State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER	PAGE
DEFK10007	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
JOHN ABBOTT
304-558-2544

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
DIV ENGINEERING & FACILITIES
NATIONAL GUARD ARMORY
142 ROBERT E. LEE EXT.

ELKINS, WV
26241 341-6368

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
12/09/2009				

BID OPENING DATE: 12/18/2009 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
				ADDENDUM #04		
				THIS ADDENDUM IS ISSUED TO MODIFY, CLARIFY, AND ADD TO THE ORIGINAL REQUEST FOR QUOTATION SPECIFICATIONS, AND ANSWER VENDOR QUESTIONS, PER THE ATTACHED DOCUMENTATION; AND EXTEND THE BID OPENING TO 12/18/09; 1:30 PM.		
				NO ADDITIONAL QUESTIONS WILL BE ACCPETED DUE TO THE TIME CONSTRAINTS FOR FUNDING OF THE PROJECT.		
				REVISED BID OPENING DATE: 12/18/2009; 1:30 PM		
0001	1	LS		968-20		
				BUILDING CONSTRUCTION		
				****** THIS IS THE END OF RFQ DEFK10007 ****** TOTAL:		

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE

TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

E. Eraser Pocket: Manufacturer's standard.

F.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.

B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed.

C. Install panels from marked packages in numbered sequence indicated on Shop Drawings.

D. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

E. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

3.2 ADJUSTING

A. Adjust operable panel partitions to operate smoothly, without warping or binding. Lubricate hardware, electric operator, and other moving parts.

B. Adjust storage pocket doors to operate smoothly and easily, without binding or warping. Check and readjust operating hardware. Confirm that latches and locks engage accurately and securely without forcing or binding.

3.3 FIELD QUALITY CONTROL

A. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids; adjust partitions for acceptable fit.

B. NIC Testing: Engage a qualified testing agency to perform tests and inspections.

C. Testing Methodology: Perform testing of installed operable panel partition for noise isolation according to ASTM E 336, determined by ASTM E 413, and rated for not less than NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.

D. Testing Extent: Testing agency shall randomly select one operable panel partition installation(s) for testing.

E. Repair or replace operable panel partitions that do not comply with requirements.

F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of repaired, replaced, or additional work with specified requirements.

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.

2. The State may accept or reject in part, or in whole, any bid.

3. All quotations are governed by the ***West Virginia Code*** and the ***Legislative Rules*** of the Purchasing Division.

4. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required $125 fee.

5. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods, this Purchase Order/Contract becomes void and of no effect after June 30.

6. Payment may only be made after the delivery and acceptance of goods or services.

7. Interest may be paid for late payment in accordance with the ***West Virginia Code***.

8. Vendor preference will be granted upon written request in accordance with the ***West Virginia Code***.

9. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

10. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.

11. The laws of the State of West Virginia and the ***Legislative Rules*** of the Purchasing Division shall govern all rights and duties under the Contract, including without limitation the validity of this Purchase Order/Contract.

12. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.

13. BANKRUPTCY: In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.

14. HIPAA BUSINESS ASSOCIATE ADDENDUM: The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, and available online at the Purchasing Division's web site (**http://www.state.wv.us/admin/purchase/vrc/hipaa.htm**) is hereby made part of the agreement. Provided that, the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

15. WEST VIRGINIA ALCOHOL & DRUG-FREE WORKPLACE ACT: If this Contract constitutes a public improvement construction contract as set forth in Article 1D, Chapter 21 of the West Virginia Code ("The West Virginia Alcohol and Drug-Free Workplace Act"), then the following language shall hereby become part of this Contract: "The contractor and its subcontractors shall implement and maintain a written drug-free workplace policy in compliance with the West Virginia Alcohol and Drug-Free Workplace Act, as set forth in Article 1D, Chapter 21 of the West Virginia Code. The contractor and its subcontractors shall provide a sworn statement in writing, under the penalties of perjury, that they maintain a valid drug-free work place policy in compliance with the West Virginia and Drug-Free Workplace Act. It is understood and agreed that this Contract shall be cancelled by the awarding authority if the Contractor: 1) Fails to implement its drug-free workplace policy; 2) Fails to provide information regarding implementation of the contractor's drug-free workplace policy at the request of the public authority; or 3) Provides to the public authority false information regarding the contractor's drug-free workplace policy."

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division.

2. SPECIFICATIONS: Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.

3. Complete all sections of the quotation form.

4. Unit prices shall prevail in case of discrepancy.

5. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.

6. BID SUBMISSION: All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER	PAGE
DMV100099A	3

ADDRESS CORRESPONDENCE TO ATTENTION OF:
FRANK WHITTAKER
304-558-2316

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
DIVISION OF MOTOR VEHICLES

1317 HANSFORD STREET
CHARLESTON, WV
25311 558-0002

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
10/08/2009				

BID OPENING DATE: 11/04/2009 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT. NO	ITEM NUMBER	UNIT PRICE	AMOUNT

****** THIS IS THE END OF RFQ DMV100099A ****** TOTAL:

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE

TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

TO: ALL AUTHORIZED BIDDERS

ELKINS AFRC PROJECT

December 09, 2009

ADDENDUM # 4

Containing Part A and Part B

Our ref: 0803(12-09-09)10

This document forms a part of Addendum # 4 as issued by the West Virginia Dept of the Administration, Purchasing Division

The following clarifications and/or changes to the Bid Documents pertain to the New Construction associated with the New Elkins AFRC, Elkins, WV. This addendum forms a part of the Bid Documents and modifies the original drawings.

NOTICE TO BIDDERS:

A. This addendum is issued pursuant to Article I.I.I of the General Conditions of the Contract for Construction (AIA Document A201) and is hereby made part of the Contract Documents. The addendum serves to clarify, revise, and supersede information in the Project Manual, the Drawings, and previously issued Addenda. It should be bound into the Project Manual in order following the Supplementary Conditions.

Electronic copies of these documents may be downloaded from this link:

http://www.etbarchitects.com/guest01/0803ElkinsAFRC/DWGS/ADDENDA/Addendum04-Package/

DEFK10007 ELKINS AFRC ADDENDUM #4 -- PART A Wed, Dec 09, 2009

Consultant Team Responses to Bid Questions.

Bidders may download this file and the attachments from this link:
http://www.etbarchitects.com/guest01/0803ElkinsAFRC/DWGS/ADDENDA/Addendum04-Package/

Alternatively, Bidders may order hard copies from Charleston Blueprint at no charge:
Phone: +1 (304) 343-1063 / +1 (800) 220-9625
Contact: Dave chasblue@newwave.net

Note: Some Questions / Answers may repeat as all questions received have been answered.	***>> Project team answers / comments*** ***Attachment issued*

NO.	ITEM DESCRIPTION	NOTES
A1.	HD Nov. 27, 09 What type pipe is to be used on the 3" waterline? Hopefully not sch40 glue pipe. ***>> PVC Pressure gasket SDR 21 is for 2" to 4" piping.***	
A2.	HD Nov. 27, 09 Will valves be installed on water main at change of direction and pipe sizes? ***>> Valves are shown on utility plan***	
A3.	HD Nov. 27, 09 The 12" inline drains show 6" & 8" drains coming in from the Readiness Center. Inline drains are usually designed as a straight through run. How do you propose to tie the lines in at these drains & can you provide a detailed drawing or are these inline drains to be Nyloplast drain basins? ***>> Yes, Nyloplast or equal.***	
A4.	WT Nov. 25, 09 (1) C700 & C500 C700 -- shows an 8" line in at MH-A2 from the Southeast. C500 shows a 6" line in at MH-A2 from the Southeast. Please clarify which pipe size feeds into MH-A2 from the Southeast. ***>>Sheet C-500 is correct; it is a 6" line.*** (2) C710 -- On line 2B on C710, please confirm that at DI -2C, the size on the inflow pipe perpendicular to Line 2B should read 24" instead of 18" ***>> No, 18" is correct.*** (3) C710 & C300 -- There is a 6" storm line shown tying into Line 2A between DI-2A-2 and YD 2A-3 on C300. This line is not shown on C710. Please advise. ***>>Sheet C-300 is correct.***	**The Elkins AFRC Utility Extension project** This will extend water and sewer service to the Elkins AFRC site from existing infrastructure. Major items of work include a 10,000' waterline extension from existing lines of the Norton-Harding-Jimtown PSD at WV Route 151 near Norton and a 4900' sanitary forcemain that connects to the existing Town of Junior sanitary forcemain running along US Route 33 serving the Regional Jail near Norton. The project also includes a fire pump and enclosure as well as a sewage

NO.	ITEM DESCRIPTION	NOTES
	(4) C710 & C300 -- There is a 6" sanitary line shown on C710 to the West side of the sidewalks, that crosses below Line 2A between DI 2A-2 and YD 2A-3. On C300,= there is a sanitary line that runs directly below the sidewalk but not to the West of the sidewalks. Please clarify the location of the 6" sanitary line. ***>>Sheets C-300 and C-500 have the correct location.*** (5) C710 & C300 -- The 8" piping shown on C-710 from D1-2D at STA 4+08 leading to the Cleanouts at STA 4+68 and at STA 7+03 along with the associated tie-in to the readiness center is not shown on C300 or C500. Please confirm the locations of the Cleanout at STA 7+03 and the tie in to sector D of the Readiness Center ***>>C-710 has been revised and is reissued with this addendum.*** (6) C-850 -- The 30'0" Slide gate as shown at the East end of the Loading Ramp is not shown on any other site plans. Please confirm that this gate is needed and should be constructed similar to 1/C-821. ***>>There is no gate required at the loading ramp.*** (7) C-210 & C-850 -- Please confirm that the access road/apron for the loading ramp is to be concrete as shown on C-850 on the foundation cross section and on Section A-A. C-210 shows this access as hardstand paving. ***>>The concrete aprons shown on C-850 are part of the lump sum loading ramp bid item. The area around the loading ramp is hardstand paving as shown on C-210.*** (8) C-860 -- Please confirm that paving surrounding the fuel truck parking pads is to be concrete paving. C-210 indicates this area as hardstand paving. With the heavy repeated loading and concrete ramp, we feel that concrete paving is more appropriate for this location. Please advise. ***>>Area around fuel truck parking pads is hardstand paving as shown on the plans.*** (9) Site -- Are existing buildings to be demolished under this contract? ***>>There are no existing buildings on the site. Existing debris and ruins must be removed from site and disposed of properly.*** (10) Site/Div. 15 -- Will a fire pump be required? ***>>Not in this contract.*** (11) Civil -- Does this contract include Water main downhill labeled Proposed C-500? Define limits/extent of water piping in this contract. ***>>The Utility extensions are not part of this contract.*** (12) Civil -- Water line profiles not included in initial bid set. Please provide info. ***>>Water line profiles are not available.***	lift station, both at the Elkins AFRC site ***C710 - Attached with Addenda-Package01*

NO.	ITEM DESCRIPTION	NOTES
A5.	CC Dec. 01, 09 3. Stop bar strip in the parking lots for a 3 total, is it painted or vinyl? ***>> Painted.*** 4. Handicaps ramps are placed in front of parking spaces. ***>> The two ramps will be located at the Handicapped parking access.***	
A6.	KS Dec. 03, 09 We would like to see the following on the Civil side of the project: 1. Bid item for Mobilization/Demobilization ***>> See Bid Item 1.a.1 – Mobilization / Demobilization.*** 2. Explanation on how to handle the discharge of water into the Tygart River. ***>> Any discharges must comply with the laws of the State of West Virginia.*** 3. Explanation on the Unclassified Excavation within the footprint of the building. ***>> Excavation to floor subgrade is paid by the bid items "Unclassified Excavation" and "Rock Excavation". Building foundation excavation is part of sum Bid Item 1.a. and is paid as a lump sum.*** 4. Extend the bid opening date to at least 12/22/09. ***>>Request Submitted to Client – refused.***	
A7.	JFA Dec. 02, 09 In the areas that finish grade falls on rock material. Will there be an undercut needed to place top soil for vegetation? Is there an undercut around the building site? Below the finish grade contours provided on Sheet C- 300. ***>> If rock is present at finish grade, lawn areas around the building will be excavated 12" below finish grade to allow soil placement.***	
A8.	CC Dec. 03, 09 Our paving subcontractor wants to know sine you are using the WV Department of Highways specs should they use the WV Department of Highways Asphalt and Diesel Index? ***>>No.***	
A9.	WT Dec. 03, 09 Civil Bid Units/ The civil bid number 5 indicates that the flag poles are to be 60'. The drawings and specifications indicate a total pole length of 44'. Please confirm that the pole length is to	***Revised Bid Items with Addenda-Package01*

NO.	ITEM DESCRIPTION	NOTES
	be 44' total (40' showing above ground with 4' underground.) ***>> The flag poles are forty feet high as shown on the Plans. The bid item name and description have been revised.*** C-870 Please provide the grass type to be used for lining the type 4 Ditches. ***>> The type indicated for the area around the ditch.*** C-210 Please provide the extents of the lawn type 1. General locations are shown, but no limits are indicated Also, please show locations for lawn types 2 and 3 on the drawings. ***>> The access road serves as the demarcation line for Type I Lawn.***	
A10	KA Nov. 27, 09 Is the 2" PVC pipe to be sch40 as written in specs or will you do away with it and go with 2" sdr21 cl200 slip joint waterline w/gasket? ***>> PVC Pressure gasket SDR 21 is for 2" to 4" piping.***	
A11	CC Nov. 30, 09 Can we get more information regarding the anti-freeze loop system? It would be nice to have a drawing with pipe sizes ***>> This system is for fire protection of loading dock area. See drawing P-201 and detail on P-401. Final pipe routing and sizing to be per sprinkler contractor shop drawing and approved by engineer.***	
A12	CM Nov. 30, 09 With regards to spec 16726 (Paging System) would Telecor be an acceptable manufacturer? ***>>Yes. Telecor is acceptable as a manufacturer, this may be added to the list of manufacturers under specification #16726, 2.1, A.***	
A13	GC Nov. 23, 09 There are 3(5) electrical bid alternates that are not listed on the bid form. Will a corrected bid form be issued? ***>> A corrected bid form is issued with the following additions:*** ***E-4 Alternate:*** *Panelboards: Reference plan note 'P' on drawing E-501: Each configuration of 480-volt and 208-volt panelboards and their associated transformer, with the exception of those located in room #111, are to be quoted as an Additive Alternate for unitized or integrated construction (see specifications sections*	***Revised Bid Form/ Alts issued*

NO.	ITEM DESCRIPTION	NOTES
	16442,2.7 and 16461, 2.6). ***E-5 Alternate:*** *Solar-powered signage lighting: Reference plan note 'F' on drawing SEU-3: The solar-powered signage lighting is to be quoted as an Additive Alternate. At the time of bidding, a supplier for this type of fixture had not been identified-and (per lighting fixture schedule on drawing E-506) is to be selected by the Owner*	
A14	HW Dec. 01, 09 According to specification section 15900 (Building Automation and Automatic Temperature Control Systems) the approved manufacturers listed are: The Trane Company, Siemens, Andover, Automated Logic, Carrier Controls, Johnson Controls & Invensys. Is there a substitution request procedure, or separate substitution request form that we can fill out so we too can have the opportunity to bid the project, and be added to this list of bidders? Our product meets the requirements of the specification, and we would like the opportunity if possible to bid the project as well. Any insight would be greatly appreciated. I have also attached documentation on our products as it relates to the specification. ***>>Not approved as an alternate.***	
A15	Acceptable Alternate – For testing and Balancing For testing and balance, in specification #15990, we have Associated Air Balance Council (AABC) and Environmental Engineering Consultants (EEC) listed as qualified agents. A contractor has requested to bid as being certified by National Environmental Balancing Bureau (NEBB). ***>> NEBB is acceptable.***	
A16	LL Dec. 01, 09 Please review and advise as to the location of the five (5) reheat coils tagged RHC-D3-1 through RHC-D3-5 ***>>The reheat coils "RHC-D3-1" through "RHC-D3-5" were shown incorrectly on the drawing M-104 s as "VAV-D3-1" through "VAV-D3-5". Please correct drawing M-104.***	
A17	JFA Dec. 02, 09 What is the Sizing of the Sediment Ponds/Traps on the Armed Forces Reserve Center in Elkins? From the erosion control plan it looks like there are 5 structures. Is this True? Is it the contractors Responsibility to determining all of the information needed to obtain a Storm Water Permit for construction or will this information be obtainable from a consultant. ***>> There are 5 sediment traps on Sheet C-400. Information on the structures shown on Sheet C-400 will be available from the consultant to aid in storm water permitting.***	

NO.	ITEM DESCRIPTION	NOTES
A18	CC Dec. 03, 09 I am with Cardinal Concrete Company and we have a ready mix plant at Ravenswood, WV and would like to be considered a supplier for the Millwood site location. ***>> The Millwood site is not associated with this project.***	
A19	WT Dec. 03, 09 E-401 Note A on E-401 references a detail on E-201 that does not exist, please advise. ***>> Change plan note "A" on drawing E-401 to refer to detail on drawing E-204. The detail "Wiring Schematic For Electronic Flush Valves And Faucets (Typical)" was moved from E-201 to E-204.***	
A20	WT Nov. 25, 09 (13) S-204 -- There is a note for a detail on 2-S204, however there is no detail please advise. ***>> On sheet S-204, Revise section tag reading 1/S204 to read 3/S305, and 2/S204 to 4/S305.***	
A21	SS Nov. 25, 09 Entry Lobby Roof framing 1. Details are given that the ends of the Outriggers and Rafters are to be coped, however, no closure plates are shown. Are these ends to be left open? ***>> No, add note to details 4/S306 and 5/S306 to read "PROVIDE CLOSURE PLATE AT ENDS AND COPES."*** 2. The W8x13 beams with 1/4" bottom plates supporting the rafters and outriggers are shown to be galvanized. The bottom plate will most likely warp during the galvanizing process. We suggest a thicker plate to minimize the warpage. ***>> On 3/4" scale portion of detail 4/S306, revise " 1/4" BOTTOM CLOSURE PLATE ...." to read " 3/8" BOTTOM PLATE... "***	
A22	BBL Dec. 01, 09 Please provide clarification for the following: 1. Is a foundation drain required for the AFRC Building? 1/S-121 shows a foundation drain for the Workshops. Is this the only place one is required? ***>> All Arch drawings show drain. It is specified in Spec. Section 02620***	
A23	GC Dec. 02, 09 4. Can you furnish section views 1 & 2 from S-204? ***>> On sheet S-204, Revise section tag reading 1/S204 to read 3/S305, and 2/S204 to 4/S305.***	
A24	TKS Dec. 02, 09	

NO.	ITEM DESCRIPTION	NOTES
	1. Is Chief Building Systems an acceptable manufacturer for the pre-engineered metal building? ***>> Substitutions will be considered as per spec section 01635*** 2. What is the Snow Importance Factor for the Work Shop? What is the Wind Importance Factor for the Work Shop? ***>> 1.20*** 3. What is the collateral load for the Work Shop? ***>> 10 psf*** 4. On drawing S-221 the crane is called out as a 20 ton, but on drawing A-321 it is described as a 15 ton. Is the building to be designed for a 20 ton or 15 ton crane? ***>> 20 ton*** 5. Is the crane and crane rails a part of this contract or just the runway beams? If the crane is part of the contract are there specs? ***>> Crane is not part of the contract – provision for future only. Provide runway beams only.*** 6. In Spec Section 13125-2.8-A it calls for manufacturers standard roof clip, but in Spec Section 07411-2.7-A it states the roof clips are to be stainless steel? Can roof clips be manufacturer's standard that allow for expansion? **>> Provide manufacturer's standard clip for Metal Building, as per section 13125, and stainless steel for Readiness Center roof as per section 07411** 7. Are there Specifications for the Unheated Storage Unit Structure? ***>> No.*** 8. What is the eave height of the Unheated Storage Unit? ***>> Minimum 10ft.*** 9. Is insulation required in the roof of the Unheated Storage Unit? ***>>Yes.***	
A25	GC Dec. 03, 09 1. We need make and model of the 20 ton crane. 2. We need to know center to center of wheels across the span. 3. We need to know if crane is single or double girder. 4. We need to know the number of wheels and the spacing of them. 5. We need to know weight of the crane. 6. We need to know the weight of the trolley. 7. We need to know the service classification of the crane. ***>>Provision for crane only in this contract – crane not included.***	
A26	WT Dec. 03, 09 S-102 Drawing S-102 calls for the drawings to be in 1/8" = 1'	

NO.	ITEM DESCRIPTION	NOTES
	scale. However this scale does not match the plan dimensions. Please correct. ***>> Drawing S-102 will be re-issued.*** S-102 Drawing S-102 cuts off before the east wall of room 111. Please issue a drawing showing the structural details for this wall. ***>> Drawing S-102 will be re-issued.***	
A27	WT Nov. 25, 09 (14) Arch. Please confirm that the weapons racks are owner furnished. ***>>No GC to provide*** (15) 10605 Please provide locations for the wire mesh shelving units as specified in section 10605 ***>>Wire mesh lockers in specification 10605 are not in contract -- delete section 2.4 in its entirety.*** (16) Workshop Please provide finishes for the Workshop Building. ***>> WorkShop Finishes are as below:*** **M01 - Workshops** Floor – Sealed Concrete Walls – 12' tall pre-finished metal liner panel, or Epoxy Painted CMU. Ceiling – Manufacturer's metalized, scrim-reinforced insulation liner, per Section 13125. **M04 – POL Store** Floor – Sealed Concrete Walls – Epoxy Painted CMU Ceiling – Suspended, painted finish gypsum board system. **M05 – USAR Office** Floor – Resilient floor tile and accessories, per Sections 09651 and 09653. Walls - Epoxy Painted CMU. Ceiling – 2'x4' suspended acoustical tile, fine fissured. **M06 – Tool Room** Floor – Sealed Concrete Walls – Epoxy Painted CMU Ceiling – Suspended, painted finish gypsum board system. **M07 – TR** Floor – Sealed Concrete Walls – Epoxy Painted CMU Ceiling – Suspended, painted finish gypsum board system. **M08 – Equipment Alcove** Floor – Sealed Concrete Walls – Epoxy Painted CMU Ceiling – Suspended, painted finish gypsum board system.	

