Addendum No. 1 and already reflect the correct quantities for Bid Items 21 and 22.
21.	Please provide the bid item in which the Chain Link Fence and Gates shall be included.	See new bid item 25 as discussed in revised Bid Form and revised Bid Item 25 above.
22.	Pursuant Specification Section 40 05 31, Paragraph 3.3, C, 1, is the HDPE storm drainpipe to be mandreled? Or, only sewer pvc?	1. Specification 40 05 31 is only for PVC plastic pipe. HDPE storm drain pipe is per specification 33 40 00. 2. Sewer is PVC.
23.	Pursuant Drawing 04FX601 and Specification Section 21 05 00, 1.3, b, please confirm product/material for the 48" Wet Well Pit? Is this to be manhole material? And, what is the 20"pipe backfill requirement, sand, slurry, etc?	1. 48" wet well can be a modified concrete manhole. 2. Trenching and backfill will be per specification 31 23 33.
24.	Sheet 02E103 show (1) exit sign, there are no other exit signs shown on the plans in any other areas of the project. Is this the only exit sign that will be required?	There is only one man door located at the main building. Technically all the bay openings are exits, but only one door exit.

	QUESTION	ANSWER
25.	Sheet 00E601, Note 2 gives direction to salvage the existing power transformer back to PG&E to be remounted on pole #4 unless a larger pad mounted transformer is required. Has there been coordination with PG&E regarding the transformer and the potential that the transformer will be required to be upsized and located on a concrete transformer pad?	No. Application for relocation of utility service will need to be applied for by contractor.
26.	Please provide a specification for wall mounted dimmer switches.	Provide standard digital programmable dimming switch, same manufacturer as toggle light switches. Provide with on/off button and dimming capabilities.
27.	Metal Wall Liner. Liner is shown on details on Sheet 02A503 and in the room finish schedule on Sheet 00A001. It is also listed in Section 13 34 19, 2.10, A. Confirm there is no metal liner panel or indicate where it is specifically.	As noted on Sheet 00A001, metal liner panel shall be installed on all four walls of the tipping room. This is to be interpreted as “full height”.
28.	Detail 6/02A503 calls for a "proprietary liner panel attachment" Can the meaning of this be expanded upon? We are not sure of the intent.	Per the manufacturer selected, provide manufacturer recommended fasteners to attach the liner panel.
29.	Section 13 34 19 2.7 calls for a fluted wall panel with concealed fasteners. Given the use of this structure, an exposed fastener would facilitate wall repairs if need be. Concealed fasteners do not allow for panel replacement without great effort. A reverse rib would meet the design esthetic. Please advise.	Aesthetics are usually decided by client preference. A functional reason for concealed fasteners is that exposed fasteners tend to show corrosion and wear more quickly. Before a design change is made, a discussion regarding pros and cons should happen.
30.	Reference Section 13 34 33. You give as basis of design 4 vendors for the modular shelters. Porta-King will not quote the fire pump house. At least one of the optional vendors buildings don't meet all the specs, specifically electrostatic paint. Will the optional vendors be acceptable if they don't meet all of the specifications listed?	Yes.
31.	Please provide borrow sources for the required import fill material.	There are no pre-approved sources of borrow soil for the project.

	QUESTION	ANSWER
32.	RFI request is for clarification of scope of work for division 09 91 10 Architectural Painting. Please clarify if rooms 100, 101, 102, 103, and 104 will the exposed ceiling receive paint. Please clarify if exterior Pre-Engineered Metal Building metal siding is to be painted. Are the scuppers and downspouts paint grade? Exterior Stain grade wood is noted in Spec Section 099110. Please clarify the exposed wood surfaces location.	All gypsum wall board surfaces shall be painted as per the “GWB” abbreviation definition on Sheet 00A001. Finishes for PEMB are covered within Section 13 34 19, and are mostly, if not all factory finishes. Delete reference to “exterior stain grade wood”.
33.	Pursuant Specification Section 01 30 00, 1.3, A, 1, d, please provide minimum size for Engineer's trailer and what contents are required?	The Engineers trailer is removed. Specification 01 30 00, 1.3 A.d Engineer’s Field Office is removed in its entirety.
34.	Pursuant Project Manual Book 1 of 2, the cover page states questions are due December 16, 2022. However, page 11 of same document states "The County makes no assurance that questions received within five (5) calendar days of the bid opening date will be answered". December 16, 2022 is nearly 4 weeks prior to bid date, potential vendors/subcontractors will probably not even review the documents until after this date. Please confirm question due date.	The question due date was December 16, 2022.
35.	See Section 13 34 33 Modular Shelters; We have contacted all the "acceptable manufactures" listed and none of them ship over 10' wide and all of them only manufacture square or rectangular buildings. Is CalTrans aware of a modular building manufacturer that can meet the specs? If not, what alternative will be allowed?	Alternate similar manufacturers will be considered. Use the acceptable list as minimum standards for quality.
36.	Spec Section 03 31 30, 2.2 Materials, G Aggregates for Normal Weight Concrete, 3. Concrete Mix for all tipping floor flat areas. A Specific gravity: 2.91. None of the concrete suppliers that can service this project can meet this requirement. The specific gravity on their coarse aggregate runs 2.50 to 2.60. Please modify the spec so we can get available concrete.	See response to question 40.

	QUESTION	ANSWER
37.	1. Sheets 03S103, and 03S302 note "SEE ARCHITECTURAL DRAWINGS FOR UNDER SLAB INSULATION REQUIREMENTS." a. Architectural sheets do not indicate the underslab insulation required at these areas.	A code modification is pending to eliminate requirement for underslab insulation under mechanical wing. Scale houses will require underslab insulation. R 25 polystyrene is the requirement.
38.	Detail 1/02A701 Backing type C: This shows a 4" 14ga track welded to the back of regular 6" 14ga flat strap. This is much heavier backing than is normal. Normal backing would be just 1 piece of 6" 16ga flat strap. a. Can the 400T125-68 stiffeners be omitted? b. Can the 600FS-68 plates be changed to 600FS-54 plates? c. Can the backing plates be mechanically fastened with 3 #10sms's in lieu of welding?	Contractor has option to propose other systems as a substitution. Since this particular detail deals with load, an engineer's seal will be required in proposing the substitution.
39.	Provide additional detail regarding the finishes noted on sheet 00A001. Have material selections been made for ACT, VCT, and CT?	Specifications provide product information other than color. Colors and textures shall be selected during submittal process.
40.	There are significant savings available if there are changes made to the concrete specifications. The specified specific gravity of 2.91 would require any supplier to import Orca, or similar, which results in a drastic increase in cost per yard of concrete. We suggest the following: a. Combining the use of macro fibers, .38 w/c ratio, 6000 psi, and silica fume would allow for a lower specific gravity aggregate (Suggest 2.75). b. Increasing abrasion loss to 15% and eliminating air from tipping floor slab. Using silica fume will make the concrete dense enough so that water will not be able to migrate through the concrete, thus eliminating the possibility of freeze-thaw damage. c. Eliminating the requirement that all concrete include super plasticizer. Instead, allow contractor and supplier decide where 8" slump is needed and where 5" slump is acceptable. d. Any aggregate meeting ASTM C1293 is inherently acceptable for all concrete. 2.75 S.G. and 15% abrasion loss restrictions would only apply to tipping floor slab.	This is a specialty facility and therefore a specialty concrete mix is required for the tipping floor to avoid or limit the cost of future maintenance. a. Macrofibers (or microfibers) and silica fume are already required in the mix per Specification Section 03 31 30, Parts 2.3-E-6 and 2.3-E-3b. However, lower specific gravity of 2.75 for aggregate is acceptable if abrasion loss is kept below 13.5% per Specifications. b. Abrasion loss and air content are required to satisfy Specifications limits. 15% abrasion loss and zero air are not acceptable. c. Superplasticizer is not required, but allowed per contractor's option, if concrete slump satisfies the requirements of specification Section 03 31 30 Part 2.3-D. d. Specific gravity of 2.91 (2.75 is acceptable) and abrasion limit of 13.5% (15% is NOT acceptable) are required for the tipping floor concrete only. All other concrete aggregates are not required to meet the above-mentioned requirements as long as they satisfy the rest of the requirements in specification Section 03 31 30 Part 2.2-G (including ASTM C1293).

