

Specifications

Early Head Start Facility City of Pocahontas

Pocahontas, Arkansas

Commission No. 14617



**BRACKETT
KRENNERICH**

architects

100 East Huntington, Suite D
Post Office Box 1655
Jonesboro, Arkansas 72403-1655
(870) 932-0571 • (870) 932-0975 fax
www.bkarchts.com

SECTION 00 0101

PROJECT TITLE

**EARLY HEAD START FACILITY
CITY OF POCAHONTAS
POCAHONTAS, ARKANSAS**

OWNER:

**CITY OF POCAHONTAS
410 NORTH MARR STREET
POCAHONTAS, ARKANSAS 72455**

OWNER'S REPRESENTATIVE:

**MAYOR KEITH SUTTON
(870) 892-3924**

ARCHITECT:

**BRACKETT KRENNERICH ARCHITECTS
100 E. HUNTINGTON, SUITE D
POST OFFICE BOX 1655
JONESBORO, ARKANSAS 72403-1655
(870) 932-0571**

CONSULTING ENGINEERS:

CIVIL:

**DeCLERK THROESCH ENGINEERING
114 PYBURN STREET
POCAHONTAS, ARKANSAS 72455
(870) 892-9412**

STRUCTURAL:

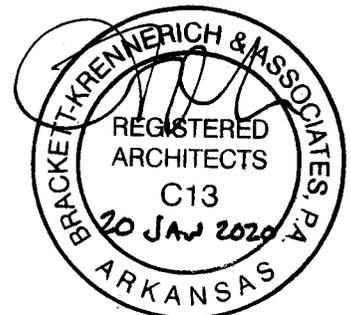
**SMITH ENGINEERING CO.
P.O. BOX 299
MARION, AR 72364
(870) 739-5533**

MECHANICAL / PLUMBING / ELECTRICAL:

**STRICKLAND ENGINEERING, LLC
113 W. MAIN STREET, SUITE 1
JACKSON, MISSOURI 63755
(573) 243-4080**

COMMISSION NUMBER: 14617

PROJECT DOCUMENTS DATE: APRIL 4, 2019



DIVISION 00

**PROCUREMENT
AND CONTRACTING REQUIREMENTS**

SECTION 00 0110

TABLE OF CONTENTS

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

00 0101	PROJECT TITLE	1
00 0110	TABLE OF CONTENTS	4
00 0115	LIST OF DRAWING SHEETS	2
00 1113	INVITATION TO BID	1
00 2100	INSTRUCTIONS TO BIDDERS	16
00 3100	AVAILABLE PROJECT INFORMATION	118
00 4100	BID FORM	3
00 5200	AGREEMENT FORM	13
00 6000	PROJECT FORMS	11
00 7200	GENERAL CONDITIONS	52
00 7300	SUPPLEMENTARY CONDITIONS	24

DIVISION 01 – GENERAL REQUIREMENTS

01 1100	SUMMARY OF THE WORK	2
01 1115	ITEMS FURNISHED BY OWNER	1
01 2200	UNIT PRICES	2
01 2973	SCHEDULE OF VALUES	2
01 2976	PROGRESS PAYMENT PROCEDURES	1
01 3113	COORDINATION	1
01 3119	PROJECT MEETINGS	2
01 3216	CONSTRUCTION SCHEDULES	1
01 3223	SURVEY AND LAYOUT DATA	1
01 3323	SUBMITTALS	4
01 4000	QUALITY REQUIREMENTS	4
01 5000	TEMPORARY FACILITIES AND CONTROLS	2
01 5713	TEMPORARY EROSION AND SEDIMENT CONTROL	1
01 5719	ENVIRONMENT PROTECTION	2
01 6000	PRODUCT REQUIREMENTS	2
01 6300	PRODUCT OPTIONS AND SUBSTITUTIONS	4
01 7300	EXECUTION REQUIREMENTS	2
01 7329	CUTTING AND PATCHING	2
01 7400	CLEANING	2
01 7700	CLOSEOUT PROCEDURES	1
01 7800	CLOSE-OUT SUBMITTALS	3
01 7839	PROJECT RECORD DOCUMENTS	1

DIVISION 03 - CONCRETE

03 3000	CAST-IN-PLACE CONCRETE	08
---------	------------------------------	----

DIVISION 04 - MASONRY

04 0511	MASONRY MORTARING AND GROUTING	3
04 2000	UNIT MASONRY	6

DIVISION 05 - METALS

05 5000	METAL FABRICATIONS	3
05 5001	METAL GATES	3

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 1000	ROUGH CARPENTRY	5
06 1001	FASTENERS AND ANCHORS	2
06 1636	WOOD PANEL PRODUCT SHEATHING	2
06 1723	PARALLEL STRAND LUMBER	2
06 1753	SHOP-FABRICATED WOOD TRUSSES	3
06 2000	FINISH CARPENTRY	3
06 4116	LAMINATE CLAD MILLWORK	4
06 4117	CABINET HARDWARE	2
06 6116	SOLID SURFACING FABRICATIONS	2

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 1310	ROOF UNDERLAYMENT MEMBRANE	2
07 1900	WATER REPELLENTS	2
07 2113	BOARD INSULATION	2
07 2116	BLANKET INSULATION	2
07 2501	WEATHER RESISTANT MEMBRANES	1
07 2510	BITUMINOUS VAPOR BARRIER	1
07 2600	VAPOR RETARDERS	2
07 3113	ASPHALT SHINGLES	2
07 4618	EXTERIOR METAL SOFFITS	2
07 4646	FIBER CEMENT SIDING	3
07 6200	SHEET METAL FLASHING AND TRIM	2
07 6500	FLEXIBLE FLASHING	2
07 7123	MANUFACTURED GUTTERS AND DOWNSPOUTS	2
07 7226	ROOF VENTILATORS	1
07 9005	JOINT SEALERS	3

DIVISION 08 – OPENINGS

08 1113	HOLLOW METAL FRAMES	3
08 1416	FLUSH WOOD DOORS	3
08 4313	ALUMINUM ENTRANCES	4
08 5113	ALUMINUM WINDOWS	4
08 7100	DOOR HARDWARE	17
08 8000	GLAZING	4

DIVISION 09 – FINISHES

09 2116	GYPSUM BOARD ASSEMBLIES	3
09 3000	TILING	3
09 5100	ACOUSTICAL CEILINGS	4
09 6500	RESILIENT FLOORING	3
09 6700	EPOXY FLOORING	3
09 9000	PAINTING AND COATING	5
09 9656	EPOXY COATINGS	2

DIVISION 10 – SPECIALTIES

10 1416	BRONZE PLAQUE	1
10 1419	CAST ALUMINUM LETTERS	1
10 1425	DOOR AND ROOM SIGNS	2
10 1453	HANDICAPPED SIGNS	1
10 2813	TOILET ACCESSORIES	3
10 4116	EMERGENCY KEY CABINETS	1
10 4400	FIRE PROTECTION SPECIALTIES	2

DIVISION 31 – EARTHWORK

31 1000	SITE CLEARING	2
31 2200	GRADING	2
31 2316	EXCAVATION	1
31 2316.13	TRENCHING	4
31 2323	FILL	4
31 3116	TERMITE CONTROL	2

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 1123	AGGREGATE BASE COURSES	3
32 1216	ASPHALT PAVING	3
32 1313	CONCRETE PAVING	4

32 1713	PARKING BUMPERS	1
32 1723.13	PAINTED PAVEMENT MARKINGS	2
32 9213	HYDROMULCHING	3
	END OF TABLE OF CONTENTS		

TABLE OF CONTENTS

DIVISION 22 - PLUMBING

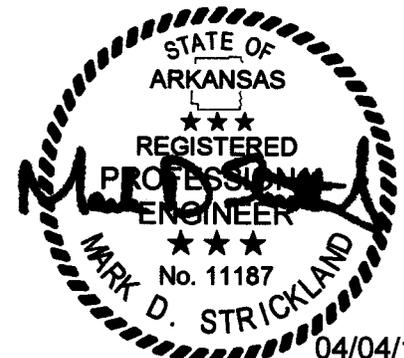
22 0200	PLUMBING GENERAL REQUIREMENTS
22 0519	METERS AND GAUGES FOR PLUMBING PIPING
22 0548	VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
22 0553	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 0719	PLUMBING PIPING INSULATION
22 1005	PLUMBING PIPING
22 1006	PLUMBING PIPING SPECIALTIES

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 0200	HVAC GENERAL REQUIREMENTS
23 0513	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
23 0548	VIBRATION AND SEISMIC CONTROLS FOR HVAC DUCTWORK PIPING AND EQUIPMENT
23 0553	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 0593	TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 0713	DUCT INSULATION
23 0719	HVAC PIPING INSULATION
23 0993	SEQUENCE OF OPERATIONS FOR HVAC CONTROLS
23 2300	REFRIGERANT PIPING
23 3100	HVAC DUCTS AND CASINGS
23 3300	AIR DUCT ACCESSORIES
23 3423	HVAC POWER VENTILATORS
23 3700	AIR OUTLETS AND INLETS
23 4000	HVAC AIR CLEANING DEVICES
23 7413	PACKAGED OUTDOOR CENTRAL-STATION AIR-HANDLING UNITS
23 8126.13	SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

DIVISION 26 - ELECTRICAL

26 0200	ELECTRICAL GENERAL REQUIREMENTS
26 0519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 0526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 0529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 0533.13	CONDUIT FOR ELECTRICAL SYSTEMS
26 0533.16	BOXES FOR ELECTRICAL SYSTEMS
26 0548	VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS
26 0553	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 0583	WIRING CONNECTIONS
26 0923	LIGHTING CONTROL DEVICES
26 2100	LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE
26 2416	PANELBOARDS
26 2726	WIRING DEVICES
26 2816.16	ENCLOSED SWITCHES



Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

26 2913 ENCLOSED CONTROLLERS
26 5100 INTERIOR LIGHTING
26 5600 EXTERIOR LIGHTING

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 4600 FIRE DETECTION AND ALARM

SECTION 00 0115
LIST OF DRAWING SHEETS

THE FOLLOWING DRAWINGS DATED APRIL 4, 2019 BEARING THE ARCHITECT'S COMMISSION NUMBER 14617 WITH THESE SPECIFICATIONS FORM THE CONTRACT DOCUMENTS.

GENERAL

COVER SHEET

CIVIL

C000 TOPOGRAPHIC SURVEY
C001 CIVIL SITE PLAN
C002 SITE GRADING PLAN, SITE UTILITIES, SITE DETAILS
C003 SITE LAYOUT PLAN
C004 SITE DETAILS
C005 SITE DETAILS

LIFE SAFETY

LS001 LIFE SAFETY PLAN

ARCHITECTURAL

A001 DOOR SCHEDULE, VISUAL DOOR TYPES, ALUMINUM FRAME SCHEDULE,
HOLLOW METAL FRAME SCHEDULE, WINDOW SCHEDULE, WOOD FRAME
SCHEDULE
A002 WINDOW DETAILS, ALUMINUM FRAME DETAILS
A003 FINISH FLOOR PLAN, FINISH SCHEDULE
A100 FLOOR PLAN
A101 ROOF PLAN, ROOF DETAILS
A102 ROOF DETAILS
A200 BUILDING ELEVATIONS
A201 BUILDING SECTIONS
A400 REFLECTED CEILING PLAN
A500 WALL SECTIONS
A501 WALL SECTIONS
A502 WALL SECTIONS
A503 WALL SECTIONS
A600 STANDARD MOUNTING HEIGHTS, ADA NOTES
A601 ENLARGED TOILET PLANS AND ELEVATIONS
A602 MILLWORK ELEVATIONS

STRUCTURAL

S100 FOUNDATION PLAN, FOUNDATION DETAILS
S200 FRAMING PLAN, FRAMING DETAILS

MECHANICAL

MPE1 SITE UTILITY PLAN, LIGHT POLE DETAIL
M100 FLOOR PLAN – MECHANICAL, ENLARGED MECHANICAL PLAN
M101 HVAC EQUIPMENT SCHEDULE, DETAILS
M102 AIR DEVICE SCHEDULE, HVAC DETAILS

PLUMBING

- P100 FLOOR PLAN – WASTE AND VENT PIPING
- P101 WASTE AND VENT PIPING RISER DIAGRAM, PLUMBING FIXTURE SCHEDULE,
FITTING/ACCESSORY PACKAGE SCHEDULE
- P200 FLOOR PLAN – SUPPLY PIPING, WATER SUPPLY PIPING SCHEDULE
- P201 SUPPLY PIPING RISER DIAGRAM, WATER SUPPLY RISER PIPING DIAGRAM,
WATER SERVICE CALCULATIONS
- P300 FLOOR PLAN – GAS PIPING, DETAILS

ELECTRICAL

- E100 FLOOR PLAN – POWER WIRING, ELECTRICAL SYMBOLS
- E101..... PANEL SCHEDULE, ELECTRICAL SERVICE RISER DIAGRAM, DETAILS
- E200 FLOOR PLAN – LIGHTING, ELECTRICAL ACCESSORY SCHEDULE, LIGHTING CONTROL
DETAIL
- E300 FLOOR PLAN – FIRE ALARM, FIRE ALARM RISER DIAGRAM

End of List of Drawings

**SECTION 00 1113
INVITATION TO BID**

Qualified Contractors are invited to bid on a contract for "**Early Head Start Facility, City of Pocahontas, Pocahontas, Arkansas**". The bids shall be on a lump sum basis.

The City of Pocahontas, hereinafter termed owner, will receive bids until **Tuesday, February 4, 2020 at 2:00 p.m.** Bids may be mailed or delivered in care of Mayor Keith Sutton, City of Pocahontas, 410 North Marr Street, Pocahontas, Arkansas 72455. Bids received after this time will not be accepted.

Bids will be publicly opened and read aloud at the stated time at the Mayor's Office, City of Pocahontas, 410 North Marr Street, Pocahontas, Arkansas, 72455.

The scope of work consists of a conventionally framed wood structure with shingle roof, fiber cement siding, and masonry wainscot. Building is approximately 5,000 sq. ft. with extended porch areas. Daycare includes site paving, walks, curb and other site improvements including utility extensions.

Plans, specifications, bid forms, and other contract documents may be examined at the office of the architect. While contract documents can be examined at the following plan rooms, bidders should use caution in doing so:

**Jonesboro Blueprint
222 Madison Street
Jonesboro, AR 72401
(870) 932-4349**

**Southern Reprographics
901 W. 7th Street
Little Rock, AR 72201
(501) 372-4011**

Obtaining contract documents through any source other than the Design Professional or their representative(s) is not advisable due to the risks of receiving incomplete or inaccurate information. Contract documents obtained through the Design Professional or their representative(s) are considered the official version and take precedence should any discrepancies occur. The official version of the complete set of the contract documents should be examined and are obtainable from Jonesboro Blueprint & Supply, 222 Madison St. Jonesboro, AR 72401, 870-932-4349 on behalf of Brackett-Krennerich and Associates, P.A., 100 E. Huntington, Suite D, Jonesboro, Arkansas. General contractors may obtain two (2) complete sets of bidding documents from Brackett-Krennerich and Associates upon deposit of **\$100.00** which is refundable, less postage/shipping costs, if applicable, to bona fide bidders upon return of documents in good condition within 3 days after bid date.

Additional sets of documents may be obtained for use by subcontractors and material suppliers upon receipt of **\$50.00** per set which is refundable less cost of reproduction (**50% refundable**), and less postage/shipping costs if applicable, upon return of documents in good condition within 3 days after the bid date. No partial sets will be issued.

Bid Security in the amount of five percent (5%) of the bid must accompany each bid in accordance with the Instructions to Bidders.

Bidders shall conform to the requirements of the Arkansas licensing laws and regulations for contractors, and shall be licensed before his bid is submitted.

The District encourages all small, minority, and women business enterprises submit bids for capital improvements. Encouragement is also made to all general contractors that in the event they subcontract portions of their work, consideration is given to the identified groups.

There will be a **Pre-Bid Conference** held at the site on **Tuesday, January 28, 2020**. The conference will start at exactly **2:00 p.m.** Prime contractors who arrive late or fail to attend this meeting may forfeit their bidding privilege. The owner reserves the right to waive this requirement and/or schedule additional meetings.

The owner reserves the right to reject any and all bids, or to waive any formalities.

Mayor Keith Sutton
City of Pocahontas
Pocahontas, Arkansas

**SECTION 00 2100
INSTRUCTIONS TO BIDDERS**

1.01 RECEIPT AND OPENING OF BIDS

- A. Owner: City of Pocahontas, 410 North Marr Street, Pocahontas, Arkansas 72455
- B. Bid Location: **City Hall, 410 North Marr Street, Pocahontas, AR.**
- C. Bid Date/Time: **Tuesday, February 4th, 2020 @ 2:00 p.m.**
- D. The owner reserves the right to reject any or all bids and to waive formalities.
- E. The owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities.
- F. Owner assumes no obligations to accept the lowest bid or any bid withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.
- G. Any bid received after the time and date specified shall not be considered.
- H. No bidder may withdraw a bid within 60 days after the actual date of the opening thereof.

1.02 PREPARATION OF BID

- A. Each bid must be submitted on the prescribed forms.
- B. All blank spaces for bid prices must be filled, in ink or typewritten.
- C. Bids must be signed in ink showing title or authority to bind bidder to a contract.
- D. Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, the name of the project and the contractor's license number as issued and approved by Arkansas State Licensing Board previous to bid date. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope as specified in the bid form.

1.03 PROPRIETARY INFORMATION

- A. All information submitted in response to this bid is public after the bid opening. The bidder should not include as a part of the response to the invitation to bid any information which the bidder believes to be a trade secret or otherwise privileged or confidential. If the bidder wishes to include such material with a bid, then the material should be supplied under separate cover and identified as confidential. The Owner does not warrant or agree to, but will endeavor to keep that information confidential. Contractor acknowledges that information in the possession of the City of Jonesboro may be subject to the provisions of the Arkansas Freedom of Information Act.

1.04 SEVERABILITY

- A. The finding or determination of any part or parts of the general instructions, terms and conditions is void, unenforceable, invalid or voidable shall result in only that part being stricken with the remainder to continue in full force and effect.

1.05 BIDDING DOCUMENTS

- A. Bidders may obtain complete sets of Contract Documents from the architect.
- B. Complete sets of Contract Documents must be used in preparing bids; neither Owner nor Design Professional assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents.
- C. Obtaining Contract Documents through any source other than the architect is not advisable due to the risks of receiving incomplete or inaccurate information, and the bidder runs the risk of basing bidder's proposal on such information.
- D. The documents obtained through the architect are considered the official version and take precedence if any discrepancies occur.

- E. The fact that documents used for bidding purposes are named "Contract Documents" does not diminish in any way the right of the owner to reject any and all bids and to waive any formality.

1.06 QUALIFICATION OF BIDDER

- A. The owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the owner all such information and date of same for this purpose as the owner may request.
- B. The owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein.
- C. Conditional bids will not be accepted.
- D. All bidders shall comply with the requirements of the Contractor's Licensing Law of the State of Arkansas, Arkansas Code Annotated § 17-25-101 et seq.
 - 1. **Note: All contractors must be licensed the day the project bids.**
- E. The company may be required, upon request, to prove to the satisfaction of the owner that they have the skill, experience, and the necessary facilities and financial resources to perform the contract in a satisfactory manner and within the required time.

1.07 ASSIGNMENTS

- A. Neither this contract nor any interest therein nor claim thereunder may or shall be assigned or transferred by the contractor except as expressly authorized in writing by the Owner.
- B. No contractor, subcontractor or agreement shall be made by the contractor with any other party for furnishing any of the product, work or services herein contracted without the written approval of the Owner.

1.08 CONFLICT OF INTEREST

- A. By submitting a bid, the contractor represents and warrants that no employee of the Owner is in any manner interested directly or indirectly in the bid or contract which may result from the bid or in any of the expected profits which might arise therefrom; further, that no attempt has been made to influence or gain favorable advantage by communicating directly or indirectly with any official of the Owner.
- B. It is understood that any action taken which might tend to degrade the integrity of the competitive bidding process will be considered as grounds for disqualification or a breach of this contract.

1.09 NON-COLLUSIVE AFFIDAVIT

- A. By submitting a bid, the company and the individual personally signing the bid represent and warrant that such bid is genuine and is neither collusive or made for or on behalf of any person not named, and that he has neither induced or solicited any other company to place a sham bid nor directly or indirectly caused another company to refrain from or be unable to present a bid.

1.10 BID SECURITY

- A. Each bid proposal shall include with it a bid security in the amount of 5% of the total bid offered.
- B. The bidder will be required to submit a bidder's deposit which includes enclosing a cashier's check payable to the order of the owner drawn upon and certified by a bank or trust company doing business in Arkansas or by a corporate bid bond in an amount equal to 5% of the bid.
- C. Such bid bonds will be returned to all except the three lowest bidders within three days after the opening of the bids, and the remaining bid bonds will be returned promptly after the owner and the accepted bidder have executed the contract, or if no bids were accepted, upon demand of the bidder at the time specified, so long as he has not been notified of the acceptance of his bid.

1.11 LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

- A. The successful bidder, upon his failure to execute the contract and bonds required within ten (10) days after he has received notice of the acceptance of his bid, shall forfeit to the owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

1.12 TIME OF COMPLETION / LIQUIDATED DAMAGES

- A. Bidder must agree to commence work within ten (10) days of the date of the "Notice to Proceed" of the owner and to **fully complete the project within 350 calendar days from the Notice To Proceed date.**
- B. The contractor will proceed with the work at such rate of progress to insure full completion within the contract time. It is expressly understood and agreed, by and between the contractor and the owner, that the contract time for completion of the work described in the contract is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.
- C. If the contractor shall fail to complete the work within the contract time, of extension of time granted by the owner, then the contractor will pay to the owner the amount of **One Hundred Fifty Dollars (\$150.00)** for liquidated damages for each calendar day that the contractor shall be in default after the time stipulated in the contract documents for each phase of the work.
- D. Time extensions will be granted to the contractor only when the delay in completion of the work is due to the following and the contractor has promptly given written notice of such delay to the owner or architect.
 - 1. To any preference, priority or allocation order duly issued by the owner.
 - 2. To unforeseeable causes beyond the control and without the fault or negligence of the contractor, including, but not restricted to, acts of God, or the public enemy, acts of the owner, acts of another contractor in the performance of a contract with the owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and
 - 3. To any delays of subcontractors occasioned by any of the causes specified in 1. and 2. above.

1.13 CONDITIONS OF WORK/EXAMINATION OF SITE OF WORK

- A. Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor therein.
- B. Bidder shall examine the Contract Documents and visit the project site of work.
- C. Bidder shall become familiar with all existing conditions and limitations under which the work is to be performed, and shall base bid on items necessary to perform the work as set forth in the contract documents.
- D. No allowance will be made to Bidder because of lack of such examination or knowledge.
- E. The submission of a bid shall be construed as conclusive evidence that the Bidder has made such examination.

1.14 PRE-BID CONFERENCE

- A. A Pre-Bid Conference is to be held on **Tuesday, January 28, 2020** at the site.
- B. The meeting will begin precisely at **2:00 p.m.**
- C. Prime contractors who arrive late or fail to attend this meeting may forfeit their bidding privilege.
- D. The owner reserves the right to waive this requirement and/or schedule additional meetings.

1.15 ADDENDA AND INTERPRETATIONS

- A. No interpretation of the meaning of the plans, specifications, or other pre-bid documents will be made to any bidder orally.
- B. Every request for such interpretation should be in writing addressed to: Brackett Krennerich and Associates, P.A., Architects, 100 E. Huntington, Suite D, Post Office Box 1655, Jonesboro,

Arkansas 72401/72403 and to be given consideration must be received at least three (3) days prior to the date fixed for the opening of bids.

- C. All such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed and faxed to all prospective bidders (at the respective addresses and fax numbers furnished for such purposes), not later than three days prior to the date fixed for the opening of bids.
- D. All addenda so issued shall become part of the contract documents.

1.16 SECURITY FOR FAITHFUL PERFORMANCE

- A. Simultaneously with his delivery of the executed contract, the contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under the contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein.
- B. The surety on such bond or bonds shall be a surety company duly authorized to do business in the State of Arkansas and satisfactory to the owner.

1.17 POWER OF ATTORNEY

- A. Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their Power of Attorney.