NO.	ITEM DESCRIPTION	NOTES
	M09 – Toilet Floor – Resilient floor tile and accessories, per Sections 09651 and 09653. Walls – Epoxy Painted CMU Ceiling – Suspended, painted finish gypsum board system. **M10 – ARNG Office** Floor – Resilient floor tile and accessories, per Sections 09651 and 09653. Walls - Epoxy Painted CMU. Ceiling – 2'x4' suspended acoustical tile, fine fissured. **M11 – Flammable Mat. Storage** Floor – Sealed Concrete Walls – Epoxy Painted CMU Ceiling – Suspended, painted finish gypsum board system.	
A28	AI Nov. 25, 09 We are requesting that the following manufacture be accepted as a substitute for the following specification Division 08221 Fiberglass Doors / Frames Note: the frame information could not be edited to meet your specification for Fib R Door frame as the frame section was omitted from your spec. Equal to the manufacture specified is Corrim. ***>>Corrim is approved.*** Also Please note the following discrepancies : 1) Depth and head size for all frame sections shown on dwg A702 are not given. Assumed 5 ¾" and 4" header at the larger head detail. ***>>Frame head size should match frame elevations.*** 2) There are seven wood doors scheduled for Aluminum frames (109 a, 115a,121a,122a,123a,124a,151a) the head and jamb details do not reflect this configuration. ***>>The schedule is correct and details are similar to the shown configuration.*** 3) A specification for Blast protection doors was omitted from specs (146a.2, 146a.3 146b.1, 146b.2) ***>>Blast proof doors to be wood veneer laminate over metal core.*** *Door assemblies to meet or exceed GSA blast, DOD Force Entry Protection/Anti-Terrorism criteria, and certify manufacturers offering products that may be incorporated into the work included, but not limited to the following:* *1) Ambico Limited*	

NO.	ITEM DESCRIPTION	NOTES
	2) *Krieger Specialty Products* 3) *Protective Door Industries* 4) *United States Bullet Proofing, Inc.* 5) *SH Door Tech Co. Ltd.* Also note that Dr #146a.1 is shown as a wood door in the door material column but is shown in notes column on the schedule to be a blast protection door. ***>> Door 146a.1 is not to be blast protected.*** 4) The Fib R Door specifications calls for the balsa core door and the fire rated mineral core to have an R- value of 11, I believe this only applies to the polyurethane core, is this required for interior doors? ***>> Not required for interior doors.***	
A29	SS Nov. 23, 09 1. Provide details of the removable handrail on the Loading Dock and the permanent handrail on the Dock Wall. ***>>Provide 1 ½" diameter handrail per elevations along front of dock with posts set in the concrete. For removable handrail set rails in 2" diameter sleeves cast into the concrete. Post spacing not to exceed 5' c/c. Provide a connection at columns that "pin" the rail in place. Connection may be plate or gate clamp style with removable pins. Railings need to meet OSHA and IBC Code requirements.*** 2. Provide details of the bolt-down Pipe Bollards. ***>>As per Spec. Section 05500 - 2.16 METAL BOLLARDS. Cast pipes into concrete floor slab instead of bolt down plates.*** 3. Is handrail/wall rail required on the steps and ramp up to the Loading Dock? ***>> Yes – Add railing on the steps and ramp up to the Loading Dock.***	
A30	CC Nov. 23, 09 1. Where does Heavy and Highway wages start vs. the building trades? 2. Whose work is the sidewalks, Heavy and Highway or the building trades? ***>> These are questions of State and Federal Wage law that they should consult an attorney about. We cannot respond to questions outside of our scope of work.*** I cannot find either the liquidated damages amount or the date	

NO.	ITEM DESCRIPTION	NOTES
	of completion in either the spec book or the RFQ. Could you please provide me the information so that I may request our bid bond? ***>> As per the Pre-Bid meeting minutes issued as an Addendum.***	
A31	GC Nov. 23, 09 We have a question regarding the bid form on the above referenced project. The bid form has 3 Architectural bid items on the bid form and the description of Architectural bid items has 6 items. ***>>Revised Bid Form issued with this Addendum.*** GC Dec.02, 09 After reviewing the bid documents for the Elkins Project, it appears the spaces that are specified for liquidated damages were left blank. We can't seem to locate where the liquidated damages are specified. Can you please let us know what the liquidated damages are for this project? ***>> As per the Pre-Bid meeting minutes issued as an Addendum.***	
A32	BBL Nov. 30, 09 I have a question relating to 2 items on the unheated storage building. First, with the tube- skid bases shown, which is a standard Parkline base detail for pre-erected buildings, is this building to be pre-erected and shipped complete in modular shipping units to be attached in the field or is it to be site erected? ***>> Both options will be acceptable.*** Secondly, the floor plan shows 6070 double leaf mandoors and single leaf 3070 hollow metal doors. Typically on these types of structures, a mini-warehouse rolling steel door is provided. Can you confirm the need for hollow metal doors? The roll up's will be a couple thousand dollars a door cheaper ***>> All these options will be acceptable.***	
A33	DT Nov. 30, 09 I am the local area sales representative for YKK AP America, we are one of the world's largest manufacturers of aluminum entrances, storefronts, curtainwalls and windows. There are basically two (2) questions. 1. I am contacting you on behalf of YKK AP America and numerous glazing contractors, who wish to use YKK AP's products as their preference of materials for your project. We know our products will meet and exceed any of your specification requirements and give you the most cost-effective package. This is not a request for substitution but merely a request for inclusion to your base specifications so that we could bid you project more cost effectively as a single source supplier. ***>>YKK is accepted as an approved equal.***	

NO.	ITEM DESCRIPTION	NOTES
	2. I have worked on and supplied aluminum products on many National Guard facilities and cannot find any reference to "blast resistant" within the drawings or specifications on entrances, windows and curtainwall products within this project. The only reference shows up in the glass & glazing specification 08800. Please confirm if all the products holding the glass into the building are to meet a criteria for blast resistance and what would the level of protection be? Should this project require products for blast resistance, we would be glad to offer our design services to ensure the correct application of products. ***>>All windows requiring blast proof rating shall have laminate glazing (self cleaning not required), and frame assemblies that meet or exceed DOD requirements.***	
A34	CC Dec. 01, 09 1. Please clarify wall types 5, 6 and 7, wall type 8 is a blast proof wall notes as for type 9 but with 09250.5 sec. gyp, please what are the requirements for this wall type also? ***>> Wall partition type 8 -- Blast Proof Partition (see drawings A-103, A-104 and A-681) to the SIPRNET café, the COMSEC rooms and the Mail Rooms -- walls to be constructed from floor to the roof without penetrations. All wall types are clearly detailed on drawings except security gypsum. Security gypsum wall assembly shall have security barrier mesh applied to one side of metal stud framing full height with manufacturer specialty clips. Mesh gauge and size should comply with military specification MIL-M-17194 Type II, Class 1; ASTM 1267.*** 2. Reflected ceiling plans are unclear as to what the finishes are, it appears that the drawings indicate the finishes required but are blacked-out, please review the reflected ceiling drawings, and clarify what finishes are to be used or what the blacked-out boxes represent. Drawings A-202, A-203, A-204, A-205. ***>>Please contact printing company for printing issues – drawings have been checked and display correctly. Also refer to online PDFs for clarity.***	
A35	**Acceptable Substitution - For Stone Products and Oversized Masonry Units** ***>> Accepted - Basis of design manufacturer is 'RockCast' and 3 acceptable substitutions have been included in the alternate Spec Section. 04220 - issued with this Addendum***	*** Alternate Spec. Section. 04220(rev_a)Cast-Stone-Masonry-Veneer issued*

NO.	ITEM DESCRIPTION	NOTES
	Colors and Type translate as follows: "Blacksburg Blend" identified by 'RockCast' (or approved equal) as a having the four specific color types: **Boxley Name / RockCast Colors Used / Percentage in Wall** Dark Gray — 10% "Charcoal" - 90% "Ice Gray" — 35% +/- Light Gray — 10% "Pewter" - 90% "Ice Gray" — 35% +/- Tan Blend — 25% "Pewter" - 75% "Creme Buff" — 18% +/- Charcoal — All "Charcoal" — 12% +/- **Keynote Reference.** • ***04860*** *-- Natural Stone: "Blacksburg Blend" chiseled face.* • ***04720.B*** *– Precast Coping, Sills, Water table etc: Smooth faced 'RockCast Charcoal' (or as per selected sample)(even color – not mottled)* • ***04720*** *-- F Precast Foundation Base: Smooth faced 'RockCast Charcoal'.* • ***04720.D*** *-- Accent to Monumental Masonry Veneer : Smooth faced 'RockCast Charcoal'* • ***04720.D*** *-- Monumental Masonry Veneer : Split Face "RockCast Ice Gray" (or as per selected sample)(even color – not mottled).* • ***04810.H*** *-- Accent to Oversized Masonry Veneer: Split-faced 'RockCast Charcoal'.* • ***04810.H*** *-- Oversized Masonry Veneer: Smooth Face "RockCast Ice Gray" (or as per selected sample).*	
A36	BH Dec. 02, 09 1. What is the height to the bottom of the deck above the cages on A-633 in the unit storage 141 & 144. ***>>This height varies as the roof structure slopes.*** 2. What is the height of the cages in unheated storage on A-641? Do these cages have ceilings? ***>>They extend to the underside of the deck.*** 3. Is there wire mesh in the work shop on A-121 or is it all chain link fence? See tool room MO6- USAR and ARNG. ***>>Yes there is a wire mesh partition extending to the underside of the deck.*** 4. Is this really 6 ga 2" diamond as shown in the spec or is it 10 ga 2x1 rectangular mesh as indicated on the drawings? ***>>6ga 2" diamond as in specification.***	

NO.	ITEM DESCRIPTION	NOTES
A37	BBL Dec. 02, 09 1. Section 10400 calls for the freezer/cooler to be 16'x4x8'-8" however the drawing K-101 shows A 12'-6"x12"-0". Which is correct? ***>> Walk-in cooler/freezer dimensions were changed and should now read 11'7" x 12'6" instead of earlier dimensions.*** 2. Do we furnish the fire extinguishers? ***>>See Add/ Alt A5 Alternate. Total asw per FEC tag on drawings.*** 3. Do we furnish the "Weapon Racks"? DWG: A-631. ***>> Yes.*** 4. Can you furnish section views 1 & 2 from S-204? ***>> See Structural Engineer's previous Response.*** 5. Is there more than on page for section 10651? ***>> Yes there should be 8 pages total. Original specification 10651 re-ssued herewith.*** 6. Could you give more details for the suspension bracket, 7-3/8 x 2-1/2, shown on "A1" on A-655? ***>>Consult partition manufacturer.*** 7. Could you give details for the "adjustable floor support "system for the FRP grating in room 010? DWG: A-632 ***>>Consult the floor system manufacturer for details. The floor supports vary in height to accommodate sloping concrete floor below floor system.*** 8. Are there any wardrobe, 10814, coat hooks or coat rack to be furnished on this project? ***>> Yes – as per Spec. Provide total 75 coat hooks / Six 3ft long coat racks – in positions TBD.*** 9. Are there any floor mats and frames on this project? ***>> Yes one 144"x96".*** 10. Is there a section 11460 missing from the specification book? DWG A-822 ***>>Please disregard all 11460.A annotation and provide custom cabinetry and equipment per elevations.***	*** 0651S(rev_a)Operable-Panel-Partn – re-issued*

NO.	ITEM DESCRIPTION	NOTES
	11. Could you furnish a specification for the trench drains at the workshop? ***>>Trench drains will be precast or cast in place radius bottom channels with interlocking ends, built-in slope and a nominal clear opening of 12". Units shall have cast in anchoring features on outside wall to ensure maximum bond with surrounding concrete. Grates shall be ADA heavy duty ductile iron slotted and secured. Outlets shall be coordinated with plumbing drawings.*** 12. Are laminated dock bumpers required at all 4 truck bays on DWG A-102? ***>>Yes.*** 13. Are there handrails required for the loading dock stairs on DWG A-102? ***>> Yes – Add railing on the steps and ramp up to the Loading Dock.***	
A38	BA Dec. 02, 09 Spec Section 01030-Alternates 3.01 A-I Alternate calls for providing broadloom roll-good carpet in Open Office (#149) in lieu of ECOsurfaces "ECOearth" rubber floor tile. Sheet A-801 Finish Schedule indicates Carpet Tile to go in Open Office (#149). Which is correct for the base bid, ECOearth or Carpet Tile? If it is ECOearth, I do not find this name in the Floor Tile specification 09651. ***>> Revision to A-1 Alternate*** *Provide costing deduction to place broadloom roll-good carpet in Open Office (#149 & #151) in lieu of Carpet Tile. Delete any reference to "ECOsurfaces "ECOearth" rubber floor tile." Base bid is carpet tile.*	
A39	BA Dec. 02, 09 I have not been able to find a Finish Schedule for the Workshops Building on sheet A-121. ***>> See item below***	
A40	BA Dec. 02, 09 A composite panel manufacturer has informed me that composite panels cannot be curved in 2 directions as depicted for the fascia on the curved roof shown on Elevation A-402 and Roof Details A-672. ***>> See answer below***	

NO.	ITEM DESCRIPTION	NOTES
A41	MC Dec. 03, 09 1. Ref. details N02/A402; S01/A404; 6A,6D/A661; 6E/A663; 1E/A672 - Detail 1E/A672 shows a curved fascia panel transitioning into the soffit panel. Aluminum composite material cannot curve in two different planes as shown in details N02/A402 & S01/A404. Please advise. Potential solutions are: a. Square off the fascia panel. b. Segment the roof in plan allowing us to curve the fascia panel; however eliminating the radius curve in the roof. c. Split the fascia and soffit panels into such small segments that the roof will still appear curved while allowing us to curve the fascia panel. 2. Ref. specification SECTION 07412 - ALUMINUM COMPOSITE WALL PANELS a. Specification calls for a 6mm material with a fire retardant core. A fire retardant core is unavailable in a 6mm thickness; however a 4mm material is available in a fire retardant core and is the industry standard panel thickness. b. Exterior finish is to be Color Anodized; however an anodized finish cracks and distorts the look when curved. We encourage you to visit our YouTube video (http://www.youtube.com/watch?v=2-E_SEsAOJM) that you can hear the cracking of the panel finish Ultimately altering the appearance of the finish when transitioning from curved panels to non curved panels. Also the specification calls for a 10 year finish warranty. There is no finish warranty offered for an anodized finish. All ACM manufacturers offer a painted finish that provides an equivalent look to the color anodized finish that will meet the requirements for a 10 year finish warranty. c. Our potential solution to these problems are to provide a 4mm	

NO.	ITEM DESCRIPTION	NOTES
	material with a fire retardant core in a 3-coat finish. ***>> General Clarification:*** *Aluminum composite panels at the soffit overhangs are to flat and segmented with the radius bullnose to be segmented the same width as the panels allowing the segments to create the curve and slope.* ***>>Specification Clarification:*** *Section 07412 – 1.2 A and 2.4 B.1* ***Replace "6mm" with "4mm"*** ***>>Section 07412 – 2.1 A.2.a*** *Replace "Exterior Anodic Finishes" with "Exterior Finishes" and "a. Exterior surfaces shall be coil coated with FEVE or PVDF based resin which meets or exceeds AAMA 2605-02 testing for durability.* ***>> Section 07412 – 2.4 B.3*** *Replace "Color Anodized" with "Color to be selected from manufacturer's standard colors to include 3 coat metallic finish."* ***>>Drawing Clarification:*** *Replace all leaders that read "05730.A Composite Mtl Pnl System" with "07412.A Composite Mtl Pnl System"*	
A42	BA Dec. 03, 09 There are Weapons Racks depicted on Sheet A-631 with a reference to Specification 10670 Metal Shelving. However, the specification only mentions Heavy Duty Shelving with different dimensions at 2.2.B, and Duffel Bag Storage Units, again with different dimensions at 2.2.C. Please clarify specifications for the Weapons Racks. ***>>Please provide per the dimensions shown on the drawings.***	
A43	GC Dec. 03, 09 Should part of the East Elevation, on A-422, be exposed masonry? (Ref S-221) ***>>The metal is full height of wall and covers the masonry as shown on elevations.***	
A44	MW Dec. 03, 09 I was wondering if there was any way I could get the budget for this project, the construction schedule for substantial and final completion, and the liquidated damages? Our bonding	

NO.	ITEM DESCRIPTION	NOTES
	company is wanting this information. ***>>See notes in Pre-Bid meeting minutes issued as Addendum. Budget not available.***	
A45	BA December 03, 2009 The specification for Wire Mesh Partitions 10605 2.4 indicates there are Wire Mesh Storage Lockers in the project. I have not found any on the plans. Please clarify. ***>>Wire mesh lockers in specification 10605 are not in contract delete section 2.4 in its entirety.***	
A46	BBL December 03, 2009 Please provide clarification for the following: 1. Please provide a locker base detail. ***>> See attached sketch.***	*** 'A-CONC-LOCKER-BASE-DET' issued herewith.*
A47	BA December 03, 2009 There is a specification for Floor Mats and Frames 12484 but there doesn't appear to be any designated as such on the plans. Please provide locations and sizes. ***>> One mat 144" x 96".***	
A48	BA December 03, 2009 Section 10505-3, L., 1. Continuous Zee Base is specified and details C-1 on A614 show legs for closed base not continuous. Zee base and legs are two different types of base which are both commonly used for KD lockers, not welded lockers. Locker manufactures suggest the use of concrete base or integral welded base for all welded lockers. Integral welded base will be flush with the locker door without overhang. Zee base and angle legs are not strong enough to support the weight of a welded locker especially when lockers are mounted back to back without the support of a wall. Please clarify base type for welded lockers. ***>> See attached sketch.***	
A49	BA December 03, 2009 At the bottom of the Toilet Accessories Key E6/A-611, the very last item says "10523.A Fire Extinguisher (Not Funded)." Is this to indicate the Fire Extinguishers are Not In Contract (NIC) or something else. I've never seen "Not Funded" on a plan before. Please clarify. ***>> Fire extinguishers are not in base bid but to be included in appropriate alternate.***	
A50	BH December 03, 2009 Substitutions requests from a block supplier. 04810 2.04 Brick 'Watsontown' for 'Belden Brick' 04230 2.01 'Shouldice Stone' for 'ArrisCraft Stone'. 04810 2.4 Brick	

NO.	ITEM DESCRIPTION	NOTES
	'Bowerston Shale' for 'Belden Brick' 04810 2.01 Brick "Alcon' CMU for 'Morelli', 'Lollini', 'Peerless'. ***>> All the above are approved as long match same color range.***	
A51	WT Dec. 03, 09 A402 vs. A403 Per sheet A403 where is a detail for N04/A402, it appears to be a precast foundation base as well as a precast going up the vertical wall. However, referring to sheet A402 (partial elevation N04) the detail calls out for the masonry to be a Monumental Masonry Veneer (Accent). Please advise how the Masonry Veneer Accent defers from the Masonry Veneer Field? What exactly is the Masonry Veneer as the specs show it to be cast stone (window sills, lintels, surrounds, coping, and wall caps). Please advise. ***>>Monumental Masonry Veneer is to comply with the cast stone specification 04720 with full range of standard colors available as shown on elevations and sections. "Field" stone and "Accent" stone will be different in color and shape.*** A-105 Are the storage units in storage rooms 135 and 136 in this contract? If so, please advise as to storage unit/shelving unit preferred. ***>>No the units are not in this contract.*** A-633/A634 The wire mesh partition height is labeled ceiling mounted and "TBD"on A633. A634 indicates a 10' high wire mesh cage. There is not a 10' ceiling in these storage units. Please provide the correct height of the wire mesh partitions and confirm that they are to be ceiling mounted. ***>>These partitions are to be installed to the underside of deck or ceiling. Please disregard 10' dimension on A-634.*** A-712 In the maintenance building doors MO1A.1, Mo1A.6, MO4a, and M11A.2 are shown on the door schedule as aluminum. The elevations do not concur. Please advise which is correct. ***>> The doors and frames are to be hollow metal MD3.*** A-712 Doors M01a.1, M01a.6, and M11a.2 call for the frames to be AF8. There is no detail for AF8 on A-701. Please confirm which frame should be supplied for these doors or supply a cut of the AF8 door frame. ***>> The frames are to be MF5 not AF8..***	

NO.	ITEM DESCRIPTION	NOTES
	08411 This specifications calls that it relates to spec sections for sliding automatic entrance doors. There is now specification for these automatic sliding doors. Please provide. ***>>See attached specification.***	
	08411 There are a number of aluminum frames designated as 90 min. There is no aluminum specifications which includes 90 min aluminum framing. Please provide ***>> Aluminum frames are not to be 90 min rated disregard fire rating note.***	***0651S(rev_a)Operable-Panel-Partn – re-issued*
	A-723 The 4"x4" tube steel shown on A-723 detail J4 is not called out to be aluminum clad. Should this be? ***>>Provide aluminum clad around column matching window type and color.***	
	A-721 Windows W08A and W08B are described on the elevations as windows 08520A. Should these windows be sandwich panels as specified in section 08950 Please verify. ***>> Yes these windows should be sandwich panels as specified. Disregard 08520A note on elevations.***	
	A-721 Please provide specification for the interior blackout blinds. ***>>Blinds to be aluminum 8 ga construction, with one inch or 2 inch slats. Provide no-hole construction and integral contoured headrails that do not require a valance. Blinds to have a baked on paint finish. Color to be selected from manufacturer's full range of standard colors.*** ***Manufacturers offering products that may be incorporated into the work are, but not limited to the following:*** ***1) Graber*** ***2) Blinds.com*** ***3) Hunter Douglas*** ***4) Levolor***	
	08911 There is a finish section that refers to a bone white painted finish. Should this finish be placed on all metal in the system? ***>>No.***	
	A-631/Appendix A Keynote 10670.C The weapons racks shown are non-locking open racks. We do not feel that these racks	

NO.	ITEM DESCRIPTION	NOTES
	meet Army standard AR190-11. Please confirm that the racks as shown on A-631 meet the Army requirements for weapons storage. If they do not, please provide an alternate storage rack that meets AR190-11. ***>> Please bid as shown.*** A-712 Doors 146.1.2, 146a.3, 146b.1 and 146b.2 are called out to be Blast Prot. Will there be a Blast Prot. Specification ***>>See item below.*** Alt. 6 Should alternate A-6 read that the doors are now FRP and the alternate is to have them bid in hollow metal? ***>> No the alternate is correctly worded the FRP doors are to be in the alternate.*** A-681 Note 7 calls for abuse resistant drywall in high traffic areas. Need locations ***>> All areas but interior offices are to be high traffic area.*** A-681 Partition type 8 keynote 09511.D, sec. gyp.. No detail for 09250.2 in keynotes or drawings. ***>> Security gypsum wall assembly is similar as shown on drawings but with a security barrier mesh applied to one side of metal stud framing full height with manufacturer specialty clips. Mesh gauge and size should comply with military specification MIL-M-17194 Type II, Class 1; ASTM 1267.*** A-681 Note 5, partition type 9. No specification for 1/2" sound attenuation board ***>> Please provide ½" soundboard per the following: Sound Deadening Fiberboard: Meets ASTM C208, the Standard Specification for Cellulosic Fiber Insulation Board for Type 1 sound deadening board.*** ***1. 1/2 inch (13 mm) thick.*** ***2. Minimum noise reduction coefficient of 0.35 (ASTM C423)*** ***3. Minimum sound transmission class of 26 (ASTM E90)*** A-203 Legend item 09511.D acoustical ceiling. Cannot locate this type on reflected ceiling plans ***>> The legend is provided on all ceiling plan drawings although some may not be used on all of the drawings. Please refer to plan and annotations***	

NO.	ITEM DESCRIPTION	NOTES
	for ceiling type location. A-681 note 1 references UL u 474 for 2 hour partitions. This UL number talks about humidifiers, not partitions. Please clarify. ***>> Please disregard note UL design u474.*** Keynote 0925.A references requirement for level 5 drywall finishing. Is level 5 finish required for all interior gypsum wall board noted as 0925.A? ***>> Yes. A level 5 finish is required for all interior gypsum board assemblies.*** A-861 Finish schedule refers to keynote 9250.L, Gyp. Board security spec. And 9250.N. Cannot locate requirements for these keynotes. ***>> See previous item.*** 08800 The specified requirement for "self cleaning" glass is not available this is a residential specification for 1/8" glass, and not available in commercial of industrial applications ***>> Self cleaning is not required.***	
A52	WT Dec. 03, 09 Appendix F Questions 2.2.9 The narrative mentions a fence, located "at least 82.5' from all portions of the main and auxiliary buildings". This fence is not shown on the contract drawings. Is this fence needed? If so, please provide exact location and type of fencing to be used. Miscellaneous/ General Questions Does the West Virginia Business & Operation Tax, Business Franchise Tax, or any such similar tax apply to this project? ***>> See CEI answers.***	
A53	WT Dec. 03, 09 **KITCHEN** **K-Drawings/Specification :** "The following items are listed in the 11400 specifications #4, 6, 7, 9, 13, 16, 18, 20, 36, 50, 51, 61 and 62 to provide, yet the K-101 drawings indicates these items have been "omitted", which is correct. If these items are not to be omitted, please indicate whether they will part of the base bid or alternates. ***>> These items are to be omitted.*** **K-Drawings:** Please provide routing locations for the refrigerant piping to the walkin cooler/freezer from the condensing units	

NO.	ITEM DESCRIPTION	NOTES
	(units shown outside the building perimeter) ***>> Routing through sleeves under the floor of the Controlled Waste Room #010*** **K-Drawings:** Drawing K -102 indicates the slab depression for the walkin cooler/freezer is to be 4 - 1/2". Drawing K-103 indicates this slab depression to be 6". Please advise. ***>>Minimum is 4 ½"(with no tile), depending on flooring, it can be up to 8". Normal for tile floor is 6", with floor of box being 1 ½" below to allow tile bed.*** K101 Item 14(work table) is on the alternates list, however item 48 (disposer) which is integrated into the work table, is on the base bid list. Please advise. The sink shown as part of this table are also not shown on the cutsheet for this table and are not called out on the schedule. Please advise. ***>>Include the disposer with the Work table on the alternates list – not in the base bid.*** **K-103/K-104/M-302:** The hood schedule on M-302 indicates that the manufacturer is to be Greenheck. The Kitchen schedule on K-104 and specification section 11400 shows the manufacturer of these 3 hoods to be Captive Aire. Please advise as to which manufacturer is to be used for the hoods. If the Captive Aire hoods are to be installed please confirm that they meet all exhaust and code requirements. Also, please confirm that these hoods are to included in this contract and are to be furnished by the kitchen equipment supplier per the mechanical note on K-103 and are not by others as indicated on K-104. ***>> See the Mechanical Documents. SECTION 15875 — KITCHEN HOOD SYSTEM*** K104/Spec.11400: K-104 indicates item # 35 is to be a 3-well refrigerated unit. Spec. 11400 indicates this is a spare number and no item has been specified. Please confirm that item #35 is to be the 3-well refrigerated unit and is to included as an add Alt. item. ***>> This item is omitted and will be provided outside of this contract.*** ***>>In addition:*** ***Walk-in cooler/freezer dimensions were changed and should now read 11'7" x 12'6" instead of earlier dimensions.*** ***Change Item#2 shelving to 8-36" units and 2-48" shelving units (4shelves per unit, 4 posts per unit)***	

NO.	ITEM DESCRIPTION	NOTES
A54	BBL Up to Dec. 03, 09 [RFI #1] What are the days for completion? / Is there a penalty clause? If so, what is the amount per day? ***>> See Addendum #3*** [RFI #2] Are bid document's going to be distributed to any of the local plan rooms (CAWV, KVBA, etc.) where subcontractor's and material suppliers may view them at no charge? ***>> Yes.*** [RFI #3] [ADD1.4] Please issue an addendum accepting Excel spreadsheets as Bid form with the following language, "that if the vendor inadvertently leaves out a line item they are automatically disqualified". Will comply. Bidders supply their own Excel format. ***>> Excel spreadsheets are acceptable as Bid Form. If vendors inadvertently leave out a line item on the bid form, they are automatically disqualified.*** [RFI #4] -- Skipped to 5 [RFI #5] 10/C-810, is this Bid Item 12. 6" Concrete Paving? The detail shows 9" concrete paving. ***>> The detail is wrong - the concrete thickness is 6". Detail 14/C-810 has the correct information.*** 10/C-810, what are the reinforcing requirements for this concrete paving? ***>> The concrete paving is not reinforced, but it does have load transfer dowels at the joints as shown on Detail 14/C-810 and wire mesh throughout. A corrected 10/C-810 detail is attached.*** [RFI #6] C-210 – Site Layout Note 16 Door Stoop, is this to be included in Civil Bid Item 26, Concrete Sidewalks? ***>> If it is outside the five foot building boundary it would be paid for under Concrete sidewalks. If it is inside the five foot building boundary it is part of the building lump sum.*** [RFI #7] 1. C-210, Site Layout Note 32, Concrete Dumpster Pad, is this item included in Bid Item #12? ***>> Yes***	***_10-C-810(12-07-09)Supplemental-Paving-Det Attached with Addenda-Package01*