	QUESTION	ANSWER
41.	Section 34 78 13 a. 1.1.A.: References 4 truck scales for axle weights with tamping as well as 4 single platform truck scales at the Entrance Plaza. This note would mean 8 total scales would be installed as a truck scale for axle weights cannot serve as single platform truck scales when tamping is being done. Furthermore, tamping can't really take place at the Entrance Plaza as there is a roof above portions of the scales. b. 2.2.B.: Items 7 and 9 are in direct conflict with one another. A rocker column load cell by design will always need to have checking mechanisms built in and cannot be self-checking. c. 2.2C.3.: Lists the transfer station separately from the data management system related to the entrance truck scales.	The axle scales have been removed from the project. This refinement has also removed the necessity for tamping. See specifications revised. See revised specifications attached.
42.	Section 28 46 00 a. 1.4.B.11.: What is the intended purpose for the tone generator? b. 2.1.A.1.: We would like to propose Potter Electric Signal Company products for the fire alarm control panel and system. This product meets or exceeds the specifications with the following exceptions. Are these acceptable? i. 2.2.2.B.: Proposed Potter product does not use plug in modules. ii. 2.2.3.C.: Proposed Potter product can support up to 1,550 single point LEDs, which exceeds the proposed use of this project. iii. 2.2.3.D.: Proposed Potter product does not give battery voltage readouts on the FACP display. iv. 2.2.3.G.: Proposed Potter product supports charging of up to 55 Ah batteries. This exceeds the proposed use of this project.	The purpose of the tone generator is to create an audible alarm in the event of a specified condition. Without having reviewed the full proposed fire alarm control panel and system, the alternative appears acceptable. Ultimately, the fire alarm panel and system must be approved by the Fire Department and AHJ.

	QUESTION	ANSWER
43.	Section 10 14 23 a. 3.1.D.1.: "Signs and markers must comply with California MUTCD, California Sign Specifications, and the FHWA publication Standard Highway Signs and Markings." i. These standards are for freeways and roadways not public facilities. The signs detailed on sheet 01C600 Signage Plan are all custom signs excluding the stop signs. ii. Sign size, letter size requirements, required typestyles, graphic icons, and colors are not clear. iii. Site plan is not clear as to what signs are to be installed on concrete hardscape and which signs will be poured over landscaping.	Contractor to submit sample lettering size and color for the project. a. Sample to be submitted for size graphic and colors b. Installing signs on hardscape or landscape is similar, the same foundation is required. Please clarify what "poured over landscaping" means?
44.	What bid item is the site Clearing and Grubbing paid for in?	Bid Item 6
45.	What bid item is site Demolition paid for in?	Bid Item 6
46.	It was indicated at the job walk that the county would be handling the permitting. However, Item 25 includes permit fees and inspection, where the scope includes providing all labor for securing permits. Please clarify.	The building permit related fees for the main transfer building, are being covered by the County. All other permits that may be required for the project are the responsibility of the Contractor and included in the bid item to which it pertains. Bid Item 25 is deleted.
47.	Reference section 10 14 23. Upon sharing plans and and specification section specified manufacturers, no proposal was able to be prepared. Aluminum letters specification doesn't appear to apply for this project. Please clarify.	The configuration of this signage will be decided during submittal process. Contractor shall provide a line item for the installation of up to 50 characters. A credit will be provided if owner wishes to reduce number of characters or eliminate this requirement altogether. At minimum, a street address is required per building code. Per owner request, this may include the name of the building.
48.	In the Preliminary Stormwater Pollution Prevention Plan, Page 11, Section 2.1.4 Project Description states, "The proposed development will expand parking surfaces, entrance roads, and will construct a new transfer station. The on-site impermeable surface area will increase by 2.8 acres from 8.8 pre-construction acres to 11.6 post-construction acres (Figures 3 & 4). Sitework will require approximately 5,000 cubic yards of earthwork cut and 30,000 cubic yards of earthwork fill." Bid Item 6, Excavation and Rough Earthwork, 200 CY Is the 200 CY quantity correct? If it is what are the limits of excavation for this item?	The redesign of the facility has resulted in reducing the quantities of earthwork that were described in the Preliminary Stormwater Pollution Prevention Plan. However, the quantities of pervious and impermeable surfaces remain applicable. The earthwork quantities are revised as shown on the revised Bid Form. Bid Item 6 has been revised to a Lump Sum pay item and will include clearing, stripping, demolition, excavation, and rough earthwork. The limits of excavation are as shown on the drawings.

	QUESTION	ANSWER
49.	Erosion control plan includes note to install fiber roll per detail 10/01C501. Erosion control plan does not indicate where fiber rolls are to be installed. Please clarify location of fiber rolls.	Fiber roll shall be placed on slopes as with spacing as shown on detail 1/C501.
50.	Is the plan set in Addendum No. 1 available in 24x36 instead of 8.5x11?	The plan set is provided in an electronic format that can be printed at any size preferred. The full size print format is 24x36.

End of Addendum

Respectfully Submitted,

Diana Wilburn Buyer
Nevada County

REVISED BID ITEM LIST

No.	Bid Schedule Item	Quantity	Unit	Unit Cost	Total Price
1	General Conditions – Maximum of 10% of total bid.	1	LS		
2	Phasing Plan.	1	LS		
3	Traffic Control & Temporary Detours.	1	LS		
4	Sheeting, Shoring & Bracing.	1	LS		
5	Locating and Pot Holing Utilities.	1	LS		
6	Clearing, Stripping, Demolition, Excavation & Rough Earthwork.	1	LS		
7	Dynamic Compaction.	1	LS		
8	Import Fill, Placed & Compacted.	33,000	CY		
9	Fire Protection System, Complete.	1	LS		
10	Water Supply System, Complete.	1	LS		
11	Site Finish Grading.	1	LS		
12	Transfer Station PEMB, Foundation, Walls, Roof, Fire Suppression, Plumbing, Electrical, Complete.	1	LS		
13	Site Electrical System, Complete	1	LS		
14	Site Fire Water Distribution System	1	LS		
15	Storm Drain Cleaning and Lining of Existing CMP Storm Lines.	1	LS		
16	Leachate Collection System from PRA to 3” POC, Complete	1	LS		
17	Site Storm Drainage System, Complete	1	LS		
18	Site Sanitary Sewer, Complete	1	LS		
19	Entrance Plaza, Scales, Scale Houses, Canopy, Electrical, Plumbing, Civil, Complete.	1	LS		
20	Site Paving HMA Vehicular Traffic (6” AC /12” AB), Complete.	133,000	SF		
21	Site Paving Non Vehicular (3” AC/6”AB)	4,000	SF		
22	Site Concrete Paving (8” PCC/6” AB) , Complete.	6,800	SF		
23	Erosion Control	1	LS		
24	Signage, Temporary & Permanent.	1	LS		
25	Chain Link Fencing and Gates, Complete.	1	LS		

TOTAL BID:_____

NOTE: "Total Bid" line is provided for convenience purposes only. The actual bid shall be computed asdescribed above.

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Complete metal building system including but not limited to:
      a. Design.
      b. Materials.
      c. Fabrication.
      d. Shipment.
      e. Erection.
      f. Components as specified.

B. Related Specification Sections include but are not necessarily limited to:
   1. Division 00 - Procurement and Contracting Requirements.
   2. Division 01 - General Requirements.
   3. Section 03 15 19 - Anchorage to Concrete.
   4. Section 07 92 00 - Joint Sealants.
   5. Section 09 96 00 - High Performance Industrial Coatings.