1.18 TAXES, LAWS, AND REGULATIONS

- A. The bidders' attention is directed to the fact that all applicable sales tax, social security taxes, state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout; and they will be deemed to be included in the contract, inspection fees, licenses, and building permits where required.
- B. The contractor shall pay for all such taxes and fees required for this project.
- C. Labor. Contractors employed upon the work will be required to conform to the labor laws of the State of Arkansas and various acts amendatory and supplementary thereto, and to all laws, regulations, and legal requirements applicable thereto.
- D. State licensing laws for contractors.

1.19 DISCRIMINATION

- A. Bidder shall not discriminate against any employee, applicant for employment, or subcontractor as provided by law.
- B. Bidder shall be responsible for ensuring that all subcontractors comply with federal and state laws and regulations related to discrimination.
- C. Upon final determination by a court or administrative body having proper jurisdiction that the Bidder has violated state or federal laws or regulations, the Owner may impose a range for appropriate remedies up to and including termination of the contract

1.20 SUBMISSION OF POST-BID INFORMATION

- A. The selected bidder shall within seven (7) days after "Notice of Intent of Award of Contract" submit the following:
 - 1. A statement of costs of each major item of work included in his bid.
 - 2. A designation of the work to be performed by the bidder with his own forces.
 - 3. A list of names of subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design), proposed for the principal portions of the work, including suppliers of major equipment. Prior to the award of the contract, the architect will notify the bidder in writing if either the owner or the architect, after due investigation, has reasonable and substantial objection to any person or organization on such list. If the owner refuses in writing to accept such person or organization, the bidder may, at his option withdraw his bid without forfeiture of bid security, notwithstanding anything to the contrary contained in Paragraph 1.07 "Liquidated

Damages for Failure to Enter into Contract." Subcontractors and other persons and organizations proposed by the bidder and accepted by the owner and the architect must be used on the work for which they were proposed and accepted and shall not be changed except with the written approval of the owner and the architect.

- a. Note: Subcontractors referred to in above paragraph are those subcontractors other than those listed on bid form. Subcontractors listed on the bid form must be used for work listed in compliance with Arkansas Statutes, Arkansas Code Annotated § 22-9-204.
- B. Upon completion of the project, List of Subcontractors, AIA Document G-805, shall be completed to include subcontractors and suppliers of major equipment, complete with names and addresses, along with telephone numbers.

1.21 SUBCONTRACTORS

- A. Arkansas Code Annotated § 22-9-204, requires that in each instance where the total bid submitted by the licensed prime contractor exceeds \$50,000.00, all prime contractors, as a condition to perform work for and in the State of Arkansas shall use no other subcontractors when the subcontractors' portion of the project is \$50,000 or more, except those qualified and licensed by the Contractors Licensing Board in Mechanical (HVAC-R), Plumbing, Electrical and Roofing.
- B. For those bids where the listed work is \$50,000 or more, the prime contractor must make a definite decision as to which subcontractor he intends to use. The prime contractor shall place the names, licenses of each subcontractor and indicate on the space provided on the Form of Proposal the amount of the listed work is \$50,000 or more. The prime contractor may use his own forces to do the listed work, however if the listed work is \$50,000 or more, the prime contractor must be qualified and licensed by the Arkansas Contractors Licensing Board to perform the listed work. Once the prime contractor determines his own forces will be used, he shall place his name, license number and indicate on the space provided on the Form of Proposal the amount of listed work is \$50,000 or more.
- C. In the event, the amount of the listed work is below \$50,000, the Prime Contractor shall place the names of the person or firm performing the work and indicate on the space provided on the Form of Proposal the listed work is under \$50,000.
- D. Failure to fill the form correctly shall cause the bid to be declared non-responsive and the bid will not receive consideration.
- E. In the event that one (1) or more of the subcontractors named by the prime contractor in his successful bid thereafter refuse to perform his contract or offered contract, the prime contractor may substitute another subcontractor, after having obtained prior approval from the architect or engineer, and the owner.
- F. The prime contractor shall submit written evidence that the substituted contractor is costing the same amount of money or less and, if costing less, that his savings will be deducted from the total contract of the prime contractor and rebated to the owner.
- G. It shall be mandatory that any subcontractors listed in (A) – (D) on the form of proposal by the Prime Contractor be awarded a contract under Arkansas Code Annotated § 22-9-204.
- H. Subcontractors List:
 1. Mechanical H.V.A.C.
 2. Plumbing
 3. Electrical (cannot be included in the Mechanical Bid)
 4. Roofing and Sheet metal
- I. Electrical License Requirement
 1. No person shall perform electrical work on the contract without processing an Arkansas State Master or Journeyman License from the Arkansas State Electrical Examiners Board. All electrical work and apprentice electricians shall be supervised by a Master or Journeyman Electrician on a one to one ratio.

2. All electricians shall have a copy of their license with them and shall be required to show it to an appropriate inspector upon request.

1.22 STANDARDS OF QUALITY

- A. Reference in the specifications to any article, device, product, material, fixture, etc., by name, manufacturer, or catalog numbers, shall be interpreted as establishing a standard of quality and shall not be considered or construed as limiting competition.
- B. The contractor may use any article, device, product, material, fixture, etc., which, in the judgment of the architect, and with written approval, is equal to that specified.

1.23 SUBSTITUTION APPROVAL

- A. Request for approval and/or substitutions prior to the time/date for receiving bids on this project shall be submitted to the architect, in written form, only through general contractors or prime contractors who propose to submit bids.
- B. Submission of each request shall be in accord with Section 01 6300 – Product Options and Substitutions.
- C. Such requests shall include a complete description of the proposed substitution with drawings, cuts, performance and test data, or information necessary for a complete evaluation.

1.24 METHOD OF BIDDING

- A. Base Bid:
 1. Base bid to be a lump sum bid including all construction work required to complete the total project in accordance with the requirements of the contract documents and shall cover all new construction including Site Work, Mechanical H.V.A.C. Work, Plumbing Work, Electrical Work, Roofing and Sheet metal Work.

1.25 EVALUATION AND CONSIDERATION OF BIDS

- A. It is the intent of the Owner to award a contract to the lowest responsive, qualified Bidder provided the bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available.
- B. The Owner shall have the right to waive formalities in a bid received and to accept the bid which, in the Owner's judgment, is in the Owner's own best interests.
- C. The Owner shall have the right to accept any bid for a period not to exceed 30 days.
- D. Bids will be considered on the basis of price, however, the Owner reserves the right to establish the award criteria and to reject any or all and to award the Contract to the firm who, in the judgment of the Owner, is the best qualified to perform the work.

1.26 TIE BIDS

- A. If two or more sealed bids are equal in amount, meet specifications, and are the lowest received at the bid opening, then the apparent low bidder will be determined by lot (placing the name of the tie bidders into a container and drawing one name).
- B. The drawing will be done by the owner or another person so designated by the owner in the presence of a witness and tie bidders. The witness shall be an employee of the Owner.
- C. Documentation of the drawing must be included on the bid tabulation and signed by those present.
- D. Nothing in the above and foregoing will diminish the owner's reserved right to reject any and all bids and to waive formalities.

1.27 MODIFICATION, WITHDRAWAL AND SCRIVENER'S ERROR

- A. Modification and Withdrawal. Bidder may withdraw bid at any time before bid opening and may resubmit up to the date and time designated for receipt of bids. No bid may be withdrawn or modified after time has been called for the bid opening. Oral modifications to bids will not be considered. Bidder may submit written modifications to bid in writing, or by facsimile at any time prior to the expiration of the bidding time and date and shall so word the modification(s) as

to not reveal the amount of the original bid. Facsimile modifications shall require written confirmation over the Bidder's signature within 24 hours after bid opening.

- B. **Scrivener's Error.** Pursuant to Ark. Code Ann. § 19-4-1405 (e), bidders may request in writing, to be relieved of their bid any time after the bid opening, but no later than 72 hours after receiving the intent to award, excluding Saturdays, Sundays and holidays. Scrivener's error is an error in the calculation of the bid which can be documented by clear and convincing written evidence and which can be clearly shown by objective evidence drawn from inspection of the original work papers, documents, or materials used in preparation of the bid sought to be withdrawn; and the bid was submitted in good faith and the mistake was due to a calculation or clerical error, an inadvertent omission, or typographical error as opposed to an error in judgment.
- C. Failure to make a timely request constitutes a waiver by the bidder of the bidder's right to claim that the mistake in his or her bid was a scrivener's error.

1.28 DISQUALIFICATION OF BIDDERS.

- A. The Owner shall have the right to disqualify bids (before or after opening), which includes but is not limited to, evidence of collusion with intent to defraud or other illegal practices upon the part of the Bidder, to reject a bid not accompanied by the required bid security or by other data required by the Contract Documents, or to reject a Bid which is in any way incomplete or irregular.
- B. The Owner may reject any and all bids and may reject a bid of any party who has failed to perform, been unfaithful and/or delinquent in any former relationship with the Owner. The Owner reserves the right to waive any irregularities or formalities in any solicitation or bid response. The Owner shall be the sole judge as to which bid is best and, in determining that fact, may consider the contractor's business integrity, financial resources, experience, facilities and/or capacity for performing the work.

1.29 EXECUTION OF CONTRACT.

- A. The successful Bidder shall be prepared, if so required by the Owner, to present evidence of experience, qualifications, and financial ability to carry out the terms of the Contract.
- B. The successful Bidder will be required to execute an Agreement with the Owner on a form identical to the Agreement Form included with the Contract Documents and the Performance and Payment Bond and Certification of Insurance and a copy of the policies showing all endorsement, exclusions within 10 days after receipt of the Intent to Award. Failure of the Bidder to do so may result in the Bidder being rejected and could result in disqualification and forfeiture of bid bond. The owner's notice to proceed shall not be issued until the insurance policies have been reviewed and approved by the owner.
- C. The successful Bidder will be required to furnish Owner with proof of insurance, as prescribed by the General Conditions and Supplementary General Conditions.

1.30 RESERVATIONS

- A. The invitation to bid does not commit the Owner to award a contract, to pay any costs incurred in the preparation of a bid in response to this invitation, or to procure or contract for services or supplies. The Owner reserves the right to accept, or reject, in part or its entirety, any bid received as a result of this invitation, if it is in the best interest of the Owner to do so.

END OF SECTION

AIA[®] Document A701[™] – 1997

Instructions to Bidders

for the following PROJECT:

(Name and location or address)

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

THE OWNER:

(Name, legal status and address)

City of Pocahontas
410 North Marr Street
Pocahontas, Arkansas

THE ARCHITECT:

(Name, legal status and address)

Brackett Krennerich Architects
100 E. Huntington Ave, Suite D
Jonesboro, Arkansas 72401

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

- 1 DEFINITIONS**
- 2 BIDDER'S REPRESENTATIONS**
- 3 BIDDING DOCUMENTS**
- 4 BIDDING PROCEDURES**
- 5 CONSIDERATION OF BIDS**
- 6 POST-BID INFORMATION**
- 7 PERFORMANCE BOND AND PAYMENT BOND**
- 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

§ 3.3 SUBSTITUTIONS

§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the

signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBMITTALS

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1)

withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

ATTACHMENT TO AIA DOCUMENT A701-1997, *Instructions to Bidders*

The provisions of this Attachment shall delete, modify and supplement the provisions contained in the "*Instructions to Bidders*," AIA Document A701-1997 Edition. The provisions contained in this Attachment will supersede any conflicting provisions of the AIA Document. The term "Agency," as used in this Attachment, shall mean the United States of America, acting through the United States Department of Agriculture.

ARTICLE 2, BIDDER'S REPRESENTATIONS

2.1 Add the following subparagraph to paragraph 2.1:

2.1.5 This Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid, with any other Bidder or with any competitor.

ARTICLE 4, BIDDING PROCEDURES

4.1.1 Add the following sentence to subparagraph 4.1.1:

Only one copy of the Bid is to be submitted.

4.2.1 Delete subparagraph 4.2.1 and substitute the following:

4.2.1 Each Bid must be accompanied by a Bid Bond payable to the Owner for five percent of the total amount of the Bid.

4.2.2 Delete Subparagraph 4.2.2 and substitute the following:

4.2.2 The Bid Bond shall be written on a form identical to that included in the Bidding Documents, and the attorney-in-fact who executes the Bid Bond on behalf of the surety shall affix to the Bid Bond a certified and current copy of the power of attorney.

4.2.3 Add the words "payment and performance" before the word "bonds"; and add the following to subparagraph 4.2.3:

As soon as the Bid prices have been compared, the Owner will return the Bid Bonds of all except the three lowest responsible Bidders. When the Agreement is executed, the Bid Bonds of the two remaining unsuccessful Bidders will be returned.

4.2 Add the following subparagraph to paragraph 4.2:

4.2.4 If a Bidder refuses to execute the Agreement or obtain the Performance and Payment Bonds within the agreed time, the Owner may consider the Bidder in default, in which case the Bid Bond accompanying the Bid shall become the property of the Owner.

4.3 Add the following subparagraphs to paragraph 4.3:

4.3.5 All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project, shall apply to the Contract throughout.

4.3.6 The Bidder agrees to abide by the requirements of Executive Order 11246, specifically including the provisions of the Equal Opportunity Clause and the Standard Federal Equal Employment Construction Contract Specifications set forth in the Supplementary Conditions.

4.3.7 The Bidder agrees to abide by the requirements of section 319 of Public Law 101-121, which pertains to lobbying activities and applies to recipients of contracts or subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. Each Bid shall be accompanied by a completed lobbying certification form identical to that included in the Bidding Documents.

4.3.8 The Bidder agrees to abide by the requirements under 7 C.F.R. part 3017, which pertains to the debarment or suspension of a person from participating in a Federal program or activity. Each Bid exceeding \$25,000 shall be accompanied by a relevant completed certification form identical to that included in the Bidding Documents.

4.4.1 Delete subparagraph 4.4.1 and substitute the following:

4.4.1 No Bidder may withdraw, modify or cancel a Bid within 60 calendar days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder, and the concurrence of the Agency.

4.4.4 Delete the words ", if required," from Subparagraph 4.4.4.

ARTICLE 5, CONSIDERATION OF BIDS

5.3.2 Delete subparagraph 5.3.2 and substitute the following:

5.3.2 The Owner shall have the right to accept Alternates in the sequence or combinations listed and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates accepted.

ARTICLE 7, PERFORMANCE BOND AND PAYMENT BOND

7.1.1 Delete subparagraph 7.1.1 and substitute the following:

7.1.1 Prior to execution of the Contract, the Bidder shall furnish Bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Both Bonds shall be separately written, each in the amount of the Contract Sum. The cost shall be included in the Bid.

7.1.2 Delete subparagraph 7.1.2 and substitute the following:

7.1.2 Surety companies executing Bonds must hold a certificate of authority as a acceptable surety on Federal Bonds as listed in Treasury Circular 570, as amended, and be authorized to transact business in the State where the Project is located.

7.1.3 Delete subparagraph 7.1.3.

7.2.1 Delete subparagraph 7.2.1 and substitute the following:

7.2.1 The Bidder to whom the Contract is awarded will be required to execute the Agreement and obtain Performance and Payment Bonds within ten (10) calendar days from the date when the Notice of Award is delivered to the Bidder. The Notice shall be accompanied by the necessary Agreement and Bond forms.

7.2.2 Delete subparagraph 7.2.2 and substitute the following:

7.2.2 The Bonds shall be written on forms identical to those included in the Bidding Documents.

(Note: Any additional provisions that are necessary to remain effective after execution of the Contract for Construction will be inserted here and continue in the same format.)

o0o

SECTION 00 3100
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

EXISTING REPORTS AND SURVEYS

1.01 TOPOGRAPHIC SURVEY

- A. A copy of a topographic survey with respect to the project site is included in the drawings.
 - 1. Title: Topographic Survey;
 - 2. Date: April 4, 2019
 - 3. Prepared by: DeClerk-Throesch Engineering – Land Surveying, 114 Pyburn Street, Pocahontas, Arkansas 72455
- B. This survey identifies grade elevations prepared primarily for the use of the Architect in establishing new grades and identifying natural water shed.

1.02 SUBSURFACE INVESTIGATION REPORT

- A. A copy of a geotechnical report with respect to the building site is included with this document at the end of this section:
 - 1. Title: Report of Geotechnical Exploration
 - 2. Date: May 4, 2018
 - 3. Prepared by: MTA Engineers, P.O. Box 23715 Little Rock, AR 72221
- B. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Brackett Krennerich Architects and structural engineer.
- C. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.
- D. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Sum accruing to the owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**ARKANSAS COMMUNITY AND ECONOMIC
DEVELOPMENT PROGRAM (ACEDP)**

**ACEDP SAMPLE BID PACKAGE
(For General Contractors)**

ARKANSAS
A natural for business

**Arkansas Economic Development Commission
Grants Division
900 W. Capitol Ave., Suite 400
Little Rock, Arkansas 72201
Telephone 501-682-7682**

The Economic Development Commission does not discriminate on the basis of Race, Color, National Origin, Sex, Age, Religion or Disability; and provides upon request, reasonable accommodation including auxiliary aids and services necessary to afford an individual with a disability an equal opportunity to participate in all programs and activities.

**Sample Bid Package for ACEDP Funded Projects
Table of Contents**

Name of Document	Page
A. Advertisement for Bids	4
B. Instruction to Bidders	5
C. Bid for Unit Price “Line-Item” Contract	10
D. Bid for Lump Sum Contract	13
E. Certification of Bidder Regarding Equal Employment Opportunity	16
F. Contractor Section 3 Certification	17
G. Estimated Project Workforce Breakdown	18
H. Contract and General Conditions	19
I. Bonding and Insurance Requirements	23
J. Bid Bond	26
K. Arkansas Statutory Payment and Performance Bond	28
L. Certificate of Owner’s Attorney	30
M. General Conditions of the Contract	31
N. Supplemental Conditions of the Contract	44

O.	Wage Determination Preface Sheet	45
P.	Architect's Certification of Compliance with Minimum Standards for Access by Handicapped	46
Q.	Regulatory Requirements	47
R.	Enumeration of Plans, Specifications and Addenda	69
S.	Technical Specifications of the Contract	72
T.	ACEDP Project Sign Specification	73
U.	Arkansas Energy Code (Form 121 and 122)	74
V.	Disclosure Required by Executive Order 98004 (Form 123)	76
W.	Section 3 Business Status Certification	79

Attachment 1A
Sample Bid Package for ACEDP Funded Projects
Advertisement for Bids

Date: _____

_____ (City/County)
_____ Project

ACEDP Grant #790-0 _____

Sealed bids from licensed contractors for construction of _____
_____ (Describe type of construction)

_____, Arkansas, will be received by _____

_____ until _____ (Time) _____ (Date) and then at
said location publicly opened and read aloud.

The scope of work consists of _____ construction
to Bidders, ACEDP grant requirements, Bid and Contract Forms, Plans, Specifications,
and other contract documents may be examined and obtained (\$ _____ cost per
set obtained) at _____.

The owner reserves the right to waive any informalities or to reject any or all bids. Bidders may not withdraw their bids within 30 days after the date of bid opening and must provide bid bonds as required. All bidding processes shall be in accordance with State law.

To request bidding information or obtain further information contact:

(Grantee's Signatory Agent) _____

(Name of City or County) _____

Attachment 1B
Sample Bid Package for ACEDP Funded Projects
Instruction to Bidders

The following information is specific to prospective bidders of ACEDP-funded construction projects:

1. **Receipt and Opening of Bids**

The _____ (herein identified as "Owner"), invites bids on the forms attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the office of _____ until _____ o'clock a.m. /p.m., _____ CST _____ (Date), and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed _____ to _____ at _____ and designated as Bid for _____.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or scheduled time for bid opening or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of bid opening.

2. **Preparation of Bid**

Each bid must be submitted on the prescribed form **and must be accompanied by completed Certification of Bidder Regarding Equal Employment Opportunity and Contractor Section 3 Certification forms**. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form. Identification of subcontractors must be per State law.

3. **Facsimile/Telegraphic Modification**

Any bidder may modify his bid by facsimile/telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the Owner prior to closing time, and, provided further, the Owner is satisfied that a written confirmation of the facsimile/telegraphic modification over the signature of the bidder was mailed prior to closing time. The communication should not reveal the bid price but

should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received within two days after closing time, no consideration will be given to the facsimile/telegraphic modification.

4. **Method of Bidding**

The Owner invites the following bid(s):

5. **Qualifications of Bidder**

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids shall not be accepted.

6. **Bid Security**

Each bid must be accompanied by a certified check from the bidder, or a bid bond prepared on the form of the bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company, licensed in the State of Arkansas, approved by the Owner, in the amount of 5 percent of the bid. Such check or bid bond will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within 30 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

7. **Liquidated Damages for Failure to Enter into Contract**

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received Notice of Award shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

8. **Time of Completion and Liquidated Damages**

The bidder must agree to commence work on or before a date to be specified in a written Notice to Proceed issued by the Owner and to fully complete the project within _____ consecutive calendar days thereafter. The bidder must agree also to pay as liquidated damages, the sum of \$ _____ for each consecutive calendar day thereafter.

9. **Conditions of Work**

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible, the contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

10. **Addenda and Interpretations**

No interpretation of the meaning of the plans, specifications, drawings and other contract documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to _____ at _____ and, to be given consideration, must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the contract documents which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

11. **Security for Faithful Performance**

In accordance with the Notice to Proceed, the contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bonds shall be a duly authorized surety company, licensed in the State of Arkansas, and satisfactory to the Owner.

12. **Power of Attorney**

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and dated copy of their power of attorney.

13. **Notice of Special Conditions**

Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

- Bonding and Insurance Requirements
- General Conditions of the Contract
- Regulatory Requirements
- Wage Rates

14. **Laws and Regulations**

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

15. **Method of Award-Lowest Qualified Bidder**

If, at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates (if applicable) applied in the numerical order specified by the contract documents, as produces a net amount within the available funds.

16. **Obligation of Bidder**

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of his bid.

17. **Safety Standards and Accident Prevention**

With respect to all work performed under this contract, the contractor shall

- Comply with the safety standards provisions of applicable laws, building and construction codes and the Manual of Accident Prevention in Construction: published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596 and the requirement of Title 29 of the Code of Federal Regulations, Section 1518, as published in the Federal Register, Volume 36, No. 75, Saturday, April 17, 1971), and specifically OSHA's Standard for Excavation and Trench Safety Systems, 29 CFR Part 1926, Subpart P.
- Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.

- Maintain at his office or other conspicuous place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site.

For Contracts with Excavation in Excess of 5 Feet

- A separate lump sum bid item must be included for Excavation/Trench Safety System (for excavation in excess of 5'). Bidder is required to complete this pay item in accordance with Act 291 of the Arkansas 79th General Assembly.
- In the event a bidder fails to complete this pay item, the Owner shall declare that the bid fails to comply fully with the provisions of the specifications and bid documents and will be considered invalid as a nonresponsive bid. Payment for the lump sum bid item for Excavation/Trench Safety System will be paid at the completion of the contract. No partial payments will be allowed thereunder.

Attachment 1C
Sample Bid Package for ACEDP Funded Projects
Bid for Unit Price “Line-Item” Contract

Required for all water, wastewater projects.

_____ (City/County), Arkansas
 _____ Type of Project
 _____ Location of Project
 Grant # 790-0 _____ ACEDP Project Number

As bidder, _____ (Insert name of corporation, partnership or individual), in accordance with your invitation for bids for the construction of the above-identified project, having examined all contract documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices as stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

The bidder agrees to perform all work identified above for the following unit prices:

Item Number	Estimated Quantity	Description	Unit Price Each*	Total*
1.				
2.				
3.				
4.				
5.				
6.				
7.				

* The unit prices and total price must be specified in both words and figures, e.g., \$100.00, one-hundred dollars. In case of discrepancy, the amount shown in words will govern.

Item Number	Estimated Quantity	Description	Unit Price Each*	Total*
8.				
9.				
10.				
11.				
12.				
13.				

NOTE: The number of line items above is for illustrative purposes only. The number of line items may be larger or smaller depending upon the complexity of the project.

14. Excavation/Trench Safety (See General Conditions of Contract)

\$ _____

TOTAL BID \$ _____

The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the complete project.

Deductive Alternatives

Deductive alternatives are **required for all projects.**

Deductive Alternate No 1:

Deduct the sum of: _____ " _____ "

\$ _____

Total Base Bid minus Deductive Alternate No. 1

\$ _____

Deductive Alternate No. 2:

Deduct the sum of: _____ " _____ "

\$ _____

Total Base Bid minus Deductive Alternatives No. 1 and No. 2

\$ _____

Note: Continue the same process as above for all additional deductive alternatives.