NO.	ITEM DESCRIPTION	NOTES
	2. C-210, Conc. Helipad, is this item included in Bid Item #12? ***>> Yes*** 3. C-861, Bid Item #40, please clarify reinforcing requirements. ***>> Same as Concrete Paving - WWF 6x6, W2.9XW2.9*** 4. C-210, Site Layout Note #36 & SEU-2, Bid Item #44, please provide more information/details. ***>> See the "General Note Regarding Site Electrical Power" on drawing SEU-2 which refers to drawing SEU-4 for these details.*** 5. C-210, Site Layout Note #35, Bid Item #43, please provide more information/details. ***>> See plan note "V" on drawing E-501 which states:*** *CONTRACTOR TO PROVIDE REINFORCED CONCRETE PAD FOR ENGINE/GENERATOR SET PER EQUIPMENT MANUFACTURER'S SPECIFICATIONS. Also see specifications sections #16050, 3.6 and #16231, 3.2 for additional instructions on mounting of equipment on concrete bases. The intent is as the plan note says, to install according to the manufacturer's specifications. The specifications are to ensure that the concrete pad is reinforced. No diagram or drawing is given since multiple suppliers can bid on this equipment.* [RFI #8] 1. S-001, Foundation Note 4. "Foundations for the main AFRC Building are to bear on bedrock, over excavate as required." Bid Item #8, Over excavation, is this included in this bid item? If not, please provide an allowance due to the un-quantifiable nature of this item. ***>> Bid Item #8 is for soft spots in subgrade of fill areas and is only used upon direction from the COTR. The building and foundations are a lump sum bid item. The borings are included in the contract documents to form a basis for estimating the CLSM required for backfill up to the foundation from suitable bearing rock.*** [RFI #9] 1. E506, SEU-2, M-65, M-66 pole lights are not listed on the lighting fixture schedule. We also can't find any foundation details for these fixtures. ***>> Light fixtures "M65" and "M66" are included in the light fixture schedule on drawing E506. The schedule has two (2) columns. Poles to be set on elevated bases that are (typically) from 24 to 30 inches high – as per submitted detail _Elec-Pole-***	

NO.	ITEM DESCRIPTION	NOTES
	Base-Detail(12-08-09). 2. We request a one week bid and question cut off extension. ***>> Date extended to 15th Dec.2009.*** [RFI #10] 1. A-101, Rooms 142 & 143; S-101, 9/S-301, on the architectural drawings these rooms are listed as vaults. On the structural detail, 9/S-301 it shows a typical masonry wall detail. Is this correct or should it reference 7/S-301? ***>> It should reference 7/S-301*** 2. 2/S-305, 2x Nailer, attach to HSS6x4x1/4. Does this continue on the joists as well ***>> Yes, see detail 1/S-301*** [RFI #11] Please provide clarification for the following: 1. Is a foundation drain required for the AFRC Building? 1/S-121 shows a foundation drain for the Workshops. Is this the only place one is required? ***>> All Arch drawings show drain. It is specified in Spec. Section 02620.*** 2. What masonry walls receive furred out Drywall walls? A-413 Assembly Hall Elevations show masonry walls, A-801 finish schedule Finish Type E shows furring and Drywall. Many of the interior elevations do not match the finish schedule. Should we go by the interior elevations or the finish schedule? ***>>Interior Masonry walls all receive furring, except*** • ***Assembly Hall 107,*** • ***Entrance 101b*** • ***Curved Wall to 102,104, 151b, 151k, 106.*** • ***Wind Lobby 101a*** • ***Curved Wall in Corridor 101c*** • ***Storage 107a & 107b.*** • ***Stores / Vaults 141, 142, 143 & 144.*** • ***Mech. & Caretaker 111 & 111a.*** • ***Contr. Waste 010*** 3. Specifications, 09720, Wall Coverings, none are shown on the finish schedule. Is there any Wall Coverings, and if so, where do they go? ***>> No wall coverings omit specification 09720 in its entirety.***	

NO.	ITEM DESCRIPTION	NOTES
	4. A-801, Kitchen 112, are the finishes the same in Rooms 112 A, B, C, D, E, & F? ***>> Yes – all finishes the same in Kitchen 112 and all these areas. Add white glazed tiles up to 6ft height in all these rooms (112 A, B, C, D, E, & F)*** [RFI #12] 1. Bid Item #28, Concrete Wall, 35 LF, where is this located? What is the height, thickness, etc. ***>>Located at loading dock – see Sheet S-301 for details.***	
A55	GLH - Enquiries regarding Addendum #3 Dec. 08, 09 Question #3 refers to Alt 8, we still do not have a description for this alternate in Spec Sect. 01030. ***>> Alternates as follows:*** • ***Architectural: A-1 to A-7*** • ***Civil: C-1 to C-5*** • ***Electrical: E-1 to E-5*** Question #22 refers to a bid Item 1.a.4, WVDOH Encroachment Permit(s), to be handled by an allowance. What is this allowance? ***>> See revised Bid form issued with this Addendum.*** Question #23 implies there is a new C-710 Storm Sewer Profile, we do not have this drawing. ***>> See Drawing C-710 issued with this Addendum.*** Question #30 adds Alt E4 and E5. We have no description for these alternates. ***>> See revised Bid form.*** The bid form does not show the Bid Items 1a.1, 1a.2, 1a.3 or 1a.4 nor the Electrical Alternates (E-1, through E-5). ***>> See revised Bid form.***	*** Revised 01030(rev_a)ADD_ALTS and 0100(rev_a)Section II-Bid-Sheet issued herewith.*
A56	BDT - Enquiries regarding Addendum #3 Dec. 04, 09 Addendum 3, Item 22 indicates there is an Allowance to cover Highway Fees. If the GC is not responsible, who is? Is the GC/Bidder required to include the Allowance in the Bid? If so, how much is it? ***>> See revised Bid form issued with this Addendum.*** Where are Bid Items 1.a.2 and 1.a.4 "WVDOH Encroachment Permit(s) located? ***>> See revised Bid form.*** The new Bid Form in Addendum 1 does not have Bid Items labeled this way. ***>> See revised Bid form.***	" " " "

NO.	ITEM DESCRIPTION	NOTES
A57	There are Residential Kitchen Appliances shown on Sheet A-822 (3-refrigerators, 1-range) but a specification is not provided. Are these items to be included in the bid? **>> This item is omitted and will be provided outside of this contract.**	

DEFK10007 ELKINS AFRC ADDENDUM #4 -- PART B Wed, Dec 09, 2009

Consultant Team Addenda.

Bidders may download this file and the attachments from this link:
http://www.etbarchitects.com/guest01/0803ElkinsAFRC/DWGS/ADDENDA/Addendum04-Package/

Alternatively, Bidders may order hard copies from Charleston Blueprint at no charge:
Phone: +1 (304) 343-1063 / +1 (800) 220-9625
Contact: Dave chasblue@newwave.net

***Attachment issued*

NO.	ITEM DESCRIPTION	NOTES
	CIVIL	
B1.	**Revisions to Section III – Civil Bid Item Descriptions** **Bid Item 33: Security Fencing** Revised the first sentence of the **Description** to read: "This work consists of furnishing and complete installation of chain link fencing with six foot fabric height and personnel gates."	***Attachment 0102(rev_a)Section III - Civil Bid Item Descriptions*
B2.	**Changes to Bid Item 38:** Revised to change the name from 60' Flagpole to 40' Flagpole and revised the description to "furnishing and installing the 40' flagpole" rather than 60'. See below. **Bid Item 38: 40' Flagpole** **Unit:** Each (EA) **Description:** This item includes furnishing and installing the 40' aluminum flagpole in front of the facility. The foundation, including excavation, aggregate, concrete and miscellaneous hardware are incidental to this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work. **Measurement:** There shall be no direct measurement of materials, labor, and services provided by the Contractor in completing this item. **Payment:** Payment shall be made at the contract unit price for each.	" " " "
B3.	**Changes to Bid Item 42:** Revised to include concrete aprons at both ends. See below. **Bid Item 42: Loading Ramp** **Unit:** Lump Sum (LS) **Description:** This item of work is a cast-in-place reinforced concrete loading ramp with two levels, and	" " " "

NO.	ITEM DESCRIPTION		NOTES
		concrete aprons at both ends. The aggregate, backfill, dock bumpers, excavation and soil backfill, and any other ancillary equipment required are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.	
	Measurement:	There shall be no direct measurement for materials, labor, and services provided by the Contractor in completing this item.	
	Payment:	Payment shall be made at the contract unit price for lump sum.	
B4.	**Added Alternate Bid Item #5**		***Attachment 01030(rev_a)ADD_ALTS and 0100(rev_a)Section II-Bid-Sheet*
	Bid Item 78:	**Fencing/Gate Upgrade**	
	Unit:	Lump Sum (LS)	
	Description:	This work shall consist of upgrading all fencing, swing gates, sliding gates, and alternate bid items to an eight foot chain-link fabric height. Force Protection Gate is not included. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.	
	Measurement:	There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item.	
	Payment:	Payment shall be made at the contract unit price for lump sum.	
B5.	**Revisions to Specification Section 02300 – Earthwork** Changed the test procedure for soil compaction from ASTM D 698 to ASTM D 1557 throughout the specification. Eliminated the requirement to remove surplus satisfactory soil and legally dispose of it off Owner's property (Section 3.25 "Disposal of Surplus and Waste Materials" subsection A). Added Section 3.23 "Free Draining Base Course".		***Attachment 02300(rev_a)Earthwork*
B6.	**Revisions to Specification Section 02741 – Asphalt Paving** Changed the lowest acceptable percentage for Average Density (3.7.C.1 COMPACTION/Intermediate Rolling) from 94% to 89%. Eliminated (3.7.C.2) requirement for average density.		***Attachment 02741(rev_a)Asphalt-Paving*

NO.	ITEM DESCRIPTION	NOTES
B7.	**Revisions to Plans** Drawing C-710, "Storm Sewer Profiles" revised several pipe sizes and revised profile for Line 2 to include additional length of pipe.	***Attachment C-710r1.1*
B8.	**Revisions to Specification Section 02510 – Water Distribution** Added Section 2.4.D "PVC, SDR 21 Pipe: ASTM D2241 with bell end with gasket and spigot end."	***Attachment 02510(rev_a)Water Distribution*
	MEP	
B9.	**THE FOLLOWING MEP DRAWING REVISIONS TO APPLY** **Drawing MEP** On drawing MEP (Symbol Legend), change the description for the telephone/data systems outlet (a solid triangle with number designation) to read as follows: "TELEPHONE AND DATA OUTLET, DOUBLE-GANG BOX (4-11/16-INCH SQUARE, 2-1/4-DEEP) WITH 1-INCH CONDUIT TO ABOVE ACCESSIBLE CEILING, NUMBER DENOTES QUANTITY OF RJ-45 JACKS" **Drawing E-505,** On drawing E-505, on the TELECOMMUNICATIONS RISER, change ¾" CONDUIT (TYP) noted at jacks to read: 1" CONDUIT (TYP). On drawing E-505, on the TELECOMMUNICATIONS RISER, for the fiber optic cable shown between rooms #110c and #M07 ONLY, change the description to read: "12-STRAND TOTAL, 12-STRAND SINGLE-MODE, HYBRID FIBER-OPTIC CABLE". **Reference Drawing SEU-2, Plan Note 'Y':** Revise the note to read: "oil/water separator monitoring system (highland tank #htg1 or equivalent) and associated sensor and components are to be provided with oil/water separator equipment. Electrical contractor is to receive the system components and install them per the manufacturer's instructions. Provide 1" conduit with alarm signal cables from monitoring system to alarm panel inside of maintenance workshop (see plan notes 'a' and 'b' on dwg. E-305 for continuity). Coordinate with oil/water equipment vendor and installing contractor for location of termination of conduit and for required number and size of signal wires/cables and terminate at equipment as required."	MEP Drawings

NO.	ITEM DESCRIPTION	NOTES
	Drawings E201 through E-204 A general note is to be added to the power plan drawings (drawings E201 through E-204) that reads: "GENERAL NOTE REGARDING TELECOMMUNICATIONS CABLE ROUTING: ALL TELECOMMUNICATIONS CABLES INCLUDING BOTH COPPER AND FIBER-OPTIC CABLES ROUTED BETWEEN ROOMS #110c, #114c and #114d ARE TO BE ROUTED THROUGH THE CABLE TRAY SHOWN ON THE DRAWINGS. TELECOMMUNICATIONS CABLES ROUTED BETWEEN ANY OF THE THREE (3) ROOMS #110c, #114c and #114d AND EITHER OF THE TWO (2) VAULTS (ROOMS #142 OR #143) ARE ALSO TO BE ROUTED THROUGH THE CABLE TRAY SHOWN ON THE DRAWINGS. CABLES ARE TO BE CONVEYED BY CONDUIT FROM INSIDE THE VAULT AREAS TO THE CABLE TRAY." **Drawings E201 through E-205** A general note is to be added to the power plan drawings (drawings E201 through E-205) that reads: "USE OF CONDUIT IS TO BE MAXIMIZED FOR ROUTING OF ALL TELECOMMUNICATIONS CABLES TO MINIMIZE THE USE OF "J" HOOKS AND THE POTENTIAL DAMAGE THEY POSE TO THE CABLES INVOLVED." **Drawings E201 through E-205** A general note is to be added to the power plan drawings (drawings E201 through E-205) that reads: "GENERAL NOTE REGARDING TELECOMMUNICATIONS CABLES: USE OF CONDUIT IS TO BE MAXIMIZED FOR ROUTING OF ALL TELECOMMUNICATIONS CABLES TO MINIMIZE THE USE OF "J" HOOKS AND THE POTENTIAL DAMAGE THEY POSE TO THE CABLES INVOLVED." **Drawings E205** A note is to be added to power plan drawing E-205 which reads: "ONE (1) TELECOMMUNICATIONS OUTLET CONSISTING OF TWO (2) RJ-45 JACKS EACH WITH CAT 6E CABLES IN A TWO-GANG BOX MOUNTED AT 48 INCHES AFF WITH 1-INCH CONDUIT TO ROOM #M07 SHALL BE INSTALLED IN EACH CORNER OF EACH MAINTENANCE BAY. ONE BAY FOR ARNG AND ONE BAY FOR USAR WILL REQUIRE A TOTAL OF EIGHT (8) ADDITIONAL OUTLETS. COORDINATE LOCATIONS OF OUTLETS IN VICINITY OF SIDES OF ROLL DOORS AND VERIFY EXACT LOCATION WITH OWNER. **Drawing E-205** A note is to be added to power plan drawing E-205 which reads: "ONE (1) TELECOMMUNICATIONS OUTLET CONSISTING OF TWO (2) RJ-45 JACKS EACH WITH CAT 6E CABLES IN A TWO-GANG BOX MOUNTED AT 48 INCHES AFF WITH 1-INCH CONDUIT TO ROOM #M07 SHALL BE INSTALLED IN EACH CORNER OF EACH MAINTENANCE BAY. ONE BAY FOR ARNG AND ONE BAY FOR USAR WILL REQUIRE A TOTAL OF EIGHT (8) ADDITIONAL OUTLETS. COORDINATE LOCATIONS OF OUTLETS IN	

NO.	ITEM DESCRIPTION	NOTES
	VICINITY OF SIDES OF ROLL DOORS AND VERIFY EXACT LOCATION WITH OWNER. **Reference drawing E-305, plan note 'a':** Revise the note to read: "oil/water separator alarm panel (highland tank #htg1 or equivalent) is to be provided with oil/water separator equipment. Electrical contractor is to receive the panel and install it per the manufacturer's instructions. Coordinate with oil/water separator equipment vendor for requirements (see plan note 'y' on dwg. Seu-2 for continuity). Make terminations at panel per manufacturer's recommendations (see plan note 'b'). Connect to circuit #lx4-20 for power requirements." Further clarification of design intent: The original remote panel listed (Highland Tank #HT-DCX) was removed from the design. The alarm panel to be installed inside the maintenance bay is the Highland Tank #HTG1 (or equivalent). One sensor, included with the equipment package to monitor for high level overfill protection, is to be installed in the oil/water separator tank. **Drawing E-506:** (See Spec. Revisions below) Lighting Fixture Schedule: For Fixture Mark "X15", change series number to read: "LHQM/H1006" and change description to read: "SINGLE FACED STENCIL RED LETTER EXIT W/ BATTERY PACK, THERMOPLASTIC, WHITE, 2 – 6 VOLT / 10 WATT WEATHERPROOF MINI-CYLINDER REMOTE HEADS".	
B10.	**THE FOLLOWING DIV. 15 SPEC. REVISIONS TO APPLY:** **Specification 15561** paragraph 2.7: Add paragraph C to read as follows "All controls must be per awarded temperature control contractor and not manufacturers DDC controls unless they happen to be the awarded temperature control contractor. Temperature control contractor to furnish controls as noted in this section and identified in sections 15900 and 15985 to equipment manufacturer for installation in the factory, calibration and testing at the manufacturers cost. In Section 2.1A - Add AAON to the manufacturer's list **Specification 15783** paragraph 2.6: Add paragraph B to read as follows "All controls must be per awarded temperature control contractor and not manufacturers DDC controls unless they happen to be the awarded temperature control contractor. Temperature control contractor to furnish controls as noted in this section and identified in sections 15900 and 15985 to equipment manufacturer for installation in the factory, calibration	Division 15

NO.	ITEM DESCRIPTION	NOTES
	and testing at the manufacturers cost. In Section 2.1A - Add AAON to the manufacturer's list **Specification 15785** Section 2.5 - Add the following 2.5 MANUFACTURERS A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: 1. Greenheck. 2. Hastings Industries; Division of Eric, Inc. 3. Modine Mfg. Co.; Heating Div. 4. Rapid Engineering, Inc. 5. Reznor/Thomas & Betts. 6. CaptiveAire 7. AAON **Specification 15840** paragraph 2.1M: Add sentence as follows "All controls must be per awarded temperature control contractor and not manufacturers DDC controls unless they happen to be the awarded temperature control contractor. Temperature control contractor to furnish controls as noted in this section and identified in sections 15900 and 15985 to equipment manufacturer for installation in the factory, calibration and testing at the manufacturers cost. **Specification 15845** paragraph 2.2F: change wording "compatible" to read "from awarded controls contractor". Also, note paragraph 2.2F items 1 and 2 describe VAV controls furnished to this contractor for installation in the VAV manufacturers factory. VAV manufacturer to provide factory testing of damper, actuator, electric heater and all associated controls, etc. prior to shipping to site for installation. Paragraph 2.2F item 3 is to be furnished and installed by control contractor. **Specification 15900**: add paragraph as follows: 2.4B This temperature control contractor to furnish all HVAC equipment controls for project. All terminal equipment to be shipped to awarded HVAC equipment manufacturer for each piece of equipment for their installation and testing in the factory and the equipment manufacturer is to cover all of these installation and testing costs. No HVAC manufacturers terminal equipment controllers will be allowed (unless they are the awarded temperature control contractor/vendor) other than boiler and chiller controllers. **Specification 15985:** paragraph 3.1G1: Change last sentence of this paragraph to read " The cost to factory mount, calibrate and test the controller, transducer, transformer and actuator shall be coordinated prior to bid day and included in each specific equipment manufacturers costs – not the temperature	

NO.	ITEM DESCRIPTION	NOTES
	control contractor costs. **Specification section 15985:** paragraph 3.1K: This sequence of control and required BAS points applies only to for kitchen rooftop systems condensing units. **Specification section 15985:** add paragraph 3.1P to read as follows: Ductless Split Systems Control. All split systems are to be provided with equipment manufacturers controls (not by temperature control contractor) to interface interior air handling unit with remote condensing unit through packaged controls with remote mounted space thermostat assembly (refer to section 15738, paragraph 1.11). Each of these spaces is also to be provided with a BAS temperature sensor furnished and installed by the control contractor. **Specification #15783:** section 2.1, A: Remove Johnson Controls from list of approved manufacturers. **Specification #15840:** section 2.1, N: Remove Johnson Controls from list of approved manufacturers. **Specification #15845:** section 2.2, A: Remove Johnson Controls from list of approved manufacturers. **Specification #15900:** section 2.1, A: Remove Johnson Controls from list of approved manufacturers.	
B11.	**THE FOLLOWING DIV. 16 SPEC. REVISIONS TO APPLY:** **Specification #16231:** Add the following as section 3.5, H: Provide a four (4) hour load bank test at full load with documentation. **Specification #16441:** Change subsection #2.3, A, 3, d to read as follows: "Provide ground-fault pickup level, time delay, I2t response for circuit breakers where indicated on the drawings." **Specification #16441:** Change subsection #2.3, A, 5 to read as follows: "Provide Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip) where indicated on the drawings."	DIVISION 16

NO.	ITEM DESCRIPTION	NOTES
	Specification #16441: Add the following to end of subsection #2.3, A, 6, d: "Provide where indicated on drawings." **Specification #16441:** Remove subsections #2.3, A, 6, e, g, h, i and j. **Specification #16441:** Add the following to end of subsection #2.3, B, 3, c: "Provide where indicated on drawings." **Specification #16441:** Remove subsections #2.3, B, 4, 5 and 7. **Specification #16441:** Remove subsections #2.3, C, D and E. **Specification #16511**: section 2.1, A: Change to read as follows: Basis-of-Design Product: The design for each lighting fixture is based on the product named in the Lighting Fixture Schedule on the drawings. Subject to compliance with requirements, provide either the named product or a comparable product of equal value by one of the following manufacturers: 1. Cooper Lighting 2. LSI Industries 3. Day-Brite Lighting 4. Omega Lighting 5. McPhilben Lighting 6. Elliptipar Lighting 7. General Electric Lighting 8. H.E. Williams Lighting **Specification #16511**: Add section 2.1, L, to read as follows: Basis-of-Design Product: The design for each lighting fixture is based on the product named in the Lighting Fixture Schedule on the drawings. Subject to compliance with requirements, provide either the named product or a comparable product of equal value by one of the following manufacturers: 1. Cooper Lighting 2. Day-Brite Lighting 3. General Electric Lighting	

NO.	ITEM DESCRIPTION	NOTES
	4. Gardco Lighting 5. KIM Lighting	
	ARCHITECTURAL	
B12.	**REQUIREMENTS ARISING FROM FIRE MARSHAL REVIEW 11/04/09** 1. Change door swing to double egress doors at corridor 101 C, corridor 152 / corridor 101C and corridor 126 to eliminate dead end corridor. ***>> Revise Doors 152d.3 and 126a.1 to become double Egress Doors.*** 2. Provide opposite swing doors at corridor 137C and corridor 137 to be 90 minute fire rated to complete the building separation. ***>> Revise Doors 137 126a.4 and 137a to 90min. FR.*** 3. Notify sprinkler contractor to submit plans to this office for review. ***>> Contractor to comply.*** 4. Notify fire alarm contractor to submit plans to this office for review. ***>> Contractor to comply.*** 5. Notify hood suppression system contractor to submit plans to this office for review. ***>> Contractor to comply.*** 6. Any construction revisions making changes to exiting, major mechanical and electrical plans prior to and during construction shall be submitted to this office for review. ***>> Contractor / Project Team to comply.*** 7. Two weeks prior to completion, please notify the Inspection Division at ext. 53214. All review fees have been paid. ***>> Contractor / Project Team to comply.***	
B13.	**The following architectural drawing revision to apply** **Drawing G-002** **Corrected areas are as follows:** BUILDING AREA = 51,072 SF (Includes corridor 6,722 SF) MAINTENANCE & W.SHOP = 3,102 SF SUB TOTAL = 54,174 SF FLAMM. MATERIALS = 109 SF CONTR. WASTE +WALLS = 305 SF ORGANIZATIONAL STORAGE = 2,560 SF **TOTAL = 57,148 SF**	Arch. Drawings

NO.	ITEM DESCRIPTION	NOTES
B14.	**Specification Section 10505: Metal Lockers** Add: Republic Storage Systems, 1038 Belden Ave. NE, Canton, Ohio. As an acceptable alternate supplier. The "All Welded Ventilated" locker is accepted as an alternate.	
B15.	**Revision to Architectural Bid Section II – Bid Sheet** Addition of Allowance for "WVDOH Encroachment Permits" as Item 1.a.4. with a price of $20,000.	
B16.	**Revision to Architectural Bid Section III – Bid Item Descriptions** Revision of description of "General Construction Administration" allowance as Item 1.a.2. Revised as follows: **Bid Item 1.a.2:** **General Construction Administration** **Unit:** Lump Sum (LS) **Description:** This work consists of performing the construction administrative duties associated with managing the construction of the Project as stated in Division I of the Specifications, providing construction layout, providing temporary utilities for the site until 100% acceptance of the project by the C&FMO, and coordination of permanent utility installation and tie-in of site grading and access roads with the WVDOH, administration and maintenance of all required permits for the project, including permit fees (except WVDOH encroachment permit(s) fees and WV NPDES Construction Stormwater Permits which are paid under separate Bid Items). **Measurement:** There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item. **Payment:** Payment shall be made at the contract lump sum price, based on percentage of contract completion.	
B17.	**Addition of description of "WVDOH Encroachment Permit(s)" allowance** as Item 1.a.4. Added the following: **Bid Item 1.a.4:** **WVDOH Encroachment Permit(s)** **Unit:** Lump Sum (LS) (Allowance of $20,000.00) **Description:** This work shall consist of obtaining encroachment permit(s) for the access road tie-in, grading, and stormwater drainage on WVDOH right of ways as shown on the Plans or as required by the WVDOH. This includes performing all work prescribed in a	