C. Buildings listed below are included in the metal building system contractor scope. Locations for buildings on-site can be found on civil drawings.
   1. Main Transfer Station Building.
   2. Fire Riser/Mechanical/Electrical/Restroom Building.
   3. Scale House Canopies.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Architectural Manufacturers Association (AAMA):
      a. 621, Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
   2. ASTM International (ASTM):
      a. A36/A36M, Standard Specification for Carbon Structural Steel.
      b. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
      c. A563, Standard Specification for Carbon and Alloy Steel Nuts.
      d. A792/A792M, Standard Specification for Steel Sheet, 55 PCT Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
      e. B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
      f. C653, Standard Guide for Determination of the Thermal Resistance of Low-Density Blanket-Type Mineral Fiber Insulation.
      g. C665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
      h. C991, Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings.
      i. C1136, Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
      j. D2244, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
      k. D4214, Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

l. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
m. E96/E96M, Standard Test Methods for Water Vapor Transmission of Materials.
n. E1592, Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
o. F436, Standard Specification for Hardened Steel Washers.
p. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
q. F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
r. F3125, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

3. American Welding Society (AWS):
   a. D1.1/D1.1M, Structural Welding Code - Steel.
   b. D1.3/D1.3M, Structural Welding Code - Sheet Steel.
4. FM Global (FM).
   a. FMRC Standard 4471, Approval Standard for Class 1 Roofs for Hail Damage Resistance, Combustibility, and Wind Uplift Resistance.
5. International Accreditation Service (IAS):
   a. AC472, Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems.
6. Metal Building Manufacturer's Association (MBMA):
   a. Low Rise Building Systems Manual.
7. Research Council on Structural Connections (RCSC):
   a. Specification for Structural Joints Using High-Strength Bolts.
8. The Society for Protective Coatings/NACE International (SSPC/NACE).
   a. SP 6/NACE No. 3, Commercial Blast Cleaning.
9. Underwriters Laboratories, Inc. (UL):
   a. Building Materials Directory.

B. Qualifications:
1. Manufacturer's qualifications:
   a. Manufacturer must be member in good standing of the MBMA.
   b. Manufacturer must be currently approved by IAS Accreditation Committed under the Inspection Programs for Manufacturers of Metal Buildings Systems IAS AC472 to assure compliance with fabrication Special Inspections as required by the building code.
2. Erector qualifications:
   a. Erector (installer) must be approved in writing by metal building manufacturer.
   b. Erector must have minimum of 10 years current experience in erection of similar structures.
3. Manufacturer's Structural Engineer: Registered in the State where project is located.

1.3 DEFINITIONS

A. Code: The word "code" refers to the building code.

B. Installer, Erector or Applicator:
1. Installer, erector or applicator is the person actually installing, erecting or applying the product in the field at the Project site.
2. Installer, erector and applicator are synonymous.

C. PVDF: Polyvinylidene fluoride.
1. Nomenclature as listed in Bibliography of the MBMA Low Rise Building Systems Manual.

1.4 SUBMITTALS

A. Shop Drawings:
1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.

2. Product technical data including:
    a. Acknowledgement that products submitted meet requirements of standards referenced.
    b. Manufacturer's technical reference manual containing all of the manufacturer's standard construction details and specifications.
        1) Manufacturer's erection manual containing all details and methods for installation of building frame, roof system, wall system, and accessories.
        2) Edit to mark out items not used for this installation.
3. Design and fabrication drawings:
    a. Erection drawings minimum scale: 1/8 IN = 1 FT-0 IN.
    b. Details and sections minimum scale: 1-1/2 IN = 1 FT-0 IN.
    c. List of all design loads and combination of loads.
    d. Size and location of each component of the building.
        1) Include clearance under structural framing members, both horizontal and vertical.
        2) Include cross-section of components.
    e. Fasteners and details of fasteners connecting each component of the building.
    f. Size, location and details of anchor bolts, base plates, and all other components fastened to the foundation.
        1) Size anchor bolts and base plates assuming 3000 PSI concrete.
    g. Details of wall panels, roof panels, finishes, flashings, closures, closure strips, trim, gutters, downspouts, sealant, and all other miscellaneous components.

B. Samples:
1. Metal color and finish samples of roof and wall panels, roof trim, wall trim, and interior liner panel colors for Engineer's selection.
2. Color chart is not acceptable.

C. Contract Closeout Information:
1. Operation and Maintenance Data:
    a. See Specification Section 01 33 04 for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

D. Informational Submittals:
1. Manufacturer's and Erector's Qualifications.
2. Manufacturer's approval of erector.
3. Manufacturer's Certificate of Accreditation per IAS AC472.
4. Structural calculations stamped and signed by a professional Structural Engineer licensed in the State where Project is located.
    a. Include list of design loads and loads transmitted to foundation through columns or walls and location where loads occur.
    b. Submit calculations for information only.
5. Certificate of compliance by fabricator that steel was fabricated in accordance with the approved construction documents.

1.5 WARRANTY

A. Manufacturer's standard warranty.

B. Manufacturer's standard warranty for factory applied PVDF coating system against blistering, chipping, cracking, peeling, or color fading of wall and roof panels.

C. Metal building system manufacturer shall provide a written weathertightness warranty for a maximum of 25 years against leaks in roof panels, arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions.
1. Warranty shall be signed by both the metal roof system manufacturer and the metal roof system installer.
2. Maximum liability of warranty shall be no less than $0.70/SQFT of roof area.

D. Metal building system manufacturer shall provide a written warranty for 20 years against perforation of metal roof and wall panels due to corrosion under normal weather and atmospheric conditions.
   1. Warranty shall be signed by metal roof system manufacturer.
   2. Acrylic Coated Galvalume: Product will not rupture, fail structurally, or perforate within period of 20 years due to normal atmospheric corrosion.

E. Metal building system manufacturer shall provide a paint film written warranty for 25 years against cracking, peeling, chalking, and fading of exterior coating on painted roof and wall panels.
   1. Warranty shall be signed by metal building system or roof system manufacturer and state that the coating contains 70 PCT "Kynar 500 IN or "Hynar 5000 IN resin.
   2. Failure of adhesion, peeling, checking, or cracking for 25 years.
   3. Color fading in excess of 5 Hunter units per ASTM D2244 for 25 years.
   4. Chalking in excess of No. 8 rating per ASTM D4214 for 25 years.

F. Provide written notice of any exceptions taken to warranties.
   1. Any exceptions may be grounds for not accepting the manufacturer, at the discretion of the Owner or Engineer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
   1. Metal building systems:
      a. Butler Manufacturing.
      b. NCI Building Systems.
      c. Nucor Building Systems.
      d. Star Building Systems.
   2. Insulation:
      a. Fiberglass batt or blanket:
         1) Certainteed.
         2) Johns Mansville.
         3) Owens-Corning Fiberglass Corp.
         4) United States Gypsum Company (USG).
      b. Rigid extruded polystyrene board:
         1) Dow Building Solutions.
         2) Owens Corning.
         3) VC Industries.
         4) Johns Mansville.

B. Submit request for substitution in accordance with Specification Section 01 25 13.

2.2 SYSTEM DESCRIPTION

A. Tipping floor of the building shall be non-insulated type with vertical walls and gable type roof.
   1. Provide partial height wall liner panels and no ceiling liner panel.
   2. Provide cross bracing in the side walls perpendicular to the rigid frame.
   3. Buildings with flush girts must have cast-in-place anchor bolts, due to minimum edge distance requirements for alternate anchor types.

B. Mechanical Wing of the building shall be insulated type with vertical walls and flat type roof.
   1. Finish as shown in the drawings.
   2. Provide cross bracing within walls. Do not put bracing outside of the plane of the wall.
   3. Buildings with flush girts must have cast-in-place anchor bolts, due to minimum edge distance requirements for alternate anchor types

C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns and rafters.

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

2.3 BUILDING DESIGN CRITERIA

A. Critical Dimensions:
   1. Building Size:
      a. As indicated on the Drawings.
   2. Roof slope:
      a. As indicated on the Drawings.
   3. Horizontal Plan Dimensions:
      a. Measure to interior face of girts / outside face of rigid frame.
   4. Eave Height:
      a. Measure from top of finished floor to intersection of insides of roof and sidewall sheets.
   5. Clear height between finished floor and bottom of roof steel: indicated on the drawings.