The bidder hereby agrees to commence work under this contract within 10 days after receiving a Notice to Proceed from the Grantee and to fully complete the project within _____ consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of \$ _____ for each consecutive calendar day thereafter.

The bidder acknowledges receipt of the following addendum:

The bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the bid opening.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or bonds as required by the General Conditions. The bid security attached in the sum of \$ _____ is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

By: _____
(Signature)

By: _____
(Signature)

Company DUNS Number

(Please Print Name of Owner/Contractor)

Individual/Company Tax ID Number

(Seal - if bid is by a corporation)

(Title)

(Business Address and Zip Code)

(Date)

Attachment 1D
Sample Bid Package for ACEDP Funded Projects
Bid for Lump-Sum Contract

_____ (City/County), Arkansas
_____ (Type of project)
_____ (Location of project)
_____ (ACEDP project number)

As _____ bidder

_____,
(Insert name of corporation, partnership or individual) in accordance with your invitation for bids for construction of the above-identified project, having examined all contract documents and the site of the proposed work, and being familiar with all of the conditions surrounding construction of the proposed project including availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies and to construct the project in accordance with the contract documents, within the time set forth therein, and at the price(s) stated below. Such price(s) shall cover all expenses incurred in performing the work required by the contract documents, of which this proposal is part.

The bidder hereby agrees to commence work under this contract within 10 days after receiving a Notice to Proceed from the Owner and to fully complete the project within _____ consecutive calendar days thereafter as stipulated in the specifications. The bidder further agrees to pay as liquidated damages, the sum of \$ _____ for each consecutive calendar day thereafter.

The bidder acknowledges receipt of the following addendum:

Base Proposal

The Bidder agrees to perform all of the work contained in these contract documents for a Lump Sum Total Bid Base of _____ (\$_____). *(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)*

If excavation/trench safety is required, a separate line item shall be provided as

Excavation/Trench Safety (See General Conditions of Contract)

\$ _____

TOTAL BID \$ _____

“ _____ ”

The above price(s) shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the complete project.

DEDUCTIVE ALTERNATIVES

Deductive alternatives are **required for all projects.**

Deductive Alternate No 1:

_____ Deduct the sum of: “ _____ ”

\$ _____

Total Base Bid minus Deductive Alternate No. 1

\$ _____

Deductive Alternate No. 2:

_____ Deduct the sum of: “ _____ ”

\$ _____

Total Base Bid minus Deductive Alternatives No. 1 and No. 2

\$ _____

Deductive Alternate No. 3:

_____ Deduct the sum of: “ _____ ”

\$ _____

Total Base Bid minus Deductive Alternates No. 1, No. 2, No. 3
\$ _____

Note: Continue the same process as above for all additional deductive alternatives.

The bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the bid opening.

Upon receipt of written notice of acceptance of this bid, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by the General Conditions.

The bid security attached in the sum of \$ _____
is to become the property of the Owner in the event the contract and bond are not executed within the time set forth above, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

By: _____
(Signature)

By: _____
(Signature)

Company DUNS Number

(Please Print Name of Owner/Contractor)

Individual/Company Tax ID Number

(Seal - if bid is by a corporation)

(Title)

(Business Address and Zip Code)

(Date)

Attachment 1E
Sample Bid Package for ACEDP Funded Projects
Certification of Bidder Regarding Equal Employment Opportunity

This certification is required pursuant to Executive Order 11246 (30 FR 12319-25) which provides that any bidder or prospective contractor or any of their proposed subcontractors, shall state as an initial part of the bid whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and if so, whether it has filed all compliance reports due under applicable instructions. Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven (7) calendar days after bid opening. **No contract shall be awarded unless such report is submitted.**

Certification by Bidder
Name and Address of Bidder (Including Zip Code)

<i>Name and Title of Bidder's Agent</i>

1. Has the bidder participated in a previous contract or subcontract subject to the Equal Opportunity Clause?
Yes No

2. Were compliance reports required to be filed in connection with such contract or subcontract?
Yes No

3. Has the bidder filed all compliance reports due under applicable instructions?
Yes No N/A

4. Has the bidder ever been or is being considered for sanction due to violation of Executive Order 11246, as amended?
Yes No

<i>Signature and Title of Bidder's Agent</i>	<i>Date</i>
--	-------------

Attachment 1F
Sample Bid Package for ACEDP Funded Projects
Contractor Section 3 Certification
for contracts over \$100,000

_____ (*Name of contractor*) agrees to implement the following specific affirmative steps directed at increasing the utilization of lower income residents and businesses within the City or County of _____.

- | | |
|----|---|
| A. | To implement Section 3 requirements by seeking the assistance of local officials in determining the exact boundaries of the applicable project area |
| B. | To attempt to recruit from within the City/County the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area |
| C. | To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists |
| D. | To insert this Section 3 plan in all bid documents, and to require all bidders to submit a Section 3 affirmative action plan (when contracts exceed \$100,000) including utilization goals and the specific steps planned to accomplish these goals |
| E. | To formally contact unions, subcontractors, and trade associations to secure their cooperation for this project |
| F. | To ensure that all appropriate project area business concerns are notified of pending subcontractual opportunities |
| G. | To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken |
| H. | To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan |
| I. | To list on the Estimated Project Workforce Breakdown form, all projected workforce needs for this project by job classification |

As officers and representatives of _____

(Name of contractor)

We, the undersigned, have read and fully agree to the above and become a party to the full implementation of this program.

Title

Date

Signature

Attachment 1G
Sample Bid Package for ACEDP Funded Projects
Estimated Project Workforce Breakdown

Job Category	Total Estimated Positions	No. of Positions Currently Occupied by Permanent Employees	No. of Vacant Positions	No. of Positions to be Filled With LIPAR (Note 1)*
Officers/Supervisors				
Professionals				
Technicians				
Office				
Clerical				
Trade				
Journeyman				
Apprentices				
Trainees				
Others				
Total				

* Note 1: Lower Income Project Area Residents. Individuals residing within the City/County of _____ whose family income does not exceed 80 percent of the median income in the area.

_____ Company

Attachment 1H
Sample Bid Package for ACEDP Funded Projects
Contract and General Conditions

THIS AGREEMENT, made and entered into this ____ day of _____, 20____, by and between _____, hereinafter called the "Contractor" and _____, hereinafter called the "Owner".

In consideration of the mutual premises and agreements contained herein, the undersigned Contractor and Owner agree as follows:

A. The Contractor shall

1. Furnish all labor, materials, tools, machinery, supervision and services necessary to perform all of the work in accordance with the description of work consisting of all plans, specifications, and supplemental contract documentation, dated _____ for work defined in _____, Arkansas, for the sum of \$_____.
2. Perform all work timely and diligently in a good and workmanlike manner using approved or equal materials as specified by the Grantee.
3. Begin work within 10 calendar days of receipt of the written Notice to Proceed and shall complete the work within _____ calendar days thereafter.
4. Carry Worker's Compensation and Employer's Liability Insurance in accordance with the laws of the State of Arkansas for all persons engaged in work at the site; and carry Contractor's Public Liability and Property Damage Insurance and Comprehensive Automobile Liability Insurance.
5. Furnish, before beginning the work, a Certificate of Insurance showing compliance with the provisions of Section A, Paragraph 4 above.
6. Keep the premises clean and orderly during the work and upon substantial completion of the contract, remove all rubbish, tools, scaffolding, and surplus materials from and about the site(s) and leave the work and premises consistent with prior appearance or equivalent. Material and equipment that have been removed and replaced as part of the work shall belong to the contractor.

Not assign the contract without written consent from the Owner.

8. Guarantee the work performed for a period of twelve months from the date of final acceptance of all work required by this contract. Furthermore,

furnish the Owner and the Grantee with all manufacturer's and supplier's written guarantees and warranties covering materials and equipment furnished under this contract.

9. Furnish the Owner, upon completion of the work and upon final payment by the Owner, a Release of Lien Form certifying that all charges for materials, labor, and/or any other expenses incurred by the Contractor pertaining to the execution of this contract have been paid in full.
10. Defend, indemnify and hold harmless the Owner, the Arkansas Economic Development Commission, their agents or employees from and against any and all claims for injuries or damages to persons or property of any kind or character, whatsoever, whether real or asserted, arising out of the performance of this contract. Furthermore, shall assume all liability and responsibility for injuries, claims or suits for damages, to persons or property of any kind or character, whatsoever, whether real or asserted, arising out of the performance of this contract.

B. The Owner shall

1. Not make, or permit to be made, any changes to the description of work, without written approval from the Economic Development Commission.
2. Permit the contractor to use existing utilities such as lights, heat, power and water necessary to carry out and complete the work as specified.
3. Cooperate with the contractor to facilitate the performance of the work.
4. Issue a written Notice to Proceed to the contractor within ten (10) days from the date of this agreement.

C. Method of Compensation:

1. Payment for work shall be on percentage complete, plus on-site stored materials minus retainage. Final payment shall be made after: a Certificate of Substantial Completion has been executed; Economic Development Commission has received the contractor's Final Invoice and a satisfactory release of liens, or claims for liens, by subcontractors, laborers and material supplies for completed work or installed materials; and, after a final inspection has been conducted.
2. The contractor shall be liable for and shall pay to the Owner the sum of \$ _____ as fixed, agreed and liquidated damages for each calendar day of delay from the above stipulated completion date (Section A, Paragraph 3) or as modified by a properly executed Change Order until such work is satisfactorily completed and accepted by the Owner and Grantee.

D. General Provisions:

1. The contractor agrees to perform all contract work as specified, and the Owner agrees that neither he nor the members of his family, his tenants, agents, or employees will hinder the contractor or his work.
2. The contractor shall take affirmative steps to ensure that applicants for employment are not discriminated against in any manner prescribed by the Regulatory Requirements of this contract during employment. Employment activities shall include, but not be limited to employment, upgrading, demotion, or transfer; termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship.
3. The contractor shall post in conspicuous places, for employees and applicants for employment, notices setting forth the provisions, as stated, of the non-discrimination clause contained within the contract's Regulatory Requirements.
4. The contractor shall incorporate the foregoing requirements in all subcontracts.
5. In the event of any breach of this contract by the contractor, the Owner and the Grantee may, at their option, engage the services of another contractor to complete the work and deduct the cost of such completion from any amount due the contractor.
6. This contract embodies all of the representations, rights, duties, and obligations of the parties hereto, and any prior oral or written agreement not embodied herein shall not be binding upon or endure to the benefit of any of the parties

**This Contract and All Terms and Conditions Contained Herein
Are Approved and Accepted as of the Date First Above Written.**

(Seal)

Attest:

(Owner)

By

(Secretary)

(Witness)

(Title)

(Seal)

Attest:

(Contractor)

By

(Secretary)

(Witness)

(Title)

Attachment 1I
Sample Bid Package for ACEDP Funded Projects
Bonding and Insurance Requirements

- 1.1 This section defines **ACEDP grant requirements for bonding and insurance**. No other bonding and insurance requirements, unless specified by State law, shall be imposed.
- 2.1 Entities receiving Federal assistance which involves contracting for construction or facility improvements shall follow State law relating to bid guarantees, performance bonds, and payment bonds except for contracts exceeding \$100,000. **For contracts exceeding \$100,000, the following minimum bonding requirements shall apply:**
 - 2.1.1 A bid guarantee from each bidder equivalent to 5 percent of the bid price. The "**bid guarantee**" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.
 - 2.1.2 A "**performance bond**" furnished by the contractor in an amount at least equal to 100 percent of the contract price as security for faithful performance of the contract.
 - 2.1.3 A "**payment bond**" in an amount not less than 100 percent of the contract price or in a penal sum not less than that prescribed by State law, to assure contractor payment of all persons performing labor on the project under this contract and/or furnishing materials and supplies during the execution of this contract.

The performance bond and the payment bond may be in one or in separate instruments in accordance with State law.

- 3.1 Where bonds are required as per section 2.1 above, the bonds shall be obtained from **acceptable companies** holding certificates of authority within the State of Arkansas.
- 4.1 **Additional or Substitute Bond** If, at any time, the Owner, for justifiable cause, shall be dissatisfied with any surety or sureties, then upon the Performance or Payment Bonds, the contractor shall within five (5) days after notice of dissatisfaction, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond(s) shall be paid by the contractor. No further payments shall be deemed due nor made until the new surety or sureties furnish acceptable bond(s) to the Owner.

- 5.1 **Insurance** The contractor shall not commence work under this contract until he has obtained all insurance, as approved by the Owner, required under this paragraph, nor shall the contractor allow any subcontractor to commence work on his subcontract until the subcontractor's required insurance has been obtained and approved.
- 5.1.1 **Compensation Insurance:** The contractor shall procure and maintain throughout this contract Workmen's Compensation Insurance as required by applicable State law for all of his employees engaged in work at the site of the project under this contract and, in case of any such work sublet, the contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees engaged in such work unless such employees are covered by the protection afforded by the contractor's Workman's Compensation Insurance. In case any class of employees engaged in hazardous work under this contract is not protected under the Workmen's Compensation Statute, the contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of his employees as are not otherwise protected.
- 5.1.2 **Contractor's Public Liability and Property Damage and Vehicle Liability Insurance:** The contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in amounts specified in the contract conditions.
- 5.1.3 **Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance:** The contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplementary Contract Conditions or, (2) obtain policy insurance on such activities as specified in subparagraph 5.1.2 above.
- 5.1.4 **Scope of Insurance and Special Hazards:** The insurance required under subparagraphs 5.1.2 and 5.1.3 above shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards, if specified, which may be encountered in the performance of this contract.
- 5.1.5 **Risk Insurance:** The Owner or contractor may be required to maintain Risk Insurance on a 100 percent completed value based on the insurable portion of the project (until accepted by the Owner as substantially complete) for the benefit of the Owner, the Contractor, or subcontractors

as their interests may appear. Any requirements pertaining to adequacy of Risk Insurance shall be as per State law.

- 5.1.6 **Proof of Carriage of Insurance:** The contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the Owner."

Attachment 1J
Sample Bid Package for ACEDP Funded Projects
Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal,
and _____ as Surety,
are hereby held and firmly bound unto _____, as
Owner, in the penal sum of _____
for the payment of which, well and truly to be made, we hereby jointly and severally bind
ourselves, our heirs, executors, administrators, successors and assigns.
Signed, this _____ day of _____, 20__.

The condition of the above obligation is such that whereas the Principal has submitted to
_____ a certain Bid, attached hereto and hereby
made a part hereof to enter into a contract in writing, for the

NOW, THEREFORE.

- A. If said Bid shall be rejected, or in the alternate,
- B. If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract specified (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Surety

Surety's Agent

Principal

Seal

Note: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570, as amended) as authorized to transact business in Arkansas and have underwriting authority in an amount equal to or greater than the bid amount.

Attachment 1K
Sample Bid Package for ACEDP Funded Projects
Arkansas Statutory Payment and Performance Bond

We

_____,
as Principal, hereinafter called Principal, and _____,
authorized to do business in the State of Arkansas, as Surety, hereinafter called Surety,
are held and firmly bound unto _____
as Oblige, hereinafter called Owner, in the amount of

Dollars (\$ _____), for the payment whereof Principal and Surety bind
themselves, their heirs, personal representatives, successors and assigns, jointly and
severally, by these presents.

Principal has by written agreement dated _____ entered into a contract with
Owner for _____

which contract is by reference made a part hereof and hereinafter referred to as the
Contract.

THE CONDITION OF THIS OBLIGATION is such that if the Principal shall faithfully
perform the Contract on his part and shall fully indemnify and save harmless the Owner
from all cost and damage which he may suffer by reason of failure to do so and shall fully
reimburse and repay the Owner all outlay and expense which the Owner may incur in
making good any such default, and further, that if the Principal shall pay all persons all
indebtedness for labor or materials furnished or performed under said Contract, failing
which such persons shall have a direct right of action against the Principal and Surety,
jointly and severally, under this obligation, subject to the Owner's priority, then this
obligation shall be null and void; otherwise it shall remain in full force and effect.

No suit, action or proceeding shall be brought on this bond outside the State of Arkansas.
No suit, action or proceeding shall be brought on this bond except by the Owner after six
months from the date final payment is made on the Contract, nor shall any suit, action or
proceeding be brought by the Owner after two years from the date on which the final
payment under the Contract falls due.

Any alterations which may be made in the terms of the Contract, or in the work to be
done under it, or the giving by the Owner of any extension of time for the performance of
the Contract, or any other forbearance on the part of either the Owner or the Principal to

the other shall not in any way release the Principal and the Surety or Sureties, or either or any of them, their heirs, personal representatives, successors or assigns from their liability hereunder, notice to the Surety or Sureties of any such alteration, extension or forbearance being hereby waived.

In no event shall the aggregate liability of the Surety exceed the sum set out herein.

Executed on this _____ day of _____, 20____

Principal

Surety Agent

Attorney-in-Fact

Attachment 1L
Sample Bid Package for ACEDP Funded Projects
Certificate of Owner's Attorney

I, the undersigned, _____, the duly
authorized and acting legal representative of _____
_____, do hereby
certify as follows:

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Attorney Signature

Date

Attachment 1M
Sample Bid Package for ACEDP Funded Projects
General Conditions of the Contract

1.1 Definitions

1.1.1 Contract and Contract Documents

The project to be constructed pursuant to this contract will be financed with assistance from Community Development Block Grant funds and is subject to all applicable Department of Housing and Urban Development (HUD), State and Federal laws.

The plans, specifications, contract documents and any addenda shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were incorporated verbatim. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or infer interpretation of the provisions to which they refer.

1.2 Execution

1.2.1 Six copies of the Contract Documents shall be signed by the Owner and contractor.

1.2.2 Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

1.3 Contract Authorization

1.3.1. All original Drawings and Specifications will remain in the ownership of the architect or engineer. Notice and description of any changes to the original documents or scope of work by the contractor shall be communicated to the architect/engineer prior to completion of the affected work.

1.3.2 The Owner, architect/engineer and funding agencies shall have access to the construction site at all times and shall make site visits as necessary to verify project progress.

1.3.3 The architect/engineer shall make, or have made, determinations that the work for each payment request is or is not complete and meets the requirements of the contract documents. The request for payment process shall be defined at the Preconstruction Conference.

- 1.3.4 The architect/engineer shall have the authority to request corrections to deficient work by notifying the contractor in writing.
- 1.3.5 The contractor shall meet the requirements of all State, Federal and local laws including, but not limited to those listed in these contract documents as **Regulatory Requirements**.
- 1.3.6 The architect/engineer shall give all orders and directions under this contract, relative to execution of work including the amount, quality, acceptability, and fitness of the work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to work and the construction thereof. The architect or engineer's decisions shall be final and conclusive, except as State law may otherwise prescribe. Any differences or conflicts in regard to the contract documents that may arise between the contractor performing work for the architect/engineer shall be adjusted and determined by the architect/owner after consultation with the contractor.
- 1.3.7 All work and materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Owner, engineer or architect or representative(s) thereof, who shall adjudge the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet their approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the contractor at his own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the architect/engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the contractor shall be reduced by such amount adjudged by the architect/engineer as equitable.
- 1.3.8 No claim for extra work or cost shall be allowed unless authorized by change order executed by the engineer/architect and approved by the Owner and the Economic Development Commission. In the event of temporary suspension of work, or during inclement weather, or whenever the engineer or architect shall direct, the contractor will, cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the architect/engineer, any work or materials were damaged or injured by reason of failure on the part of the contractor or any of his subcontractors, such materials shall be removed and replaced at contractor expense.
- 1.3.9 Should the contractor encounter site conditions that differ from the contract documents, he shall immediately give notice to the

architect/engineer before commencing work on the affected properties. The architect/engineer will thereupon investigate, or have investigated the conditions, and if found that they materially differ from those shown in the contract documents, will request changes as deemed necessary. Any increase or decrease of cost resulting from such changes shall be adjusted as per the General Conditions.

2.1 Definitions

- 2.1.1 The following terms as used in this contract are respectively defined as follows:
- 2.1.2 **Contractor:** A person, firm or corporation with whom the owner contracts with.
- 2.1.3 **Subcontractor:** A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with the contractor.
- 2.1.4 **Work on (at) the project:** Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the contractor and any subcontractor.

3.1 Contractor's Responsibilities

- 3.1.1 The contractor shall and will, in good workmanlike manner, complete and perform all work and furnish all supplies, materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary to perform and complete all the work required by this contract. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract documents, and complete the entire work to the satisfaction of the engineer/architect and Owner.

It is understood that unless otherwise specifically stated in the contract documents, the contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every kind, and all other services and facilities of every kind whatsoever necessary to execute, complete, and deliver the complete project within the specified time. Any work necessary to be performed after regular working hours, on Sundays or legal Holidays, shall be performed without additional Owner expense.

3.1.2 The contractor shall at all times safe guard the Owner's property from injury or loss in connection with this contract. He shall at all times safe guard and protect his own work, and that of adjacent property from damage. In case of emergency, which threatens loss or injury of property, and/or safety or life, the contractor will be allowed to act, without previous instructions from the architect/engineer, in a diligent manner. He shall notify the engineer/architect of actions immediately thereafter. Any claim for compensation by the contractor due to such extra work may be submitted to the architect/engineer for approval and Owner for consideration. Where the contractor has not taken action but has notified the architect/engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the architect/engineer.

The amount of reimbursement to the contractor on account of any emergency action shall be determined in the manner provided in the general conditions.

3.2 Contractor Requirements

The contractor shall

- 3.2.1 Take every precaution against injuries to persons or damage to property;
- 3.2.2 Store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work or elsewhere as will not unduly interfere with the progress of his work or the work of any other contractors;
- 3.2.3 Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;
- 3.2.4 Before final payment, remove all surplus material, temporary structures, equipment and debris of every nature resulting from his operations, and to put the site in an orderly condition;
- 3.2.5 Effect all cutting, fitting or patching of his work to conform to the contract documents.
- 3.2.6 No materials or supplies for the work shall be purchased by the contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which interest is retained by the seller. The contractor warrants that he has good title to all materials

and supplies used by him in the work, free from all liens, claims or encumbrances.

- 3.2.7 The contractor shall not assign the whole or any part of this contract or any moneys due or to become due hereunder without written consent of the Owner. In case the contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.
- 3.2.8 If, through contractor neglect, any other contractor or subcontractor suffers loss or damage on the work, the contractor agrees to settle with such other parties by agreement or arbitration if such parties will so settle. If such other contractors or subcontractors shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the contractor, who shall indemnify and save harmless the Owner against any such claim.
- 3.2.9 Neither the final certificate of payment nor any provision in the contract documents, shall constitute an acceptance of work not completed in accordance with the contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

3.3 Subcontractor's Responsibilities

- 3.3.1 The contractor may hire specialty subcontractors to complete work which, under normal contracting practices, is performed by specialty subcontractors, however, the contractor shall be fully responsible to the Owner for the acts or omissions of his subcontractors, and of persons either directly or indirectly employed by him.
- 3.3.2 The contractor shall coordinate his operations with those of other contractors in the arrangement for storage of materials and in the detailed execution of the work. The contractor, including his subcontractors, shall keep informed of the progress and the detail work of other contractors and shall notify the Owner immediately of lack of progress or defective workmanship on the part of other contractors. Failure of a contractor to

keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory.

3.4 Patents

The contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents. License and/or Royalty Fees for the use of a process which is authorized by the Owner must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the contractor.

If the contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the holder of such patented or copyrighted design, device or materials. It is mutually understood that, without exception, the contract price shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The contractor and/or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

3.5 Superintendence

At the site of the work, the contractor shall employ a construction superintendent or foreman who shall have full authority to act for the contractor.

3.6 Conflicting Conditions

Any provisions in any of the contract documents, which may be in conflict, or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

3.7 Arkansas Economic Development Commission Inspection

Authorized representatives of the Arkansas Economic Development Commission shall be permitted to inspect all work, materials, personnel records, invoices of materials, and other data and records of the contractor and his subcontractor(s).