NO.	ITEM DESCRIPTION	NOTES
	workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work. **Measurement:** The contractor will not bid on this work, but will be reimbursed the actual permit fee(s). The contractor shall submit an estimate for the permit(s) to the COTR for approval prior to submitting the application(s). **Payment:** This item shall be reimbursed by submitting the permit fee(s) receipt(s), based on acceptance of the encroachment(s) by the WVDOH and the COTR.	
B18.	**Revision to A-1 Alternate** Provide costing deduction to place broadloom roll-good carpet in Open Office (#149 & #151) in lieu of Carpet Tile. Delete any reference to "ECOsurfaces "ECOearth" rubber floor tile." Base bid is carpet tile.	***Attachment 01030(rev_a)ADD_ALTS and 0100(rev_a)Section II-Bid-Sheet*
B19.	**Ceiling Heights are revised as follows:** Refer to Ceiling Plans A-202 to A-205 (a) ARNG Lockers (Rooms 110a and 110b) – 10' reduced to 9'. (b) ARNG Vault (Room 142) – 10' reduced to 8'. (c) USAR Vault (Room 143) – 10' reduced to 8'. (d) SIPRNET (Room 114e) – 10' reduced to 9'. (e) Recruiting (Room 103 and 103a) – 10' reduced to 9'. (f) Family Support (Room 102) – 10' reduced to 9'. (g) Offices (Rooms 151b, h and k) – 10' reduced to 9'. (h) Recruiting (Room 105), Lobby (Room 105a) – 10' reduced to 9'. (i) Family Support (Room 106) – 10' reduced to 9'. (j) Chair & Table Storage (Rooms 107a & b) – 10' reduced to 8'. (k) Toilets (Rooms 116a & b) – 10' reduced to 8'. (l) Vending, Kitchenette, Lobby (Rooms 116c, d and e) – 10' reduced to 8'. (m) USAR Men's Locker (Room 129) – 10' reduced to 9'. (n) Toilets & Shower (Rooms 130a, b, c, d, e, & f) – 10' reduced to 8'. (o) USAR Female Lockers (Room 131) – 10' reduced to 9'. (p) AV Storage (Room 132a) – 9' reduced to 8'. (q) Training Aid Storage (Room 133) – 9' reduced to 8'.	
B20.	**Acoustical Panels for Acoustical Ceiling Specs:** Page 095113 Add Armstrong World Industries as alternate supplier. **Acoustical Wall Panels Sect. 09841:** Page 09841-2 & 3	

NO.	ITEM DESCRIPTION	NOTES
	Add Armstrong World Industries as alternate supplier.	
B21.	**ACOUSTICAL CEILINGS SPECIFIED** Basis of Design: (See Keynotes) Armstrong World Industries: • 09511.A Ultima # 1910 • 09511.B School Zone Fine Fissured # 1714 • 09511.C Tierra # 3461 • 09511.D MetalWorks Vector # 9420U6A2MY Gun Metal Grey. **PERFORMANCE CRITERIA for ACOUSTIC CEILINGS:** **Acoustical Panels Type 09511.A:** 1. Surface Texture: Fine 2. Composition: Mineral Fiber 3. Color: White 4. Size: 24in X 24in X 3/4in 5. Edge Profile: Square Lay-In for interface with Prelude XL 15/16" Exposed Tee. 6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.70. 7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 35 8. Flame Spread: ASTM E 1264; Class A (UL) 9. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.90. 10. Dimensional Stability: HumiGuard Plus - temperatures up to 120 degrees F and high humidity excluding only exterior use, use over standing water, and direct contact with moisture . 11. Mold/Mildew Inhibitor: The front and back of the product have been treated with BioBlock, a paint that contains a special biocide that inhibits or retards the growth of mold or mildew, ASTM D 3273. 12. Acceptable Product: Ultima, 1910 as manufactured by Armstrong World Industries. **Acoustical Panels Type 09511.B:** 1. Surface Texture: Medium 2. Composition: Mineral Fiber 3. Color: White 4. Size: 48in X 24in X 3/4in 5. Edge Profile: Square Lay-In for interface with Prelude XL 15/16" Exposed Tee. 6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.70. 7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 40 8. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton Not Applicable.	

NO.	ITEM DESCRIPTION	NOTES
	9. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality" 10. Flame Spread: ASTM E 1264; Class A (UL) 11. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.85. 12. Dimensional Stability: HumiGuard Plus - Temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry. 13. Antimicrobial Protection: BioBlock Plus - Resistance against the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria. 14. Acceptable Product: School Zone Fine Fissured, 1714 as manufactured by Armstrong World Industries. **Acoustical Panels Type 09511.C:** 1. Surface Texture: Fine 2. Composition: BioAcoustic 3. Color: White 4. Size: 48in X 24in X 5/8in 5. Edge Profile: Square Lay-In for interface with Prelude XL 15/16" Exposed Tee. 6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.85. 7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, N/A 8. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton 180. 9. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality" 10. Flame Spread: ASTM E 1264; Class A (UL) 11. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.88. 12. Dimensional Stability: HumiGuard Plus - Temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry. 13. Antimicrobial Protection: BioBlock Plus - Resistance against the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria. 14. Acceptable Product: Tierra, 3461 as manufactured by Armstrong World Industries. **Ceiling Panels Type 09511.D:** 1. Surface Texture: Smooth 2. Composition: Metal 3. Color: Silver Grey 4. Size: 24in X 24in	

NO.	ITEM DESCRIPTION	NOTES
	5. Edge Profile: Vector for interface with Prelude ML 15/16" Exposed Tee 6. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 31 7. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton . 8. Flame Spread: ASTM E 1264; Class A (FM) 9. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.61. 10. Dimensional Stability: Standard . 11. Acceptable Product: MetalWorks Vector, 9420U6A2, as manufactured by Armstrong World Industries.	
B22.	**Specification 08460:** Added -- For Automatic Entrance Doors.	*** 08460(rev_a)Aut-Entr-Doors submitted herewith.*

ELKINS ARCHITECTURAL BID ITEMS

NO.	ITEM	QTY	AREA	TOTAL AREA		EXTENDED PRICE
BID No. 1 - AFRC BUILDING						
1a	Primary AFRC Building	1	LS			
1a.1	Mobilization/Demobilization	1	LS			
1a.2	General Construction Admin	1	LS			
1a.3	Quality Control	1	LS			
1a.4	WVDOH Encroachment Permit(s)	1	LS		Allowance	$20,000.00
1b	Workshop	1	LS			
1c	Unheated Storage Building	1	LS			
					TOTAL	

ELKINS CIVIL BID ITEMS

NO.	ITEM	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
SITE PREPARATION					
1	Site Preparation	1	LS		
2	Sediment and Erosion Control	1	LS		
EARTHWORK					
3	Unclassified Excavation	90,000	CY		
4	Rock Excavation	25,000	CY		
5	Subgrade Preparation	15,000	SY		
6	Soil Drying	100	TN		
7	Soil Conditioning	1,000	SY		
8	Over-Excavation	1,000	SY		
9	6" Subsurface Drains	2,200	LF		
10	Type I Lawn	1	LS		
11	Type III General Seeding	1	LS		
ROADS					
12	6" Concrete Paving	3,500	SY		

13	HMA Wearing Course	1,150	TN		
14	HMA Base Course	4,700	TN		
15	Free Draining Base	4,000	TN		
16	Free Draining Base Trench and Piping	5,400	LF		
17	Fabric, Woven	7,700	SY		
18	Fabric Separation	17,600	SY		
19	AASHTO #1	5,200	TN		
20	Class 1 Stone	3,000	TN		
21	Guardrail	2,500	LF		
22	Wheel Stops	100	EA		
23	Concrete Curbing	1,300	LF		
24	Pavement Marking	1	LS		
25	Signage	1	LS		
MISCELLANEOUS					
26	Concrete Sidewalk	1,280	SY		
27	Cobblestone Pavers	90	SY		
28	Concrete Wall	35	LF		
29	Rock Wall	680	LF		
30	30' Force Protection Gate	1	EA		
31	24' Sliding Gates	2	EA		
32	16' Swing Gates	4	EA		
33	Security Fencing	1,600	LF		
34	Field Fencing	210	LF		
35	Bollards 8"	30	EA		
36	Bollards 12"	17	EA		
37	Bollards Removeable	2	EA		
38	40' Flagpole	2	EA		
39	Vehicle Wash System	1	LS		
40	Fuel Truck Containment Pad	1	LS		
41	Oil/Water Separator	1	EA		
42	Loading Ramp	1	LS		
43	Transformer Pad	1	EA		
44	Equipment Pad	2	EA		
WATER					
45	2" PVC Water	110	LF		
46	3" PVC Water	300	LF		
47	4" PVC Water	160	LF		
48	6" PVC Water	750	LF		
49	6" DIP Water	120	LF		
50	8" PVC Water	1,400	LF		

51	8" DIP Water	40	LF		
52	PIV	2	EA		
53	Fire Hydrant	4	EA		
54	Water Vault	1	EA		
SEWER					
55	Manholes, Sanitary Sewer	52	VF		
56	Frame and Cover, Sanitary Sewer	8	EA		
57	6" PVC Sanitary Sewer	840	LF		
58	8" PVC Sanitary Sewer	1,000	LF		
59	Cleanout, Sanitary Sewer	10	EA		
STORM DRAINAGE					
60	6" PVC Storm	1,200	LF		
61	8" PVC Storm	700	LF		
62	12" PVC Storm	450	LF		
63	15" PVC Storm	250	LF		
64	12" HDPE Storm	200	LF		
65	18" HDPE Storm	1,250	LF		
66	24" HDPE Storm	500	LF		
67	Type 1 Ditch	1,200	LF		
68	Type 2 Ditch	500	LF		
69	Type 3 Ditch	1,000	LF		
70	Type 4 Ditch	2,200	LF		
71	Junction Box	2	EA		
72	Type "B" Drop Inlets	17	EA		
73	Type "B" Inlet Grate and Frame	17	EA		
74	10" Yard Drains	5	EA		
75	12" In-Line Inlets	4	EA		
76	Trench Drain and Grate	30	LF		
77	Concrete Headwalls	4	EA		
				TOTAL	

ELKINS ARCHITECTURAL BID ITEMS - ALTERNATES

A-1 ALTERNATE BID ITEM - Broadloom roll-good carpet in Open Office in lieu of Carpet Tile

a	Costing Deduction		SY			

A-2 ALTERNATE BID ITEM - Provide Polished Concrete in lieu of Rubber Tile

a	Costing Deduction		SY			

A-3 ALTERNATE BID ITEM – Reduction of Unheated Storage from 2700 Sq. Ft. to 2490 Sq. Ft.

a	Costing Deduction	210	SF			

A-4 ALTERNATE BID ITEM – Replace External Stone with Oversized Brick.

a	Costing Deduction		LS			

A-5 ALTERNATE BID ITEM – Provide costing for providing Fire Exinguishers

a	Cost Addition		LS			

A-6 ALTERNATE BID ITEM –Provide costing for providing Fberglass Doors in lieu of Hollow Metal doors.

a	Cost Addition					

A-7 ALTERNATE BID ITEM – Provide costing for additional Kitchen Equipment

a	Cost Addition		LS			

A-8 ALTERNATE BID ITEM – Provide costing for Banners

a	Cost Addition		LS			

TOTAL _____

ELKINS CIVIL BID ITEMS - ALTERNATES

ALTERNATE BID ITEM #1 - Military Equipment
Parking Expansion

5	Subgrade Preparation	2,100	SY			
16	Free Draining Base Trench and Piping	200	LF			
17	Fabric, Woven	2,100	SY			
19	AASHTO #1	1,500	TN			
20	Class 1 Stone	375	TN			
33	Security Fencing	200	LF			

TOTAL _____

ALTERNATE BID ITEM #2 - Military Equipment
Parking Concrete Paving

12	6" Concrete Paving	5,300	SY			
15	Free Draining Base	1,250	TN			
18	Fabric Separation	5,300	SY			
17	Fabric, Woven (Deduct)	-5,300	SY			
19	AASHTO #1 (Deduct)	-3,760	TN			
					TOTAL	

ALTERNATE BID ITEM #3 - Overflow Parking Area

12	6" Concrete Paving	90	SY			
13	HMA Wearing Course	450	TN			
14	HMA Base Course	880	TN			
15	Free Draining Base	1,230	TN			
16	Free Draining Base Trench and Piping	520	LF			
18	Fabric Separation	5,200	SY			
20	Class 1 Stone	920	TN			
24	Pavement Marking	1	LS			
25	Signage	1	LS			
					TOTAL	

ALTERNATE BID ITEM #4 - Fuel Truck Containment Pad

40	Fuel Truck Containment Pad	1	LS			
					TOTAL	

ALTERNATE BID ITEM #5 - Fencing and Gate Upgrade

78	Fencing/Gate Upgrade	1	LS			
					TOTAL	

ELKINS ELECTRICAL BID ITEMS - ALTERNATES

E-1 ALTERNATE BID ITEM - TVSS System

a	Cost Addition		SY			

E-2 ALTERNATE BID ITEM - INT System

a	Cost Addition		SY			

E-3 ALTERNATE BID ITEM – Emergency Generator

a	Cost Addition	210	SF			

E-4 ALTERNATE BID ITEM – Panelboards

a	Cost Addition		LS			

E-5 ALTERNATE BID ITEM – Solar-powered signage lighting

a	Cost Addition		LS			

TOTAL

GRAND TOTAL

SECTION III – DESCRIPTION OF BID ITEMS

Bid Item 1:	**Site Preparation**
Unit:	Lump Sum (LS)
Description:	This work shall consist of the removal of trees and other vegetation, topsoil stripping and stockpiling, removal of existing utilities, installation of temporary utilities, and clearing and grubbing of all areas disturbed by the Contractor. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There will be no direct measurement of materials, labor, and services provided by the contractor in completing this item.
Payment:	Payment shall be made at the contract unit price per lump sum.

Bid Item 2:	**Sediment and Erosion Control**
Unit:	Lump Sum (LS)
Description:	This item shall consist of furnishing, installation, maintenance and subsequent removal of necessary storm water structures, best management practices, and other work required to prevent escape of sediment from disturbed areas of project site. Also included is the preparation, submission, and administrative maintenance of any permits required by the West Virginia Department of Environmental Protection (WVDEP) or other agencies. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There will be no direct measurement of materials, labor, and services provided by the contractor in completing this item.
Payment:	Payment for item shall be in three installments. The first payment of 50% of the lump sum price shall be made on the first estimate following issuance of a WV NPDES Construction Stormwater Permit and installation of best management practices required by the approved Stormwater Pollution Prevention Plan. The second payment of 25% shall be made on the next estimate following finish grading and stabilization of all waste and borrow areas. The remaining 25% shall be paid upon termination of the WV NPDES permit by the WVDEP for properly stabilizing the site, demobilization, and final completion of the Project.

Bid Item 3:	**Unclassified Excavation**
Unit:	Cubic Yard (CY)
Description:	This work shall consist of, but is not limited to, unclassified excavation, loading and hauling of excavated material, placement and compaction, and shall include final grading, shaping and contouring of the excavation and fill areas. The terms for earthwork used in the remainder of this Section imply excavation in native materials.

The Contractor, with approval of the COTR, shall adjust the final grades as necessary to create a finished project. The Contractor shall excavate to the lines and grades shown on the Plans. The Contractor shall perform all excavation of every description and of whatever materials encountered to the depths indicated on the Plans. No additional compensation shall be considered for rock excavation. Over-excavation and/or fill not shown on the Plans or specified herein shall be at the Contractor's expense, unless approved by the COTR prior to commencing such work. If unsuitable materials exist below the grades shown on the Plans, this material shall be removed with the prior approval of the COTR and shall be paid per the unit price for "Overexcavation".

Except at locations where excavation of unsuitable material is required, care shall be taken not to excavate below the depths specified. Final shaping and contouring of the areas shall be performed to the satisfaction of the COTR.

This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The method of measurement for determining the quantity of excavation required for grading work as described above shall be on a cubic yard for excavated material which includes hauling, placing and recompacting material to the surfaces as shown on the Plans. Method of measurement shall be before and after surveyed cross-sections of the excavation area(s) and the average-end-area method for computing volume performed by a Professional Surveyor licensed in West Virginia. Cross sections are subject to the approval of the COTR.

Borrow areas (on- or off-site) shall be regraded and reclaimed, including sediment and erosion control and revegetation, at no additional cost to the COTR. Disposal of surplus and waste materials, if encountered, are incidental to this bid item and shall be performed at no additional cost to the COTR.

Payment: This item will be paid for at the contract unit price per cubic yard.

Bid Item 4: **Rock Excavation**

Unit: Cubic Yard (CY)

Description: This work shall consist of excavation, hauling and placement of material classified as rock. Over-excavation shall be backfilled and compacted in accordance with the Specification to the proper grade with suitable material at the expense of the Contractor, unless approved by the COTR prior to commencing such work. Costs for survey work shall be included by Contractor in this Bid Item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The method of measurement for determining the quantity of rock excavation shall be on a per cubic yard basis for excavated material which includes hauling, placing and recompacting material. Method of measurement shall be before and after surveyed cross-sections of the excavation areas and the average-end-area method for computing volume.

Payment: This item shall be paid for at the contract unit price per cubic yard.

Bid Item 5: **Subgrade Preparation**

Unit: Square Yard (SY)

Description: This work shall include, but is not limited to, excavation, scarification, and recompaction of the top 24 inches of in-place subgrade under structures, building slabs, steps, and pavements in excavated areas. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work. Manipulation of the excavated material to achieve optimum moisture content shall be considered incidental to the work. If additional satisfactory soil fill is required to achieve subgrade elevations after compaction, it shall be considered incidental to the work.

Measurement: Measurement shall be based on square yards of area completed for the work described. Material prepared beyond approved limits shall not be included in the measured quantity. Subgrade preparation of other areas, such as walkways and lawn areas, is incidental to earthwork and shall not be paid for by this bid item.

Payment: Payment shall be made at the contract unit price per square yard.

Bid Item 6: **Soil Drying**

Unit: Ton (TN)

Description: This work shall include, but is not limited to, quicklime application and mixing of stockpiles of existing satisfactory soils with high moisture content. The required demonstration of proposed techniques is incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work completed shall be measured in tons of quicklime used as evidenced by weigh tickets for bulk loads or delivery slips for packaged materials certified by the contractor to be correct.

Payment: Payment shall be made at the contract unit price per ton.

Bid Item 7: **Soil Conditioning**

Unit: Square Yard (SY)

Description: This work shall include, but is not limited to, scarifying, hydrated lime application, mixing, compacting and rolling areas of existing satisfactory soils with high moisture content to a depth of 12" in locations directed by the COTR. The required demonstration of proposed techniques on test pads is incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement:	Measurement shall be based on square yards of area completed for the work described. Excess material or material placed beyond approved limits shall not be included in the measured quantity.
Payment:	Payment shall be made at the contract unit price per square yard.

Bid Item 8:	**Over-excavation**
Unit:	Square Yard (SY)
Description:	This work shall include, but is not limited to, excavation below subgrade, transportation and disposal of unsuitable materials, placement of geogrid and AASHTO #1 stone, and proof-rolling areas of unsuitable soils in locations directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on square yards of area completed for the work described. Excess material or material placed beyond approved limits shall not be included in the measured quantity.
Payment:	Payment shall be made at the contract unit price per square yard.

Bid Item 9:	**6" Subsurface Drains**
Unit:	Linear Foot (LF)
Description:	This work shall consist of installation of subsurface drains of specified size in locations specified on the plans or directed by the COTR. The drains are to be installed in locations that will intercept the maximum amount of seepage. Subsurface drain work includes dewatering, excavation, drainage fabric, stone, pipe, fittings, cleanouts and backfill. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on linear feet of drains in place, completed, and accepted by the COTR. It shall be measured along the centerline and shall include all fittings as typical pipe section in the pipe being measured.
Payment:	This item shall be paid for at the contract price per linear foot.

Bid Item 10:	**Type I Lawns**
Unit:	Lump Sum (LS)
Description:	This work shall consist of Type I Lawns as shown on the Drawings and specified in Section 02920, "Lawns and Grasses". The bid item shall include fine grading and preparing lawn areas, protection and maintenance of lawn areas. This includes performing all work prescribed in a workmanlike and acceptable manner, including

labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: There will be no direct measurement of materials, labor, and services provided by the contractor in completing this item.

Payment: This item shall be paid for at the contract lump sum price upon satisfactory completion of the work described.

Bid Item 11: **Type III General Seeding**

Unit: Lump Sum (LS)

Description: This work shall consist of Type III General Seeding as shown on the Drawings and specified in Section 02920, "Lawns and Grasses". The bid item shall include fine grading and preparing seeding areas, protection and maintenance of seeded areas. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: There will be no direct measurement of materials, labor, and services provided by the contractor in completing this item.

Payment: This item shall be paid for at the contract lump sum price upon satisfactory completion of the work described.

Bid Item 12: **6" Concrete Paving**

Unit: Square Yard (SY)

Description: This work consists of furnishing and complete installation of Portland cement concrete pavement, reinforcing, joints, and sealants at the areas as shown on the plans. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on square yards of area completed for the work described. Excess material or material placed beyond approved limits shall not be included in the measured quantity.

Payment: Payment shall be made at the contract unit price per square yard.

Bid Item 13: **HMA Wearing Course**

Unit: Ton (TN)

Description: This work shall consist of furnishing and installing designated scratch course and wearing course asphalt in accordance with the Plans and Specifications. The completed pavement shall be accepted, with respect to compaction, on a lot-to-lot basis. Each lot

shall consist of approximately 2,000 SF of each layer or course by shall be taken at a random location of each of the five sub-lots.

The target percentage of density shall be 96 percent.

The compaction density of the asphalt shall be considered satisfactory so long as the averages of all the five consecutive compaction results equal to or exceed the specified compaction percent of 96% and no individual strength test result falls below the specified compaction by more than 5 percent. If the average of five consecutive compaction results is below the 96 percent, then a payment adjustment shall be made for that tonnage of asphalt representing the area of placement.

This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantities of work done shall be measured in tons as designated. The quantity shall be determined by the Contractor from the total weigh slips for each vehicle load weighed upon automatic batching plant, and certified by the Contractor to be correct. Each weigh slip shall indicate the contract item numbers for the material being delivered.

Payment: Payment shall be made at the contract unit price per ton.

The quantities, determined as provided per the specifications, shall be paid for at the Contract unit prices bid for the items listed, which prices and payments shall be full compensation for furnishing all materials and doing all the work prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, field laboratory, supplies and incidentals necessary to complete the work.

Adjustment of Price: Bituminous concrete found not in compliance with the tolerance requirements shall be paid for at an adjusted contract price specified

The payment adjustment to tonnage of work places is as follows:

Average Compaction % for a Lot	Percent of Contract Price Paid
96	100
94-96	98
92-94	93
89-90	90
Less than 89	No acceptance

Bid Item 14: **HMA Base Course**

Unit: Ton (TN)

Description: This work shall consist of furnishing and installing designated base course asphalt in accordance with the Plans and Specifications. Scratch course is incidental to the overlaying wearing course. The completed pavement shall be accepted, with respect to compaction, on a lot-to-lot basis. Each lot shall consist of approximately 2,000 SF of each layer or course by shall be taken at a random location of each of the five sub-lots.

The target percentage of density shall be 96 percent.

The compaction density of the asphalt shall be considered satisfactory so long as the averages of all the five consecutive compaction results equal to or exceed the specified compaction percent of 96% and no individual strength test result falls below the specified compaction by more than 5 percent. If the average of five consecutive compaction results is below the 96 percent, then a payment adjustment shall be made for that tonnage of asphalt representing the area of placement.

This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantities of work done shall be measured in tons as designated. The quantity shall be determined by the Contractor from the total weigh slips for each vehicle load weighed upon automatic batching plant, and certified by the Contractor to be correct. Each weigh slip shall indicate the contract item numbers for the material being delivered.

Payment: Payment shall be made at the contract unit price per ton.

The quantities, determined as provided per the specifications, shall be paid for at the Contract unit prices bid for the items listed, which prices and payments shall be full compensation for furnishing all materials and doing all the work prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, field laboratory, supplies and incidentals necessary to complete the work.

Adjustment of Price: Bituminous concrete found not in compliance with the tolerance requirements shall be paid for at an adjusted contract price specified

The payment adjustment to tonnage of work places is as follows:

Average Compaction % for a Lot	Percent of Contract Price Paid
96	100
94-96	98
92-94	93
89-90	90
Less than 89	No acceptance

Bid Item 15: **Free Draining Base**

Unit: Ton (TN)

Description: This work consists of furnishing and complete installation of open graded free draining base course for pavements. Aggregate, compaction, binder material, and curing are included with this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantities of work done shall be measured in tons as designated. The quantity shall be determined by the Contractor from the total weigh slips for each vehicle load weighed on an approved standard scale or from digital print-out slips from an automatic batching plant, and certified by the Contractor to be correct. Each weigh slip shall indicate the contract item numbers for the material being delivered. Only work accepted by the COTR shall be included, any work rejected or materials used for other items or purposes shall be deducted.

Payment: Payment shall be made at the contract price per ton.

Bid Item 16: Free Draining Base Trench and Piping

Unit: Linear Foot (LF)

Description: This work shall consist of constructing free draining base trenches and outlet pipes in reasonably close conformity with the lines, grades, dimensions, and locations shown on the Plans or established by the COTR. Excavation, perforated pipe, filter material, outlet pipe, aggregate backfill, and disposing of all surplus material is included with this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured by the linear foot of free draining base trench installed, complete in place and accepted. The perforated pipe, geotextile, and aggregate backfill is a component of the free draining base trench. Length shall be determined from actual measurements once the free draining base trench is in place. No deductions shall be made for placement of the drop connection required at outlet pipe locations. Outlet pipes required from the free draining base trench to daylight or another drainage structure are incidental to this item.