B. Building Foundation:
   1. All footings, foundations, anchor bolts and piers have been designed based on assumed loadings and reactions.
      a. Member sizes and geometry may vary depending on the building being supplied.
      b. Do not construct these members until Engineer has verified design with approved Shop Drawings of metal building being supplied.
      c. Design all column base plates as pinned connections. Fixed base plates are not permitted.
   2. Building dimension changes in either horizontal or vertical direction resulting in either 5 PCT change of envelope volume or lighting height or spacing shall be addressed by incorporating any necessary changes to mechanical or electrical systems or any other building component impacted, at no additional cost to Owner.
      a. Design changes must be approved by Engineer prior to constructing changed item or system.
      b. Does not apply to structural member sizes.
   3. Contractor is responsible for incorporating any necessary changes to foundations, mechanical, or electrical systems or to any other building component.
      a. Design changes must be approved by Engineer prior to constructing changed item or system.
   4. Itemize modifications in a separate attachment to the bid form and include all modifications in the bid price.
   5. Completed building to be free of excessive noise from wind induced vibrations under ordinary weather conditions to be encountered at location of erection, and meet all specified design requirements listed below.

C. Lateral Seismic Resisting System
   1. As indicated on sheet 00S001.

D. Roof Live Loads:
   1. Roof panels:
      a. Per building code.
      b. 20 PSF uniformly distributed live load.
      c. 300 LB concentrated (point) live load (over a 1 x 1 FT area) located at center of maximum roofing (panel) span.
      d. The most severe condition governs.
   2. Roof framing members:
      a. Per building code.
   3. The above loads are in addition to other applicable equipment loads and shall be applied to the horizontal projection of the roof.

E. Snow Loads:
1. Design structure for snow loading as set forth in the building code.
a. Project site conditions are as follows:
1) Basic ground snow: 40 PSF.
2) Importance factor: 1.0.
3) Snow exposure coefficient: 0.9.
2. Design roof panels, secondary support members and primary framing where appropriate for a snow load drifting accumulation as specified in the building code.

F. Wind Loads:
1. Design structure for wind loading as set forth in the building code.
a. Project site conditions are as follows:
1) Basic wind speed: 94 MPH.
2) Site exposure: Class C.
3) Enclosure type: Enclosed/Partially open, the most stringent one.

G. Seismic (Earthquake) Loads:
1. Design structure for seismic forces as set forth in the building code.
a. Project site conditions are as follows:
1) Importance factor: 1.00.
2) Spectral response acceleration (Ss): 0.522.
3) Spectral response acceleration (S1): 0.23.
4) Site class: C.
5) Spectral response coefficient (Sds): 0.45.
6) Spectral response coefficient (Sd1): 0.23.
7) Seismic design category: D.

H. Auxiliary Loads:
1. Consider other superimposed loads as part of the design requirements and combine with the normal design (dead, live, seismic and wind) loads as prescribed hereafter and on drawings.
a. Static loads:
1) 100 PSF for stairs and landings.
2. Contractor to coordinate and verify magnitude and location of auxiliary loads before fabrication.

I. Combination of Loads:
1. The combining of dead, live, wind, seismic and auxiliary loads for design purposes as set forth in the building code, unless otherwise specified.
2. Horizontal sway deflection of building due to combination of required design loads:
a. 3 IN.
3. Deflection of purlins and secondary members not to exceed L/180 of its span when supporting applicable vertical live, dead, and auxiliary loads.
4. Wind beams supporting masonry walls: Do not deflect more than L/240 of its span when resisting applicable loads.
5. Lintel beams supporting brick/masonry: Do not deflect more than the lesser of L/600 of span or 0.3 IN.

2.4 MATERIALS

A. Steel:
1. Structural Shapes and Plate:
a. All W-shapes and WT-shapes: ASTM A992/A992M.
b. All other plates, bars and rolled shapes: ASTM A36/A36M.
c. Unless noted otherwise on Drawings.
2. Miscellaneous Metals:
a. Insulation support: Structural Steel Grade 50 per ASTM C653.

B. Bolts, Nuts and Washers, High Strength:
1. Bolts: ASTM F3125, Grade A325.

2. Nuts: ASTM A563.
3. Washers (hardened): ASTM F436.
4. Galvanized, ASTM A153/A153M.
5. Provide two washers with all bolts.

C. Bolts and Nuts:
1. ASTM A307, Grade A.
2. Galvanized, ASTM A153/A153M.

D. Anchor Bolts:
1. ASTM A307, ASTM A36/A36M, galvanized steel.
2. Embedment details to be developed by Engineer upon receipt of anchor bolt and loading information for approved Shop Drawings from building manufacturer.

E. Fasteners:
1. Roof and wall panels: 300 series stainless steel, ASTM F593.
2. Miscellaneous fasteners: Corrosion resistant.

F. Any structural member to be hot-dipped galvanized shall be minimum 12 GA thickness.

G. Roof and Fascia Panels:
1. General:
a. Galvalume per ASTM A792/A792M.
1) Painted surfaces: AZ50.
2) Unpainted surfaces: AZ55.
b. Apply clear acrylic film for additional protection.
1) Apply to both sides of panels.
2. Wall Panels:
a. General:
b. Galvalume per ASTM A792/A792M.
1) Painted surfaces: AZ50.
2) Unpainted surfaces: AZ55.
c. Apply clear acrylic film for additional protection.
1) Apply to both sides of panels.
3. Wall and Roof Liner Panels and Soffit Panels:
a. Galvalume: ASTM A792/A792M, Grade 50B.

H. Perimeter Trim, Panel Closures, Flashing and Counterflashing:
1. Same material and factory applied finish to match roof and wall panels.

I. Insulation:
1. Blanket or Batt:
a. Glass or other inorganic fibers and resinous binders formed into flexible blankets or semi-rigid sheets.
1) Unfaced: ASTM C665, Type I.
2) Nonreflective membrane: ASTM C665, Type II.
3) Reflective membrane: ASTM C665, Type III.
2. Rigid Foam Board:
a. Extruded polystyrene, ASTM C578, Type X.

J. Vapor Retarder: ASTM C665.

K. Translucent Panels: ASTM D3841, Grade 1 (weather resistant).

L. Gutters and Downspouts:
1. Same material and factory applied finish to match roof panels.

M. Grout: See Division 03.

N. Closures: Neoprene.

O. Calking and Sealants:

1. See Specification Section 07 92 00.

2.5 FABRICATION

A. General:
   1. Fabricate building structure, roof and wall panels, accessories and trim in accordance with requirements of AISC and MBMA.
   2. Provide all necessary clips, flashing angles, caps, channels, closures, bases and any other miscellaneous trim required for complete water and airtight installation.
      a. Provide an inside closure at the base of all corrugated panels and an outside closure at the top of all corrugated panels in addition to all other closure strips required.
         1) Form closure strips to fit the corrugation of the metal panels and securely support in place.
         2) Closure strips shall fit between corrugated panels and trim or flashing as required to completely separate the interior of the building from the exterior.
      b. Provide flashing at all intersections of wall panels and roof panels, and above all openings in wall and roof panels, in addition to all other flashing required.
         1) Form flashing:
         2) To completely contain water on the outside of the building.
            a) To be watertight and securely fastened in place.
      c. Provide sealant at all edges where metal panel trim or flashing is adjacent to the foundation of the building in addition to all other sealant required.
   3. At door and window and louver openings, provide additional framing and fasteners as required to structurally replace the wall panel and/or framing displaced.
   4. Fabricate and prepare material for shipment knocked down.
   5. Factory punch frame to receive all fasteners.
   6. Finishes:
      a. Clean ferrous surfaces of oil, grease, loose rust, loose mill scale, and other foreign substances.
         1) Clean all primary and secondary structural steel members, not noted as being galvanized, in accordance with SSPC SP 6/NACE No. 3.
      b. All structural components shall have primer paint coats applied in the shop and finish coats applied in the shop.
         1) Shop paint, prime and finish coats, all surfaces which will be inaccessible after erection.
         2) Paint in accordance with Specification Section 09 96 00**, unless otherwise noted in Subsection G below.**
         3) Paint surfaces of all components not exposed to view.
         4) Manufacturer's standard shop applied primer is not acceptable as substitute for primer specified.
      c. Wall and roof panels:
         1) Exterior surface:
            a) Thermosetting fluoropolymer resin enamel.
               (1) Minimum 70 PCT "KYNAR" resin.
            b) Meet requirements of AAMA 621.
            c) FM Class 1 rated.
            d) Exposed screw heads shall match color of panel.
         2) Interior surface:
            a) Galvalume with no additional coating.