3.8 Payment Provisions

- 3.8.1 To ensure the proper performance of this contract, the Owner shall retain ten percent (10%) of the amount of each estimate until the project is 50 percent complete. Final retainage shall be released upon acceptance of the Certificate of Substantial Completion.
- 3.8.2 In preparing payment estimates, materials stored on the site and preparatory work completed may be included.
- 3.8.3 The contractor agrees to indemnify and hold the Owner harmless from all claims arising from the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies incurred in the performance of this contract. The contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the above nature have been paid, discharged, or waived. If the contractor fails to do so, then the Owner may, after having served written notice to the contractor, pay unpaid bills (of which the owner has written notice), and direct, or withhold from the contractor's unpaid compensation, a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the contractor shall be resumed, in accordance with the terms of this contract. In no event shall the above sentences impose any obligations upon the Owner to the contractor or his surety. In paying any unpaid bills of the contractor, the Owner shall be deemed the contractor's agent, and any such payments made by the Owner shall be considered as payment made under the contract to the contractor and the Owner will not be liable to the contractor for any such payments.
- 3.8.4 After execution and delivery of the contract prior to making the first partial payment, the contractor shall deliver to the owner an estimated construction progress schedule in a form satisfactory to the owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due in accordance with the progress schedule. The contractor shall furnish on forms supplied by the Owner a detailed estimate giving a complete breakdown of the contract price and periodic itemized estimates of work completed for the purpose of making partial payments thereon. The costs employed in maintaining these schedules will be used only to determine the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

3.8.5 The contractor shall procure and pay all permits, licenses and approvals necessary for the execution of his contract.

4.1 **Changes in Work**

No changes in the work defined within the contract documents shall be made without a change order. Charges or credits for the work covered by the change order shall be determined by one or more, or a combination of the following:

- Unit bid prices previously approved
- An agreed upon lump sum
- The actual cost of labor, including foremen
- Materials entering permanently into the work
- The ownership or rental cost of construction plant and equipment during the time of use on the extra work
- Power and consumable supplies for the operation of power equipment
- Insurance, Social Security and unemployment contributions

4.2 **Additional Instructions and Drawings**

If necessary, the contractor will be furnished additional instructions and drawings to execute contract work. These additional drawings and instructions will be prepared so that they can be generally interpreted as part of the contract documents thereof. Any additional instructions or drawings will be issued to and discussed by all parties and shall be carried out by the contractor as specified.

4.3 **Contractor and Owner**

4.3.1 It is hereby understood and mutually agreed, by and between the contractor and the Owner, that the date of beginning and the time for completion, as specified in the contract, of the work to be completed hereunder, are Essential Conditions of this contract; and it is further mutually understood and agreed that the work to be completed in this contract shall be started on a date to be specified in the "Notice to Proceed."

If the contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension of time granted by the Owner, then the contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract, not as a penalty, but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the contractor shall be in default after the time stipulated in the contract for completing the work.

Provided, that the contractor shall not be charged with liquidated damages or any excess cost where the Owner determines that the contractor is

without fault and the contractor's reasons for the time extension are acceptable to the Owner;

Provided further, that the contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to;

- a. Any preference, priority or allocation order duly issued by the Government;
- b. Unforeseeable cause beyond the control and without the fault or negligence of the contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and documented severe weather; and,
- c. Any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article;

Provided further, that the contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the contractor within a reasonable time of its decision in the matter.

- 4.3.2 Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable determination to be set forth in writing.
- 4.3.3 Any notice to any contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said contractor at his last given address, or delivered in person to the said contractor or his authorized representative on the work.

5.1 **Owner**

- 5.1.1 The Owner is the entity identified in the Owner-Contractor Agreement and is referred to as such in the contract documents. The term Owner means the Owner or his authorized representative.
- 5.1.2 Prior to the start of construction, the Owner shall obtain all land and rights-of-way necessary for carrying out and completion of work to be performed under this contract. The contractor shall comply with all laws,

ordinances, rules, orders, and regulations relating to performance of the work, the protection of adjacent property, and the maintenance of passageways, guard fences or other protective facilities.

- 5.1.3 Unless otherwise expressly provided for in the contract documents, the Owner will furnish to the contractor all surveys necessary for the execution of the work.
- 5.1.4 No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any contracts or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, attorney, or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other pertinent contract.
- 5.1.5 Should any provisions of this contract be violated by the contractor, or any of his subcontractors, the Owner may serve written notice upon the contractor and the Surety of its intention to terminate the contract. Such notices shall contain the reasons for such intention to terminate the contract, and unless within ten (10) days after the serving of such notice upon the contractor, such violation, or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the contractor and the Surety shall have the right to take over and perform the contract; provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account at the expense of the contractor and the contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.
- 5.1.6 The Owner shall meet the requirements of all State, Federal and local laws including but not limited to those listed in these contract documents as Regulatory Requirements.

6.1 Safety Standards and Accident Prevention

With respect to all work performed under this contract, the contractor shall:

- 6.1.1 Comply with the safety standards provisions of applicable laws, building and construction codes and the Manual of Accident Prevention in Construction: published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act (OSHA) of 1970 (Public Law 91-596) and the requirements of Title 29 of the Code of Federal Regulations, Section 1518, as published in the Federal Register, Volume 36, Number 75, Saturday, April 17, 1971, and specifically, OSHA's Standard for Excavation and Trenches Safety Systems, 29 CFR Part 1926, Subpart P.
- 6.1.2 Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- 6.1.3 Maintain, at his office or other conspicuous place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site.

7.1 Miscellaneous Provisions

- 7.1.1 The architect/engineer shall review all submittals to include but not be limited to samples, shop drawings and product data. The architect/engineer shall provide the contractor with approved or rejected submittals within ten days of their receipt. The contractor shall retain one copy in his construction files at all times and provide one copy to the resident project representative. Upon completion of the contract, the contractor shall provide the complete submittal file to the owner who will retain them in the permanent construction file. Upon receiving a rejected submittal, the contractor shall resubmit an alternate or provide what was originally specified.
- 7.1.2 The contractor shall insert in any subcontracts the Federal Labor Standards Provisions Contained herein (See Regulatory Requirements) and such other clauses as the Economic Development Commission may deem necessary, and also, a clause requiring subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.
- 7.1.3 The contractor may agree to the use and occupancy of a portion or unit of the project before formal acceptance by the owner provided that the owner

secures written consent of the contractor, except in the event, in the opinion of the architect/engineer, the contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements. Also, an endorsement of the insurance-carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction must be secured.

- 7.1.4 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the owner (in accordance with State procurement requirements) who will pay for all such services direct and exclusive to this contract. Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

Subparagraph 7.1.5 below is applicable to Projects Requiring Resident Observation

- 7.1.5 The architect/engineer shall provide a qualified resident observer to be on site at all times when the contractor, subcontractor and workmen are working. The resident observer shall represent the engineer/architect by verifying that the requirements of the contract documents are met but will also represent the owner by verifying that those requirements are met and that the work is completed in a manner to assure that the construction means, methods and techniques represent the best interests of the owner. The resident observer shall be responsible to check the quality and quantities of work and report immediately any discrepancies to the engineer/architect.

Subparagraphs 7.1.6 and 7.17 below are applicable to Projects Requiring Trenching

- 7.1.6 A separate lump sum bid item must be included for Excavation/Trench Safety System (for excavation in excess of five feet). The bidder is required to complete this pay item in accordance with Act 291 of the Arkansas 79th General Assembly.
- 7.1.7 In the event a bidder fails to complete this pay item, the Owner shall declare that the bid fails to comply fully with the provisions of the contract documents and will be considered invalid as a nonresponsive bid. Payment for the lump sum bid item for Excavation/Trench Safety System will be paid at the completion of the contract. No partial payments will be allowed.

Attachment 1N
Sample Bid Package for ACEDP Funded Projects
Supplemental Conditions of the Contract

8.1 Special Hazards

The contractor's and his subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

8.1.1 Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance. As required in the General Conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than _____ for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$ _____ on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$ _____.

8.1.2 The Contractor shall either require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph, or insure the activities of his subcontractors in his own policy.

8.1.3 The contract documents shall consist of all specifications, plans, contract documents and addenda for the project.

9.1 Supplementary Contract Conditions

Any supplementary conditions of the contract must be inserted below:

Attachment 10
Sample Bid Package for ACEDP Funded Projects
Wage Determination Preface Sheet

(The appropriate Wage Determination(s) requested from the Arkansas Economic Development Commission shall be inserted in place of this page.)

Note: Please contact the Arkansas Economic Development Commission or project administrator, ten (10) days before the date of bid opening to confirm that the issued wage determination(s) is still valid. Modified or superseded wage determinations must be added to the contract.

Attachment 1P
Sample Bid Package for ACEDP Funded Projects
Architect's Certification of Compliance with Minimum Standards
for Access by Handicapped

ACEDP Project Number: _____

Project Name: _____

City/County, State: _____

Pursuant to the requirements of the Architectural Barriers Act of 1968, 42 USC 4151, and the regulations issued subsequent thereto, including the Americans with Disability Act, the undersigned certifies that the design of the above-referenced project is in conformance with the minimum standards contained in the American Standard Specifications for Making Buildings and Facilities Accessible To and Usable By the Physically Handicapped, Number A-117.1R-1971 (as modified by 41 CFR 101-19.603).

Name and Address of Project Architect:

Registration Number: _____

Signature: _____

Typed Name: _____

Date: _____

Attachment 1Q
Sample Bid Package for ACEDP Funded Projects
Regulatory Requirements

1.1 Interest of Member or Delegate to Congress

No member of or Delegate to Congress, or Resident Commissioner, shall be a party to or benefit from this contract, except that provisions of this clause shall not extend to situations where the contract accrues to a corporation for its general benefit.

1.2 Equal Employment Opportunity

1.2.1 During the performance of this contract the contractor agrees as follows:

The contractor will not discriminate against any employee or applicant for employment because of age, race, religion, sex, color, handicap, veteran status or national origin. The contractor will take affirmative steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their age, race, religion, sex, color, handicap, veteran status or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms or compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

1.2.2 The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, religion, sex, color, handicap, veteran status or national origin.

1.2.3 The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965 (EO 11246), and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

1.2.4 The contractor will comply with all provisions of EO 11246, and of the rules, regulations, and relevant orders of the Secretary of Labor.

1.2.5 In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders,

this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or Federally-assisted construction contracts.

- 1.2.6 The contractor will include the provisions of these paragraphs in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of EO 11246, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Economic Development Commission and HUD may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by HUD, the contractor may request the United States to enter into such litigation to protect its interests.

1.3 **Employment Practices**

The contractor shall

- 1.3.1 To the greatest extent practicable, follow hiring and employment practices for work on the project, which will provide new job opportunities for the unemployed and underemployed (Section 3 requirements).
- 1.3.2 Insert or cause to be inserted the same provisions in each construction subcontract.

2.1 **Special Equal Opportunity Provisions**

- 2.1.1 **Activities and Contracts Not Subject to EO 11246, as Amended** (Applicable to Federally assisted construction contracts and related subcontracts *under \$10,000*). During the performance of this contract, the contractor agrees to incorporate the following requirements into all subcontracts:

- 2.1.1.1 The contractor shall not discriminate against any employee or applicant for employment because of age, race, religion, sex, color, handicap, veteran status or national origin. The contractor shall take affirmative steps to ensure that applicants for employment are employed, and that employees are treated during employment, with regard to their age, race, religion, sex, color, handicap, veteran status or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

2.1.1.2 The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided, setting forth the provision of this nondiscrimination clause. The notice shall state that all qualified applicants will receive consideration for employment without regard to age, race, religion, sex, color, handicap, veteran status or national origin.

2.2.1 **Contracts Subject to EO 11246, as Amended** (Applicable to Federally assisted construction contracts and related subcontracts *exceeding \$10,000*). During the performance of this contract, the contractor agrees as follows:

2.2.1.1 The contractor will not discriminate against any employee or applicant for employment because of age, race, religion, sex, color, handicap, veteran status or national origin. The contractor will take affirmative steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their age, race, religion, sex, color, handicap, veteran status or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

2.2.1.2 The contractor will in all solicitations or advertisements for employees placed by or on his behalf, state that all qualified applicants will receive consideration for employment without regard to age, race, religion, sex, color, handicap, veteran status or national origin.

2.2.1.3 The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

- 2.2.1.4 The contractor will comply with all provisions of EO 11246, and of the rules, regulations and relevant orders of the Secretary of Labor.
- 2.2.1.5 The contractor will furnish all information and reports required by EO 11246, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Arkansas Economic Development Commission, HUD, and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 2.2.1.6 In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract, or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or Federally-assisted construction contracts.
- 2.2.1.7 The contractor will include all provisions of the seven paragraphs immediately above in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of EO 11246, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Division may direct as a means of enforcing such provisions, including sanctions for noncompliance provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Division, the contractor may request the United States to enter into such litigation to protect its interests.

**"Section 3" Compliance in the Provision
of Training, Employment and Business Opportunities**

- 3.1.1 During the performance of this contract, the contractor agrees as follows:
- 3.1.1.1 The contractor agrees to comply with the requirements of Section 3 of the Housing and Urban Development Act of 1968, 12 USC 170 (u), as amended, the HUD regulations issued pursuant thereto at 24 CFR 135, and any applicable rules and orders of HUD issued thereunder.
 - 3.1.1.2 The "Section 3 clause" set forth in 24 CFR 135.20 (b) shall form part of this contract, as set forth in the General Conditions.
 - 3.1.1.3 Contractors shall incorporate the "Section 3 clause" shown below and the foregoing requirements in all subcontracts.

Section 3 Clause as Set Forth in 24 CFR 135.20(b)

The work to be performed under this contract is on a project funded with Federal financial assistance from HUD and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 170(u). Section 3 requires that to the greatest extent feasible, opportunities for training and employment will be given to lower income residents of the project area and, contracts for work in connection with the project be awarded to business concerns which are located in or substantially owned by persons residing in the project area.

The parties to this contract will comply with the provisions of Section 3 and the regulations issued pursuant thereto by the Secretary of HUD set forth in 24 CFR 135, and all applicable rules and orders of the Division issued there under prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability, which would prevent them from complying with these requirements.

The contractor will send to each labor organization or workers' representative with which he has a collective bargaining agreement or other contract or understanding, a notice advising them of his commitments under Section 3 and will post copies of the notice in conspicuous places available to employees and applicants for employment or training.

The contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations

issued by HUD, 24 CFR 135. The contractor will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR 135, and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.

Compliance with Section 3 provisions, the regulations set forth in 24 CFR 135, and all applicable rules and orders of the Division issued there under prior to the execution of the contract, shall be a condition of the Federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors, and assigns to those sanctions specified by the grant or loan agreement or contract through which Federal assistance is provided, and to such sanctions as are specified by 24 CFR 135.

4.1 Access to Records/Maintenance of Records

The contractor shall maintain accounts and records, including personnel, property, and financial records, adequate to identify and account for all costs pertaining to the contract and such other records as may be deemed necessary by the locality to assure proper accounting for all funds. These records will be available for audit purposes to the locality or the State or any other authorized representative, and will be retained for three years after contract completion. Moreover, the locality, State, or any authorized representative shall have access to any books, documents, papers, and records of the contractor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

5.1 Conflict of Interest of Officers or Employees of the Local Jurisdiction, Members of the Local Governing Body, or Other Public Officials

No officer or employee of the local jurisdiction or its designees or agents, no member of the governing body, and no other public official of the locality who exercises any function or responsibility with respect to this contract, during his/her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed. Further, the contractor shall cause to be incorporated in all subcontracts the language set forth in this paragraph prohibiting conflict of interest.

6.1 Section 503 of the Rehabilitation Act of 1973 (If \$2,500 or Over)

6.1.1 The contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The contractor agrees to take affirmative steps to employ, advance in employment and otherwise treat qualified handicapped individuals without

discrimination based upon their physical or mental handicap in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

- 6.1.2 The contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- 6.1.3 In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- 6.1.4 The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices stating the contractor's obligation under the law to take affirmative steps to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.
- 6.1.5 The contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative steps to employ and advance in employment physically and mentally handicapped individuals.
- 6.1.6 The contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director of the office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

7.1 Section 402 Veterans Readjustment Assistance Act of 1973 (If \$10,000 or Over)

7.1.1 Affirmative Steps for Disabled Veterans and Veterans of the Vietnam Era

- 7.1.1.1 The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era in regard to any position for which the employee or applicant for employment is qualified. The

contractor agrees to take affirmative steps to employ, advance in employment and otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability or veteran status in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, and selection for training, including apprenticeship.

7.1.1.2 The contractor agrees that all suitable employment openings which exist at the time the contract is executed and those which occur during the performance of this contract (including those not generated by this contract and including those occurring at an establishment of the contractor other than the one wherein the contract is being performed but excluding those of independently operated corporate affiliates) shall be listed at an appropriate local office of the State employment service system wherein the opening occurs. The contractor further agrees to provide reports to local offices regarding employment openings and hires as may be requested.

7.1.1.3 State and local government agencies holding Federal contracts of \$10,000 or more shall also list all their suitable openings with the appropriate office of the State employment service.

7.1.1.4 Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and non-veterans. The listing of employment openings does not require the hiring of any particular job applicant or selection from any particular group of job applicants, and nothing herein is intended to relieve the contractor from any requirements in Executive Orders or regulations regarding nondiscrimination in employment.

7.1.1.5 The reports required in regard to this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office, or where the contractor has more than one hiring location in a State, with the central office of that State employment service. Such reports shall indicate for each hiring location (1) the number of individuals hired during the reporting period, (2) the number of nondisabled veterans of the Vietnam era hired, (3) the number of disabled veterans of the Vietnam era hired, and (4) the total number of disabled veterans hired for on-the-job training under 38 U.S.C. 1787. The contractor

shall submit a report within 30 days after the end of each reporting period wherein any performance is made of this contract identifying data for each hiring location. The contractor shall maintain at each hiring location copies of the reports submitted until the expiration of one year after final payment under the contract, during which time these reports and related documentation shall be made available, upon request, for examination by any authorized representative of the contracting officer for of the Secretary of Labor. Documentation would include personnel records respecting job openings, recruitment and placement.

- 7.1.1.6 Whenever the contractor is subject to the listing provisions of this clause, it shall advise the employment service system in each State where it has establishments of the name and location of each hiring location in the State. As long as the contractor is subject to these provisions and has so advised the State system, there is no need to advise them of subsequent contracts. The contractor may inform the State system when it is no longer bound by this contract clause.
- 7.1.1.7 This clause does not apply to the listing of employment openings occurring and filled outside the 50 States, the District of Columbia, Puerto Rico, Guam and the Virgin Islands.
- 7.1.1.8 The provisions of this clause do not apply to openings, which the contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union firing arrangement. This exclusion does not apply to a particular opening since an employer decides to consider applicants outside of his own organization or employer-union arrangement for that opening.
- 7.1.1.9 The phrase "All suitable employment openings" includes, but is not limited to, openings which occur in the following job categories; production and nonproduction; plans and office; laborers and mechanics; supervisory and nonsupervisory; technical; and executive administrative and professional openings compensated on a salary basis of less than \$25,000 per year. This term includes full-time employment, temporary employment of more than 3 days' duration, and part-time employment. It does not include openings which the contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement nor openings in an educational institution which are restricted to students of the institution. Under the most compelling circumstances, an employment opening may not be

suitable for listing, including such situations where the needs of the Government cannot reasonably be otherwise supplied, where listing would be contrary to national security, or where the requirement of listing would otherwise not be for the best interest of the Government.

- 7.1.1.10 "Appropriate office of the State employment service system" means the local office of the Federal-State national system of public employment offices with assigned responsibility for serving the area where the employment openings are to be filled, including the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.
- 7.1.1.11 "Openings which the contractor proposes to fill from within his own organization" means employment openings for which no consideration will be given to persons outside the contractor's organization (including any affiliates, subsidiaries, and the parent companies) and includes any openings which the contractor proposes to fill from regularly established "recall" lists.
- 7.1.1.12 "Openings, which the contractor proposes to fill pursuant to a customary and traditional employer-union, hiring arrangement," means employment openings, which the contractor proposes to fill from union halls, which is part of the customary and traditional hiring relationship, which exists between the contractor and representative of his employees.
- 7.1.1.13 The contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- 7.1.1.14 In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- 7.1.1.15 The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the contracting officer. Such notices shall state the contractor's obligation under the law to take affirmative steps to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era for employment, and the rights of applicants and employees.
- 7.1.1.16 The contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or

other contract understanding, that the contractor is bound by the terms of the Vietnam Era Veterans Readjustment Assistance Act, and is committed to take affirmative steps to employ and advance in employment qualified disabled veterans and veterans of the Vietnam Era.

7.1.1.17 The contractor will include the provisions of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to the Act, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

8.1 Section 109 of the Housing and Community Development Act of 1974

- 8.1.1 No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.
- 8.1.2 Whenever the Secretary of HUD determines that a State or unit of general local government which is a recipient of assistance under this title has failed to comply with subsection 8.1.1 or an applicable regulation, he shall notify the Governor of such State or the chief executive officer of such unit of local government of the noncompliance and shall request the Governor or the chief executive officer to secure compliance. If within a reasonable period of time, not to exceed sixty days, the Governor or the chief executive officer fails or refuses to secure compliance, the Secretary is authorized to (1) refer the matter to the Attorney General with a recommendation that an appropriate civil action be instituted; (2) exercise the powers and functions provided by Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d); (3) exercise the powers and functions provided for in section 111 (a) of this Act; or (4) take such other action as may be provided by law.
- 8.1.3 When a matter is referred to the Attorney General pursuant to above, or whenever he has reason to believe that a State government or unit of general local government is engaged in a pattern or practice in violation of the provisions of this section, the Attorney General may bring a civil action in any appropriate United States court for such relief as may be appropriate, including injunctive relief.

9.1 **Civil Rights Act of 1964**

9.1.1 Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, sex, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance. Subsequent civil rights legislation has extended nondiscrimination to classes based on age and handicap.

10.1 **Certification of Compliance with Air and Water Acts**

(Applicable to Federally-assisted construction contracts and related subcontracts exceeding \$100,000)

10.1.1 During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42, USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR 15, as amended.

10.1.2 In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the owner, the following:

A stipulation by the contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.

Agreement by the contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857 c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.

A stipulation that as a condition of contract award, prompt notice will be given of any notice received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract, is under consideration to be listed on the EPA List of Violating Facilities.

Agreement by the contractor that he will include, or cause to be included, the criteria and requirements in 10.1.2.1 to 10.1.2.4 of this section in every subcontract and requiring that the contractor take enforcement action as the Government

11.1 Hazards, Safety Standards and Accident Prevention

11.1.2 Use of Explosives

11.1.2.1 When the use of explosives is necessary for the prosecution of the work, the contractor shall observe all local, State and Federal laws in purchasing and handling explosives and take all necessary precaution to protect completed work, neighboring property, waterlines, or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material covered with suitable timber, steel or rope mats. The contractor shall notify all owners of public utility property of intention to use explosives at least 8 hours before blasting is done, close to such property.

11.1.3 Danger Signals and Safety Devices (Modify as Required)

11.1.3.1 The contractor shall take all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other devices necessary to protect the public. In case the contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the contractor. Such action by the Owner does not relieve the contractor of any liability incurred under these specifications or contract.

12.1 Or Equal Clause

Whenever a material, article or piece of equipment is identified on the plans or specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, meets State plumbing requirements as equal in substance or structure.

FEDERAL LABOR STANDARDS PROVISIONS
U.S. Department of Housing and Urban Development
Office of Labor Relations Previous editions are obsolete
Form **HUD-4010** (06/2009) ref. Handbook 1344.1

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

- (1)** The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2)** The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part Previous editions are obsolete Page 2 of 5 form **HUD-4010** (06/2009) ref. Handbook 1344.1

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted

under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes

any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both.”

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms “laborers” and “mechanics” include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

Attachment 1R
Sample Bid Package for ACEDP Funded Projects
Enumeration of Plans, Specifications and Addenda

Following are the Plans, Specifications and Addenda which form a part of this contract, as set forth in the General Conditions, "Contract and Contract Documents":

Plans/Drawings

General Construction:	Nos.	_____
Heating and Ventilating:	"	_____
Plumbing:	"	_____
Electrical:	"	_____
Other (_____)	."	_____
Other (_____)	."	_____

Specifications

General Construction:	Page	_____	to	_____	, incl.
Heating and Ventilating:	"	_____	to	_____	, incl.
Plumbing:	"	_____	to	_____	, incl.
Electrical:	"	_____	to	_____	, incl.
Other (_____)	"	_____	to	_____	, incl.
Other (_____)	"	_____	to	_____	, incl.

Addenda

No. _____	Date _____	No. _____	Date _____
No. _____	Date _____	No. _____	Date _____

STATED ALLOWANCES

Pursuant to the General Conditions, the contractor shall include the following cash allowances in his proposal:

For _____ (Page ___ of Specifications) \$ _____
For _____ (Page ___ of Specifications) \$ _____

Special Hazards

The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance

As required in the General conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$ _____ for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$ _____ on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$ _____.