Payment: The quantities, determined as provided above, shall be paid for at the contract unit price of linear feet.

Bid Items 17–18: Fabric Woven, Fabric Separation

Unit: Square Yard (SY)

Description: This work shall consist of furnishing and installing geotextile fabric of designated types in pavement sections as directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on square yards of area completed for the work described. Excess material or material placed beyond design limits shall not be included in the measured quantity. Fabric used in free draining base trench is not included in this pay item.

Payment: Payment shall be made at the contract unit price per square yard.

Bid Item 19:	AASHTO #1 Stone
Unit:	Ton (TN)
Description:	This work includes, but is not limited to, furnishing and complete installation of AASHTO #1 stone for pavements as directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	The quantities of work done shall be measured in tons as designated. The quantity shall be determined by the Contractor from the total weigh slips for each vehicle load weighed on an approved standard scale or from digital print-out slips from an automatic batching plant, and certified by the Contractor to be correct. Each weigh slip shall indicate the contract item numbers for the material being delivered. Only work accepted by the COTR shall be included, any work rejected or materials used for other items or purposes shall be deducted.
Payment:	Payment shall be made at the contract unit price per ton.

Bid Item 20:	Class 1 Stone
Unit:	Ton (TN)
Description:	This work includes, but is not limited to, furnishing and complete installation of Class 1 aggregate course for pavements as directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	The quantities of work done shall be measured in tons as designated. The quantity shall be determined by the Contractor from the total weigh slips for each vehicle load weighed on an approved standard scale or from digital print-out slips from an automatic batching plant, and certified by the Contractor to be correct. Each weigh slip shall indicate the contract item numbers for the material being delivered. Only work accepted by the COTR shall be included, any work rejected or materials used for other items or purposes shall be deducted.
Payment:	Payment shall be made at the contract unit price per ton.

Bid Item 21:	Guard Rail
Unit:	Linear Foot (LF)
Description:	This work shall consist of the construction of guard rail at the locations shown on the Plans or as directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	The quantity of work done shall be measured in linear feet measured along the face of the rail from center to center of end posts.

Payment:	Payment shall be made at the contract unit price per linear foot.

Bid Item 22:	**Wheel Stops**
Unit:	Each (EA)
Description:	This work includes, but is not limited to, furnishing and complete installation of plastic wheel stops as directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	The quantity of work done shall be measured per each wheel stop completely installed.
Payment:	Payment shall be made at the contract unit price per each.

Bid Item 23:	**Concrete Curbing**
Unit:	Linear Foot (LF)
Description:	This work shall includes, but is not limited to, the construction of cast-in-place concrete curbing at the locations shown on the Plans, or as directed by the COTR. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Curbing shall be measured along the front face of the section at the finish grade elevation.
Payment:	Payment shall be made at the contract unit price per linear foot.

Bid Item 24:	**Pavement Marking**
Unit:	Lump Sum (LS)
Description:	Pavement markings shall consist of furnishing and installing various types of markings, as shown on the plans and an additional 1,000 sq ft for miscellaneous marking as directed by the COTR. It shall include, but is not limited to, edge lines, center lines, handicapped symbols, parking lines, shoulders, stop lines and pedestrian crossing markings. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There will be no direct measurement of labor, materials and services provided by the contractor in completing this item.
Payment:	This item shall be paid for at the contract lump sum price upon satisfactory completion of all pavement markings shown on the plans.

Bid Item 25:	Signage
Unit:	Lump Sum (LS)
Description:	This item includes, but is not limited to, furnishing and installing miscellaneous signs, stop, parking, informational, etc. as noted on the Plans or as directed by the COTR. Signs, posts, foundations, and necessary hardware are included. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on completion of work described.
Payment:	Payment shall be made at the contract unit price for lump sum.

Bid Item 26:	Concrete Sidewalk
Unit:	Square Yard (SY)
Description:	This work shall consist of furnishing and installing welded wire mesh reinforcing, 4,000 psi air-entrained concrete, Class 1 stone, formwork and incidentals associated with concrete sidewalks and pads as detailed on the Plans. The areas adjacent to the building shall also include drainage fill and foam insulation. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on square yards of area completed for the work described. Excess material or material placed beyond approved limits shall not be included in the measured quantity.
Payment:	Payment shall be made at the contract unit price per square yard.

Bid Item 27:	Cobblestone Pavers
Unit:	Square Yard (SY)
Description:	This work consists of furnishing and installation of bedding, concrete, concrete joints, cobblestone paving, and mortar at the locations as shown on the plans. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on square yards of area completed for the work described. Excess material or material placed beyond approved limits shall not be included in the measured quantity.
Payment:	Payment shall be made at the contract unit price per square yard.

Bid Item 28:	Concrete Wall
Unit:	Linear Foot (LF)

Description: This item of work is a poured in place reinforced concrete retaining wall as shown on the Plans. Excavation, gravel foundations, forming, reinforcing, concrete, backfill, and associated subsurface drainage are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be by the linear foot along the front face of the wall at the finished grade elevations.

Payment: Payment shall be made at the contract unit price for linear foot.

Bid Item 29: Rock Wall

Unit: Linear Foot (LF)

Description: This item of work consists of furnishing and installing precast concrete block exterior walls as shown on the Plans. Excavation, gravel foundations, backfill, and associated subsurface drainage are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be by the linear foot along the front face of the wall at the finished grade elevations. Only one face of double-faced block shall be counted.

Payment: Payment shall be made at the contract unit price for linear foot.

Bid Items 30–32: 30' Force Protection Gate, Sliding Gate, 24 – 6' Fabric, 16' Swing Gate

Unit: Each (EA)

Description: This work consists of furnishing and complete installation of swing, sliding, and gates for chain link fences and site security. The price shall include excavating, trenching, concrete footings, backfilling, grouting posts in place, grounding, bonding, barbed wire, and locks. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be per each gate completely installed.

Payment: The accepted quantities of gates shall be paid for at the contract unit price per each complete in place.

Bid Item 33: Security Fencing

Unit: Linear Foot (LF)

Description: This work consists of furnishing and complete installation of chain link fencing with six foot fabric height and personnel gates. The price will include excavating, trenching, concrete footings, backfilling, grouting posts in place, grounding, bonding, barbed wire,

and gate hardware. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be along the bottom wire of the fence from outside to outside of end posts for each continuous run of fence, excluding lengths occupied by vehicular gates.

Payment: The accepted quantities of fencing materials shall be paid for at the contract unit price per linear foot complete in place.

Bid Item 34: **Field Fencing**

Unit: Linear Foot (LF)

Description: This work consists of furnishing and complete installation of field fencing. The price will include excavating, backfilling, minor grading for fence fabric installation. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be along the bottom wire of the fence from outside to outside of end posts for each continuous run of fence, excluding lengths occupied by vehicular gates.

Payment: The accepted quantities of fencing materials shall be paid for at the contract unit price per linear foot complete in place.

Bid Items 35–37: **Bollards 8" and 12", Bollards Removable**

Unit: Each (EA)

Description: This work consists of furnishing and complete installation of bollards. The unit price shall include furnishing and installing metal posts, and associated hardware, concrete footings, excavation, backfill, and compensation for doing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, and incidentals required to complete the work.

Measurement: The quantity of work done shall be measured per each bollard completely installed and accepted by the COTR.

Payment: Payment shall be made at the contract unit price per each.

Bid Item 38:	**40' Flagpole**
Unit:	Each (EA)
Description:	This item includes furnishing and installing the 40' aluminum flagpole in front of the facility. The foundation, including excavation, aggregate, concrete and miscellaneous hardware are incidental to this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There shall be no direct measurement of materials, labor, and services provided by the Contractor in completing this item.
Payment:	Payment shall be made at the contract unit price for each.

Bid Item 39:	**Vehicle Wash System**
Unit:	Lump Sum (LS)
Description:	This work shall consist of adding a Vehicle Wash System as shown in the Plans. Excavation, concrete, aggregate base, waterstops, associated drainage structures, piping, conduits, and other ancillary equipment within the boundary created by the edge of the concrete pad are incidental to this item of work. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item.
Payment:	Payment shall be made at the contract unit price for lump sum.

Bid Item 40:	**Fuel Truck Containment Pad**
Unit:	Lump Sum (LS)
Description:	This work shall consist of adding Fuel Truck Containment Pads as shown in the Plans. All associated drainage structures, piping, conduits, and other ancillary equipment within the fence boundary created on the detail drawing sheet are incidental to this item of work. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item.
Payment:	Payment shall be made at the contract unit price for lump sum.

Bid Item 41:	Oil/Water Separator
Unit:	Each (EA)
Description:	This work consists of furnishing and complete installation of an underground separator designed for gravity separation of free oils (hydrocarbons and other petroleum products) and settable solids from wastewater. Excavation, backfill, concrete pad, bedding material, manways, piping and fittings to a point beyond the outline of the tank, alarm and control panel, electrical and data wiring, and vent piping are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on completion of the work described according to the Basis of Payment below.
Payment:	Payment shall be made at the contract unit price for each.

Bid Item 42:	**Loading Ramp**
Unit:	Lump Sum (LS)
Description:	This item of work is a cast-in-place reinforced concrete loading ramp with two levels, and concrete aprons at both ends. The aggregate, backfill, dock bumpers, excavation and soil backfill, and any other ancillary equipment required are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	There shall be no direct measurement for materials, labor, and services provided by the Contractor in completing this item.
Payment:	Payment shall be made at the contract unit price for lump sum.

Bid Item 43:	**Transformer Pad**
Unit:	Each (EA)
Description:	This work shall consist of a cast-in-place concrete pad for the electrical transformer(s). The pad must meet the requirements of Allegheny Energy for the transformer(s) used. This shall include excavation, concrete, reinforcing, grounding hardware, aggregate base and any other incidentals necessary for a complete and functional pad. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on each pad completed and accepted by the COTR.
Payment:	Payment shall be made at the contract unit price per each.

Bid Item 44: **Equipment Pad**

Unit: Each (EA)

Description: This work shall consist of a cast-in-place concrete pad for the emergency generator. The pad must meet the requirements of the generator manufacturer. This shall include excavation, concrete, reinforcing, grounding hardware, aggregate base and any other incidentals necessary for a complete and functional pad. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on each pad completed and accepted by the COTR.

Payment: Payment shall be made at the contract unit price per each.

Bid Items 45–51: **Water Line, PVC, 2", 3", 4", 6", and 8"; DIP 6", 8"**

Unit: Linear Foot (LF)

Description: This work shall consist of furnishing and installing various sizes of water line. These prices shall fully compensate the Contractor for providing pipe, fittings, valves, bedding, excavation, steel casing pipes, backfill, concrete thrust blocks, concrete encasement, asphalt repair, curb stops, flushing, testing, coordination with the Norton-Harding-Jimtown Public Service District for acceptance. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on linear feet of water line in place, completed, and accepted by the COTR. It shall be measured along the centerline and shall include all fittings and appurtenances associated with the water line.

Payment: Payment shall be made at the contract unit price per linear foot.

Bid Item 52: **PIV**

Unit: Each (EA)

Description: This work consists of furnishing and complete installation of Post Indicator Valves. The unit price shall include furnishing and installing the valves, fittings, tamper switches, excavation, bedding, backfill, concrete thrust blocks, saw-cutting of pipe, and testing and inspection. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured per unit PIV acceptably installed.

Payment: Payment shall be made at the contract unit price per each.

Bid Item 53: **Fire Hydrant**

Unit:	Each (EA)
Description:	This work consists of furnishing and complete installation of exterior fire hydrants. The unit price shall include furnishing and installing a fire hydrant, fittings, excavation, bedding, backfill, concrete thrust blocks, saw-cutting of pipe, and testing and inspection. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	The quantity of work done shall be measured per unit fire hydrant acceptably installed.
Payment:	Payment shall be made at the contract unit price per each.

Bid Item 54:	Water Vault
Unit:	Each (EA)
Description:	This work consists of furnishing, placing and installing the precast concrete vault, bedding, backfill, water meter, backflow preventers, tamper switches, and associated valves and appurtenances as detailed in the Plans. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be per water meter pit installed and accepted by the COTR and authorities having jurisdiction.
Payment:	Payment shall be made at the contract price per each.

Bid Item 55:	**Manholes, Sanitary Sewer**
Unit:	Vertical Foot (VF)
Description:	This work shall include, but is not limited to, installing pre-cast concrete manholes at the locations specified in the plans. Excavation, bedding, manhole section and grade ring installation, backfill, and testing and inspection are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	Measurement shall be based on each manhole in place, completed and accepted by the COTR and authorities having jurisdiction.
Payment:	Payment shall be made at the contract unit price per vertical foot.

Bid Item 56:	**Frame & Cover, Sanitary Sewer**
Unit:	Each (EA)
Description:	This work consists of furnishing, placing and installing the frame and cover for sanitary manholes as detailed in the Plans. This includes performing all work prescribed in a

workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be per frame and cover installed and accepted by the COTR.

Payment: Payment shall be made at the contract price per each.

Bid Items 57–58: Sanitary Sewer, PVC, 6" and 8"

Unit: Linear Foot (LF)

Description: This work shall consist of furnishing and installing various sizes of PVC sanitary sewer piping. These prices shall fully compensate the Contractor for providing pipe, bedding, excavation, backfill, fittings, cleanouts, casing pipes, pavement repairs, testing and coordination with the Town of Junior for acceptance. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on linear feet of sanitary sewer piping in place, completed, and accepted by the COTR. It shall be measured along the centerline and shall include all fittings, appurtenances, and cleanouts associated with the sanitary sewer piping.

Payment: Payment shall be made at the contract unit price per linear foot.

Bid Item 59: Cleanout, Sanitary Sewer

Unit: Each (EA)

Description: This work consists of furnishing and complete installation of cleanout. The unit price shall include furnishing and installing pipe, fittings, concrete apron, excavation, and backfill. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured per each cleanout completely installed and accepted by the COTR.

Payment: Payment shall be made at the contract unit price per each.

Bid Items 60–63: Storm, PVC, 6", 8", 12", and 15"

Unit: Linear Foot (LF)

Description: This work consists of the furnishing and complete installation of PVC pipe for storm drainage outside the building. This price shall fully compensate the Contractor for providing pipe, bedding, excavation, backfill, fill, fittings, and pavement repairs. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Conduit of the different types and sizes, shall be measured by the linear foot in place, the measurement being made along the centerline of each pipe installed. Branch connections, cleanouts, tees, wyes, and elbows shall be measured along their centerlines and these lengths included in the total lengths of the appropriate conduit. Wyes, tees, and other branch connections shall be measured along the centerlines to points of intersection. The portion of pipe extending through to the inside face of headwalls of all types, manholes, inlets, boxes, or other structures shall be included in the measurement.

Payment: Payment shall be made at the contract unit price per linear foot.

Bid Items 64–66: **Storm, HDPE, 12", 18", and 24"**

Unit: Linear Foot (LF)

Description: This work consists of the furnishing and complete installation of high density polyethylene pipe for storm drainage. Pipe, bedding, excavation, backfill, fill, fittings, and pavement repairs, are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Conduit of the different types and sizes, shall be measured by the linear foot in place, the measurement being made along the centerline of each pipe installed. Branch connections, tees, wyes, and elbows shall be measured along their centerlines and these lengths included in the total lengths of the appropriate conduit. Wyes, tees, and other branch connections shall be measured along the centerlines to points of intersection. The portion of pipe extending through to the inside face of headwalls of all types, manholes, inlets, boxes, or other structures shall be included in the measurement.

Payment: Payment shall be made at the contract unit price per linear foot.

Bid Item 67: **Type 1 Ditch**

Unit: Linear Foot (LF)

Description: This work shall consist of the construction of open flow ways for surface drainage, using geotextile fabric, riprap and grout. Excavation, shaping and lining and geotextile fabric are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured along the flow line of the ditch, from the first point of design depth to the point where the ditch breaks the plane of the drainage structure it empties into.

Payment: Payment shall be made by the contract unit price per linear foot.

Bid Item 68: **Type 2 Ditch**

Unit: Linear Foot (LF)

Description: This work shall consist of the construction of open flow ways for surface drainage, using geotextile fabric, riprap and grout. Excavation, shaping and lining and geotextile fabric are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured along the flow line of the ditch, from the first point of design depth to the point where the ditch breaks the plane of the drainage structure it empties into.

Payment: Payment shall be made by the contract unit price per linear foot.

Bid Item 69: **Type 3 Ditch**

Unit: Linear Foot (LF)

Description: This work shall consist of the construction of open flow ways for surface drainage, using geotextile fabric and riprap. Excavation, shaping, and lining are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured along the flow line of the ditch, from the first point of design depth to the point where the ditch breaks the plane of the drainage structure it empties into.

Payment: Payment shall be made by the contract unit price per linear foot.

Bid Item 70: **Type 4 Ditch**

Unit: Linear Foot (LF)

Description: This work shall consist of the construction of open flow ways for surface drainage, using temporary erosion control matting. Excavation, shaping, seeding, and lining are incidental. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: The quantity of work done shall be measured along the flow line of the ditch, from the first point of design depth to the point where the ditch breaks the plane of the drainage structure it empties into.

Payment: Payment shall be made by the contract unit price per linear foot.

Bid Item 71: **Junction Box**

Unit: Each (EA)

Description: This work shall consist of installing pre-cast or cast-in-place concrete junction boxes for storm drainage. Pipe connection, bedding, excavation, backfill, fill, fittings, frames and

covers, and pavement repairs, are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on each junction box in place completed, and accepted by the COTR.

Payment: Payment shall be made at the contract unit price for each.

Bid Items 72–73: Type "B" Drop Inlets, Type B Inlet Grate & Frame

Unit: Each (EA)

Description: This work shall consist of installing pre-cast or cast-in-place concrete inlets for storm drainage. Pipe connection, bedding, excavation, backfill, fill, fittings, and pavement repairs, are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on each drain inlet in place completed, and accepted by the COTR.

Payment: Payment shall be made at the contract unit price per each.

Bid Items 74–75: 10" Yard Drains, 12" In-Line Inlets

Unit: Each (EA)

Description: This work shall consist of installing drains and inlets for storm drainage. Inlets, grates, piping, excavation, bedding, backfill, fill, fittings and pavement repairs are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on each drain inlet in place completed, and accepted by the COTR

Payment: Payment shall be made at the contract unit price for each.

Bid Item 76: Trench Drain & Grate

Unit: Linear Foot (LF)

Description: This work shall consist of installing a vehicular trench drain for storm drainage. Pipe connection, bedding, excavation, backfill, fittings, frames and grates are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on linear foot of trench drain installed and accepted by the COTR, measured along the center-line from end of grate to end of grate.

Payment: Payment shall be made by the contract unit price per linear foot.

Bid Item 77: **Concrete Headwall**

Unit: Each (EA)

Description: This work shall consist of installing cast-in-place concrete headwalls for storm drainage. Excavation, forming, reinforcement, concrete, pipe connection, aggregate bedding, backfill, and concrete finishing are included in this item. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: Measurement shall be based on each headwall in place completed, and accepted by the COTR.

Payment: Payment shall be made at the contract unit price per each.

Bid Item 78: **Fencing/Gate Upgrade**

Unit: Lump Sum (LS)

Description: This work shall consist of upgrading all fencing, swing gates, sliding gates, and alternate bid items to an eight foot chain-link fabric height. Force Protection Gate is not included. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.

Measurement: There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item.

Payment: Payment shall be made at the contract unit price for lump sum.

END OF SECTION

SECTION III – DESCRIPTION OF ARCHITECTURAL BID ITEMS

Bid Item 1a: **AFRC Primary Facility**
Unit: Lump Sum (LS)

Description: The item shall consist of any and all material, equipment, and labor for items required by the contract documents to provide a complete and functional building and/or assembly as shown under Base Bid in the Drawings and Specifications. This shall include any additional items related to Site Construction where a unit cost has not been requested. Additionally, this work shall include site utilities, excavation and backfill to foundation subgrade for utilities and foundations, and grading within five feet of the building perimeter, which includes the perimeter of the existing building as well as all additions. This work also includes, but is not limited to: building excavation; backfill; foundation systems; gravel dry beds; concrete; masonry; structural steel; carpentry and wood decking; waterproofing; insulation; roofing; interior and exterior walls; doors; windows; finishes; casework; mechanical systems; and electrical systems. The full extent of this work is defined by the Contract Documents, including the Drawings and Project Manual, dated March November 2, 2009, as well as any addenda issued during the bidding process.

Measurement: Measurement will be based on completion of the work described.

Payment: Payment for item will be in accordance with the specifications.

Site Lighting

Description: Bid Items 1a, is to include utilities out to 5' beyond the building plus Site Lighting, which has been included with the Building Electrical Spec. Work shall include for all Site Lighting plus site utilities, excavation and backfill to foundation subgrade for utilities and foundations, and grading within five feet of the building perimeter

Bid Item 1a.1: **Mobilization/Demobilization**
Unit: Lump Sum (LS)

Description: This work consists of the Contractor mobilizing onto the worksite at the beginning of construction, demobilizing from the worksite when construction is complete, and temporary construction facilities required by the contractor in accordance with, but not

limited to Section 1500 of the specifications, but is not limited to, construction preparatory operations, including the movement of personnel, equipment, and materials to and from the project site; payment of performance bond, guaranty bond, and other insurance premiums; storage facilities, including fenced enclosure of staging area.

Measurement: Measurement will be based on completion of the work described, prorate from lump sum amount according to the Basis of Payment below. Maximum limitation Mobilization/Demobilization will be 5% of base bid.

Payment: Payment for item will be in three installments. The first payment of 50 percent of the lump sum price will be made on the first estimate following partial mobilization including the placement or erection of the Contractor's office and storage facilities and the initiation of construction work. The second payment of 25 percent will be made on the next estimate following completion of substantial mobilization. The remaining 25 percent will be paid upon demobilization and satisfactory restoration of the contractor's staging and work area and final completion of the Project.

Bid Item 1.a.2: **General Construction Administration**
Unit: Lump Sum (LS)

Description: This work consists of performing the construction administrative duties associated with managing the construction of the Project as stated in Division I of the Specifications, providing construction layout, providing temporary utilities for the site until 100% acceptance of the project by the C&FMO, and coordination of permanent utility installation and tie-in of site grading and access roads with the WVDOH, administration and maintenance of all required permits for the project, including permit fees (except WVDOH encroachment permit(s) fees and WV NPDES Construction Stormwater Permits which are paid under separate Bid Items).

Measurement: There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item.

Payment: Payment shall be made at the contract lump sum price, based on percentage of contract completion.

Bid Item 1a.3:	Quality Control
Unit:	Lump Sum (LS)
Description:	The work shall consist of the performance of work specified in but not limited to preparation, performance, and furnishing all materials to implement the Quality Control Plan.
Measurement:	There will be no direct measurement of materials, labor, and services provided by the Contractor in completing this item. Maximum limit on Quality Control is 2%.
Payment:	This item will be paid for at the contract lump sum price at satisfactory completion of work.

Bid Item 1.a.4:	**WVDOH Encroachment Permit(s)**
Unit:	Lump Sum (LS) (Allowance $20,000.)
Description:	This work shall consist of obtaining encroachment permit(s) for the access road tie-in, grading, and stormwater drainage on WVDOH right of ways as shown on the Plans or as required by the WVDOH. This includes performing all work prescribed in a workmanlike and acceptable manner, including labor, tools, equipment, supplies, material, incidentals, and quality control required to complete the work.
Measurement:	The contractor will not bid on this work, but will be reimbursed the actual permit fee(s). The contractor shall submit an estimate for the permit(s) to the COTR for approval prior to submitting the application(s).
Payment:	This item shall be reimbursed by submitting the permit fee(s) receipt(s), based on acceptance of the encroachment(s) by the WVDOH and the COTR.

Bid Items 1b:	**AFRC Workshop**
Unit:	Lump Sum (LS)
Description:	The item shall consist of any and all material, equipment, and labor for items required by the contract documents to provide a complete and functional building and/or assembly as shown under Base Bid in the Drawings and Specifications. This shall include any additional items related to Site Construction where a unit cost has not been requested. Additionally, this work shall include site

utilities, excavation and backfill to foundation subgrade for utilities and foundations, and grading within five feet of the building perimeter, which includes the perimeter of the existing building as well as all additions. This work also includes, but is not limited to: building excavation; backfill; foundation systems; gravel dry beds; concrete; masonry; structural steel; carpentry and wood decking; waterproofing; insulation; roofing; interior and exterior walls; doors; windows; finishes; casework; mechanical systems; and electrical systems. The full extent of this work is defined by the Contract Documents, including the Drawings and Project Manual, dated March November 2, 2009, as well as any addenda issued during the bidding process.

Measurement: Measurement will be based on completion of the work described.

Payment: Payment for item will be in accordance with the specifications.

Bid Item 1c: **AFRC Unheated Storage**
Unit: Lump Sum (LS)

Description: The item shall consist of any and all material, equipment, and labor for items required by the contract documents to provide a complete and functional building and/or assembly as shown under Base Bid in the Drawings and Specifications. This shall include any additional items related to Site Construction where a unit cost has not been requested. Additionally, this work shall include site utilities, excavation and backfill to foundation subgrade for utilities and foundations, and grading within five feet of the building perimeter, which includes the perimeter of the existing building as well as all additions. This work also includes, but is not limited to: building excavation; backfill; foundation systems; gravel dry beds; concrete; masonry; structural steel; carpentry and wood decking; waterproofing; insulation; roofing; interior and exterior walls; doors; windows; finishes; casework; mechanical systems; and electrical systems. The full extent of this work is defined by the Contract Documents, including the Drawings and Project Manual, dated March November 2, 2009, as well as any addenda issued during the bidding process.