B. Structural Steel Design:
   1. Structural Mill Sections or Welded-up Plate Sections: Design in accordance with AISC Specification for Structural Steel Buildings.
   2. Cold-Formed Steel Structural Members: Design in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
   3. Structural System: Design in accordance with specified building code (Refer to Design Loads and Building Codes).

C. Primary Framing:
   1. Painted Steel.
   2. Rigid Frames:
      a. Frames: Welded-up plate section columns and roof beams, complete with necessary splice plates for bolted field assembly.
      b. Base Plates, Cap Plates, Compression Splice Plates, and Stiffener Plates: Factory welded into place and connection holes factory fabricated.
      c. Columns and Roof Beams: Fabricated complete with holes in webs and flanges for attachment of secondary structural members and bracing.
      d. Bolts for Field Assembly of Frame Members: High-strength bolts.
   3. Endwall Structural Members:
      a. Cold-formed channel members designed in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members or welded-up plate sections designed in accordance with AISC Specification for Structural Steel Buildings.
      b. Endwall corner posts, endwall roof beams, and endwall posts as required by design criteria.
      c. Splice Plates and Base Clips: Shop fabricated complete with bolt connection holes.
      d. Base Plates, Cap Plates, Compression Splice Plates, and Stiffener Plates: Factory welded into place and connection holes shop fabricated.
      e. Beams and Posts: Factory fabricated complete with holes for attachment of secondary structural members.
   4. Intermediate Frames:
      a. Substituted for end-wall roof beams, when specified.
      b. Factory fabricate necessary endwall posts and holes for connection to intermediate frame used in endwall.

D. Secondary Structural Members:
   1. Wall Purlins (Girts):
      a. By-passing column purlins.
   2. Purlins:
      a. Purlins:
         1) Zee-shaped, precision-roll-formed, acrylic-coated G30 galvanized steel in different gauges to meet specified loading conditions.
         2) Zee sections to be design by manufacturer.
      b. Eave Members:
         1) Eave Struts:
            a) Cee-shapped precision-roll-formed, acrylic-coated G30 galvanized steel in different gauges to meet specified loading conditions.
            b) Factory punched cee sections to be design by manufacturer.
         2) Girts:
            a) Zee or Cee shaped, precision-roll-formed, acrylic-coated G30 galvanized steel in different gauges to meet specified loading conditions.
            b) Zee or cee sections to be design by manufacturer.
         3) Outer Flange of Girts: Factory-punched holes for panel connections.
      c. Bracing:
         1) Locate bracing as indicated on the Drawings.
         2) Diagonal Bracing:
            a) Hot-rolled rods of sizes sections to be design by manufacturer.
            b) Attach to columns and roof beams.
            c) Optional fixed-base wind posts or pinned-base portal frames may be substituted for wall rod bracing on buildings as required.
         3) Flange Braces and Purlin Braces: Cold formed and installed as indicated on the Drawings.

E. Welding:

1. Welding Procedures, Operator Qualifications, and Welding Quality Standards:
   a. AWS D1.1.
   b. AWS D1.3.
2. Welding inspection, other than visual inspection as defined by AWS D1.1, paragraph 6.9, shall be identified and negotiated before bidding.
3. Certification of Welder Qualification: Supply when requested.

F. Framed Openings:
1. Walls:
   a. Provide all necessary subframing, including connections, to support wall openings for doors, windows, louvers, pipe or duct penetrations, etc.
      1) Material gage to be determined by metal building manufacturer for size of opening.
   b. Size and location of opening as shown on the Drawings.
   c. Jamb, lintel and girts:
      1) Steel:
         a) Factory applied prime coat per Section 09 96 00.
      2) Metal building manufacturer responsible for providing correct size opening for penetration scheduled, shown or specified.
   d. Provide trim to cover all exposed areas of opening frames to matchwith the wall panels.
2. Roofs:
   a. Provide all necessary roof subframing to support roof mounted equipment and to frame roof penetrations.
      1) Material gage to be determined by metal building manufacturer for size of equipment or opening.
   b. Location of roof mounted equipment and/or roof or wall opening as shown on the Drawings.
   c. Purlins, angles, clips:
      1) Steel:
         a) Factory applied prime coat per Section 09 96 00.
      2) Metal building manufacturer responsible for providing correct size of opening for penetration scheduled, shown or specified.

G. Painting of Structural Steel Framing System:
1. General:
   a. Structural Steel: Prime paint as temporary protection against ordinary atmospheric conditions.
   b. Perform subsequent finish painting, if required, in field as specified in the painting section.
   c. Before painting, clean steel of loose rust, loose mill scale, dirt, and other foreign materials.
2. Primary Frames:
   a. Clean steel in accordance with SSPC SP 2.
   b. Factory cover steel with 1 coat of gray water-reducible alkyd primer paint formulated to equal or exceed performance requirements SSPC-Paint 15.
   c. Minimum Coating Thickness: 1.0 MIL.
3. Secondary Structural Members – Roll-Formed:
   a. Hot-dipped zinc coating, ASTM A653, G30; followed by 1 coat of clear acrylic finish.
   b. Acrylic-Coated G30 Galvanized Steel: Equal or exceed performance requirements of SSPC Paint-15.

2.6 ROOF PANEL SYSTEM

A. Metal Roof Panel System 1 (MR-24):
1. Materials:
a. Steel.
b. Thickness: 24 Gauge.
c. Finish: Factory applied color coating.

1) PVDF Coating.

2. **Factory roll-formed panel.**
3. **Standing seam interlocking rib configuration.**
4. **Machined seaming.**
5. **Use panels of maximum possible lengths to minimize end laps.**
6. **Extend eave panels beyond structural line of sidewalls.**
7. **Factory punch panels at panel end to match factory-punched holes in eave structural member.**
8. **Panel End Splices: Factory punched and factory notched.**
9. **Panel End Laps: Locate directly over, but not fastened to, a supporting secondary roof structural member and be staggered, to avoid 4-panel lap-splice condition.**
10. **End Laps: Floating. Allows roof panels to expand and contract with roof panel temperature changes.**
11. **Self-Drilling Fasteners: Not permitted.**
12. **Fasteners per manufactures standard recommendations.**
13. **Ridge Assembly:**
    a. **Design ridge assembly to allow roof panels to move lengthwise with expansion and contraction as roof panel temperature changes.**
    b. **Factory punch parts for correct field assembly.**
    c. **Install panel closures and interior reinforcing straps to seal panel ends at ridge.**
    d. **Do not expose attachment fasteners on weather side.**
    e. **Use lock seam plug to seal lock seam portion of panel.**
    f. **High-Tensile Steel Ridge Cover: Span from panel closure to panel closure and flex as roof system expands and contracts.**
14. **Provision for Expansion and Contraction:**
    a. **Provision for Thermal Expansion Movement of Roof Panels:**
        1) **Clips with movable tab.**
        2) **Stainless Steel Tabs: Factory centered on roof clip when installed to ensure full movement in either direction.**
        3) **Maximum Force of 8 LBS: Required to initiate tab movement.**
        4) **Each clip to accommodate a minimum of 1-1/4 IN movement in either direction.**
        5) **Provide for thermal expansion and contraction without detrimental effects on roof panels, with plus or minus 100 DEGF temperature difference between interior structural framework of building and of roof panels.**
15. **Thermal Blocking:**
    a. **Insulate purlins to eliminate "thermal short circuits" between purlins and roof panels.**
    b. **Minimize heat loss (thermal short circuit) caused by compression of blanket insulation between structural members and roof panels by use of thermal block at each purlin location.**
    c. **Standing seam metal roofing.**
16. **Roof panels based on: Butler Manufacturing.**
    a. **Profile: MR-24.**
    b. **Panel width: 24 IN nominal.**
    c. **Panel depth: 2 IN minimum.**
    d. **Panel corrugations:**
        1) **Majors: Two per panel.**
        2) **Minors (in flat portion): Optional.**
    e. **Panel length:**
        1) **Sufficient to cover entire length of any unbroken roof slope up to 40 FT.**
        2) **When cut panels are required provide a 20 FT minimum panel length.**

~~B. Metal Roof Panel System 3 (Bulterib II):~~

~~1. Design Performance:~~

a. Design roof panels to support a 200 LB load distributed evenly over a 2 FT square area centered between purlins, without exceeding a panel deflection-to-span ratio of 1/180 IN a 2-span condition.
b. See "Roof System Performance Requirements" section below for additional requirements.