The Contractor shall either require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph, or insure the activities of his subcontractors in his own policy.

Photographs of Project

As provided in the General Conditions, the Contractor will furnish photographs in the number, type, and stage as enumerated below:

Schedule of Occupational Classifications and Minimum Hourly Wage Rates as Required in the General Conditions

Given on Pages _____, _____ and _____.

Builder's Risk Insurance

As provided in Bonds and Certificates, the Contractor will/will not* maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portions of the project for the benefit of the Owner, the Contractor, and all subcontractors, as their interests may appear.

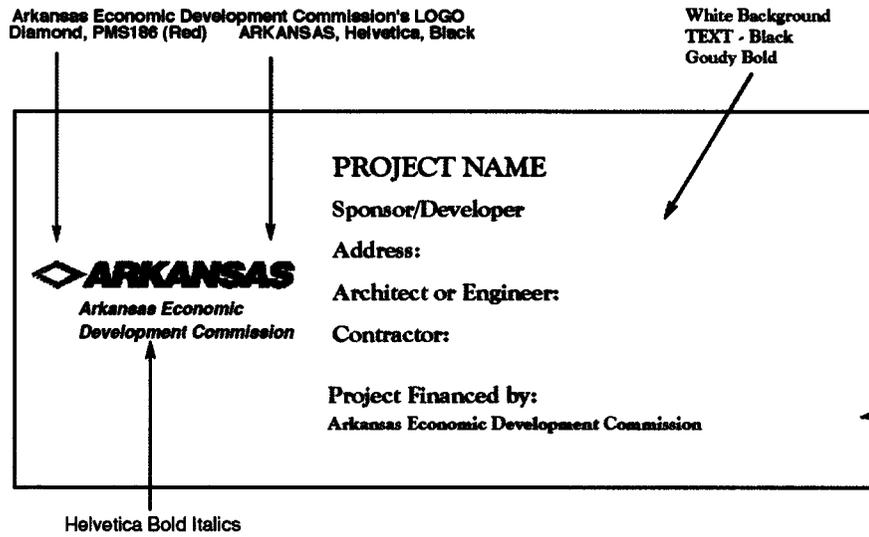
**Strike out one.*

Attachment 1S
Sample Bid Package for ACEDP Funded Projects
Technical Specifications of the Contract

Any technical specification of the contract, so desired by the Owner, in addition to the preceding specified contract documents shall be entered below.

Attachment 1T
Sample Bid Package For ACEDP Funded Projects

Attachment 1T
Sample Bid Package For ACEDP Funded Projects
ACEDP Project Sign Specifications



SIGN DIMENSIONS: Approximately 4' x 8' x 3/4" * PLYWOOD PANEL (APA Rated A-B grade exterior)

Construction Management-83
(1999)

Form 121
Attachment 1U
Certificate of Compliance for the 2014 Arkansas Energy Code
Design Professional

I, the undersigned, _____, the duly authorized licensed design professional of record for the _____, located at _____, in _____, Arkansas, certify that the aforementioned building is designed to meet and or exceed the minimum requirements of the 2014 Arkansas Energy Code * and building specifications, based on the requirements, have been provided to me by the licensed design professional(s) of record.

Signature

License Number

Date

Stamp

Per legislative authority provided by in Section 3(B)(2)(c) of Act 7 of 1981

For information regarding the specifications and requirements of the 2014 Arkansas Energy Code, contact the Arkansas Energy Office at 1-800-558-2633 or find related materials and resources at www.arkansasenergy.org .

Form 122
Attachment 2U
Certificate of Compliance for the 2014 Arkansas Energy Code
Builder/Contractor

I, the undersigned, _____, the duly authorized licensed builder/contractor of record for the _____, located at _____, in _____, Arkansas, certify that the aforementioned building is designed to meet and or exceed the minimum requirements of the 2014 Arkansas Energy Code * and building specifications, based on the requirements, have been provided to me by the licensed contractor/builder(s) of record.

Signature

License Number

Date

Per legislative authority provided by in Section 3(B)(2)(c) of Act 7 of 1981

For information regarding the specifications and requirements of the 2014 Arkansas Energy Code, contact the Arkansas Energy Office at 1-800-558-2633 or find related materials and resources at www.arkansasenergy.org .

Form 123
Attachment V
DISCLOSURE REQUIRED BY EXECUTIVE ORDER 98-04

Contracts and Grants

Any contract or amendment to a contract or any grant executed by an agency which exceeds \$25,000 shall require the contractor to disclose information as required under the terms of Executive Order 98-04 and the Regulations pursuant thereto.

Any individual contracting with the State of Arkansas shall disclose if he or she is a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or the spouse or immediate family of any of the persons as described herein.

Any entity contracting with the State of Arkansas shall disclose

- (a) any position of control, or
- (b) any ownership interest of 10% or greater

that is held by a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or the spouse or immediate family of any of the persons as described herein.

Disclosure by Sub-contractor or Assignee

Any sub-contractor or assignee (hereinafter "Third Party") shall disclose whether such Third Party is a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or the spouse or immediate family member of any of the persons as described herein, or if any of the persons here described in this sentence hold any position of control or ownership interest of 10% or greater in the Third Party. This disclosure requirement shall apply during the entire term of the contract or grant, without regard to whether the subcontract or assignment is entered into prior or subsequent to the date of contract or grant.

Failure to Disclose and Violations

The failure of any person or entity to disclose as required under any term of Executive Order 98-04, or the violation of any rule, regulation or policy promulgated by the Department of Finance and Administration pursuant to this Order, shall be considered a material breach of the terms of the contract or grant and shall subject the party failing to disclose or in violation to all legal remedies available to the state agency under the provision of existing law.

Please check all that apply if you are a current or former:

_____ Member of the General Assembly of the State of Arkansas

_____ Constitutional Officer of the State of Arkansas

_____ Member of a Board or Commission of the State of Arkansas

_____ State Employee

_____ Spouse of a current or former member of the general assembly, constitutional officer, board or commission member, or state employee.

_____ I am a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or spouse or immediate member of these persons as described, and I hold a position of control in the contracting entity or grantee of this application.

_____ I am a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or spouse or immediate member of these persons as described, and I hold a 10% or higher interest in the contracting entity or grantee of this application.

I hereby acknowledge that failure to disclose the information as required by Executive Order 98-04 shall constitute a material breach of any future agreement, resulting from this application, with the State of Arkansas or any state agency acting on its behalf.

I also acknowledge that any individual drawing a salary or performing personal services for an agency must disclose any direct or indirect benefit he or she may receive as a result of any State contract with an entity in which he or she has a financial interest. I understand that failure to report this information may subject me to criminal sanctions, as provided in Ark. Code Ann. §19-11-702.

Name

Date

Form 55
Attachment W
Section 3 Business Status Certification

All contract and subcontracts awarded on Section 3 covered projects must be reported in aggregate on the Section 3 Summary Report. For all businesses reported as being Section 3 businesses, documentation of their status must be retained in the project files. The Arkansas Economic Development Commission (AEDC) considers this form adequate documentation of Section 3 status.

Recipients funded with ACEDP CDBG funding, and any contractors or subcontractors with which they contract for more than \$100,000, are required to report on all contracts they make both with Section 3 business concerns and with businesses that are not Section 3 business concerns.

Documentation of the status of Section 3 Businesses should be retained in the project files and attached to all contracts over \$100,000.

Business being certified

Company: _____

Address: _____

Project information

Project Name: _____

Project Address: _____

Section 3 Determination

• Is your business owned (51% or more) by individuals whose household incomes are NO GREATER THAN 80% of Area Median Income (AMI)? Use the "low" income listed on the following chart http://www.arkansasedc.com/docs/default-source/community-resources/2018_income_limits.pdf?sfvrsn=9b57f91e_0 () Yes () No

• Do 30% (or more) of your full time, permanent employees have household incomes that are NO GREATER THAN 80% of Area Median Income (AMI), or within three years of the date of first employment with the business concern were Section 3 residents? Use the "low" income listed on the following chart http://www.arkansasedc.com/docs/default-source/community-resources/2018_income_limits.pdf?sfvrsn=9b57f91e_0 () Yes () No

• Will you subcontract more than 25% of this contract with a qualified business that is either 51% owned by Section 3 residents or 30% or more of its employees are Section 3 residents? () Yes () No

The information below is optional for bidders. It will be required from the successful contractor and subcontractors.

Racial/Ethnic Code of Owner:

___ Caucasian ___ African American ___ Native American ___ Hispanic ___ Asian/Pacific ___ Hasidic Jew

Woman Owned Business? Yes ___ No ___

Section 1001, Title 18 of the US Code of Federal Regulations makes it a crime to make willful false statements or misrepresentations to any department or agency of the United States on any matter within its jurisdiction.

If any of the questions above are marked "yes", the business qualifies as a Section 3 business. I certify that the above statements are true, complete, and correct to the best of my knowledge and belief.

Signature: _____

Print Name: _____ **Date:** _____



MTA Engineers: *a Division of Materials Testing of Arkansas, Inc.*

•Little Rock, AR •Springdale, AR •Jonesboro, AR
P.O. Box 23715 Little Rock, AR 72221
501-753-2526 or mtaengineers.com

REPORT OF GEOTECHNICAL EXPLORATION HEAD START FACILITY-POCAHONTAS, AR

PREPARED FOR:

BRACKETT-KRENNERICH ARCHITECTS
100 E HUNTINGTON AVENUE, STE D
JONESBORO AR 72401

PREPARED BY:

KELTON PRICE, P.E.
MATERIALS TESTING OF ARKANSAS, INC.
MTA ENGINEERS

DATE

MAY 4, 2018

• GEOTECHNICAL ENGINEERING

• CONSTRUCTION MATERIALS TESTING

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE NO.</u>
EXECUTIVE SUMMARY	3
INTRODUCTION.....	4
FIELD EXPLORATION.....	4
GENERAL SITE AND SUBSURFACE CONDITIONS	4
LABORATORY TESTING	5
ANALYSIS AND RECOMMENDATIONS.....	5
• SITE PREPARATION	5
• STRUCTURAL FILL.....	6
• BUILDING FOUNDATIONS	6
• SHALLOW FOUNDATIONS.....	7
• SEISMIC CONSIDERATIONS	7
• PAVEMENT DESIGN	7
CONSTRUCTION PROCEDURES	8

APPENDICES

APPENDIX A: Plan of Borings.....	A-1
APPENDIX B: Boring Logs	B-1
APPENDIX C: Key to Terms and Symbols	C-1
APPENDIX D: Laboratory Test Summary	D-1
APPENDIX E: USGS Seismic Data.....	E-1

TABLES

Table 1. Soil Types Encountered at the Existing Site.....	3
Table 2. General Strata Classification of Boring Logs.....	5
Table 3. Pavement Design Assumption Values	7
Table 4. Pavement Design Recommendations	8

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

EXECUTIVE SUMMARY:

The exploration of the proposed Head Start Facility was conducted south of Patrick Drive and east of Education Drive in Pocahontas, Arkansas.

The general topography of the site was uniformly sloping and had medium to dense grassy vegetation. Subsurface conditions were relatively consistent throughout the entirety of the proposed development. Major soil types encountered at each boring may be summarized as follows:

Table 1. Soil Types Encountered

SOIL TYPE	DESCRIPTION
SM	Silty Sand/Sandy Silt
SC-SM	Silty Sand/Clayey Sand

See Table 2 General Strata Classification of Boring Logs or the individual boring logs found in Appendix B for a more detailed overview of the soils encountered on site. No water table was encountered at the proposed Head Start Facility, however significantly wetter soils were encountered in most boring locations at shallow depths.

Based on the nature of the existing soil encountered at the time of exploration it is recommended that the structure be supported on spread footings and a grade beam system founded a minimum of twenty-four (24") inches beneath final exterior grade. The minimum spread footing should be four feet by four feet (4'x4'). The continuous should connect all spread footings. The minimum footing width should be twenty-four (24") inches and a minimum depth of twenty-four (24") inches is recommended. All shallow footings should be founded within properly compacted approved fill or in re-conditioned in-situ soils of Stratum I that have been scarified, moisture conditioned and re-compacted according to this report. Shallow foundations on compacted approved structural fill or re-conditioned in-situ soils may be sized using a net allowable end bearing pressure of 1200 and 1500 pounds per square foot (psf) for continuous and individual spread footings, respectively. This net allowable end bearing pressure is based on a factor of safety in excess of two and one-half (2.5) with respect to the anticipated shear strength of footing material.

All areas of the building and parking should be proof-rolled before footings are excavated and base rock is placed. Due to the moisture sensitive nature of the existing soils undercut should be anticipated after any amount of rainfall.

It is recommended that a representative of Materials Testing of Arkansas be present during placement of all compacted fill. Recommendations are expressed in further detail in subsequent sections of this report.

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

INTRODUCTION:

This exploration was requested in order to evaluate existing subsurface conditions and also provide geotechnical design recommendations. The results of this exploration and the geotechnical design recommendations for site construction are presented in this report.

Exploration was accomplished by:

- 1.) Boring seven (7) locations to a maximum depth of twenty (20') feet to explore subsurface soil, rock, and groundwater conditions.
- 2.) Obtaining samples from each stratum at the seven (7) testing locations.
- 3.) Performing laboratory tests on various samples to determine pertinent engineering properties of the subsurface strata.
- 4.) Analyzing field and laboratory test data to develop design recommendations.

The scope of this geotechnical exploration did not include an environmental assessment for determining the presence of wetlands and/or hazardous or toxic materials in the soil or groundwater on or near this site. If there is concern of wetlands or a hazardous/toxic material presence, a qualified environmental assessment consultant should be contacted to perform a site investigation before construction begins.

FIELD EXPLORATION:

Subsurface conditions at the site were explored by using dry auger methods and split-spoon sampling to a depth of twenty (20') feet at seven (7) boring locations within the marked areas. The approximate boring locations are shown on the Plan of Borings, Appendix A. Boring Log Reports presenting descriptions of the soil strata encountered and results of field and laboratory tests are included in Appendix B. A key to the terms and symbols used on the Boring Log Reports is presented in Appendix C. Laboratory testing results of the different soil types are located in Appendix D.

Samples were obtained throughout the entirety of each location in general accordance with Standard Penetration Sampling (N-Value). The recorded N-Values (Blows per foot) are indicated on the Boring Logs in the Blows per foot column. All soil samples encountered were removed from the field in moisture tight containers and transported to our laboratory for further examination. At the lab a visual classification was performed for each sample. All various soil types were then analyzed for specific engineering properties.

The dry auger drilling procedures facilitate observation of shallow groundwater conditions. Observations regarding groundwater are noted in the lower right portion of each log and are discussed in subsequent sections of this report.

GENERAL SITE AND SUBSURFACE CONDITIONS:

The exploration of the proposed Head Start Facility was conducted south of Patrick Drive and east of Education Drive in Pocahontas, Arkansas. The general topography of the site was uniformly sloping and had medium to dense grassy vegetation. It is assumed that the structures will be placed at or above the existing elevation. The stratigraphy encountered in the boring locations is

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

summarized in Table 2. For a more detailed description of soils encountered while testing see the boring log sheets found in Appendix B.

Table 2. General Strata Classification of Boring Logs

STRATA	DEPTH	SOIL CLASSIFICATION	SOIL DESCRIPTION	SIGNIFICANT PROPERTIES
STRATUM I	0 - 2' to 10'	SM	Very Loose to Loose Silty Sand	
STRATUM II	2' to 4' - 6'	SC-SM	Loose Silty Clayey Sand	
STRATUM III	4' to 6' - Boring Completion	SM	Very Loose to Loose Silty Sand	

No significant groundwater was encountered at the site. Significantly wetter soils were found in the upper six (6') feet in most boring locations. The significant properties and characteristics of the subsurface strata pertinent to design and construction are:

- A. The topography of the site and planned locations.
- B. The loose soils located in all borings to completion depth.
- C. The silty clayey sand found in Stratum II being saturated.

The relationship of these factors to design and construction of the proposed facility is considered in the subsequent sections of this report.

LABORATORY TESTING:

Descriptions of the soils encountered in the sample locations were prepared in general accordance with applicable ASTM standards. The soil stratification shown on the Boring Log Reports represent soil conditions at the specific sample locations. Possible variations occur between or beyond the sample location. The stratification lines on the Boring Log represent the approximate boundaries between soil types, but actual transitions between soil layers in the stratification of the proposed site may be gradual.

Laboratory testing was performed to verify/evaluate classification, volumetric stability, shear strength and to determine water content. The results of all testing performed are presented in Appendix D Laboratory Test Summary.

ANALYSIS AND RECOMMENDATIONS:

SITE PREPARATION:

All building, drive, and parking areas should be stripped eight inches to one foot (8" - 1') to remove the grassy vegetation and topsoil. All stripped areas should be scarified, moisture-conditioned, and re-compacted to ninety-eight (98%) percent of the materials standard proctor (ASTM D-698). Then the stripped area should be backfilled with approved select fill to the desired elevation. All areas requiring undercut should be backfilled with approved fill as noted in the "Structural Fill" section of this report. Depending upon site conditions at the time of construction, an initial "Bridge" lift may be required during the back-fill process. The initial "Bridge" lift, if needed, should be placed in a loose lift thickness of two (2') feet at or near optimum moisture content. The lift should be

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

compacted using static methods only, to a minimum of ninety-two (92%) percent of laboratory compaction (ASTM D-698). Additional lifts should be placed in eight (8") inch loose lifts and compacted to ninety-eight (98%) percent of laboratory compaction (ASTM D-698) at or near optimum moisture.

Areas requiring building foundations, parking, or drives should be "proof rolled" using a 62,000-pound equivalent load. Any areas indicating instability may require undercut up to three (3') feet and replaced and compacted with select fill.

Excavation should be performed under dry conditions, using equipment adequate to perform the work. Medium construction equipment should be adequate to perform work needed. Positive drainage should be maintained throughout this process. The addition of excessive moisture could cause a significant loss of soil stability. Depending upon the time of construction, undercutting may be needed for areas of high moisture content where loss of soil shear strength has occurred due to inundation. Construction roads and drives will require continuous maintenance to provide access to the site. Additional efforts may be required in the areas of construction drives to aide in the construction of the site.

STRUCTURAL FILL:

Fill should consist of approved materials, which are free of organic matter and debris. For approval, samples of the proposed fill material should be submitted to Materials Testing of Arkansas for classification testing. Select fill consisting of low plasticity (lean clay) soil or clayey gravel classifying as SC, CL, or GC according to the Unified Soils Classification System are generally considered suitable. High plasticity clay soils or soils with a Liquid Limit above fifty (50) should not be used. Rock fragments that are greater than 4 inches in any dimension should not be included in engineered fill in the building area. In the parking area or drive areas, a maximum rock fragment of 6 inches may be used in depths greater than 4 feet of the engineered fill. The upper 4 feet of the parking and drive areas should follow the 4 inches or smaller rock size fragments.

Placement of approved fill should be achieved in multiple thin lifts. Each lift should not exceed eight inches (8") in loose thickness. Compaction of these lifts should be performed with suitable equipment to achieve 98% of standard proctor (ASTM D-698) at two (2%) percent below to three (3%) percent above optimum moisture content. Thinner lifts may be required based on the compaction equipment being used. Care should be taken that all compaction recommendations are performed.

If cohesive soils are to be used, compaction should be performed using a kneading-type vibratory compactor, such as a vibratory sheepsfoot. The material should be broken down sufficiently to provide a dense matrix of particles.

BUILDING FOUNDATIONS:

All foundations must satisfy two basic and independent design criteria. First, foundations must have an acceptable factor of safety against bearing failure under maximum design loads. Secondly, movement of the foundation due to consolidation, shrinkage, and/or swelling of the supporting strata should not exceed tolerable limits for the structure. Construction factors such as installation of foundations units, excavation procedures, and surface and groundwater conditions should also be considered. These factors and the aforementioned subsurface conditions were influential in development of the following recommendations.

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

In view of the anticipated foundation loading and subsurface conditions encountered, it is recommended that the proposed structures be supported on a foundation system designed in accordance with the following recommendations.

SHALLOW FOUNDATIONS:

It is recommended that the proposed lightweight structure be supported on individual spread footings connected with a continuous footing system. The individual spread footings should be a minimum of four by four (4' x 4') feet and founded a minimum of twenty-four (24") inches beneath final grade. In addition, to minimize the potential for localized shear failure within the soils, the continuous footings should have a minimum width of twenty-four (24") inches and have a minimum depth of twenty-four (24") inches. The continuous and individual spread footings founded in properly compacted approved fill or re-conditioned in-situ soils, may be sized using a net allowable end bearing pressure of twelve hundred and fifteen (1200- 1500 psf) pounds per square foot, respectively. If soft soils due to saturation are encountered, undercut of the soils and backfilled with approved fill may be required. This net allowable end bearing pressure is based on a factor of safety in excess of two and one-half (2.5) with respect to the measured shear strength.

To gain bearing capacity, the building pad area should be undercut six (6') feet and backfilled with approved select fill. The fill should be placed by utilizing an initial two (2') foot bridge lift compacted according to the "Site Preparation" section of this report. Following lifts should be placed according to our "Structural Fill" section of this report. This will increase the net allowable end bearing pressure to two thousand and twenty-five hundred (2000 psf, 2500 psf) pounds per square foot for continuous and individual spread footings, respectfully. This net allowable end bearing pressure is based on a factor of safety in excess of three (3.0) with respect to the anticipated shear strength.

If any rainfall occurs undercutting should be anticipated.

SEISMIC CONSIDERATIONS:

Based on IBC Table 1615.1.1, a site soil class D may be used for design purpose. Liquefaction potential of the soils in Stratum I or II is negligible.

PAVEMENT DESIGN:

Paved drives and parking may be constructed as part of the project. Design traffic volumes and loadings have not been determined at this time; however, we anticipate that the drives will be subject to light vehicles and weekly service trucks. Parking will be used primarily by automobiles. We also anticipate that pavement construction will involve only minor cut and fill. The following design criteria were used to develop the recommended pavement sections in conjunction with the AASHTO Design Guide 1996:

Table 3. Pavement Design Assumption Values

PAVEMENT DESIGN ASSUMPTION VALUES	
CBR	5
R-VALUE	15
SOIL SUPPORT VALUE (S)	5

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

Based on information obtained during this study, subgrade soils in the paved areas should generally consist of the soils in the Stratum I or structural fill as recommended in the "Site Preparation" section of this report.

Structural fill, where required, should be placed as recommended in the site grading section of the report. It is recommended that positive site drainage be provided during construction and be incorporated during the final design.

Table 4. Pavement Design Recommendations

PAVEMENT DESIGN RECOMMENDATIONS	
Light Duty Asphalt Paving	2" Asphalt Surface Course
	8" Crushed Stone Base Course
	12" Compacted Subgrade (Min. CBR 5)
Heavy Duty Asphalt Paving	4" Asphalt Surface Course
	8" Crushed Stone Base Course
	12" Compacted Subgrade (Min. CBR 5)
Concrete Paving	5" Concrete Pavement
	8" Crushed Stone Base Course
	12" Compacted Subgrade (Min. CBR 5)
Dumpster Pad if needed	6" Concrete Pavement
	8" Crushed Stone Base Course
	12" Compacted Subgrade (Min. CBR 5)

It should be recognized that some periodic maintenance of pavement will be required. As a minimum, this should include periodic sealing of all joints and cracks to prevent surface water infiltration.

CONSTRUCTION PROCEDURES:

The potential exists for increased groundwater to develop during wetter seasons; therefore, foundation excavation and any other site grading should be performed during drier periods to reduce the possibility of changes in conditions.

Subsurface conditions that vary significantly with those encountered within the borings should be brought to the attention of the engineer, and work delayed pending evaluation and/or preparation of additional recommendations, if warranted.

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

* * * * *

The following illustrations are attached and complete this report:

- Appendix A Plan of Borings
- Appendix B Boring Logs
- Appendix C Key to Terms and Symbols
- Appendix D Laboratory Test Results
- Appendix E USGS Seismic Data

* * * * *

The opportunity to be of service on this project is highly appreciated. If there are any questions regarding information provided in this report, or if additional assistance during final design or construction is required, please contact us. Final grades have not provided at the time of this report. Requirements for retaining walls will be added, if required.