Measurement: Measurement will be based on completion of the work described.

Payment: Payment for item will be in accordance with the specifications.

SECTION 01030 -ALTERNATES

PART 1 -GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Contract Provisions, Special Provisions, Supplemental Provisions apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for Alternates.

B. Definition: An Alternate is a change to the proposed scope of work described in the Bid and Contract Documents, separately priced by the bidders, and accepted at the sole option of the Owner. An Alternate can be a change in quantity, or a change in the products, materials, equipment, systems, or specified methods.

C. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that work affected by each accepted Alternate is complete and fully integrated into the Project.

D. Schedule: A "Schedule of Alternates" is included at the end of this Section. Proposed price for each Alternate shall include miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation, whether or not specifically mentioned as part of the Alternate.

PART 2 -PRODUCTS (Not Applicable)

PART 3 -EXECUTION

3.01 SCHEDULE OF ALTERNATES

A-1 Alternate: Provide costing deduction to place broadloom roll-good carpet in Open Office (#149 & #151) in lieu of Carpet Tile. Delete any reference to "ECOsurfaces "ECOearth" rubber floor tile." Base bid is carpet tile.

A-2 Alternate: Provide costing deduction to replace rubber tile down hallways with "Level 2" polished concrete finish.

A-3 Alternate: Provide costing deduction to reduce area of unheated storage from 2700 sq. ft. to 2490 sq. ft. – a reduction of 210 sq. ft.

A-4 Alternate: Provide costing deduction to replace external stone with oversize brick.

A-5 Alternate: Provide costing addition to provide fire extinguishers as shown on drawings, to fit cabinetry specified in Section 10522, and as specified in Section 10523.

A-6 Alternate: Provide costing to provide the following doors in Fiberglass Construction in lieu of Hollow Metal, as shown in door schedule on A-711 and A-712. Doors to be reviewed in this alternate are as follows: 107a.8, 112c, 112d, 112e, 112f, 116a, 116b, 127a.1, 127a.2, 130a.1 to 130a.7, 130c.1, 130c.2, 130d.1, 130d.2, 130f, 132a, 133a, 140a.1, 140a.2141a, and 144a.1.

A-7 Alternate: Provide costing to provide the following kitchen equipment excluded from base bid as shown in Section 11400 Foodservice Equipment Schedule of Fixtures. Items to be considered in this alternate are the following:

(a) Item #2 – Epoxy Wire Shelving;
(b) Item # 11 - Chrome Storage Shelving;
(c) Item #14 - Work Table w/Drop-in Sink;
(d) Item #17 - Work Table w/2 Drawers;
(e) Item #21 - Wire Chrome Shelving Unit;
(f) Item #30 - Refrigerator Reach-in;
(g) Item #33 - Serving Counter w/ 5-Hot Food Wells;
(h) Item #35 - 3-Well Refrigerated Unit;
(i) Item #37 - Chrome Shelving Section; and
(j) Item #58 & 59 – Mobile Serving Counters.

Civil Bid Alternates

C-1 Alternate: **Military Equipment Parking Expansion:** Provide costing addition to expand Hardstand Paving and Security Fence identified in the Civil Plans. Earthwork and drainage structures associated with the parking areas are included in the Base Bid.

C-2 Alternate: **Military Equipment Parking Concrete Paving:** Provide costing addition to place 6" concrete paving in lieu of Hardstand Paving for areas indicated within the Military Equipment Parking (MEP).

C-3 Alternate: **Overflow Parking Area:** Provide costing addition to pave the parking area and access road identified in the plans. Earthwork and

drainage structures associated with the parking areas are included in the Base Bid.

C-4 Alternate: **Fuel Truck Parking Pad:** Provide costing addition to add a Fuel Truck Parking Pad at the location shown in the plans. The earthwork, hardstand paving and fencing associated with the Parking Pad are included in the Base Bid.

C-5 Alternate: **Fencing and Gate Upgrade:** Provide costing addition to increase the chain link fabric height from 6 feet to 8 feet for all fencing, swing gates, sliding gates, personnel gates, including alternate bid items, but excluding the Force Protection Gate.

Electrical Bid Alternates

E-1 Alternate: **TVSS System:** Provide costing addition to provide Transient Voltage Suppression System.

E-2 Alternate: **INT System:** Provide costing addition to provide system specified.

E-3 Alternate: **Emergency Generator:** Provide costing addition to provide emergency generator as specified.

E-4 Alternate: **Panelboards:** Reference plan note 'P' on drawing E-501: Each configuration of 480-volt and 208-volt panelboards and their associated transformer, with the exception of those located in room #111, are to be quoted as an Additive Alternate for unitized or integrated construction (see specifications sections 16442,2.7 and 16461, 2.6).

E-5 Alternate: **Solar-powered signage lighting**: Reference plan note 'F' on drawing SEU-3: The solar-powered signage lighting is to be quoted as an Additive Alternate. At the time of bidding, a supplier for this type of fixture had not been identified-and (per lighting fixture schedule on drawing E-506) is to be selected by the Owner

END OF SECTION 01030

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Preparing subgrades for slabs-on-grade walks pavements and turf and grasses.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for concrete slabs-on-grade.
4. Free draining base trench and outlet piping.
5. Subbase course for concrete walks and pavements.
6. Subbase course and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.
9. Excavating and backfilling trenches within building lines.
10. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections:

1. Division 1 Section "Construction Progress Documentation" for recording preexcavation and earth moving progress.
2. Division 1 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.
3. Division 2 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
4. Division 2 Section "Subdrainage" for drainage of foundations, slabs-on-grade, and walls.
5. Division 2 Section "Lawns and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
6. Division 3 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
7. Divisions 2, 15, and 16 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

1.3 UNIT PRICES

A. Work of this Section is affected by unit prices for earth moving specified in Division 1 Section "Unit Prices."

1.4 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the geotextile fabric and the surface treatment for the Hardstand pavement.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Durable Rock: Siltstone or sandstone having a maximum weighted loss of 30 percent when subjected to five cycles of the sodium sulfate soundness test (WVDOH MP 703.00.22) or passing the slake durability test (Modified ASTM D4644).

G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

H. Fill: Soil materials used to raise existing grades.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Aggregate layer placed between the subgrade and free draining base course for hot-mix asphalt pavement and cement concrete pavement. Also the layer between subgrade and cement concrete for sidewalks and equipment pads.

L. Free draining base course: Course placed between the subgrade course and first course of hot-mix asphalt paving.

M. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

N. Surface Treatment: Top layer of aggregate in the Hardstand pavement.

O. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Controlled low-strength material, including design mixture.
3. Geofoam.
4. Warning tapes.
5. Lime types.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches.
2. Warning Tape: 12 inches long; of each color.

C. Qualification Data: For qualified testing agency.

D. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.
3. Sulfur Fractionation according to ASTM D2492-84 and EPA 600/2-78-054, Section 3.2.6 (Modified).

E. Blasting plan approved by authorities having jurisdiction.

F. Seismic survey report from seismic survey agency.

G. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.6 QUALITY ASSURANCE

A. Blasting: Comply with applicable requirements in NFPA 495, "Explosive Materials Code," and prepare a blasting plan reporting the following:

1. Types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
2. Seismographic monitoring during blasting operations.

B. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures to perform the following services:

1. Report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
2. Seismographic monitoring during blasting operations.

C. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

D. Preexcavation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify "Miss Utility" for area where Project is located before beginning earth moving operations.

D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 2 Section "Site Clearing," are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, GC, SW, SP, SM, SC, CL, and ML according to ASTM D 2487, free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter and with Atterberg Limits meeting the criteria below.

1. Liquid Limit: Less than 50.
2. Plasticity Index: Less than 30.

C. Unsatisfactory Soils: Satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Unsuitable Soils: Soil Classification Groups OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

E. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

F. Base: Naturally or artificially graded mixture of crushed stone meeting the requirement of AASHTO No. 1.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

H. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

I. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.

K. Open Graded Free Draining Base: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57.

L. Surface Treatment: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone; meeting the requirement of Class 1 Stone from the WVDOH Standard Specifications.

M. Sand: ASTM C 33; fine aggregate.

N. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
3. Sewn Seam Strength: 142 lbf; ASTM D 4632.
4. Tear Strength: 56 lbf; ASTM D 4533.
5. Puncture Strength: 56 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 80 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.5 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
4. Tear Strength: 90 lbf; ASTM D 4533.
5. Puncture Strength: 90 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

C. Woven (Heavy Duty) Geotextile Fabric: Woven geotextile, specifically manufactured for use as an engineered geotextile; made from polyester; and with the following minimum properties determined according to ASTM D 4355 and referenced standard test methods:

1. Grab Tensile Strength: 600/500; ASTM D 4632.
2. Grab Elongation: 15%; ASTM D 4632.
3. Mullen Burst: 1,350 psi; ASTM D 3786.
4. Puncture Resistance: 140 lb; ASTM D 4833.
5. Water Flow Rate: 10 gal/min/ft^2.
6. Apparent Opening Size: No. 50; ASTM D 4751.
7. UV Resistance: 80% @ 500 hrs; ASTM D 4355.
8. Trapezoidal Tear: 250 lb; ASTM D 4533.

2.3 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, flowable concrete material produced from the following:

1. Portland Cement: ASTM C 150, Type I.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94/C 94M.
6. Air-Entraining Admixture: ASTM C 260.

B. Produce conventional-weight, controlled low-strength material with 80-psi compressive strength when tested according to ASTM C 495.

2.4 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Obtain written permission from authorities having jurisdiction before bringing explosives to Project site or using explosives on Project site.

1. Perform blasting without damaging adjacent structures, property, or site improvements.
2. Perform blasting without weakening the bearing capacity of rock subgrade and with the least-practicable disturbance to rock to remain.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

    a. 24 inches outside of concrete forms other than at footings.
    b. 12 inches outside of concrete forms at footings.
    c. 6 inches outside of minimum required dimensions of concrete cast against grade.
    d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    e. 6 inches beneath bottom of concrete slabs-on-grade.
    f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 APPROVAL OF SUBGRADE

A. Notify COTR when excavations have reached required subgrade.

1. If COTR determines that unsatisfactory soil is present, prepare subgrade in accordance with Section 3.14 "Moisture Control" as directed.

2. If COTR determines that unsuitable soil is present, continue excavation as directed and replace with geogrid and AASHTO #1 stone in accordance with "Over-excavation".

B. Proof roll subgrade with heavy pneumatic-tired equipment (a tandem-axle dump truck of at least 20 tons) to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by COTR.

D. Over-excavation will be used to "bridge" soft areas of unsuitable soils. The soft area and an additional 48" around it will be excavated 18" below subgrade and the material hauled to the waste area for disposal. A biaxial geogrid will be installed per the manufacturers guidelines and backfilled with 18" of AASHTO No. 1 stone. The stone will then be rolled to lock it in place. Any damage to the geogrid during installation will be removed and replaced at the contractor's expense.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 3 Section "Cast-in-Place Concrete."

D. Trenches under Roadways: Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course. Concrete is specified in Division 3 Section "Cast-in-Place Concrete."

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

G. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.

H. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 DURABLE ROCK FILL

A. Rock occurring in the excavation that meets the criteria for durable rock may be used to form drainage systems, the outer edges of embankments, or as a lining for drainage channels. In the case of drainage channels, the dimensions of the rock may be as large as the thickness of the lining will permit.

B. Durable rock shall be placed in separate areas from soil materials and at least 30 feet outside of proposed footings or buildings. Durable rock fill shall be placed in lifts not to exceed 24 inches and with a maximum particle size of 18 inches. The lift thickness shall be as thin as the excavated material will permit. Rock fills should be compacted using a minimum of six passes per lift of a 15-ton static weight vibratory roller. There should be at least a 30% overlap between compactor passes.

C. When used on the outer slopes of embankments, the large rocks shall be placed at the outer face and the smaller rocks and spalls near the center. The rock shall not be dumped in placed but shall be distributed and placed the full width of the lift being formed by blading or dozing in a manner to assure proper placement in the final position in the embankment. The larger rock shall be well distributed and the voids, pockets, and bridging reduced to ensure minimum deformation and still permit drainage where required. Material that is too wet to be properly compacted shall not be used to fill the voids of previously placed rock. Satisfactory material that meets moisture requirements may be blended with rock and shall be placed in the embankment in lift thickness as prescribed.

D. To the extent that it is available and needed, sufficient suitable material shall be reserved from the unclassified excavation for use in filling voids in the top of the rock fill. Where rock is placed on an embankment of other material, the top of the other material shall be sloped from the center to the sides at a rate of approximately 4%.

3.14 SOIL FILL

A. Plow, scarify, and bench sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material free of particles greater than 4" in any dimension.
3. Under steps and ramps, use satisfactory soil material free of particles greater than 4" in any dimension.
4. Under building slabs, use satisfactory soil material free of particles greater than 4" in any dimension.
5. Under Maintenance Building footings and foundations, use satisfactory soil material free of particles greater than 4" in any dimension.
6. Under AFRC footings and foundations, use controlled low-strength material.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.15 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

2. Scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight. If approved by the COTR, soil drying or soil conditioning may be used for subgrade preparation.

3. Soil Drying

a. Description. This work shall consist of drying stockpiled fill with an admixture of ground quick lime.
b. Materials. Ground quick lime shall meet the requirements of ASTM C 5. Weight of the lime used shall depend on the wetness of the subgrade soil. Contractor may perform testing at his expense to determine lime application rates required to achieve optimum moisture content in the stockpiled soil.
c. General. Soil drying shall be performed when the air temperature is 5° C (40° F) or above and the material to be treated is not frozen. No work shall be done during wet or unsuitable weather.
d. Spreading. The lime shall be spread uniformly.
e. Dry lime shall be spread in such a manner to minimize dusting. The dry lime shall not be applied when wind conditions, in the opinion of the Engineer, are such that blowing lime becomes objectionable to traffic or adjacent property owners.
f. Mixing. The spreading of the lime shall be followed immediately by a mixing operation consisting of the use of a spring tooth or disc harrow. Mixing shall be continued until the lime has been thoroughly incorporated into the mix, all soil clods have been reduced to a maximum size of 50 mm (2 inches), and the mixture is a uniform color.

4. Soil Conditioning

a. Description. This work shall consist of constructing a 12" thick lime stabilized subgrade consisting of an admixture of ground quicklime or hydrated lime with the subgrade soil constructed, mixed, shaped, compacted, fine graded, and finished.
b. Materials. Hydrated lime shall meet the requirements of ASTM C 6. Weight of the lime used shall be 3 to 5 percent of the dry weight of the subgrade soil as directed by the Engineer based on soil types encountered. Contractor may perform testing at his expense to determine lime application rates required to achieve unconfined compressive strengths of 5 tons per square foot.
c. General. Lime stabilization work shall be performed when the air temperature is 5° C (40° F) or above and the material to be treated is not frozen. No work shall be done during wet or unsuitable weather.
d. Spreading. The lime shall be spread uniformly on the subgrade by using distributors or equipment approved by the Engineer.
e. Dry lime shall be spread in such a manner to minimize dusting. The dry lime shall not be applied when wind conditions, in the opinion of the Engineer, are such that blowing lime becomes objectionable to traffic or adjacent property owners.
f. Lime slurry shall be prepared and distributed using equipment or procedures capable of keeping the slurried lime in suspension and spreading the slurry uniformly over the area to be stabilized.
g. Mixing. The spreading of the lime shall be followed immediately by a mixing operation consisting of the use of a spring tooth or disc harrow followed by an approved power driven rotary type mixer. During this mixing operation, water shall be added if necessary to bring the mixed material to optimum. Mixing shall be continued until the lime has been thoroughly incorporated into the mix, all soil clods have been reduced to a maximum size of 50 mm (2 inches), and the mixture is a uniform color.
h. Following the initial mixing, the material shall be lightly compacted with a steel-wheeled or pneumatic-tired roller to seal it against rain or excessive drying. The partially mixed material shall cure for a period of not less than 24 hours nor more than 7 days prior to final mixing. If conditions during construction are such that

more than 7 days elapse between initial mixing and final compaction, an additional ½ percent of lime shall be added during the final mixing. The added lime shall be furnished at the Contractor's expense unless the delay beyond the 7-day limit is caused by conditions beyond the control of the Contractor.

i. The final mixing shall be done with approved power driven rotary type equipment until the soil has become completely pulverized with all clods reduced to a maximum size of 25 mm (1 inch) and at least 60 percent of the clods reduced to such a size that they will pass the 4.75 mm (No. 4) sieve. Mixing shall be continued until the lime has been uniformly distributed throughout the pulverized soil.

j. Compaction. The mixture shall again be brought to optimum moisture content during the final mixing and the mixture shall then be shaped and compacted. The maximum laboratory dry density of the lime-soil stabilized subgrade shall not be less than 1440 kg/m3 (90 pounds per cubic foot). All lime-soil stabilized subgrade shall be compacted to 95 percent of the laboratory maximum dry density (ASTM D1557). Final rolling shall be performed using a steel-wheeled roller.

k. The compacted lime-soil stabilized subgrade shall cure for a period of at least 5 days prior to placement of any overlying fill. The surface shall be lightly sprinkled during hot, dry weather through the curing period to prevent excessive moisture loss, as directed by the Engineer. During the curing period, heavy equipment shall be kept off the treated subgrade.

3.16 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.18 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Division 2 Section "Subdrainage."

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer with a minimum of two passes of a plate-type vibratory compactor.

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer with a minimum of two passes of a plate-type vibratory compactor.
2. Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

3.19 FREE DRAINING BASE TRENCH

A. Trenching: The free draining base trench shall be excavated to the width and depth as detailed on the plans. Trench walls shall be as nearly vertical as practicable.

B. Bedding and Placing Perforated Pipe: After excavating the trench, geotextile fabric shall be placed in the trench in reasonable conformance with the shape of the trench. The fabric shall be smooth and free of tension, stress, folds, wrinkles, or creases. The fabric shall be installed so that any splice joints have a minimum overlap of at least 1 foot any direction. Enough fabric will be placed in order to properly tie to the mainline placement of fabric.

1. A 2 inch bedding layer of crushed stone or gravel conforming to free draining base course aggregate shall be placed in the bottom of the trench for its full width and length.

2. The pipe shall then be placed in the trench. The pipe sections shall be joined with couplings or bands as recommended by the manufacturer.
3. After pipe installation, the remainder of the trench will be backfilled with crushed stone or gravel conforming to free draining base course aggregate.

3.20 OUTLET PIPE

A. Connection to Perforated Pipe: At locations designated on the plans or as directed by the Engineer, rigid outlet pipe will be connected to the perforated pipe. A drop connection utilizing a tee or wye or other means as satisfactory to the Engineer will be used for this connection. This operation may be performed concurrently with the placement of the perforated pipe or separately.

B. Trenching: The outlet pipe trench shall be excavated to the depth of the flow line of the outlet pipe. Minimum slope of the outlet pipe is to be 3%. Width of the trench will be that width which will allow proper room for pipe placement and backfilling operations.

C. Placing and Backfilling Pipe: The outlet pipe shall be placed in the trench with all ends firmly joined by couplings or bands as recommended by the manufacturer. The outlet pipe shall be backfilled with satisfactory soil in accordance with Section 3.12, "Utility Trench Backfill".

D. Pipe End Treatment: The outlet end of all outlet pipes not tied to drainage structures shall be equipped with a slopewall and animal screen. Outlet pipes shall be tied to inlets or culverts by the use of pipe saddles, grouting cementing, or other means satisfactory to the Engineer.

3.21 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course and base course to required crown elevations and cross-slope grades.
4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials

and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.22 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.23 FIELD QUALITY CONTROL

A. Special Inspections: Contractor will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed for every 300 lineal feet of spread footing to verify design bearing capacities at each footing location. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

G. Areas of Soil Conditioning: At least one test for every 100 square yards of area treated will be performed to verify bearing capacity is at least five tons per square foot.

3.24 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.25 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 02300

SECTION 02510 - WATER DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes water-distribution piping and specialties outside the building for the following:

1. Combined water service and fire-service mains.

1.3 DEFINITIONS

A. Combined Water Service and Fire-Service Main: Exterior water piping for both domestic-water and fire-suppression piping.

B. The following are industry abbreviations for plastic materials:

1. PA: Polyamide (nylon) plastic.
2. PE: Polyethylene plastic.
3. PEX: Crosslinked polyethylene plastic.
4. PP: Polypropylene plastic.
5. PVC: Polyvinyl chloride plastic.
6. RTRF: Reinforced thermosetting resin (fiberglass) fittings.
7. RTRP: Reinforced thermosetting resin (fiberglass) pipe.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Piping specialties.
2. Valves and accessories.
3. Protective enclosures.

B. Coordination Drawings: For piping and specialties including relation to other services in same area. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.

C. Field Quality-Control Test Reports: From Contractor.

D. Operation and Maintenance Data: For specialties to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Closeout Procedures," include the following:

1. Valves.
2. Protective enclosures.

1.5 QUALITY ASSURANCE

A. Product Options: Contract Drawings indicate size, profiles, and dimensional requirements of piping and specialties and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

B. Regulatory Requirements:

1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.

C. Piping materials shall bear label, stamp, or other markings of specified testing agency.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

F. Comply with FM's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.

G. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

H. NSF Compliance:

1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, including fire hydrants, according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

F. Protect flanges, fittings, and specialties from moisture and dirt.

G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.7 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by WVARNG or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify COTR not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without COTR's written permission.

1.8 COORDINATION

A. Coordinate connection to water main with the COTR (after water main is installed).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.3 DUCTILE-IRON PIPE AND FITTINGS

A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint, bell- and plain-spigot end unless grooved or flanged ends are indicated.

1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint, bell- and plain-spigot end unless grooved or flanged ends are indicated.

1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

a. Gaskets: AWWA C111, rubber.

C. Ductile-Iron Flexible Expansion Joints: Compound, ductile-iron fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include two gasketed ball-joint sections and one or more gasketed sleeve sections. Assemble components for offset and expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

D. Ductile-Iron Deflection Fittings: Compound, ductile-iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

E. Ductile-Iron Expansion Joints: Three-piece, ductile-iron assembly consisting of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

2.4 PVC PIPE AND FITTINGS

A. PVC, Schedule 40 Pipe: ASTM D 1785.

1. PVC, Schedule 40 Socket Fittings: ASTM D 2466.

B. PVC, Schedule 80 Pipe: ASTM D 1785.

1. PVC, Schedule 80 Socket Fittings: ASTM D 2467.
2. PVC, Schedule 80 Threaded Fittings: ASTM D 2464.

C. PVC, AWWA Pipe: AWWA C900, Class 200, with bell end with gasket and spigot end.

1. Comply with UL 1285 for fire-service mains if indicated.
2. PVC Fabricated Fittings: AWWA C900, Class 200, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
3. PVC Molded Fittings: AWWA C907, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
4. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

    a. Gaskets: AWWA C111, rubber.

5. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

    a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

D. PVC, SDR 21 Pipe: ASTM D2241 with bell end with gasket and spigot end.

2.5 JOINING MATERIALS

A. Refer to Division 2 Section 02080 "Piped Utilities – Basic Materials and Methods" for commonly used joining materials.

B. Transition Couplings:

1. Underground Piping, NPS 1-1/2 and Smaller: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
2. Underground Piping, NPS 2 and Larger: AWWA C219, metal, sleeve-type coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
3. Aboveground Piping: Pipe fitting same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

C. Brazing Filler Metals: AWS A5.8, BCuP Series.

D. Soldering Flux: ASTM B 813, water-flushable type.

E. Solder Filler Metal: ASTM B 32, lead-free type with 0.20 percent maximum lead content.

F. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

2.6 PIPING SPECIALTIES

A. Flexible Connectors:

1. Nonferrous-Metal Piping: Bronze hose covered with bronze wire braid; with copper-tube, pressure-type, solder-joint ends or bronze flanged ends brazed to hose.

2. Ferrous Piping: Stainless-steel hose covered with stainless-steel wire braid; with ASME B1.20.1, threaded steel pipe nipples or ASME B16.5, steel pipe flanges welded to hose.

B. Dielectric Fittings: Combination of copper alloy and ferrous; threaded, solder, or plain end types; and matching piping system materials.

1. Dielectric Unions: Factory-fabricated union assembly, designed for 250-psig minimum working pressure at 180 deg F. Include insulating material that isolates dissimilar metals and ends with inside threads according to ASME B1.20.1.
2. Dielectric Flanges: Factory-fabricated companion-flange assembly, for 150- or 300-psig minimum working pressure to suit system pressures.
3. Dielectric-Flange Insulation Kits: Field-assembled companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure to suit system pressures.

4. Dielectric Couplings: Galvanized-steel couplings with inert and noncorrosive thermoplastic lining, with threaded ends and 300-psig minimum working pressure at 225 deg F.
5. Dielectric Nipples: Electroplated steel nipples with inert and noncorrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig minimum working pressure at 225 deg F.

2.7 CORROSION-PROTECTION ENCASEMENT FOR PIPING

A. Encasement for Underground Metal Piping: ASTM A 674 or AWWA C105, PE film, 0.008-inch minimum thickness, tube or sheet.

2.8 GATE VALVES

A. AWWA, Cast-Iron Gate Valves:

1. Manufacturers:

a. American AVK Co.; Valves & Fittings Div.
b. American Cast Iron Pipe Co.; American Flow Control Div.
c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
d. Crane Co.; Crane Valve Group; Stockham Div.
e. East Jordan Iron Works, Inc.
f. Grinnell Corporation; Mueller Co.; Water Products Div.
g. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
h. McWane, Inc.; Kennedy Valve Div.
i. McWane, Inc.; Tyler Pipe; Utilities Div.
j. NIBCO INC.
k. United States Pipe and Foundry Company.