2. Materials:
   a. Steel.
   b. Thickness: 24 Gauge.
   c. Finish: Factory applied color coating.
      1) PVDF Coating.
3. Factory roll-formed panel.
4. Standing seam interlocking rib configuration.
5. Machined seaming.
6. Use panels of maximum possible lengths to minimize end laps.
7. Extend eave panels beyond structural line of sidewalls.
8. Factory punch panels at panel end to match factory-punched holes in eave structural member.
9. Panel End Splices: Factory punched and factory notched.
10. Panel End Laps: Locate directly over, but not fastened to, a supporting secondary roof structural member and be staggered, to avoid 4-panel lap-splice condition.
11. End Laps: Floating. Allows roof panels to expand and contract with roof panel temperature changes.
12. Self-Drilling Fasteners: Not permitted.
13. Fasteners per manufactures standard recommendations.
14. Ridge Assembly:
    a. One-piece, factory formed to match roof slope.
    b. Ridge Panel Cross Section: Match roof panels.
    c. Ridge Panel Splices: Occur over first purlin on either side of building center.
    d. Design ridge assembly to allow roof panels to move lengthwise with expansion and contraction as roof panel temperature changes.
    e. Factory punch parts for correct field assembly.
    f. Install panel closures and interior reinforcing straps to seal panel ends at ridge.
    g. Do not expose attachment fasteners on weather side.
    h. Use lock seam plug to seal lock seam portion of panel.
    i. High-Tensile Steel Ridge Cover: Span from panel closure to panel closure and flex as roof system expands and contracts.
15. Provision for Expansion and Contraction:
    a. Provision for Thermal Expansion Movement of Roof Panels:
       1) Provide for thermal expansion and contraction without detrimental effects on roof panels, with plus or minus 100 DEGF temperature difference between interior structural framework of building and of roof panels.
       2) Slotted Holes: Permit thermal movement of panels without detrimental effect on roof panels.
16. Roof panels based on: Butler Manufacturing.
    a. Profile: Butlerib II.
    b. Panel width: 36 IN minimum.
    c. Panel depth: 2 IN minimum.
    d. Panel corrugations:
       1) Majors: Four per panel at12 IN on centers, 1-1/2 IN high x 2-7/8 IN wide tapering, nominal.
       2) Minors (in flat portion): Two per panel flat zone, 1 IN wide, 1/8 IN high, spaced 4 IN OC, between major corrugations.
    e. Panel length:
       1) Sufficient to cover entire length of any unbroken roof slope up to 40 FT.
       2) When cut panels are required provide a 20 FT minimum panel length.
       3) Provide 6 IN end laps at each panel.

~~f. Panel Side Laps:~~
~~1) Overlap one major corrugation.~~
~~2) One of the Outboard Corrugations: Formed as overlapping corrugation.~~
~~3) Other Outboard Corrugation:~~
~~a) Formed as underneath corrugation.~~
~~b) Full corrugation to provide bearing support to side lap.~~
~~c) Formed with continuous length sealant groove.~~

17. Color:
    a. To be selected from manufacturer's full range of primary and secondary colors.
18. Accessories:
    a. Provide all necessary trim accessories to provide a weathertight building.

C. Roof System Performance Requirements:
1. Design roof paneling system for a minimum roof slope of 1/2 IN in 12 IN.
    a. Refer to Drawing for project required roof slope.
2. Design roof paneling system to support design live, snow, and wind loads
3. Endwall Trim and Roof Transition Flashings: Allow roof panels to move relative to wall panels and/or parapets as roof expands and contracts with temperature changes.
4. UL Wind Uplift Classification Rating, UL 580: Class 90.
5. Structural Performance Under Uniform Static Air Pressure Difference: Test roof system in accordance with ASTM E1592.

D. Provision for Expansion and Contraction:
1. Clips with movable tab.
2. Stainless Steel Tabs: Factory centered on roof clip when installed to ensure full movement in either direction.
3. Maximum Force of 8 LBS: Required to initiate tab movement.
4. Each clip to accommodate a minimum of 1-1/4 IN movement in either direction.
5. Provide for thermal expansion and contraction without detrimental effects on roof panels, with plus or minus 100 DEGF temperature difference between interior structural framework of building and of roof panels.

E. Thermal Blocking:
1. Insulate purlins to eliminate "thermal short circuits" between purlins and roof panels.
2. Minimize heat loss (thermal short circuit) caused by compression of blanket insulation between structural members and roof panels by use of thermal block at each purlin location.

2.7 METAL WALL AND FASCIA PANELS SYSTEM

A. Metal Wall and Fascia Panels:
1. Material:
    a. Steel.
    b. Thickness: 24 Gauge.
    c. Finish: Factory applied color coating.
        1) PVDF Coating.
        2) Smooth finish.
2. Length sufficient to cover entire height of any unbroken wall up to 40 FT.
3. Roll-form panels with alternating box corrugations.
4. Interlocking panels
5. Provide thermal blocking at connection to purlins or structural system.
6. Concealed fasteners.
7. Wall panels based on: Butler Manufacturing.
8. Profile: eStylwall II – Fluted, 4 IN wide flutes.
9. Panel width: 16 IN nominal.
10. Panel depth: 2 IN nominal.
11. Color:
    a. To be selected from manufacturers full range of primary and secondary colors.
12. Accessories:

a. Provide all necessary trim accessories to provide a weathertight building.

B. Metal Wall and Fascia Panels:
   a. Steel.
   b. Thickness: 24 Gauge.
   c. Finish: Factory applied color coating.
      1) PVDF Coating.
      2) Smooth finish.
   2. Length sufficient to cover entire height of any unbroken wall up to 40 FT.
   3. Roll-form panels with alternating box corrugations.
   4. Interlocking panels
   5. Provide thermal blocking at connection to purlins or structural system.
   6. Exposed fasteners.
   7. Wall panels based on: Butler Manufacturing.
   8. Profile: eStylwall II – Fluted, 4 IN wide flutes.
   9. Panel width: 16 IN nominal.
   10. Panel depth: 2 IN nominal.
   11. Color:
      a. To be selected from manufacturer's full range of primary and secondary colors.
   12. Accessories:
      a. Provide all necessary trim accessories to provide a weathertight building.

2.8 FINISHES

A. PVDF Finish:
   1. Substrate Preparation:
      a. G90 Hot-Dipped Galvanized Steel or AZ50 Galvalume.
         1) Factory-controlled chemical-conversion treatment.
   2. Clean ferrous surfaces of oil, grease, loose rust, loose mill scale, and other foreign substances.
      a. Clean all primary and secondary structural steel members, not noted as being galvanized, in accordance with SSPC SP 6/NACE No. 3.
   3. All structural components shall have primer paint coats applied in the shop and finish coats applied in the shop.
      a. Shop paint, prime and finish coats, all surfaces which will be inaccessible after erection.
      b. Paint in accordance with Section 09 96 00.
      c. Paint surfaces of all components not exposed to view.
      d. Manufacturer's standard shop applied primer is not acceptable as substitute for primer specified.
   4. Paint with exterior finish system, full-strength, fluoropolymer (PVDF) coating.
   5. Exterior Panel surface (exposed side):
      a. Minimum 70 PCT "Kynar 500 IN or "Hynar 5000 IN resin.
      b. Meet requirements of AAMA 621.
      c. FM Class 1 rated.
      d. Exposed screw heads shall match color of panel.
   6. Interior surface (unexposed side):
      a. Manufacturer's standard shop applied polyester coating.

B. Panel and Accessories Finishes:
   1. PVDF Coating Warranty: Metal building system manufacturer shall warrant coating for 25 years for the following.
      a. Not to peel, crack, or chip.
      b. Chalking: Not to exceed ASTM D 4214, #8 rating.
      c. Fading: Not more than five color-difference units, ASTM D2244.
   2. Meet requirements of AAMA 621.

C. Provide this finish system for the following products but not limited to:
   1. Contact the Engineer for finishes not identified clearly or covered.

2. Roof panels and accessories.
3. Wall panels and accessories.
4. Liner panels and accessories.
5. Gable and Eave Trim and accessories.
6. Flashing and accessories.
7. Soffit panels and accessories.
8. Gutters, downspouts and accessories.