Sincerely,

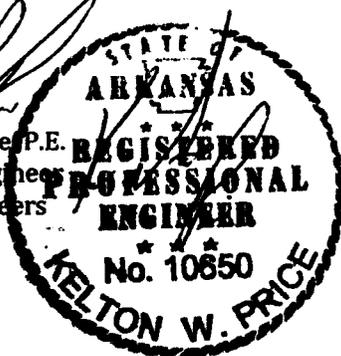
Materials Testing of Arkansas, Inc.
MTA Engineers



Trey Uekman, E.I.
Staff Engineering
MTA Engineers



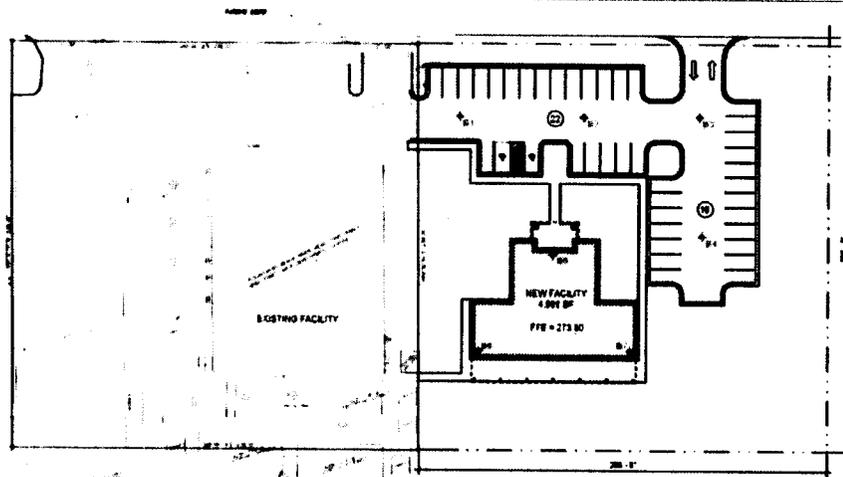
Kelton Price, P.E.
Project Engineer
MTA Engineers



Appendix A



Approximate Boring Locations



B1 B4 - 10'-0" boring depth
B2 B7 - 20'-0" boring depth



site plan
SCALE 1" = 40'-0"

EARLY HEAD START FACILITY
CITY OF POCAHONTAS
POCAHONTAS, ARKANSAS

BRACKETT
KRENNERICH
architects

Appendix B





MTA ENGINEERS a division of
MATERIALS TESTING OF ARKANSAS
www.mtaengineers.com

Boring Log Report

BORING NO. B-1
 PAGE 1 OF 1

JOB NO. _____
 JOB NAME: HEAD START FACILITY-POCAHONTAS, AR
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: POCAHONTAS, AR

DATE: 4-23-18
 TYPE OF DRILLING: DRY AUGER
 EQUIPMENT: GEOPROBE 7822DT
 LOGGED BY: G. SPAHN
 DRILLED BY: L. JOHNSON

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
5			DARK BROWN SILTY SAND	SM	NP	15.5	NV	NP	31.5	2 2-2 4 3-2 1 1-0 3 5-8 6 12-14	4 5 1 13 26
10			Boring Terminated								
15											
20											
25											
30											

COMPLETION DEPTH: 10 WATER DEPTH> INITIAL: _____ AFTER 24 HOURS: _____

REMARKS: _____



MTA ENGINEERS a division of
MATERIALS TESTING OF ARKANSAS
www.mtaengineers.com

Boring Log Report

BORING NO. **B-2**
 PAGE **1** OF **1**

JOB NO. _____
 JOB NAME: **HEAD START FACILITY-POCAHONTAS, AR**
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: **POCAHONTAS, AR**

DATE: **4-23-18**
 TYPE OF DRILLING: **DRY AUGER**
 EQUIPMENT: **GEOPROBE 7822DT**
 LOGGED BY: **G. SPAHN**
 DRILLED BY: **L. JOHNSON**

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
			BROWN SILTY SAND	SM						1 2-1 7 3-2	3 5
5			BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED 4' - 6')							2 2-3 2 3-7	5 10
10			BROWN GRAY SILTY SAND		NP	15.9	NV		20.5	4 13-20	33
			Boring Terminated								
15											
20											
25											
30											

COMPLETION DEPTH: **10** WATER DEPTH> INITIAL: _____ AFTER 24 HOURS: _____

REMARKS: _____



**MTA ENGINEERS a division of
MATERIALS TESTING OF ARKANSAS**

www.mtaengineers.com

Boring Log Report

BORING NO. B-3

PAGE 1 OF 1

JOB NO. _____
 JOB NAME: HEAD START FACILITY-POCAHONTAS, AR
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: POCAHONTAS, AR

DATE: 4-23-18
 TYPE OF DRILLING: DRY AUGER
 EQUIPMENT: GEOPROBE 7822DT
 LOGGED BY: G. SPAHN
 DRILLED BY: L. JOHNSON

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
			DESCRIPTION OF MATERIAL								
			BROWN SILTY SAND	SM						1 25 4	7 8
5			BROWN GRAY COHESIVE SILT WITH SAND (SATURATED)	SC-SM						1 2-2	4
			BROWN/GRAY SILTY SAND	SM						2 3-3 3	6 14
10			Boring Terminated							7-7	
15											
20											
25											
30											

COMPLETION DEPTH: 10 WATER DEPTH> INITIAL: _____ AFTER 24 HOURS: _____

REMARKS: _____



MTA ENGINEERS a division of
MATERIALS TESTING OF ARKANSAS
www.mtaengineers.com

Boring Log Report

BORING NO. **B-4**

PAGE **1** OF **1**

JOB NO. _____
 JOB NAME: **HEAD START FACILITY-POCAHONTAS, AR**
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: **POCAHONTAS, AR**

DATE: **4-23-18**
 TYPE OF DRILLING: **DRY AUGER**
 EQUIPMENT: **GEOPROBE 7822DT**
 LOGGED BY: **G. SPAHN**
 DRILLED BY: **L. JOHNSON**

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
			BROWN SILTY SAND							1	5
			BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED 2' - 4')	SM	NP	16.3	NV		45.7	2-3	4
		1									
5		2-2									
		2								7	
		2-5									
		3	11								
		4-7									
10		5	18								
		8-10									
			Boring Terminated								
15											
20											
25											
30											

COMPLETION DEPTH: 10 WATER DEPTH> INITIAL: AFTER 24 HOURS:

REMARKS:



MTA ENGINEERS a division of
MATERIALS TESTING OF ARKANSAS
 www.mtaengineers.com

Boring Log Report

BORING NO. **B-5**
 PAGE **1** OF **1**

JOB NO. _____
 JOB NAME: **HEAD START FACILITY-POCAHONTAS, AR**
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: **POCAHONTAS, AR**

DATE: **4-23-18**
 TYPE OF DRILLING: **DRY AUGER**
 EQUIPMENT: **GEOPROBE 7822DT**
 LOGGED BY: **G. SPAHN**
 DRILLED BY: **L. JOHNSON**

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
			BROWN SILTY SAND	SM						2 3-4	7
			BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED)	SC-SM	12	16.2	16	4	46.7	1	3
5										2	6
			BROWN/GRAY SILT WITH SAND	SM						3	13
10										5-8	14
										7	
15										1 2-2	4
20										2 1-2	3
			Boring Terminated								
25											
30											

COMPLETION DEPTH: **20** WATER DEPTH> INITIAL: _____ AFTER 24 HOURS: _____

REMARKS: _____



MTA ENGINEERS a division of
MATERIALS TESTING OF ARKANSAS

www.mtaengineers.com

Boring Log Report

BORING NO. B-6

PAGE 1 OF 1

JOB NO. _____
 JOB NAME: HEAD START FACILITY-POCAHONTAS, AR
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: POCAHONTAS, AR

DATE: 4-23-18
 TYPE OF DRILLING: DRY AUGER
 EQUIPMENT: GEOPROBE 7822DT
 LOGGED BY: G. SPAHN
 DRILLED BY: L. JOHNSON

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
			BROWN SILTY SAND	SM						1 3-1	4
5			BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED 2' - 4')	SC-SM						2 3-3	6
										2 2-2	4
										3 2-4	6
10										3 3-8	11
			BROWN/GRAY SILTY SAND	SM						3 3-2	5
15											
20					NP	21.2	NV		13.2	2 2-1	3
			Boring Terminated								
25											
30											

COMPLETION DEPTH: 20 WATER DEPTH> INITIAL: _____ AFTER 24 HOURS: _____

REMARKS: _____



Boring Log Report

BORING NO. B-7
 PAGE 1 OF 1

JOB NO. _____
 JOB NAME: HEAD START FACILITY-POCAHONTAS, AR
 COORDINATES: NORTH: _____ EAST: _____
 STATION: _____
 LOCATION: POCAHONTAS, AR

DATE: 4-23-18
 TYPE OF DRILLING: DRY AUGER
 EQUIPMENT: GEOPROBE 7822DT
 LOGGED BY: G. SPAHN
 DRILLED BY: L. JOHNSON

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	PERCENT MOISTURE (%)	LIQUID LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING #200	NO. OF BLOWS PER 6"	N-VALUE
		1	BROWN SILTY SAND	SM	NP	11.1	NV		27.8	2	9
		2	BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED 2' - 4')	SC-SM						4-5	7
5		3-4								8	
		2								9	
		3-5								12	
10		4	BROWN/GRAY SILTY SAND	SM					4	3	
		5-4									
		4									
		5-7									
15		3							2-1		
20		1							1	5	
		2-3									
			Boring Terminated								
25											
30											

COMPLETION DEPTH: 20 WATER DEPTH> INITIAL: _____ AFTER 24 HOURS: _____

REMARKS: _____

Appendix C

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

TERMS AND SYMBOLS USED ON BORING LOGS

SOIL TYPES			
	CLAY (CH)		SILTY CLAY (CL)
	CLAY (CL)		SANDY CLAY (CL)
	WELL-GRADED SAND (SW)		POORLY-GRADED SAND (SP)
	SILTY SAND (SM)		CLAYEY SAND (SC)
	WELL-GRADED GRAVEL (GW)		POORLY-GRADED GRAVEL (GP)
	SILTY GRAVEL (GM)		SANDY SILT (ML)
	CLAYEY GRAVEL (GC)		SILT (ML)
	SILT (MH)		FILL MATERIAL

ROCK TYPES			
	LIMESTONE		SHALE
	SANDSTONE		WEATHERED LIMESTONE
	WEATHERED SHALE		WEATHERED SANDSTONE

SAMPLER TYPE			
	SHELBY TUBE SAMPLE		SPLIT SPOON SAMPLE
	AUGER SAMPLE		NO RECOVERY

MTA Engineers: a Division of Materials Testing of Arkansas, Inc.

SOIL GRAIN SIZE

U.S. STANDARD SIEVE								
12"	3"	3/4"	4	10	40	200		
BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		
304	76.2	19.1	4.75	2	0.42	0.074	0.002	
SOIL GRAIN SIZE IN MILLIMETERS								

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on No 200 sieve): Includes (1) clean gravels and sands, and (2) silty clayey gravels and sands condition is rated according to relative density, as determined by laboratory tests.

DESCRIPTIVE TERMS	N VALUE	RELATIVE DENSITY
VERY LOOSE	0-4	0 - 15 %
LOOSE	4-10	15 - 35 %
MEDIUM DENSE	10-30	35 - 65 %
DENSE	30-50	65 - 85 %
VERY DENSE	50 and above	85 - 100 %

FINE GRAINED SOILS (major portion passing No 200 sieve): include (1) inorganic and organic silt and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer reading or by unconfined compression tests.

DESCRIPTIVE TERMS	UNCONFINED COMPRESSIVE STRENGTH TON / SQ. FT.
VERY SOFT	less than 0.25
SOFT	0.25 - 0.50
FIRM	0.50 - 1.00
STIFF	1.00 - 2.00
VERY STIFF	2.00 - 4.00
HARD	4.00 and higher

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above because of planes of weakness or cracks in the soil. The consistency rating of such soils are based on penetrometer readings

TERMS CHARACTERIZING MOISTURE CONTENT

DRY: No water evident in sample; fines less than plastic limit.
MOIST: Sample feels damp; fines near the plastic limit.
VERY MOIST: Water visible on sample; fines greater than plastic limit and less than liquid limit.
WET: Sample bears free water; fines greater than liquid limit.

TERMS CHARACTERIZING SOIL STRUCTURE

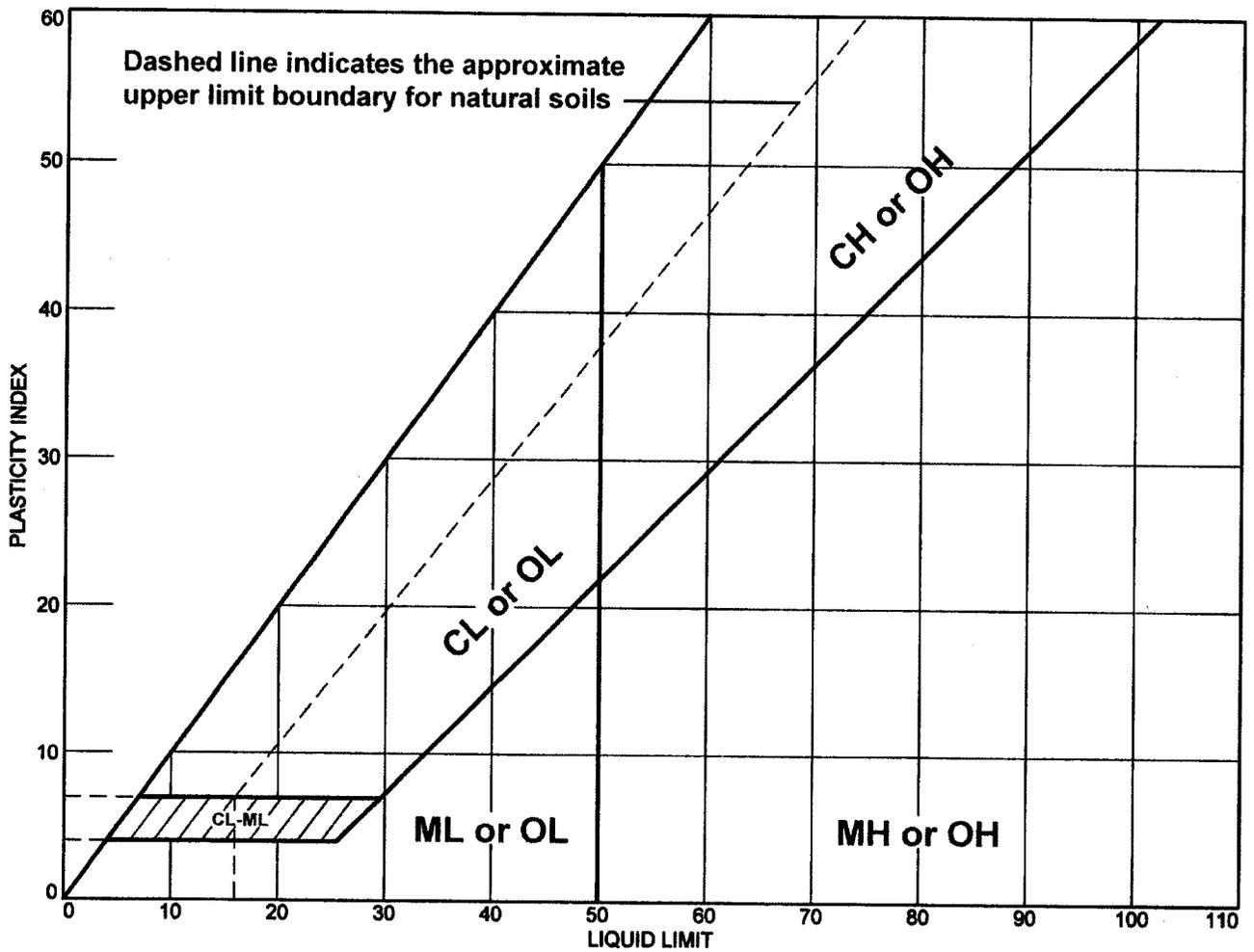
SLICKENSIDED: Having inclined planes of weakness that are slick and glassy in appearance.
FISSURED: Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
LAMINATED: Composed of thin layer of varying color and texture.
INTERBEDDED: Composed of alternate layers of different soil types
CALCAREOUS: Containing appreciable quantities of calcium carbonate.
WELL GRADED: Having wide range in grain sizes and substantial amounts of all intermediate particle size.
POORLY GRADED: Predominantly of one grain size, or having a range of sizes with some intermediate size missing

Terms used in this report for describing soils according to their texture or grain size distribution are in accordance with UNIFIED SOIL CLASSIFICATION SYSTEM as described in technical Memorandum No 3-357, Waterways Experiment Station, March 1953

Appendix D



LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	NV	NP	NP	88.1	31.5	SM

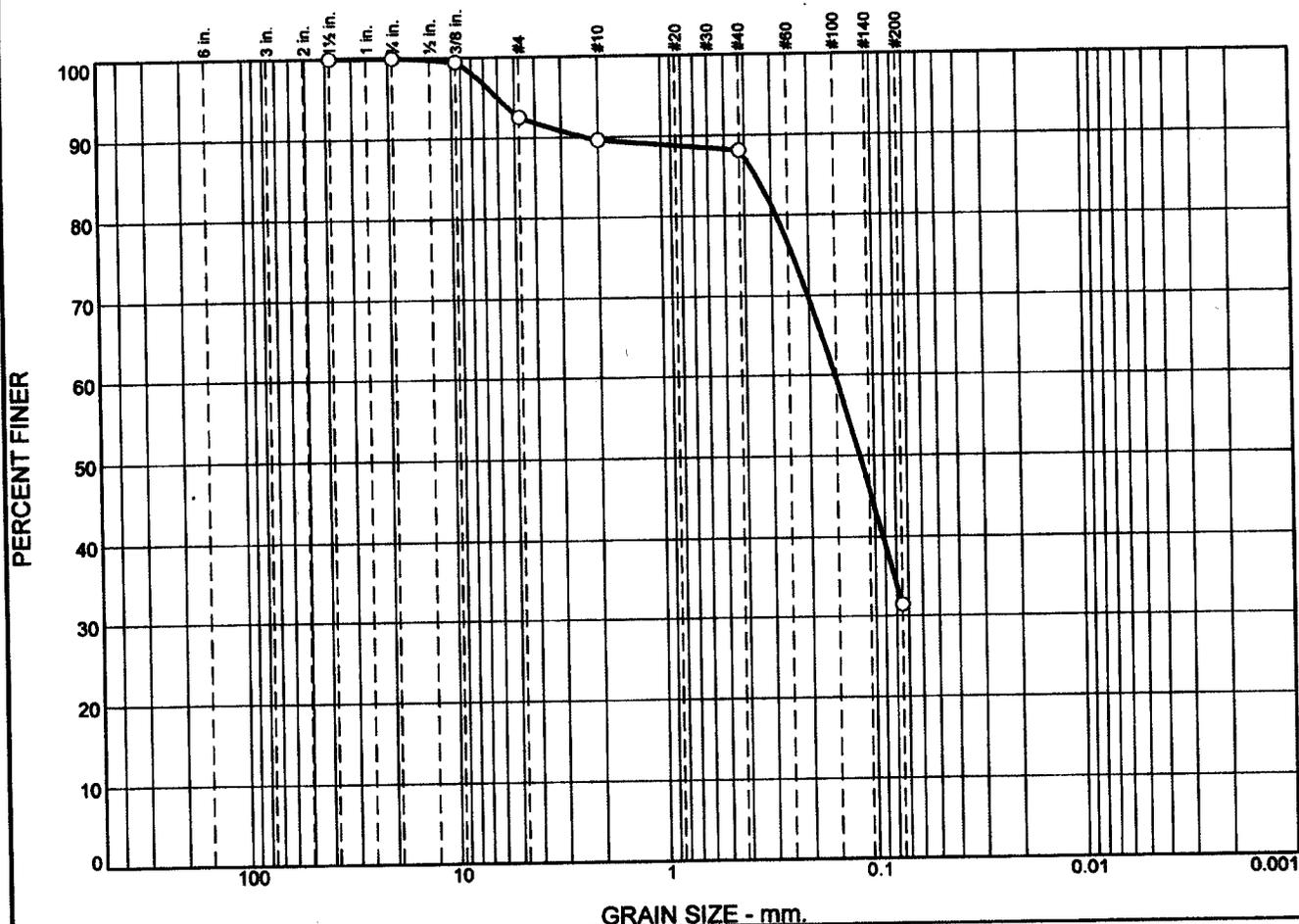
Project No. **Client:**
Project: HEAD START FACILITY-POCAHONTAS, AR
 ● **Source of Sample:** B-1 **Depth:** 4

Remarks:

Materials Testing of Arkansas
Little Rock, AR

Figure

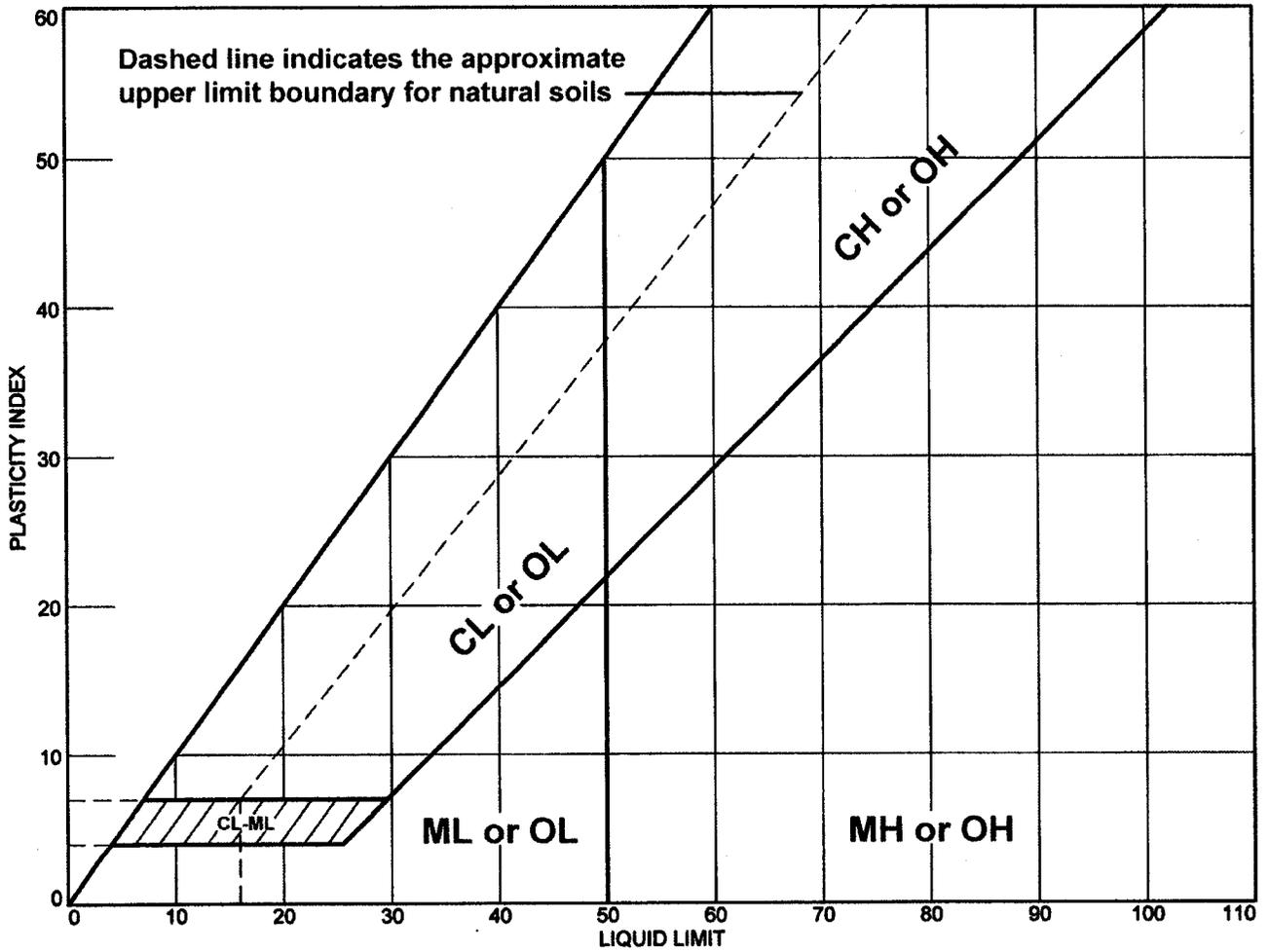
Particle Size Distribution Report



%	+3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○	0.0	0.0	7.4	3.0	1.5	56.6	31.5			
⊗	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	NV	NP	0.3544	0.1524	0.1177					
Material Description							USCS	AASHTO		
							SM	A-2-4(0)		