2. Nonrising-Stem, Metal-Seated Gate Valves: AWWA C500, gray- or ductile-iron body and bonnet; with cast-iron or bronze double-disc gate, bronze gate rings, bronze stem, and stem nut.

   a. Minimum Working Pressure: 200 psig.
   b. End Connections: Mechanical joint.
   c. Interior Coating: Complying with AWWA C550.

3. Nonrising-Stem, Resilient-Seated Gate Valves: AWWA C509, gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.

   a. Minimum Working Pressure: 200 psig.
   b. End Connections: Mechanical joint.
   c. Interior Coating: Complying with AWWA C550.

4. Nonrising-Stem, High-Pressure, Resilient-Seated Gate Valves: AWWA C509, ductile-iron body and bonnet; with bronze or ductile-iron gate, resilient seats, bronze stem, and stem nut.

   a. Minimum Working Pressure: 250 psig.
   b. End Connections: Push-on or mechanical joint.
   c. Interior Coating: Complying with AWWA C550.

5. OS&Y, Rising-Stem, Metal-Seated Gate Valves: AWWA C500, cast-iron or ductile-iron body and bonnet, outside screw and yoke, cast-iron double disc, bronze disc and seat rings, and bronze stem.

   a. Minimum Working Pressure: 200 psig.
   b. End Connections: Flanged.

6. OS&Y, Rising-Stem, Resilient-Seated Gate Valves: AWWA C509, cast-iron or ductile-iron body and bonnet, outside screw and yoke; with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.

   a. Minimum Working Pressure: 200 psig.
   b. End Connections: Flanged.

B. UL/FM, Cast-Iron Gate Valves:

1. Manufacturers:

   a. American Cast Iron Pipe Co.; American Flow Control Div.
   b. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
   c. Central Sprinkler Company.
   d. Crane Co.; Crane Valve Group; Stockham Div.
   e. Grinnell Corporation.
   f. Grinnell Corporation; Mueller Co.; Water Products Div.
   g. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
   h. McWane, Inc.; Kennedy Valve Div.
   i. McWane, Inc.; M & H Valve Company Div.

j. NIBCO INC.
k. United States Pipe and Foundry Company.

2. UL/FM, Nonrising-Stem Gate Valves: UL 262, FM-approved iron body and bonnet with flange for indicator post, bronze seating material, and inside screw.

a. Minimum Working Pressure: 175 psig.
b. End Connections: Flanged.

3. OS&Y, Rising-Stem Gate Valves: UL 262, FM-approved iron body and bonnet, bronze seating material, and outside screw and yoke.

a. Minimum Working Pressure: 175 psig.
b. End Connections: Flanged.

c. Working Pressure: 175 psig.
d. End Connections: Threaded.

2.9 GATE VALVE ACCESSORIES AND SPECIALTIES

A. Tapping-Sleeve Assemblies: Comply with MSS SP-60. Include sleeve and valve compatible with drilling machine.

1. Manufacturers:

a. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
b. East Jordan Iron Works, Inc.
c. Grinnell Corporation; Mueller Co.; Water Products Div.
d. International Piping Services Company.
e. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
f. McWane, Inc.; Kennedy Valve Div.
g. McWane, Inc.; M & H Valve Company Div.
h. United States Pipe and Foundry Company.

2. Tapping Sleeve: Cast- or ductile-iron or stainless steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
3. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.

B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," bottom section with base of size to fit over valve, and approximately 5-inch-diameter barrel.

1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

C. Indicator Posts: UL 789, FM-approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

2.10 ALARM DEVICES

A. General: Types matching piping and equipment connections.

B. Valve Supervisory Switches: UL 753; electrical; single-pole, double throw, with normally closed contacts. Include design that signals controlled valve is in other than fully open position.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

C. Do not use flanges, unions, or keyed couplings for underground piping.

D. Flanges, unions, keyed couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.

E. Underground Combined Water-Service and Fire-Service-Main Piping: Use the following:

1. NPS 6 to NPS 12: Ductile Iron Pipe, AWWA C151 listed for fire-protection service.

3.3 VALVE APPLICATIONS

A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FM, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation. Tamper switches are required for all valves on fire service mains.

B. Contract Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient - seated gate valves with valve box.
2. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FM, cast-iron, nonrising-stem gate valves with indicator post.

3.4 JOINT CONSTRUCTION

A. See Division 2 Section 02080 "Piped Utilities – Basic Materials and Methods" for basic piping joint construction.

B. Make pipe joints according to the following:

1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
2. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
3. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with keyed couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
4. Copper Tubing Soldered Joints: ASTM B 828. Use flushable flux and lead-free solder.
5. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
6. PE Piping Insert-Fitting Joints: Use plastic insert fittings and fasteners according to fitting manufacturer's written instructions.
7. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure. Refer to Division 2 Section "Utility Materials" for joining piping of dissimilar metals.

3.5 PIPING SYSTEMS - COMMON REQUIREMENTS

A. See Division 2 Section "Utility Materials" for piping-system common requirements.

3.6 PIPING INSTALLATION

A. Make connections larger than NPS 2 with tapping machine according to the following:

1. Install tapping sleeve and tapping valve according to MSS SP-60.

B. Bury piping with depth of cover over top at least 40 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:

1. Under Driveways: With at least 36 inches cover over top.
2. In Loose Gravelly Soil and Rock: With at least 12 inches additional cover.

C. Install piping by tunneling, jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

D. Extend water-service piping and connect to water-supply source and building water piping systems at outside face of building wall in locations and pipe sizes indicated.

1. Terminate water-service piping at 5' from building wall until building water piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water piping systems when those systems are installed.

E. Sleeves: Provide steel pipe sleeves in the sizes and locations indicated. Use adequate bracing to support pipe the full length in the sleeve.

F. Mechanical sleeve seals are specified in Division 15 Section "Basic Mechanical Materials and Methods."

G. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

H. Anchor service-entry piping to building wall.

I. Install water-supply piping with shutoff valve in water supply to each hydrant. Use curb valve and service box.

3.7 ANCHORAGE INSTALLATION

A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Fire-Service-Main Piping: According to NFPA 24.

B. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.8 VALVE INSTALLATION

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

B. UL/FM Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.

3.9 CONNECTIONS

A. Piping installation requirements are specified in other Division 2 Sections. Contract Drawings indicate general arrangement of piping and specialties.

B. See Division 2 Section "Utility Materials" for piping connections to valves and equipment.

C. Connect water-distribution piping to utility water main. Use service clamp and corporation valve.

D. Connect water-distribution piping to fire hydrants.

E. Connect water-distribution piping to interior domestic-water and fire-suppression piping.

F. Ground equipment according to Division 16 Section "Grounding and Bonding."

G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.10 FIELD QUALITY CONTROL

A. Piping Tests: Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

B. Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for 2 hours.

1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

C. Perform Tamper Switch testing as required by NFPA 1 and West Virginia State Fire Code.

D. Prepare reports of testing activities.

E. Coordinate for inspection, testing and acceptance of the completed line by the applicable utility provider. Any cost incurred for inspection, testing and acceptance shall be paid by the Contractor.

3.11 IDENTIFICATION

A. Install continuous underground detectable warning tape during backfilling of trench for underground water-service piping. Locate below finished grade, directly over piping. See Division 2 Section "Earthwork" for underground warning tapes.

B. Permanently attach equipment nameplate or marker, indicating plastic water-service piping, on main electrical meter panel. See Division 2 Section "Utility Materials" for identifying devices.

3.12 CLEANING AND ACCEPTANCE

A. Clean and disinfect water-distribution piping as follows:

1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as described below:

a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.

b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

C. Coordinate for inspection, testing, and acceptance of the completed line by the applicable utility upon completion of installation. Any costs incurred for inspection, testing, and acceptance shall be paid by the Contractor.

END OF SECTION 02510

SECTION 02741 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Hot-mix asphalt paving.
2. Asphalt surface treatments.
3. Pavement-marking paint.

B. Related Sections include the following:

1. Division 2 Section "Earthwork" for aggregate subbase and base courses, geotextile fabric, and for aggregate pavement shoulders.

1.3 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

B. DOT: Department of Transportation.

1.4 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of standard specifications of state or local DOT.

1. Standard Specification: West Virginia Department of Transportation, Division of Highways, Division 400.
2. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

C. Job-Mix Designs: For each job mix proposed for the Work.

D. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international graphics symbol, spaces dedicated to people with disabilities.

E. Samples: For each paving fabric, 12 by 12 inches minimum.

F. Qualification Data: For manufacturer.

G. Material Test Reports: For each paving material.

H. Material Certificates: For each paving material, signed by manufacturers.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Manufacturer shall be a paving-mix manufacturer registered with and approved by the WVDOH.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

C. Regulatory Requirements: Comply with Standards and Specifications, dated 2000 of the West Virginia Department of Transportation for asphalt paving work.

D. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
2. Review condition of subgrade and preparatory work.
3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:

1. Prime and Tack Coats: Minimum surface temperature of 60 deg F. and when temperature has not been below 35 deg F. for 12 hours immediately prior to installation.
2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, properly cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO MP 1, PG 64-22.

B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.

C. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-250.

D. Prime Coat: Asphalt emulsion prime complying with WVDOT requirements.

E. Tack Coat: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

F. Fog Seal: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

G. Water: Potable.

H. Undersealing Asphalt: ASTM D 3141, pumping consistency.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

D. Joint Sealant: ASTM D 3405, hot-applied, single-component, polymer-modified bituminous sealant.

E. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type II or AASHTO M 248, Type F.

1. Color: As indicated.

F. Glass Beads: AASHTO M 247, Type 1.

G. Wheel Stops: Solid, integrally colored, 96 percent recycled HDPE or commingled post-consumer and postindustrial recycled plastic; UV stabilized; 6 ½" high by 8" wide by 72" long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

2.4 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes of the type specified on the Contract Drawings in the pavement details.

B. Emulsified-Asphalt Slurry: ASTM D 3910, Type 1, consisting of emulsified asphalt, fine aggregate, and mineral fillers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

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

3.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot undersealing asphalt under rocking slabs until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Patching: Fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.

E. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.3 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 PAVING GEOTEXTILE INSTALLATION

A. Apply tack coat uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gal./sq. yd..

B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.

1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.

3.5 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than ~~94~~89 percent nor greater than 100 percent.
2. ~~Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.~~

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.9 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. to existing asphalt pavement and allow to cure. With a fine sand, lightly dust areas receiving excess fog seal.

B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.

1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with COTR.

B. Allow paving to age for 30 days before starting pavement marking.

C. Installation should follow requirements of WVDOH Standard Specifications, Section 663, "Pavement Markings" – Construction Methods section.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.11 WHEEL STOPS

A. Securely attach wheel stops into pavement with not less than two galvanized steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.13 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow excavated materials to accumulate on-site.

END OF SECTION 02741

SECTION 04220

CAST STONE CONCRETE MASONRY VENEER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Architectural cast stone concrete masonry veneer (RockCast Masonry Veneer).

1.2 RELATED SECTIONS

A. Section 04720 – Cast Stone.

B. Section 04810 - Unit Masonry Assemblies.

C. Section 04860 – Stone Masonry.

C. Section 07920 - Joint Sealants.

1.3 REFERENCES

A. ASTM A 615/A 615M - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

B. ASTM A767/A767M - Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.

C. ASTM C 33 - Concrete Aggregates.

D. ASTM C 90 - Loadbearing Concrete Masonry Units.

E. ASTM C 140 - Sampling and Testing Concrete Masonry Units and Related Units.

F. ASTM C 150 - Portland Cement.

G. ASTM C 270 - Mortar for Unit Masonry.

H. ASTM C 426 - Linear Drying Shrinkage of Concrete Masonry Units.

I. ASTM C 494 - Chemical Admixtures for Concrete.

J. ASTM C 666 - Resistance of Concrete to Rapid Freezing and Thawing.

K. ASTM C 979 - Pigments for Integrally Colored Concrete.

L. ACI 530 "Building Code Requirements for Masonry Structures"

1.4 DEFINITIONS

A. Concrete Masonry Veneer Units: An architectural cast stone concrete masonry veneer units manufactured to copy fine grain texture and color of natural cut stone. Meets ASTM C 90 requirements.

B. Dry Cast Concrete Products: Manufactured from zero-slump concrete.

C. Machine Casting Method: Vibratory compaction by machine of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.

1.5 SUBMITTALS

A. Comply with Section 01330 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data.

C. Shop Drawings: Submit manufacturer's shop drawings, including profiles, cross sections, modular unit lengths, reinforcement (if required), exposed faces, anchors and anchoring method recommendations (if required), and annotation of concrete masonry veneer unit types and location.

D. Samples: Submit pieces of manufacturer's cast stone veneer masonry units that represent general range of texture and color proposed to be furnished for project.

E. Test Results:
1. Submit manufacturer's test results from cast stone concrete masonry veneer units previously made by manufacturer using materials from same sources proposed for use in project.

F. Manufacturer's Project References: Submit list of projects similar in scope, including project name and location, name of architect, and type and quantity of cast stone concrete masonry veneer units installed.

G. Warranty: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:
1. Sufficient plant facilities to provide quality, shapes, quantities, and sizes of cast stone concrete masonry veneer units required without delaying progress of the Work.
2. Minimum of 10 years experience in producing masonry units.
3. Manufacturer shall have an internal Quality Assurance Testing Program with certified laboratory technician(s).

B. Mock-Ups: Provide full-size cast stone concrete masonry units for use in construction of mock-ups. Approved mock-ups shall become the standard for appearance and workmanship for project.

1. Approved mock-ups may remain as part of the completed Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
1. Deliver cast stone concrete masonry veneer units secured to shipping pallets and protected from damage and discoloration.
2. Provide itemized shipping list.

3. Number each piece individually, as required, to match shop drawings and schedules.

B. Storage:
1. Store cast stone concrete masonry veneer units and installation materials in accordance with manufacturer's instructions.
2. Store cast stone concrete masonry veneer units on pallets with nonstaining, waterproof covers.
3. Do not double stack pallets.
4. Ventilate units under covers to prevent condensation.
5. Prevent contact with dirt and splashing.

C. Handling:
1. Protect cast stone concrete masonry veneer units, including corners and edges, during storage, handling, and installation to prevent chipping, cracking, staining, or other damage.
2. Handle long units at center and both ends simultaneously to prevent cracking.
3. Do not use pry bars or other equipment in a manner that could damage units.

1.8 SCHEDULING

A. Schedule and coordinate production and delivery of cast stone concrete masonry veneer units with unit masonry work.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Basis of design is Rockcast Masonry Veneer Units manufactured by Reading Rock, Inc., 4600 Devitt Drive, Cincinnati, Ohio 45246. Toll Free (800) 482-6466. Phone (513) 874-2345. Fax (513) 874-2361. Web Site www.readingrock.com.

B. Subject to compliance with requirements, other manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
1. "Prairie Stone" by Northfield Block Company, Muldelien, IL.
2. "Mesa Stone" by Trenwyth Industries, Emigsville, PA.
3. Custom Cast Stone, Westfield, Indiana.
4. Springfield Brick, Springfield, MO.

2.2 ARCHITECTURAL CAST STONE CONCRETE MASONRY VENEER UNITS

A. Architectural Cast Stone Concrete Masonry Veneer Units: Basis of Design: RockCast Architectural Masonry Veneer.

B. Compliance: ASTM C 90.

C. Casting Method: Machine.

D. Texture: Chiseled-face.

E. Color: Blacksburg Blend.

F. Units: As indicated on the drawings.

G. Test Results:
1. Compressive Strength, ASTM C 140: Typical RockCast Architectural Masonry Veneer series compressive strength range is 4,000 - 6,000 psi at 28 days.

2. Absorption, ASTM C 140: Less than 6 percent at 28 days.
3. Linear Shrinkage, ASTM C 426: Maximum .065 percent.
4. Density, ASTM C 140: Greater than 120 pounds per cubic foot.
5. Freeze-Thaw, ASTM C 666: Less than 5 percent cumulative mass loss after 300 cycles.

H. Curing: Cure in enclosed chamber at 95 percent relative humidity and 95 to 120 degrees F for 12 to 18 hours and yard cure for 350 degree-days.

2.3 ARCHITECTURAL CAST STONE CONCRETE MASONRY VENEER UNITS MATERIALS

A. Portland Cement: ASTM C 150, Type I or III. White and/or gray as required to match specified color.

B. Coarse Aggregates: ASTM C 33, except for gradation. Granite, quartz, or limestone.

C. Fine Aggregates: ASTM C 33, except for gradation. Manufactured or natural sands.

D. Pigments: ASTM C 979, except do not use carbon black pigments. Inorganic iron oxide pigments.

E. Water Reducing, Retarding, and Accelerating Admixtures: ASTM C 494.

F. Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.

G. Water: Potable.

2.4 TEXTURE AND COLOR

A. General: Match texture and color of full-size sample on file with Architect.

B. Texture of Surfaces Exposed to View:
1. Fine-grained texture similar to natural stone and cast stone.
2. Approximately equal to approved sample when viewed in direct daylight at 10 feet.

C. Surface Air Voids:
1. Size: Maximum 1/32 inch.
2. Density: Less than 3 occurrences per any 1 square inch.
3. Viewing Conditions: Not obvious under direct daylight at 10 feet.

D. Finish:
1. Minor chipping resulting from shipping and delivery shall not be grounds for rejection of units.
2. Minor chips shall not be obvious under direct daylight at 20 feet, as determined by Architect.
3. The occurrence of crazing or efflorescence shall not constitute a cause for rejection.

E. Color Variation:
1. Viewing Conditions: Compare in direct daylight at 10 feet, between units of similar age, subjected to similar weathering conditions.

2.5 MORTAR

A. Mortar: As specified in Section 04860.

B. Mortar Materials: As specified in Section 04860.

2.6 ACCESSORIES

A. Anchors: Non-corrosive type, sized for conditions. Type 304 stainless steel.

B. Sealant: As specified in Section 07920.

C. Cleaner: Prosoco Sure Klean Custom Masonry Cleaner, Prosoco Sure Klean 600 Detergent, or Prosoco Sure Klean Vana Trol, per manufacturer's written instructions for mixture of cast rock products and clay masonry.

2.7 FABRICATION

A. Shapes: As indicated on drawings.

2.8 TOLERANCES

A. General: Manufacture cast stone concrete masonry veneer units within tolerances in accordance with ASTM C 90, unless otherwise specified.

B. Length, height, width: Do not deviate by more than plus or minus 1/8 inch from approved dimensions. These requirements do not apply to split faced units.

2.9 PRODUCTION QUALITY CONTROL

A. Mix Designs: Test new and existing mix designs for applicable compressive strength and absorption compliance before manufacturing cast stone concrete masonry veneer units.

B. Plant Production Testing: Tests to be conducted by certified laboratory testing technicians. Test from specimens selected at random from plant production in accordance with ASTM C 140.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine construction to receive cast stone concrete masonry veneer units. Notify Architect if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.

B. Examine cast stone concrete masonry veneer units before installation. Do not install unacceptable units.
   1. Waste: For various reasons due to shipping, handling or the manufacturing process, a small amount of RockCast Architectural Masonry Veneer units may have blemishes or chips and should be used for field cutting for maximum material utilization. When ordering material, please allow for waste (approximately 2 to 3%) and saw cutting in your estimate.
   2. All RockCast products are shipped on a pallet and have one unfinished side. Textured units are to be set with the texture face forward and smooth units are stacked "face up" on the pallet.
   3. RockCast Architectural Masonry Veneer units have an unfinished back, one finished face, and approximately 40 to 60% of the units have one smooth finished end. Architectural machine made split and chiseled faced units can be ordered with a matching finished end upon request.

3.2 INSTALLATION

A. Install units in conjunction with masonry, as specified in Section 04810.

B. Pull units from multiple cubes during installation to minimize variation in color and help with natural blending.

C. Cut units using motor-driven masonry saws. Finished ends should be turned to the visible side and the saw cut turned to the inside of the mortar joint to hide exposed aggregates and saw marks.

D. Do not use pry bars or other equipment in a manner that could damage units.

E. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

F. Use Type N mortar (ASTM C 270), unless specified otherwise.

G. Per ACI 530.1, it is not necessary, nor recommended, to wet the units prior to installation.

H. Set units in full bed of mortar, unless otherwise indicated on the drawings.

I. Fill vertical joints with mortar.

J. Make joints 3/8 inch, unless otherwise indicated on the drawings.

K. Tuck point mortar joints to slight concave profile (unless specified otherwise).

L. Remove excess mortar immediately.

M. Remove mortar fins and smears before tooling joints.

N. Cover wainscot for protection and bond separation with plastic, felt paper or other approved products.

O. Cover freshly installed masonry products as required to assist with the curing process.

P. Sealant Joints:
   1. As specified in Section 07920.
   2. Prime ends of units, insert properly sized backing rod, and install sealant.
   3. Provide sealant joints at following locations:
      a. Joints at relieving angles.
      b. Control and expansion joints.
      c. As indicated on the drawings.

3.3 TOLERANCES

A. Installation Tolerances:
   1. Variation from Plumb: Do not exceed 1/8 inch in 5 feet or 1/4 inch in 20 feet or more.
   2. Variation from Level: Do not exceed 1/8 inch in 5 feet, 1/4 inch in 20 feet, or 3/8 inch maximum.
   3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch or 1/4 of nominal joint width, whichever is greater.
   4. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8-inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.4 CLEANING

A. Clean exposed units after mortar is thoroughly set and cured.

B. Perform test of cleaner on small area of 4' x 4' on each type and color and receive approval by Architect before full cleaning. Let test area dry 4 to 5 days before inspection. Keep test area for future comparison.

C. Clean units by wetting down the surface first, before using the specified cleaner (as specified in Section 2.7.C). Brush on cleaner, let dwell for 2 to 3 minutes. Reapply cleaner, scrub surface with masonry brush and rinse off thoroughly. Areas with heavy soiling use a wood block or non-metallic scraper.

D. Apply cleaner to units in accordance with cleaner manufacturer's instructions.

E. Do **not** use the following to clean units:
   1. Muriatic acid.
   2. Power washing.
   3. Sandblasting.
   4. Harsh cleaning materials or methods that would damage or discolor surfaces.

3.5 REPAIR

A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.

B. Repair with touchup materials provided by manufacturer in accordance with manufacturer's instructions.

C. Repair methods and results to be approved by Architect.

3.6 INSPECTION AND ACCEPTANCE

A. Inspect completed installation in accordance with ACI 530 requirements.

3.7 PROTECTION

A. Protect installed units from splashing, stains, mortar, and other damage.

END OF SECTION

SECTION 08460 - AUTOMATIC ENTRANCE DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior and interior, sliding, power-operated automatic entrances.

1.2 PERFORMANCE REQUIREMENTS

A. Windborne-Debris-Impact-Resistance-Test Performance: Provide automatic entrances that pass large missile-impact and cyclic-pressure tests of ASTM E 1996 according to the IBC.

B. Opening-Force Requirements:
   1. Power-Operated Doors: Not more than 50 lbf required to manually set door in motion if power fails, and not more than 15 lbf required to open door to minimum required width.

C. Entrapment Force Requirements:
   1. Power-Operated Sliding Doors: Not more than 30 lbf required to prevent stopped door from closing.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For automatic entrances. Include plans, elevations, sections, details, hardware mounting heights, and attachments to other work.

   1. Wiring Diagrams: For power, signal, and control wiring.
   2. Activation and safety devices.
   3. Include hardware schedule and indicate hardware types, functions, quantities, and locations.

C. Sample: For each exposed product and for each color and texture specified.

D. Product certificates.

E. Product test reports.

F. Field quality-control reports.

G. Maintenance data.

H. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project and who employs a certified inspector.

B. Certified Inspector Qualifications: Certified by AAADM.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Power-Operated Door Standard: BHMA A156.10.

E. Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrances serving as a required means of egress.

F. Preinstallation Conference: Conduct conference at Project site.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.

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

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
2. Sheet and Plate: ASTM B 209.

B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.

3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

C. Stainless-Steel Bars: ASTM A 276 or ASTM A 666, Type 304.

D. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.

E. Glazing: As specified in Division 8 Section "Glazing."

F. Sealants and Joint Fillers: As specified in Division 7 Section "Joint Sealants."

G. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout; complying with ASTM C 1107; of consistency suitable for application.

H. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos; formulated for 30-mil thickness per coat.

I. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.2 SLIDING AUTOMATIC ENTRANCES

A. General: Provide manufacturer's standard automatic entrances including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, activation and safety devices, and accessories required for a complete installation.

B. Sliding Automatic Entrance:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Biparting-Sliding Units:

1) Besam Automated Entrance Systems, Inc.; an ASSA ABLOY Group company.
2) DORMA Automatics; Div. of DORMA Group North America.
3) Gildor, Inc.
4) Horton Automatics; Div. of Overhead Door Corporation.
5) KM Systems, Inc.
6) Nabco Entrances Inc.
7) Sierra Automatic Doors, Inc.
8) Stanley Access Technologies; Div. of The Stanley Works.
9) Tormax Technologies, Inc.

2. Configuration: Biparting- sliding door(s), with.

a. Traffic Pattern: Two way.
b. Emergency Breakaway Capability: Sliding leaf (leaves) only.
c. Mounting: Between jambs.

3. Operator Features:

a. Power opening and closing.
b. Drive System: Chain or belt.
c. Adjustable opening and closing speeds.
d. Adjustable hold-open time between 0 and 30 seconds.
e. Obstruction recycle.
f. On-off/hold-open switch to control electric power to operator, key operated.