2.9 BUILDING INSULATION SYSTEMS

A. General Batt Insulation:
   1. Provide wall insulation for complete building envelope with factory laminated fabric liner.
   2. Formaldehyde free insulation.
   3. Provide standard roll widths best suited for the project.
   4. Glass or other inorganic fibers and resinous binders formed into flexible blankets or semi-rigid sheets with vinyl or aluminum foil vapor retarder.
   5. Unfaced Fiberglass Insulation:
      a. For use in walls and roofs.
      b. Comply with NAIMA 202-96-REV 2000.
      c. Flame Spread Index less than 25 when tested in accordance with ASTM E84, NFPA 255 and UL 723.
      d. Smoke Developed Index less than 50 when tested in accordance with ASTM E84, NFPA 255 and UL 723.
      e. Contain a minimum of 60 PCT recycled glass content.
      f. GREENGUARD Indoor Air Quality Certified®.
      g. GREENGUARD Gold Certified.
      h. Wall Insulation:
         1) Nominal Thickness:
            a) 6 IN (R-19).

      i. Basis of Design: Owens Corning Eco Touch Certified R Metal Building Insulation or equal.

B. Fabric Liner Facing / Vapor Retarder:
   1. For wall and roof application.
   2. Adhered to batt insulation.
   3. Fabric liner facing/vapor retarder composed of woven high-density polyethylene coated on both sides with polyethylene.
   4. Facing material of vinyl film and metalized substrate laminated to glass fiber scrim reinforcement (VRP) rolled out over top of liner panels.
   5. Polypropylene Film Thickness: 0.0015 IN.
   6. Metallized Polyester Film Thickness: 0.0005 IN.
   7. Bursting Strength: 100 PSI per ASTM D774.
   8. Tensile Strength: 35 LBS/IN width per ASTM C1136.
   9. Perm Rating: Less than 0.02 per ASTM E 96 Procedure A.
   10. Flame Spread Index: Less than 25 per ASTM E84.
   11. Smoke Developed Index: Less than 50 per ASTM E84.
   12. Light Reflectance: 85 PCT per ASTM C523 for White and Silver.
   13. Light Reflectance: not applicable for Black.
   14. Color:
      a. White.
      b. Black.
      c. Silver.
   15. Liner Panel, Sidelaps, and Endlaps: Seal with sealant to prevent vapor transmission between sheets.
   16. Foam Closure: Use at terminating ends of liner panels to seal corrugations of panels.
   17. Basis of Design: Lamtec Corp, WMP-VR-R Plus or equal.

18. Basis of Design: Lamtec Corp, R-3035 HD or equal.

C. Insulation Support Systems:
   1. Contractor Option for either Metal Banding or Fabric Web system unless noted otherwise.
   2. Metal Banding System:
      a. Coated steel.
      b. 1 IN wide.
      c. Exposed color to match vapor retarder.
      d. Basis of Design: Owens Corning, Optiliner.
   3. Fabric Web System:
      a. 1,000 denier polyester yarn interwoven on nominal 1/2 IN-square grid coated with fire-retardant, UV-stabilized, PVC-based binder.
      b. Polypropylene tape bindings on all edges.
      c. Furnish in building bay lengths by building widths.
      d. Physical Properties:
         1) Tensile Strength (pounds/yarn):
            a) Machine Direction: 15 LBS.
            b) Cross Direction: 15 LBS.
         2) Ends per Inch:
            a) Machine Direction: 2.5.
            b) Cross Direction: 2.0.
         3) Weight: 0.28 to 0.32 OZ/SQFT.
         4) Fasteners and Attachment Hardware:
            a) Connections to Eave Members: Steel strapping and self-drilling screws.
            b) Mesh-to-Insulation Support System Edge Connections: Plastic cable ties.
         5) UL Fire-Hazard Classification Ratings, UL 723:
            a) Flame Spread: 15.
            b) Smoke Developed: 400.
      e. Basis of Design: Butler Manufacturing, Sky-web I.

D. Rigid Polyisocyanurate Board Insulation:
   1. ASTM C1289, Type 1, Class II.
   2. CFC and HCFC free.
   3. Ozone depletion potential: 0.
   4. Compressive strength: ASTM D1621, 25 PSI minimum.
   5. Density: 2 PCF nominal.
   6. Vapor transmission: 0.03 perm-IN maximum.
   7. Water absorption: 0.3 PCT maximum.
   8. Thermal conductivity (k-Value at 75 DEGF): 0.14.
   9. Reflective foil facer both sides.
   10. Minimum thickness as noted on Drawings.
   11. Provide insulation designed for intended use.
   12. Fire resistance: ASTM E84.
      a. Flame spread: Less than 25.
      b. Smoke developed: Less than 450.
      c. R-value: 6.0 per IN
      d. Minimum values provided on Drawings.

2.10 ACCESSORIES

A. Interior Wall Liner Panel:
   1. Thickness: 26 gauge.
   2. Factory cut panels to lengths required.
   3. Factory finished.
   4. Height:
      a. Partial Height: 12’-0”.
   5. Color:

a. To be selected from manufacturer's full range of primary and secondary colors.
6. Liner panels based on: Butler Manufacturing.
7. Profile: Mod-36 - Corrugations at 3 IN on center.
8. Panel width: 36 IN nominal.
9. Panel depth: 1/2 IN to 1 IN nominal.
10. Color:
    a. To be selected from manufacturer's full range of primary and secondary colors.
11. Liner panels based on: Butler Manufacturing.
12. Profile: Mod-36 - Corrugations at 3 IN on center.
13. Panel width: 36 IN nominal.
14. Panel depth: 1/2 IN to 1 IN nominal.

B. Soffit Panel:
1. Steel.
2. Thickness: 26 gauge.
3. .Interlocking panel system.
4. Factory cut panels to lengths required.
5. Factory finished.
6. Color:
    a. To be selected from manufacturer's full range of primary and secondary colors.
7. Soffit panels based on: Butler Manufacturing.
8. Profile: Moduleze II, no corrugations.
9. Panel width: 12 IN nominal.
10. Panel depth: 1 IN nominal.

C. Overhead Doors: See Division 08.

D. Metal Pedestrian Doors and Frames:
1. See Specification Section 08 11 00.

E. Louvers:
1. See Specification Section 08 90 00.

F. Gutters and Downspouts:
1. Sizes (minimum):
    a. Gutters: 4 x 4 IN.
    b. Downspouts: 3 x 5IN.
    c. Profiles:
        1) Profiles based on SMACNA Architectural Sheet Metal Manual.
        2) Gutters: Style A.
        3) Downspouts: Figure 1-32F (closed) and Figure 1-32H (open at bottom for 24 IN).
2. Material
    a. 24 GA steel.
3. Finish:
    a. Corrosion protection treatment and final finish same as roof panels.
    b. Color shall match wall and roof panels.
        1) Metal building manufacturer shall provide colored stock material to gutter and downspout suppler as necessary for color matching requirement.
    c. Color:
        1) Downspouts: Match siding color.
        2) Gutters: Match roofing color.
4. Expansion joints: 150 FT maximum spacing but not less than 1 per side of building requiring gutters.
5. Locate/arrange downspouts to avoid drainage on sidewalks, landings, stoops, driveways, etc.
6. Provide standard precast concrete splash block at each downspout location with the approximate size of 30 IN x 12 IN x 4 IN (L x W x H).

G. Heating, Ventilation and Air Conditioning Equipment:
   1. Refer to the mechanical drawings for HVAC requirements for each building.

H. Roof Curbs for Mechanical Penetrations:
   1. Minimum 18 GA steel galvanized per ASTM A653/A653M.
   2. Insulated: Minimum 1-1/2 IN 3.0 PCF density rigid insulation.
   3. Integral cricket.
   4. Minimum 8 IN high.
   5. Fabricated to conform to roof pitch and profile specified.
   6. ThyCurb Model TC-3, M.B.D.N.

I. Roof Crickets:
   1. Provide roof crickets on all roof curbs to direct water to each side of the curb.
   2. Roof cricket material shall be same material as roof panels.