Project No. _____ Client: _____ Project: HEAD START FACILITY-POCAHONTAS, AR ○ Source of Sample: B-1 Depth: 4	Remarks:
Materials Testing of Arkansas Little Rock, AR	
Figure	

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWN GRAY SILTY SAND	NV	NP	NP	98.8	20.5	SM

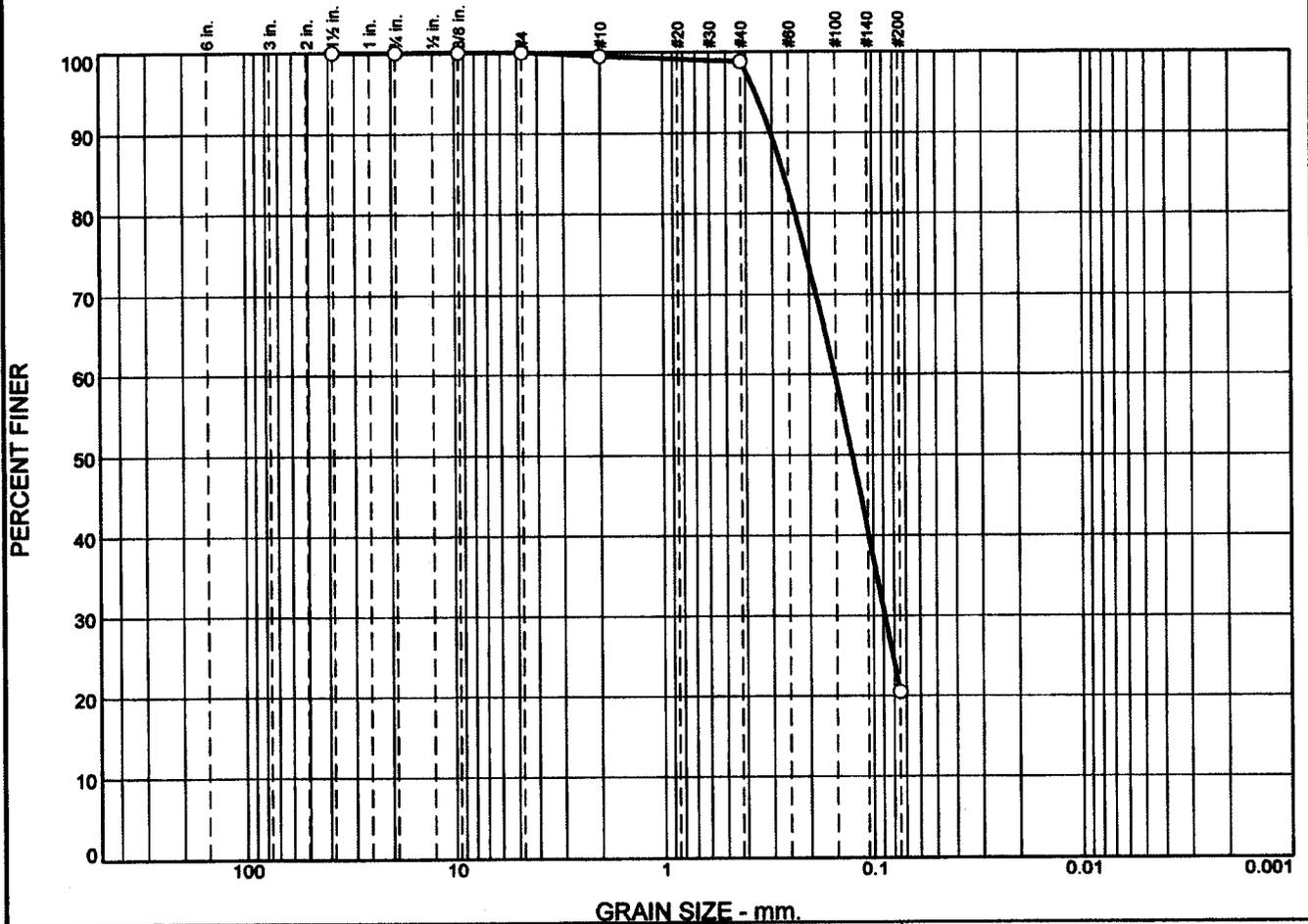
Project No. _____ **Client:** _____
Project: HEAD START FACILITY-POCAHONTAS, AR
Source of Sample: B-2 **Depth:** 8

Materials Testing of Arkansas
Little Rock, AR

Remarks:

Figure

Particle Size Distribution Report

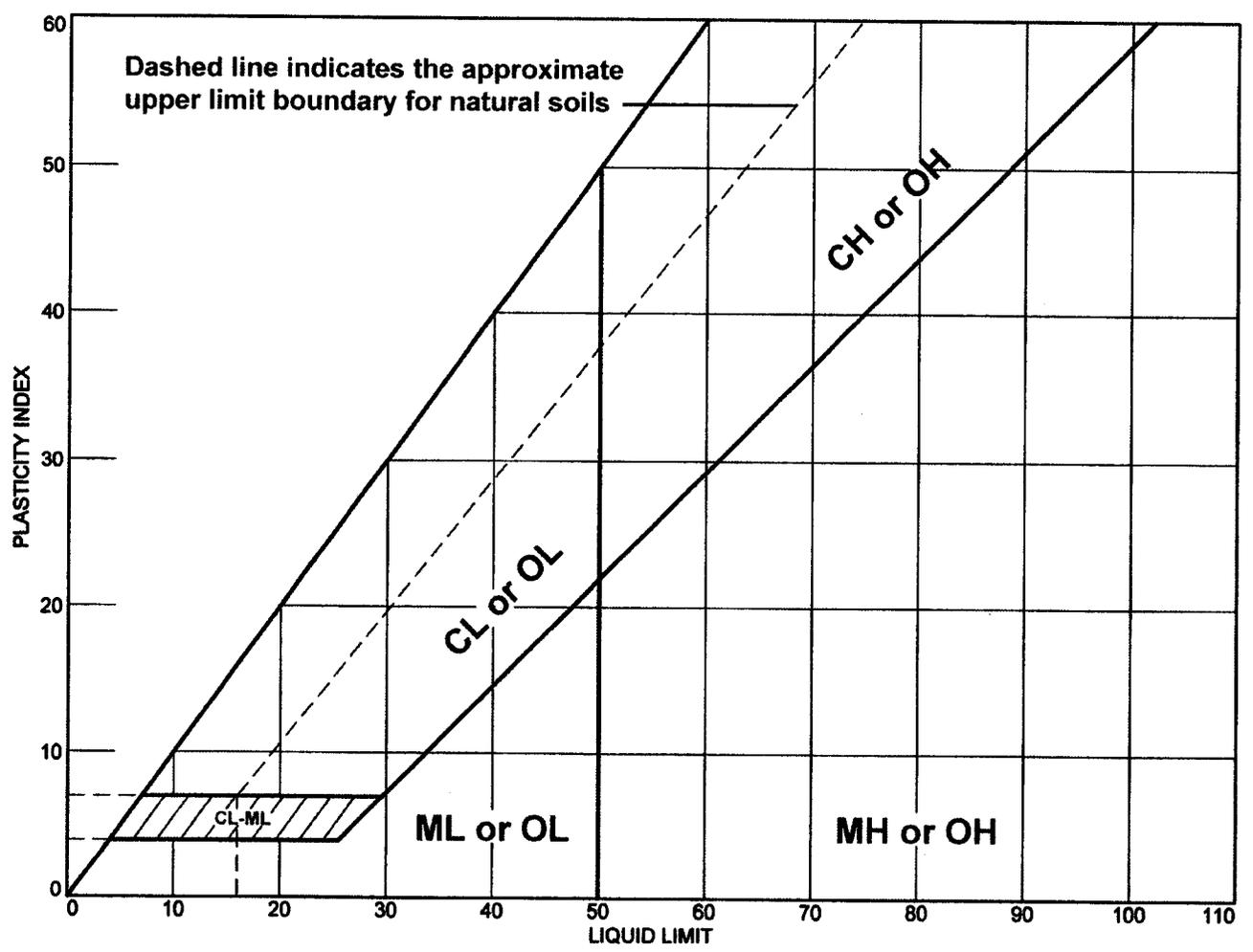


%	+3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○	0.0	0.0	0.0	0.5	0.7	78.3	20.5			
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	NV	NP	0.2642	0.1521	0.1260	0.0883				

Material Description	USCS	AASHTO
○ BROWN GRAY SILTY SAND	SM	A-2-4(0)

<p>Project No. _____ Client: _____</p> <p>Project: HEAD START FACILITY-POCAHONTAS, AR</p> <p>○ Source of Sample: B-2 Depth: 8</p>	<p>Remarks:</p>
<p>Materials Testing of Arkansas</p> <p>Little Rock, AR</p>	
<p>Figure</p>	

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED 2' - 4')	NV	NP	NP	89.4	45.7	SM

Project No. _____ **Client:** _____

Project: HEAD START FACILITY-POCAHONTAS, AR

● **Source of Sample:** B-4 **Depth:** 2

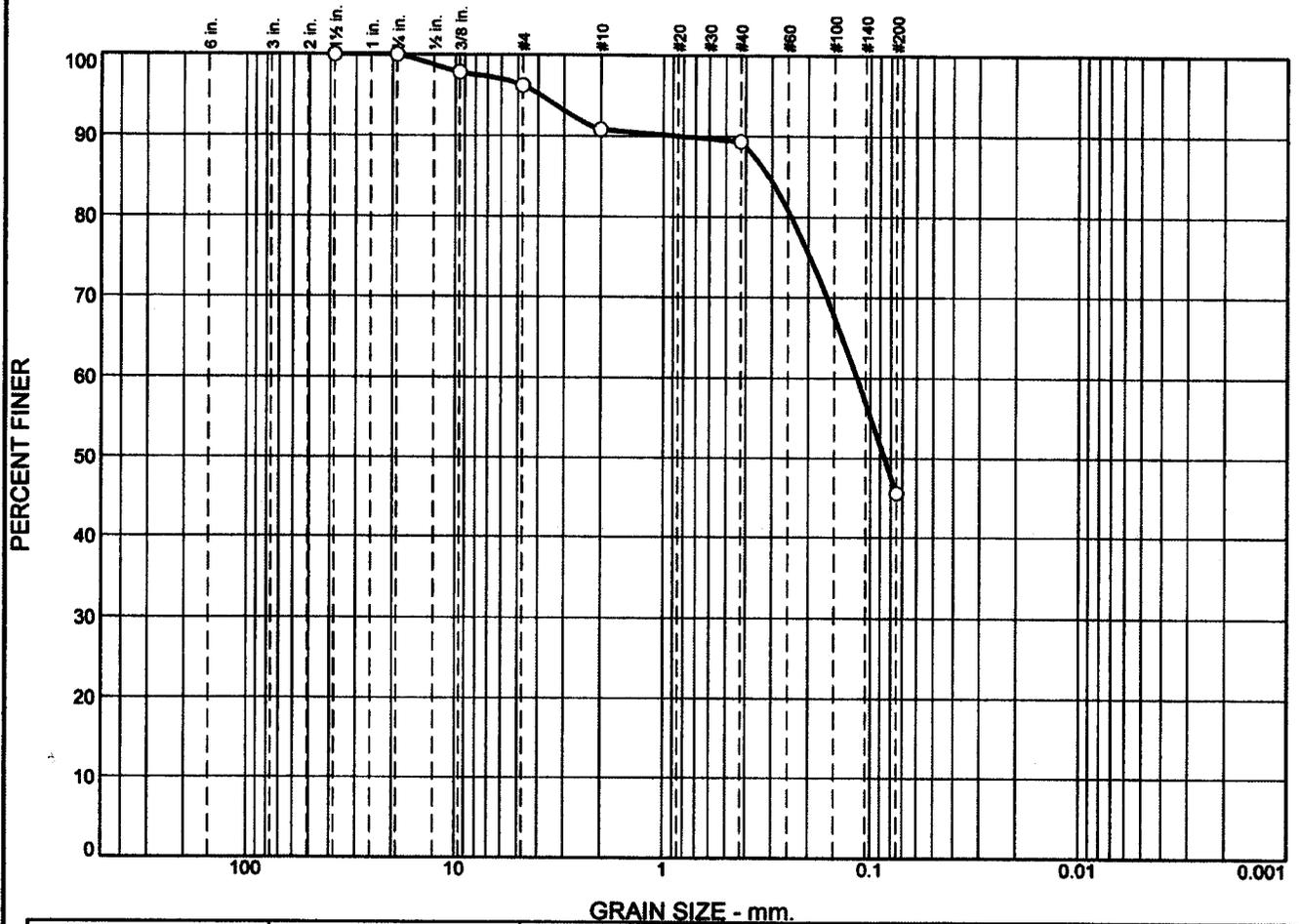
Materials Testing of Arkansas

Little Rock, AR

Remarks:

Figure

Particle Size Distribution Report

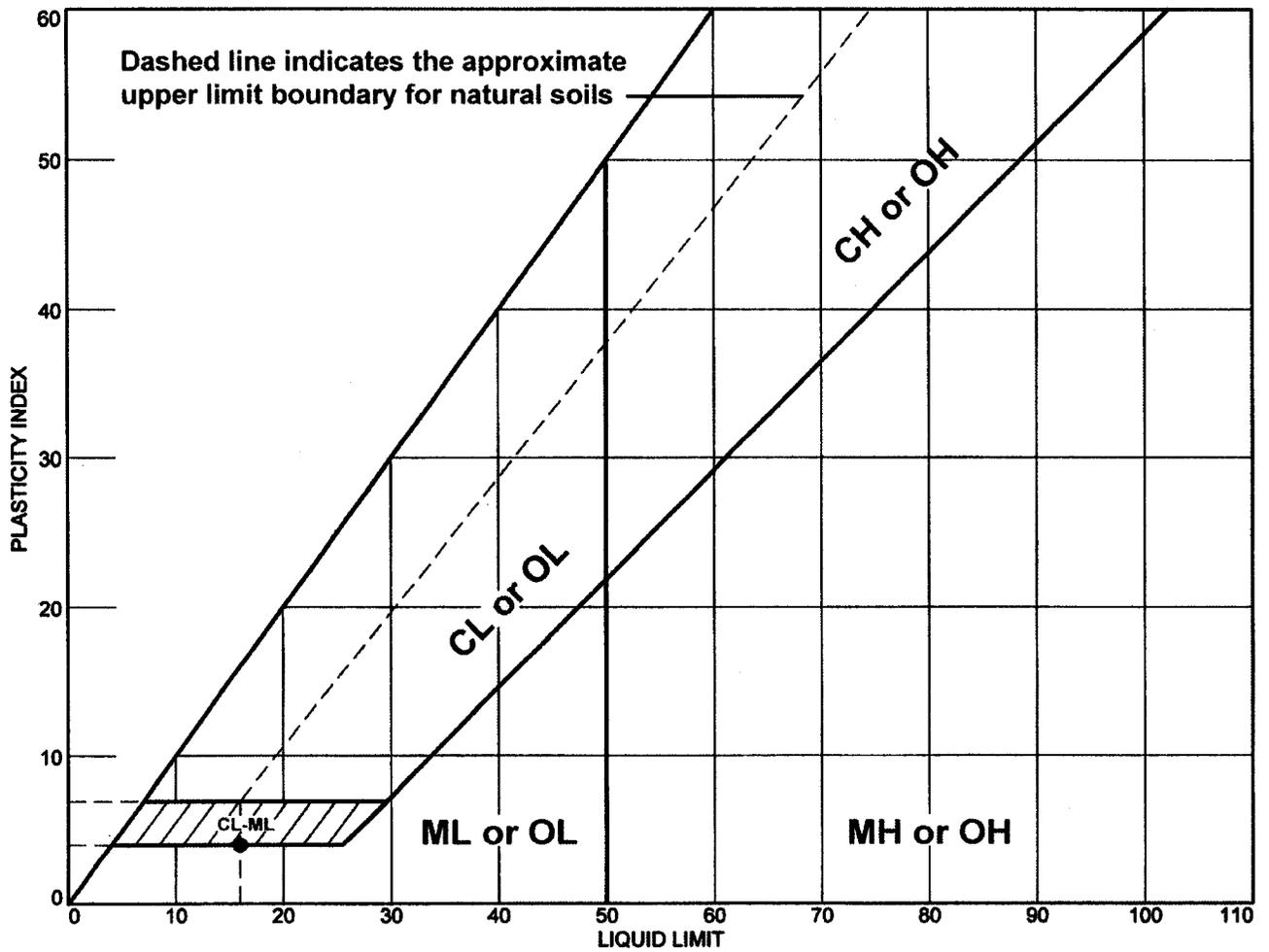


% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	3.7	5.5	1.4	43.7	45.7			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NV	NP	0.3101	0.1167	0.0855					

Material Description	USCS	AASHTO
○ BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED 2' - 4')	SM	A-4(0)

<p>Project No. _____ Client: _____</p> <p>Project: HEAD START FACILITY-POCAHONTAS, AR</p> <p>○ Source of Sample: B-4 Depth: 2</p>	<p>Remarks:</p>
<p>Materials Testing of Arkansas</p> <p>Little Rock, AR</p>	
<p>Figure</p>	

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED)	16	12	4	92.6	46.7	SC-SM

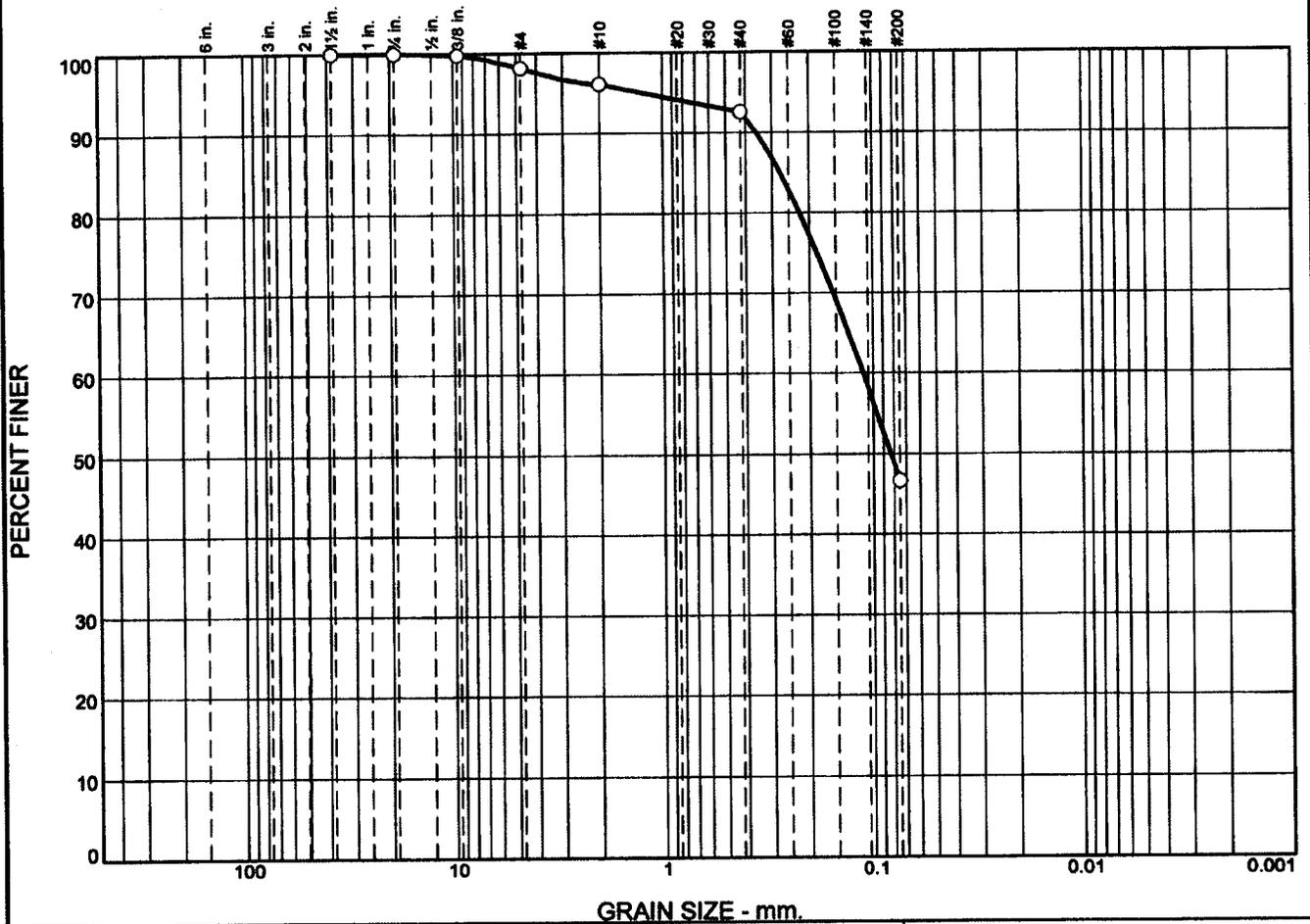
Project No. Client:
 Project: HEAD START FACILITY-POCAHONTAS, AR
 ● Source of Sample: B-5 Depth: 2

Remarks:

Materials Testing of Arkansas
 Little Rock, AR

Figure

Particle Size Distribution Report



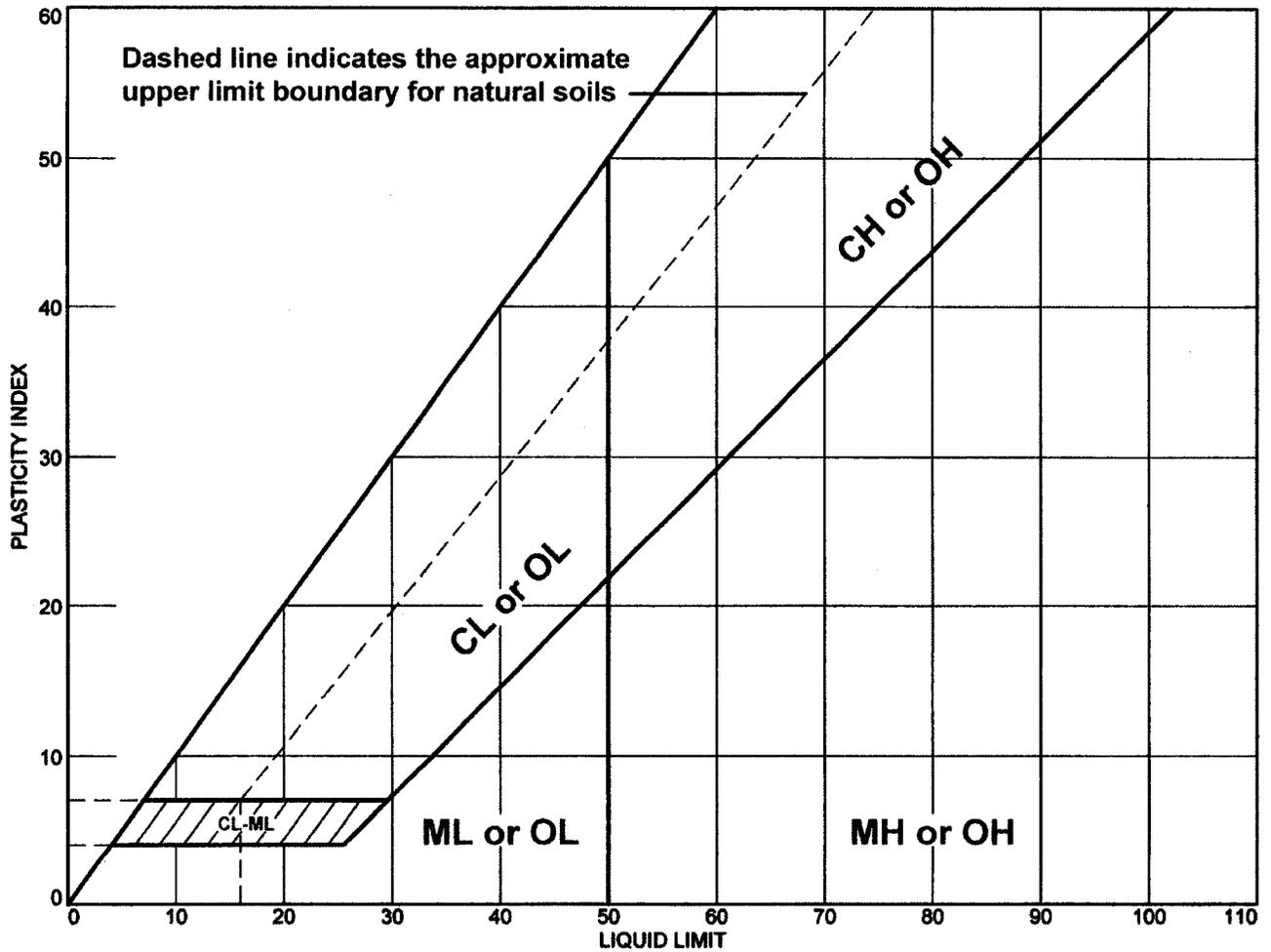
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	1.8	2.1	3.5	45.9	46.7			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
16	12	0.2749	0.1122	0.0828					