4. Sliding Door Carrier Assemblies and Overhead Roller Tracks: Manufacturer's standard carrier assembly that allows vertical adjustment; consisting of nylon- or delrin-covered, ball-bearing-center steel wheels operating on a continuous roller track, or ball-bearing-center steel wheels operating on a nylon- or delrin-covered, continuous roller track. Support doors from carrier assembly by cantilever and pivot assembly.

   a. Rollers: Minimum of two ball-bearing roller wheels and two antirise rollers for each active leaf.

5. Sliding Door Threshold: Manufacturer's standard threshold members and bottom-guide track system, with stainless-steel, ball-bearing-center roller wheels.

   a. Configuration: Saddle-type threshold across door opening and recessed guide track system at sidelites.

6. Combination Activation and Safety Device: Combination motion/presence sensor.
7. Activation Device: Motion sensors mounted on door header to detect pedestrians in activating zone to activate door operator.
8. Safety Devices: Presence sensor mounted to underside of door header and one photoelectric beam mounted in sidelite jambs to detect pedestrians in presence zone and to prevent door from closing.
9. Sidelite Safety Device: Presence sensor, mounted above each sidelite on side of door opening through which doors travel, to detect obstructions and to prevent door from opening.

   a. Finish: Finish framing, door(s), sidelite(s), and header with finish matching adjacent storefront.

2.3 ENTRANCE COMPONENTS

A. Framing and Transom Members: Manufacturer's standard extruded aluminum, minimum 0.125 inch thick and reinforced as required to support imposed loads.

   1. Nominal Size: [1-3/4 by 4-1/2 inches.
   2. Extruded Glazing Stops and Applied Trim: Minimum 0.062-inch wall thickness.

B. Stile and Rail Doors: Manufacturer's standard 1-3/4-inch- thick, glazed doors with minimum 0.125-inch- thick, extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets that are welded, or incorporate concealed tie-rods that span full length of top and bottom rails.

   1. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and manufacturer's standard preformed gaskets.

2. Stile Design: Medium stile, 3-1/2-inches.
3. Rail Design: As shown on drawings.

4. Muntin Bars: Horizontal tubular rail member for each door; match stile design and finish.

C. Sidelite(s) and Transom: Manufacturer's standard 1-3/4-inch- deep with minimum 0.125-inch-thick, extruded-aluminum tubular stile and rail members matching door design and finish.
1. Muntin Bars: Horizontal tubular rail members for each sidelite; match stile design.

D. Headers: Fabricated from minimum 0.125-inch- thick, extruded aluminum and extending full width of automatic entrance units to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.

1. Mounting: Concealed, with one side of header flush with framing.

a. Capacity: Capable of supporting doors up to 175 lb per leaf over spans up to 14 feet without intermediate supports.

E. Signage: Affixed to both sides of each door as required by BHMA A156.10 and BHMA A156.19 for type of door and its operation.

1. Application Process: Door manufacturer's standard process.

2.4 DOOR OPERATORS AND ACTIVATION AND SAFETY DEVICES

A. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.

1. Door Operator Performance: Provide door operators that will open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.
2. Electromechanical Operators: Concealed, self-contained, overhead unit powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; UL 325; and with manual operation with power off.

B. Motion Sensors: Self-contained, K-band-frequency, microwave-scanner units with metal or plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10; with relay hold time of not less than 2 to 10 seconds.

1. Provide capability for switching between bidirectional and unidirectional detection.
2. For one-way-traffic entrances, sensor on egress side shall not be active when doors are fully closed.

C. Presence Sensors: Self-contained, infrared-scanner units with metal or plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10; with relay hold time of not less than 2 to 10 seconds. Sensors shall remain active at all times.

D. Combination Motion/Presence Sensors: Self-contained units; consisting of both motion and presence sensors in a single metal or plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10.

1. Motion Sensor: K-band-frequency, microwave-scanner units; with relay hold time of not less than 2 to 10 seconds.

a. Provide capability for switching between bidirectional and unidirectional detection.
b. For one-way-traffic entrances, sensor on egress side shall not be active when doors are fully closed.

2. Presence Sensor: Infrared-scanner units; with relay hold time of not less than 2 to 10 seconds. Sensors shall remain active at all times.

E. Photoelectric Beams: Pulsed infrared, sender-receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.

F. Push-Plate Switch: Momentary-contact door control switch with flat push-plate actuator with contrasting-colored, engraved message.

1. Configuration: Round push plate with 4-by-4-inch junction box.

a. Mounting: Recess mounted, semiflush in wall.

2. Push-Plate Material: Stainless steel.
3. Message: International symbol of accessibility and "Push to Open."

G. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.5 HARDWARE

A. General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish.

B. Manual Opening for Power-Operated Swinging Doors: Provide hardware that in a power failure allows door to open with a manual force not to exceed 30 lbf according to BHMA A156.10.

a. Breakaway Device for Power-Operated Doors: Provide breakaway device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Maximum force to open door shall be 50 lbf according to BHMA A156.10. Interrupt powered operation of door operator while in breakaway mode.

C. Deadlocks: Manufacturer's standard deadbolt operated by exterior cylinder and interior thumb turn, with minimum 1-inch- long throw bolt; BHMA A156.5, Grade 1.

1. Cylinders: As specified in Division 8 Section "Door Hardware."

2. Deadbolts: Laminated-steel hook, mortise type, BHMA A156.5, Grade 1.

3. Two-Point Locking for Sliding Doors: Mechanism in stile of active door leaf that automatically extends second lockbolt into overhead carrier assembly and threshold.

D. Thresholds: BHMA A156.21, extruded-aluminum raised thresholds; with beveled edges with a slope of not more than 1:2 and a maximum height of 1/2 inch. Provide cutouts as required for door operating hardware.

E. Weather Stripping: Manufacturer's standard replaceable components.

1. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
2. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
3. Weather Sweeps: Manufacturer's standard nylon brush sweep mounted to underside of door bottom.

F. Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket.

2.6 FABRICATION

A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.

E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."

F. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.

1. Provide sliding-type weather stripping, mortised into door, at perimeter of doors.
2. Provide compression-type weather stripping at fixed stops of exterior doors. At locations without fixed stops, provide sliding-type weather stripping retained in adjustable strip mortised into door edge.
3. Provide weather sweeps mounted to underside of door bottoms of exterior doors.

G. Activation and Safety Devices:

1. General: Factory install devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.
2. Install photoelectric beams in vertical jambs of sidelites, with dimension above finished floor as follows:

a. Top Beam: 48 inches.
b. Bottom Beam: 24 inches.

3. Install photoelectric beams in sides of guide rails, with dimension above finished floor not less than 24 inches.

2.7 ALUMINUM FINISHES

1. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.
4. Level recesses for recessed thresholds using nonshrink grout.
5. Provide thresholds at exterior doors.

C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 16 Sections.

D. Access-Control Devices: Connect access-control devices to access-control system as specified in Division 16 Sections.

E. Activation and Safety Devices: Install and adjust devices to provide detection field and functions indicated.

F. Guide Rails: Install rails according to BHMA A156.10 including Appendix A and manufacturer's written instructions unless otherwise indicated.

G. Glazing: Install glazing as specified in Division 8 Section "Glazing."

H. Sealants: Comply with requirements specified in Division 7 Section "Joint Sealants" to provide weathertight installation.

1. Set bottom-guide track system, framing members and flashings in full sealant bed.
2. Seal perimeter of framing members with sealant.

I. Signage: Apply signage on both sides of each door as required by referenced door standards.

J. Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.

K. Inspection: Engage Installer's certified inspector to test and inspect automatic entrances and prepare test and inspection reports.

1. Certified inspector shall test and inspect each automatic entrance to determine compliance of installed systems with applicable BHMA standards.
2. Field Quality-Control Report: Certified inspector shall submit report in writing to Architect and Contractor within 24 hours after inspection.
3. Work will be considered defective if it does not pass tests and inspections.

L. Adjusting: Adjust door operators, controls, and hardware for smooth and safe operation and for weathertight closure; comply with requirements in BHMA A156.10.

1. Readjust door operators and controls after repeated operation of completed installation equivalent to 3 days' use by normal traffic (100 to 300 cycles). Lubricate hardware, operating equipment, and other moving parts.

M. Demonstration: Engage a certified inspector to train Owner's maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION 08460

SECTION 10651 - OPERABLE PANEL PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Electrically operated, acoustical panel partitions.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design operable panel partitions including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Seismic Performance: Operable panel partitions shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

   1. The term "withstand" means "the panels will remain in place without separation of any parts from the assembly when subjected to the seismic forces specified."

C. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:

   1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
   2. Acoustical Performance Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E 336, determined by ASTM E 413, and rated for STC value of 50.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals:

   1. Certificates for Credit MR 7: Chain-of-custody certificates certifying that operable panel partitions comply with forest certification requirements. Include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
   2. Product Data for Credit EQ 4.4: For each composite wood product used in operable panel partitions, documentation indicating that product contains no urea formaldehyde.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

   1. Indicate storage and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.

2. Wiring Diagrams: For power, signal, and control wiring.

D. Samples: For each type of exposed material, finish, covering, or facing indicated.

E. Delegated-Design Submittal: For operable panel partitions indicated to comply with performance requirements, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.

1. Design Calculations: Calculate requirements for seismic restraints.

F. Coordination Drawings: Reflected ceiling plans, drawn to scale and coordinated with each other, based on input from installers of the items involved:

G. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.

H. Seismic Qualification Certificates: For operable panel partitions, accessories, and components, from manufacturer.

I. Product certificates.

J. Product test reports.

K. Field quality-control reports.

L. Operation and maintenance data.

M. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Installer Qualifications: An employer of workers trained and approved by manufacturer.

C. Testing Agency Qualifications: Qualified according to Division 1 Section "Quality Requirements" for testing indicated.

D. Forest Certification: Fabricate products with wood, wood veneers, and wood-based panel products produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

E. Fire-Test-Response Characteristics: Provide panels with finishes meeting one of the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.

a. Flame-Spread Index: 25 or less.
b. Smoke-Developed Index: 450 or less.

2. Fire Growth Contribution: Meeting acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Frame: Steel sheet, manufacturer's standard thickness.

B. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard thickness.

C. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; manufacturer's standard strengths and thicknesses for type of use.

D. Gypsum Board: ASTM C 36/C 36M.

E. Cement Board: ASTM C 1288.

F. Plywood: DOC PS 1.

G. Particleboard: ANSI A208.1, made with binder containing no urea formaldehyde.

H. Medium-Density Fiberboard: ANSI A208.2, made with binder containing no urea formaldehyde.

2.2 OPERABLE ACOUSTICAL PANELS

A. Operable Acoustical Panels: Operable acoustical panel partition system, including panels, seals, finish facing, suspension system, operators, and accessories.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Advanced Equipment Corporation.
b. Curtition, Inc.
c. FolDoor; Holcomb & Hoke Mfg. Co., Inc.
d. Hufcor.
e. KWIK-WALL Company.
f. Moderco Inc.
g. Modernfold, Inc.; a DORMA Group Company.
h. Panelfold Inc.

B. Panel Operation: Electrically operated, continuously hinged panels.

C. Panel Construction: Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.

E. STC: Not less than 50.

F. Panel Closure: Manufacturer's standard.

G. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

2.3 SEALS

A. General: Provide types of seals indicated that produce operable panel partitions complying with acoustical performance requirements and the following:

1. Manufacturer's standard seals.
2. Seals made from materials and in profiles that minimize sound leakage.
3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.

B. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.

1. Mechanically Operated for Acoustical Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 1-1/2 inches between retracted seal and floor finish.
2. Mechanically Operated for Fire-Rated Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 1-1/2 inches between retracted seal and floor finish.
3. Automatically Operated for Acoustical Panels: Extension and retraction of bottom seal automatically operated by movement of partition, with operating range not less than 1-1/2 inches between retracted seal and floor finish.

2.4 FINISH FACING

A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.

1. Color/Pattern: As selected by Architect from manufacturer's full range.

B. Fabric Wall Covering: 100 percent polyolefin woven fabric, from same dye lot, treated to resist stains.

C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing.

2.5 SUSPENSION SYSTEMS

A. Suspension Tracks: Steel or aluminum mounted directly to overhead structural support, with adjustable steel hanger rods for overhead support, designed for type of operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.

C. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.

D. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

2.6 ELECTRIC OPERATORS

A. General: Provide factory-assembled electric operation system of size and capacity recommended and provided by operable panel partition manufacturer for partition specified;

with electric motor and factory-prewired motor controls, speed reducer, chain drive, remote-control stations, control devices, and accessories required for proper operation. Include wiring from motor control to motor. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

B. Comply with NFPA 70.

C. Control Equipment: Complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6.

D. Motor Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, within installed environment, with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1.

E. Remote-Control Stations: Two single-key-operated, constant-pressure control stations located remotely from each other on opposite sides and opposite ends of partition run. Wire in series to require simultaneous activation of both key stations to operate partition. Each three-position control station labeled "Open," "Close," and "Off." Provide two keys per station.

F. Obstruction-Detection Devices: Provide each motorized operable panel partition with automatic safety sensor that causes operator to immediately stop and reverse direction.

G. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop operable panel partition at fully extended and fully stacked positions.

H. Emergency Release Mechanism: Quick disconnect-release of electric-motor drive system, permitting manual operation in event of operating failure.

2.7 ACCESSORIES

A. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.

B. Electric Interlock: Provide each motorized operable panel partition with electric interlocks at locations indicated, to prevent operation of operable panel partition under the following conditions:

1. On storage pocket door, to prevent operation if door is not in fully open position.

C. On partitions at location of convergence by another partition, to prevent operation if merging partitions are in place.

D. Work Surfaces: Quantities, placement, and size indicated.

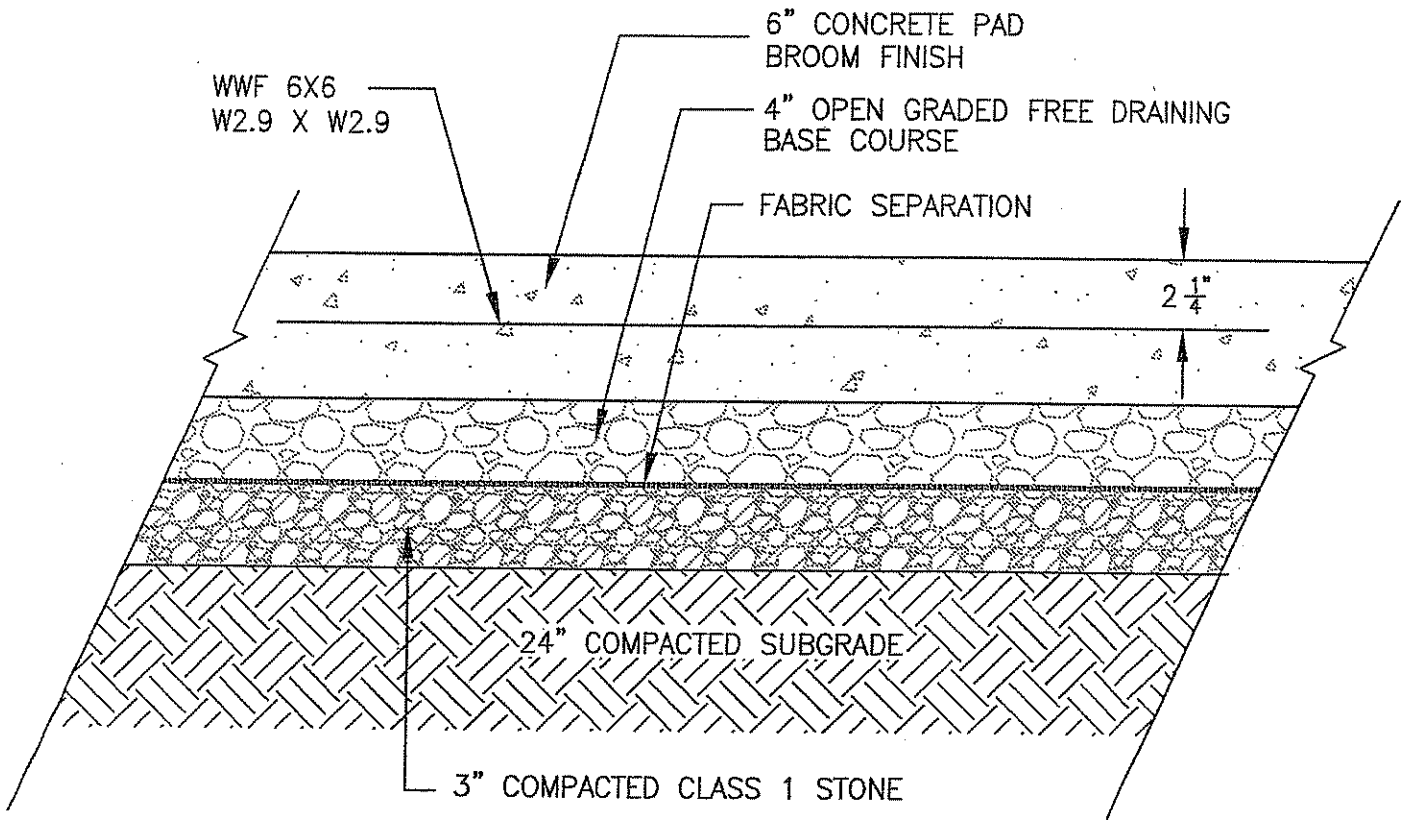
1. Surface: Porcelain steel marker/projection surface.
2. Surface Color: As selected by Architect from manufacturer's full range.
3. Size: As indicated on Drawings.
4. Trim: Aluminum slip-on or snap-on trim with no visible screws or exposed joints and with corners mitered to a neat, hairline joint.

G. Prepare test and inspection reports.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION 10651



10 / C-810 TYPICAL CONCRETE PAVEMENT SECTION

N.T.S.

ELKINS AFRC
RFI #5

CEI

Capitol Engineering, Inc.
1206 Kanawha Boulevard East
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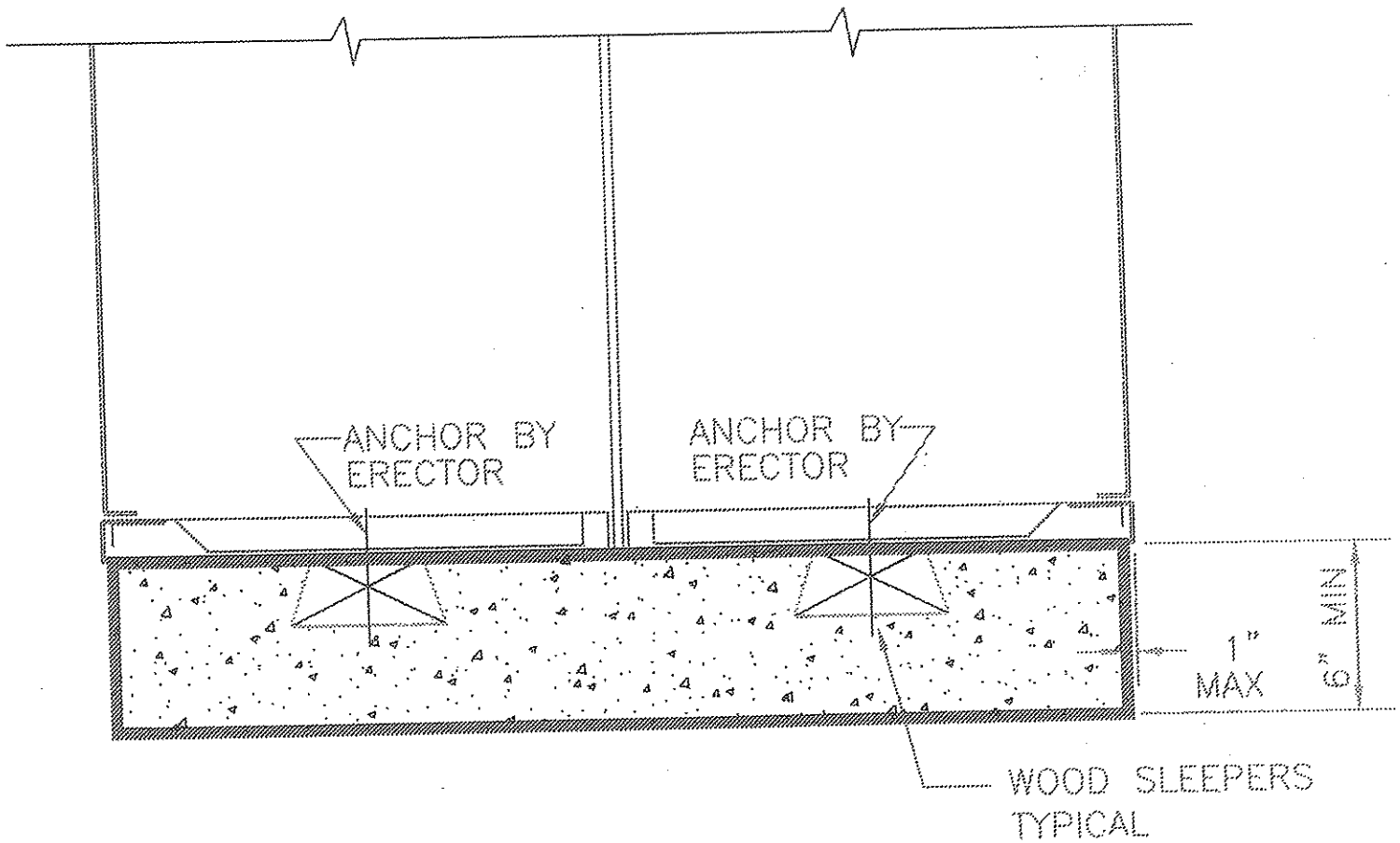
DRAWN BY: JMS

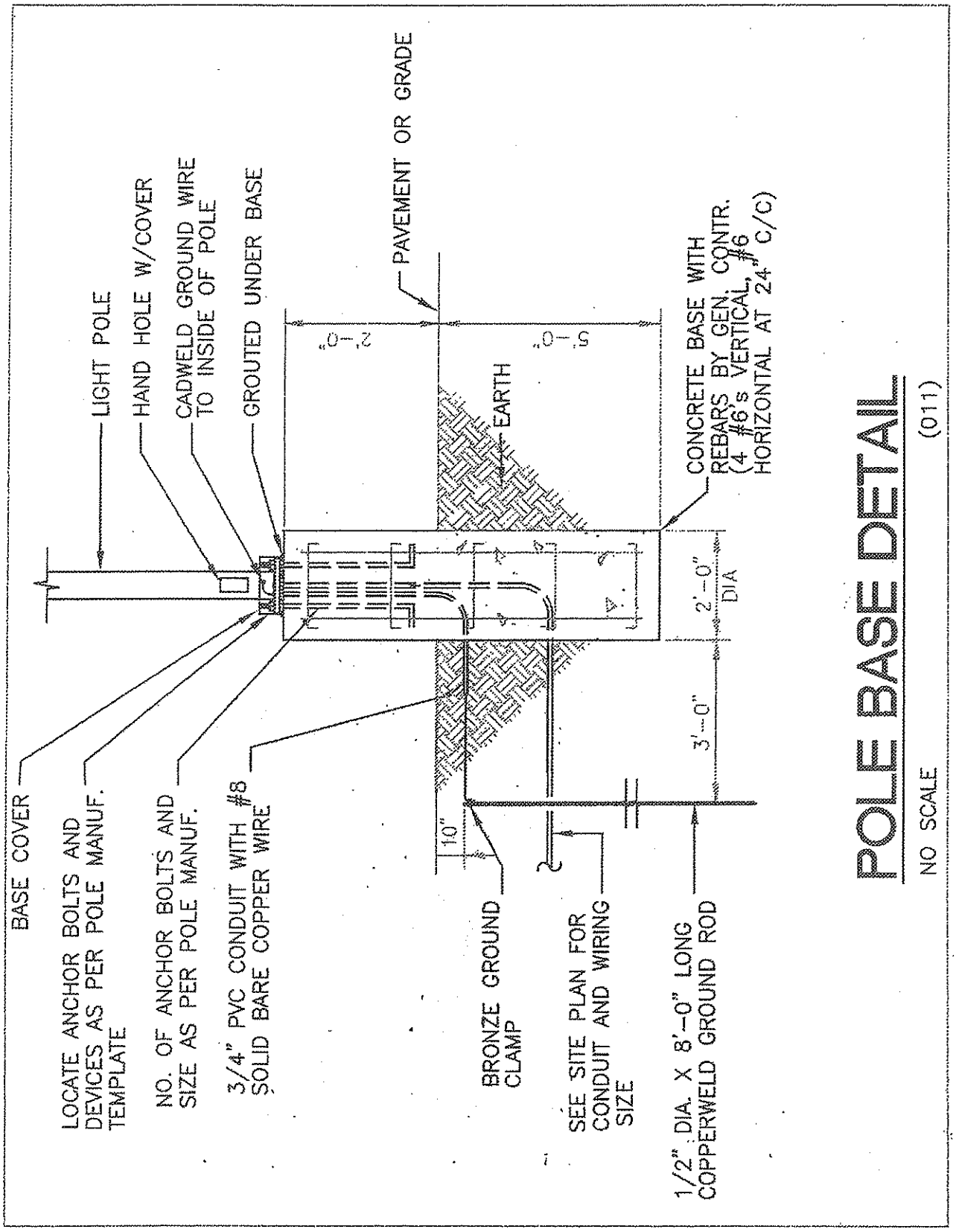
CHECKED BY: RMF

DATE: 11-16-09



LOCKER BASE DETAIL

CONCRETE BASE FOR BACK-TO-BACK LOCKERS



POLE BASE DETAIL

NO SCALE (011)