J. Snow Retention Systems:
   1. Provided by the Metal Building System manufacturer.
      a. To be covered by the warranty provided by the Metal Building System manufacturer.
   2. Mechanical non-penetrating system for sloped metal roof systems to prevent ice and snow from sliding off roof.
   3. Components:
      a. Clamps (non-penetrating attachment):
         1) 6061-T6 aluminum extrusions conforming to ASTM B221.
         2) Fasteners: 300 Series stainless steel.
      b. Cross Members:
         1) 6061-T6 aluminum extrusions conforming to ASTM B221.
         2) Receptacle in face to receive color-matched metal strips.
         3) Provide splice connectors ensuring alignment and structural continuity at end joints.
      c. Color Strips:
         1) Same material and finish as roof panels; obtained from roof panel manufacturer.
      d. Snow and Ice Clips:
         1) Aluminum, with rubber foot, minimum 3 IN wide.
         2) Height as required for roof profile.
      e. Finish:
         1) Mill.
   4. Performance Requirements:
      a. Provide snow guards to withstand exposure to the weather and environmental elements, and resist design forces without failure due to defective manufacture.
      b. Utilize a factor of safety greater than 2 to determine allowable loads from ultimate tested clamp tensile load values.
   5. Installation:
      a. Provide clamps or brackets at 32 IN maximum spacing.
      b. Install snow guards starting 2 FT from the eave edge of the roof ~~and extending uniformly upward and laterally over the entire roof area spaced at not more than 16 IN OC in each direction~~ **as shown on Sheet 02A104 Keynote 7. Install 16 inches on center.**
      c. Fasten to roof surface as recommended by manufacturer.
         1) Fasteners shall be compatible with roof panel system and shall not void any roof warranties.
         2) Fasteners shall not damage panel finish.
   6. Refer to Drawings for roof areas to receive snow guards.
   7. Basis of Design: S-5! Metal Roof Innovations; Colorgard series or equal.

K. Roof Penetration Flashing (Maximum 13 IN DIA):
   1. Flashing material: EPDM rubber with an aluminum sealing ring base.
   2. Minimum projection above the weather surface of the roof: 8 IN.

3. Configuration of the flanges to match the roof panel.

L. Specification Section for manufacturer's internal quality control requirements.

M. Testing:
1. Owner may employ and pay for the services of a qualified independent testing agency to inspect and test all structural steel work for compliance with Contract Documents.
2. Independent testing agency shall have a minimum of five (5) years performing similar work and shall be subject to Owner's approval.

2.11 MAINTENANCE MATERIALS

A. Provide 8 OZ of touch up paint for each color provided on the building.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
1. Install tolerances in accordance with AISC 303, Code of Standard Practice.
a. Install products straight without bowing, sagging, or warping.
2. Install all fasteners.
3. Install base plates on grout bed.
a. Grout bed to be 1 IN thick unless noted otherwise on the Drawings.

3.2 INSTALLATION – METAL ROOF SYSTEM

A. Metal Roof System Installation:
1. Install roof system in accordance with metal building system manufacturer’s instructions at locations indicated on the Drawings.
2. Install roof system weathertight.
3. Position panel clips by matching hole in clip with factory-punched holes in secondary structural members.
4. Position and properly align panels by matching factory-punched holes in panel end with factory-punched holes in eave structural member and by aligning panel with panel clip.
5. Field seam panel side laps by self-propelled and portable electrical lock-seaming machine.
a. Machine field forms the final 180 DEG of a 360-degree Pittsburgh double-lock standing seam.
b. Factory apply side lap sealant.
6. Panel End Laps: Minimum of 6 IN, sealed with sealant (weather sealing compound), and fastened together by clamping plates.
a. Sealants: Contain hard nylon beads, which prevent mastic from flowing out due to clamping actions.
b. Join panel laps by 2-piece clamped connection consisting of a bottom reinforcing plate and a top panel strap.
c. Locate panel end laps directly over, but not fastened to, supporting secondary roof structural member and stagger, to avoid 4-panel lap-splice condition.

B. Metal Roof System Installation:
1. Install roof system in accordance with metal building system manufacturer’s instructions at locations indicated on the Drawings.
2. Install roof system weathertight.
3. Attach roof panels to supporting structural members with seamed-in-clip device.
a. Install clip at panel major corrugation.
4. Design roof panel side laps to be interlocking seams with return leg on lower edge of female rib.
a. Factory apply side lap sealant.
5. Roof Panel End Laps:
a. Minimum of 6 IN.

b. Seal with field-applied sealant.
c. Swage 1 panel end to ensure nestible, watertight end laps.
d. Install backing plate directly over, but not fastened to, structural support members.
e. Self-Drilling Fasteners: Do not use to make panel end splices.

C. Metal Roof System Installation:
1. Install roof system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
2. Install roof system weathertight.
3. Factory cut-to-length roof panels in accordance with erection drawings furnished by metal building system manufacturer.
4. Position and align roof panels to hold 3 FT module throughout building length.
a. Position and align optional factory-punched roof panels by matching factory-punched holes in panels with factory-punched holes in roof structural members.
5. Install side laps with minimum of 1 full corrugation.
6. End Laps:
a. Minimum of 6 IN.
b. Fasten together over and to structural members.
7. Panel Side and End Laps: Seal with "Panlastic" sealant to prevent entry of capillary moisture.

3.3 INSTALLATION – METAL WALL SYSTEM

A. Metal Wall System Installation:
1. Install wall system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
2. Install wall system weathertight.
3. Verify structural system is plumb before wall panels are attached.
4. Seal wall panels with molded-foam closure block that fits panel configuration at top and bottom of wall panels.
5. Exterior Trim: Match exterior color and embossing of wall panel system.
6. Interior Trim: Painted.
7. Flashings, Trim, Closures, and Similar Items: Install as indicated on erection drawings furnished by metal building system manufacturer.

B. Metal Wall System Installation:
1. Install wall system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
2. Install wall system weathertight.
3. Verify structural system is plumb before wall panels are attached.
4. Align and attach wall panels in accordance with erection drawings furnished by metal building system manufacturer.
5. Install side laps with minimum of one full corrugation.
6. Seal wall panels at base with metal trim.
7. Windows: Factory paint aluminum extrusions (thermally broken).
8. Flashings, Trim, Closures, and Similar Items: Install as indicated on erection drawings furnished by metal building system manufacturer.

3.4 INSTALLATION – OTHER ITEMS

A. Separate the roof support member from the roof panel, except at each concealed structural fastener, with a spacer of material having a density of not less than 2 PCF and, if of a combustible material, having a flame spread rating no greater than 25.

B. Fasten roof panels to purlins or secondary support members in accordance with manufacturer's recommendations.

C. Install liner panels in accordance with manufacturer's recommendations.

1. Completely seal air tight around all building structural members and bracing when these members penetrate the liner panel.

D. Insulation Support System Installation:
   1. Install insulation support system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
   2. Verify roof structural system is in place before installation of insulation support system.
   3. Keep insulation support system in place after metal roof system is installed.

E. Install wall panels to supporting structure with concealed fasteners.
   1. Finish of fasteners to match panel finish.

F. Install door frames, louvers, trim and other miscellaneous items in accordance with manufacturer's instructions and details.

3.5 FIELD QUALITY CONTROL

A. All inspections and tests are to be performed at the Project site by a third party independent testing agency.

B. Inspect field welding in accordance with AWS D1.1/D1.1M, Section 6 including the following non-destructive testing:
   1. Visually inspect all welds.
   2. Test 50 PCT of full penetration welds and 10 PCT of fillet welds with liquid dye penetrant.
   3. Test 20 PCT of full penetration welds with ultrasonic or radiographic testing.

C. Inspect high-strength bolting in accordance with the RCSC Specification for Structural Joints, Section 9.
   1. Inspect while work is in progress.

D. Inspect structural steel which has been erected.

E. Prepare and submit test reports to Engineer.

3.6 ADJUSTING AND CLEANING

A. See Specification Section 01 75 00 for Adjusting requirements.

B. See Specification Section 01 74 00 for Cleaning requirements.

C. Touch up paint any scratched factory finished surfaces or remove and replace as directed by Engineer.

D. Remove and replace any damaged wall or roof panels, frames, etc., as directed by Engineer.

END OF SECTION