Material Description	USCS	AASHTO
○ BROWN/GRAY COHESIVE SILT WITH SAND (SATURATED)	SC-SM	A-4(0)

<p>Project No. Client:</p> <p>Project: HEAD START FACILITY-POCAHONTAS, AR</p> <p>○ Source of Sample: B-5 Depth: 2</p>	<p>Remarks:</p>
<p>Materials Testing of Arkansas</p> <p>Little Rock, AR</p>	

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	NV	NP	NP	99.2	13.2	SM

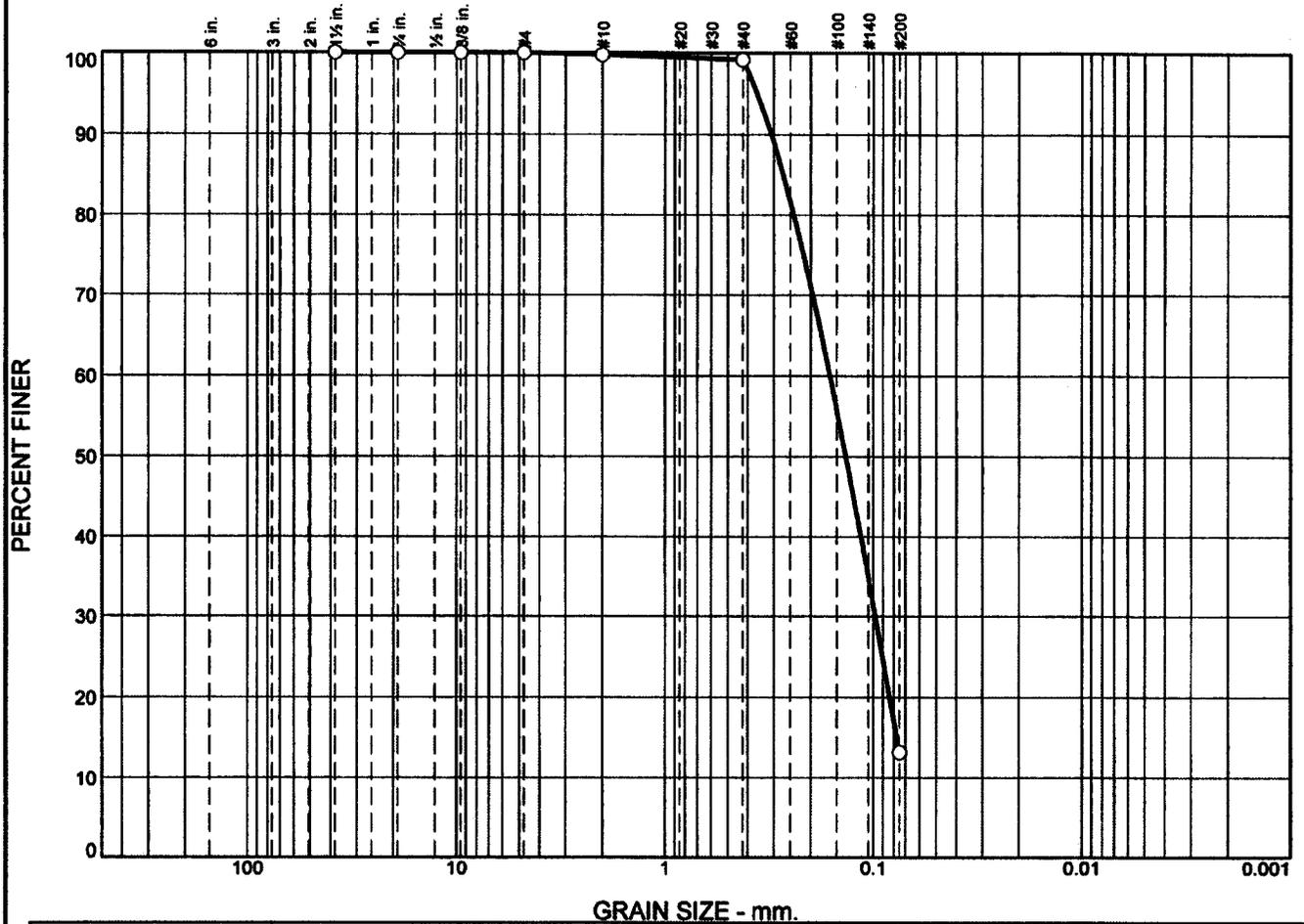
Project No. **Client:**
Project: HEAD START FACILITY-POCAHONTAS, AR
 ● **Source of Sample:** B-6 **Depth:** 18

Remarks:

Figure

Materials Testing of Arkansas
Little Rock, AR

Particle Size Distribution Report



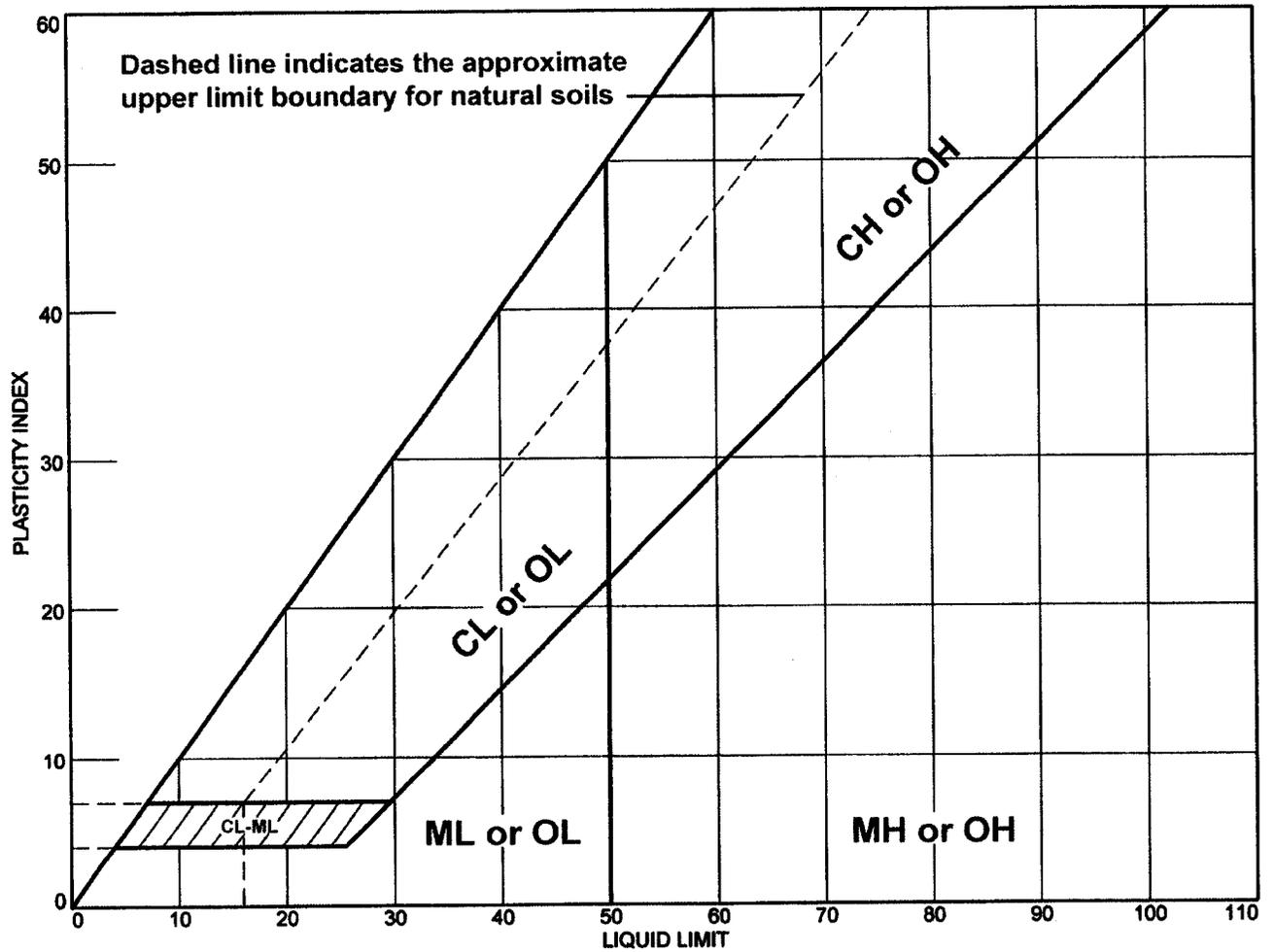
	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
<input type="radio"/>	0.0	0.0	0.0	0.2	0.6	86.0	13.2			
<input checked="" type="checkbox"/>	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
<input type="radio"/>	NV	NP	0.2707	0.1617	0.1358	0.0978	0.0771			

Material Description	USCS	AASHTO
<input type="radio"/>	SM	A-2-4(0)

Project No. _____ Client: _____ Project: HEAD START FACILITY-POCAHONTAS, AR <input type="radio"/> Source of Sample: B-6 Depth: 18	Remarks:
Materials Testing of Arkansas Little Rock, AR	

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● BROWN SILTY SAND	NV	NP	NP	97.1	27.8	SM

Project No. **Client:**

Project: HEAD START FACILITY-POCAHONTAS, AR

● **Source of Sample:** B-7 **Depth:** 0

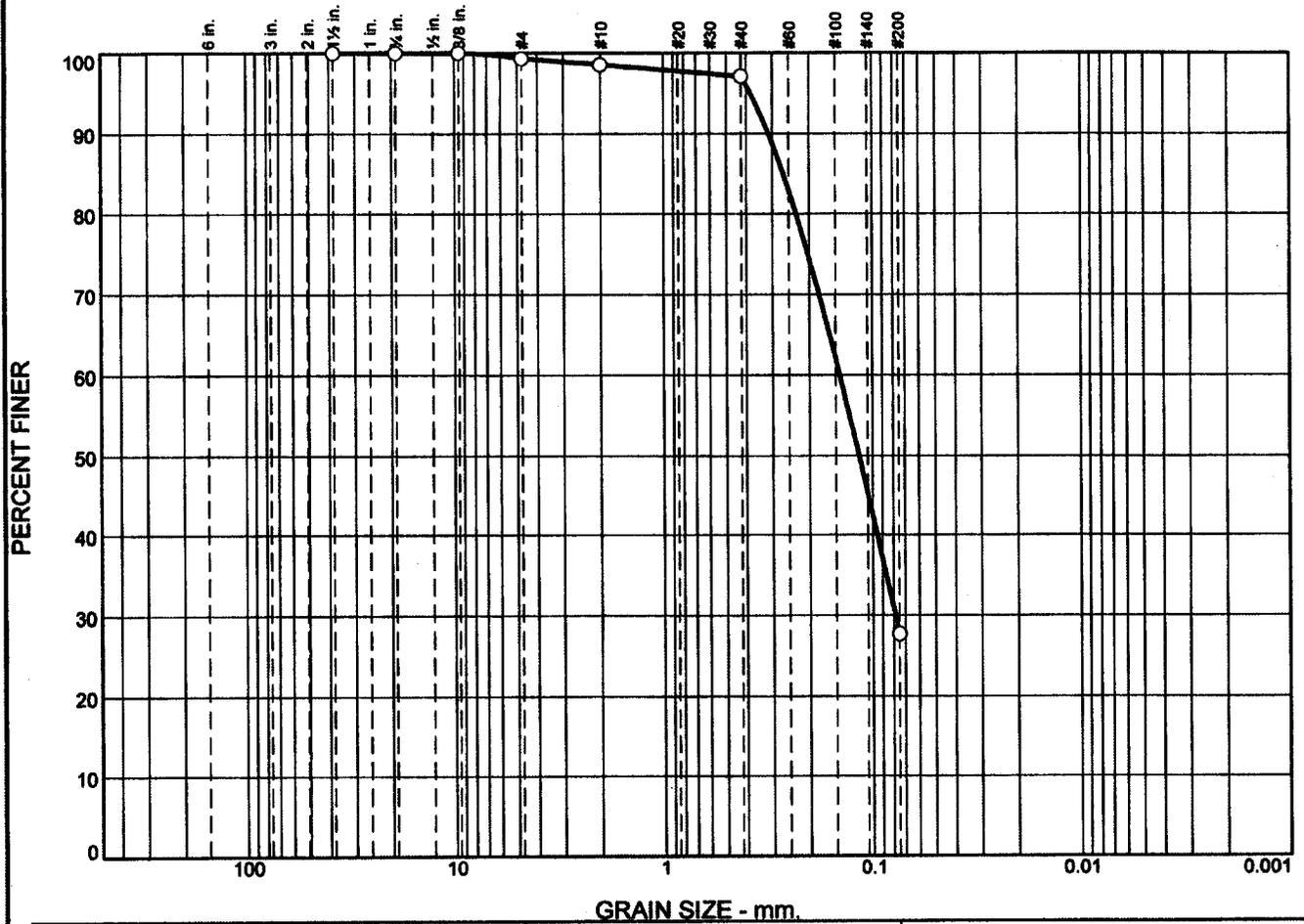
Materials Testing of Arkansas

Little Rock, AR

Remarks:

Figure

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	0.7	0.8	1.4	69.3	27.8			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NV	NP	0.2661	0.1436	0.1165	0.0783				

Material Description	USCS	AASHTO
○ BROWN SILTY SAND	SM	A-2-4(0)

<p>Project No. _____ Client: _____</p> <p>Project: HEAD START FACILITY-POCAHONTAS, AR</p> <p>○ Source of Sample: B-7 Depth: 0</p>	<p>Remarks:</p>
<p>Materials Testing of Arkansas</p> <p>Little Rock, AR</p>	

Figure

Appendix E



USGS Design Maps Summary Report

User-Specified Input

Report Title Arkansas Minimum Ss
Mon April 30, 2018 14:16:26 UTC

Building Code Reference Document 2012/2015 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 36.28335°N, 90.94397°W

Site Soil Classification Site Class D - "Stiff Soil"

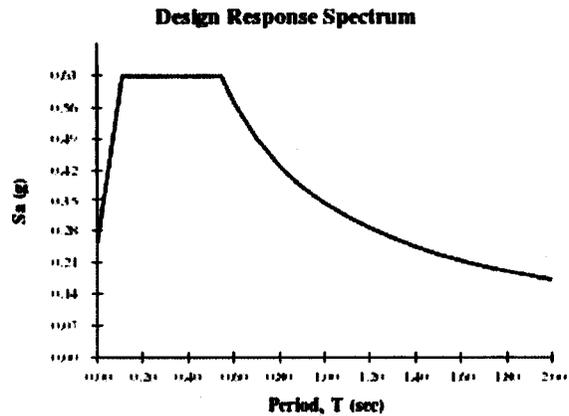
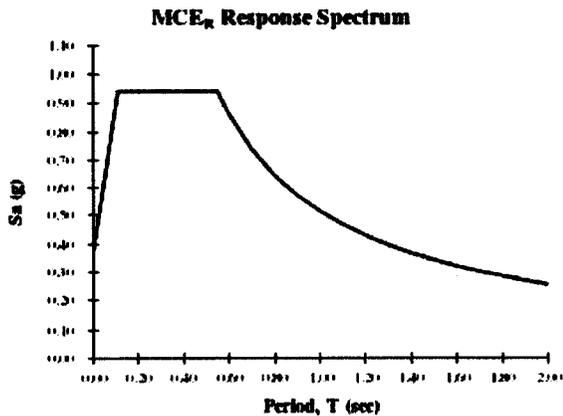
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.797 \text{ g}$	$S_{MS} = 0.941 \text{ g}$	$S_{DS} = 0.627 \text{ g}$
$S_1 = 0.281 \text{ g}$	$S_{M1} = 0.516 \text{ g}$	$S_{D1} = 0.344 \text{ g}$

For information on how the S_S and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.



**SECTION 00 4100
BID FORM**

THE PROJECT AND THE PARTIES

1.01 TO:

A. Owner: City of Pocahontas, Pocahontas, Arkansas

1.02 FOR:

A. Early Head Start Facility, City of Pocahontas, Pocahontas, Arkansas.

1.03 DATE: _____ (Bidder to enter date)

1.04 SUBMITTED BY: (Bidder to enter name and address)

A. Bidder's Full Name _____
1. Address _____
2. City, State, Zip _____

1.05 OFFER

A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by Brackett-Krennerich and Associates, P. A. Architects for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

B. _____
(dollar amount to be shown numerically)

C. We have included the required security Bid Bond as required by the Instructions to Bidders.

D. All applicable federal taxes are included and State of Arkansas taxes are included in the Bid Sum.

E. All cash allowances described in Section 01 2100 are included in the bid sum.

F. We understand that the owner reserves the right to reject any and all bids and waive any informalities in the bidding.

1.06 UNIT PRICES

A. Soils Undercut:

1. If the required quantity of soils undercut is decreased or increased by Change Order, the unit price set forth below shall apply to such quantities.

2. Add or deduct soils undercut:
Price per cubic yard _____ (\$ _____)
(dollar amount to be shown numerically)

3. Undercut quantity defined on the drawings is to be in the bid price.

1.07 ALLOWANCES

A. Allowances described in Section 01 2100 are included in the bid price.

1.08 ACCEPTANCE

A. This offer shall be open to acceptance for sixty (60) days from the bid closing date.

B. If this bid is accepted by the Owner within the time period stated above, we will:

1. Execute the Agreement within Ten (10) days of receipt of Notice of Award.
2. Furnish the required bonds within Ten (10) days of receipt of Notice of Award.
3. Commence work within Ten days after written Notice to Proceed of this bid.

C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to the Owner

by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

- D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

1.09 CONTRACT TIME/LIQUIDATED DAMAGES

- A. If this Bid is accepted, we will:
- B. Complete the work within 350 calendar days from Notice To Proceed date.
- C. Liquidated Damages: **\$150.00** for liquidated damages will be assessed to the contractor for each calendar day that the contractor is in default after time stipulated in the contract documents.

1.10 ADDENDA

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum or price.
 - 1. Addendum # _____ Dated _____.
 - 2. Addendum # _____ Dated _____.
 - 3. Addendum # _____ Dated _____.
 - 4. Addendum # _____ Dated _____.

1.11 LISTING OF MECHANICAL, PLUMBING, ELECTRICAL AND ROOFING WORK

- A. All mechanical, plumbing, electrical and roofing work shall be listed regardless of qualifications, licensures or work amount.
- B. Bidders should consult the project manual on how to fill out this form. Failure to fill out this form correctly shall cause the bid to be declared non-responsive and the bid will not receive consideration.
 - 1. Indicate the Name(s), License Number(s) of each entity performing the listed work and the amount:
- C. MECHANICAL (Indicative of HVACR): Name- _____
 - 1. License No. _____
 - 2. Is the amount of work \$50,000 or over: Yes ___ No ___
- D. PLUMBING: Name- _____
 - 1. License No. _____
 - 2. Is the amount of work \$50,000 or over: Yes ___ No ___
- E. ELECTRICAL: Name- _____
 - 1. License No. _____
 - 2. Is the amount of work \$50,000 or over: Yes ___ No ___
- F. ROOFING AND SHEET METAL: Name- _____
 - 1. License No. _____
 - 2. Is the amount of work \$50,000 or over: Yes ___ No ___

1.12 BID FORM SIGNATURE(S)

- A. Company Name: _____
- B. Signature: _____
- C. Printed Name: _____
- D. Title: _____
- E. Business Address: _____
- F. Contractor's License No. _____
- G. Seal if bid is by a corporation.

**SECTION 00 5200
AGREEMENT FORM**

PART 1 GENERAL

1.01 FORM OF AGREEMENT

- A. AIA Document A101 - 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum.
- B. Sample copy of Agreement Form is enclosed at the end of this section.

END OF AGREEMENT

AIA[®] Document A101[™] – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

City of Pocahontas
410 N. Marr Street
Pocahontas, AR 72455
Telephone Number: 870-892-3924

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

The Architect:
(Name, legal status, address and other information)

Brackett-Krennerich & Associates P.A.
100 E. Huntington Ave., Suite D
Jonesboro, AR 72401
Telephone Number: 870-932-0571
Fax Number: 870-932-0975

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101[™]-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201[™]-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

SAMPLE

Init.

AIA Document A101[™] – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. **WARNING:** This AIA[®] Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA[®] Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:13:04 ET on 04/25/2019 under Order No.4690831037 which expires on 11/20/2019, and is not for resale.

User Notes:

(1434013296)

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

Init.

Not later than TBD (TBD) calendar days from the date of commencement of the Work.

By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
-----------------	-----------------------------

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. *(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance
------	-------	---------------------------

§ 4.3 Allowances, if any, included in the Contract Sum: *(Identify each allowance.)*

Item	Price
------	-------

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

Liquated damages: **\$150.00 (One Hundred Fifty and 00/100 Dollars)** for liquated damages will be assessed to the contractor for liquidated damages for each calendar day that the contractor is in default after the time stipulated in the contract documents

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

Init.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the Twenty-fifth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the Tenth day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201-2007;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201-2007; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

5%

Init.

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

Materials and Equipment

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201-2007.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201-2007, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

Provided final certificate of payment is accompanied with all the closeout and final documents as required by the specifications.

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

%

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201-2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

Init.

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201-2007, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

- Arbitration pursuant to Section 15.4 of AIA Document A201-2007
- Litigation in a court of competent jurisdiction
- Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201-2007.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201-2007, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201-2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201-2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:
(Name, address, email address, and other information)

Mayor Keith Sutton
410 N. Marr Street
Pocahontas, AR 72455

Email Address: pocmayor@cityofpocahontas.com

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)

Init.

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2007, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A201™-2017, General Conditions of the Contract for Construction

- .3 Drawings entitled "Early Head Start Facility, City of Pocahontas, Pocahontas, Arkansas" and bearing the architects commission number 14617 – attached as Exhibit "A" – Enumeration of the Contract Documents
- .4 Specifications entitled "Early Head Start Facility, City of Pocahontas, Pocahontas, Arkansas" and bearing the architects commission number 14617 – attached as Exhibit "B" – Enumeration of the Contract Documents

(Paragraph deleted)

(Paragraphs deleted)

- .5 Addenda, if any:

Number	Date	Pages
--------	------	-------

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

- .6 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

Init.

(Paragraphs deleted)

- [X] Supplementary and other Conditions of the Contract: are those contained in the specifications entitled "Early Head Start Facility, City of Pocahontas, Pocahontas, Arkansas" and bearing the architects commission number 14617

.7 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

1. Advertisement for Bids
2. Contractor's Bid and Bid Bond
3. Certified Bid Tabulation
4. Certificate (s) of Insurance
5. Payment and Performance Bonds (filed/recorded in Randolph County)
6. Contractor's Affidavit of Payment of Debts and Claims (required at close-out)
7. Contractor's Release of Liens (required at close-out)
8. Consent of Surety to Final Payment (required at close-out)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

Mayor Keith Sutton
City of Pocahontas

(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)

Init.

ATTACHMENT TO AIA DOCUMENT A101-2017, *Standard Form of Agreement
Between Owner and Contractor*

The provisions of this Attachment shall delete, modify and supplement the provisions contained in the "*Standard Form of Agreement Between Owner and Contractor*," AIA Document A101-2017 Edition. The provisions contained in this attachment shall supersede any conflicting provisions of the AIA Document. The term "Agency," as used in the Attachment, shall mean the United States of America, acting through the United State Department of Agriculture.

ARTICLE 3, DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

Delete §3.1 and substitute the following:

§3.1 The date of commencement shall be as stipulated in the Notice to Proceed.

Replace §3.3.3 with the following:

If the work is not substantially complete on or before the date specified in §3.3.1 or within the contract term or extension thereof as granted by the Owner; damage will be sustained by the Owner. Therefore, it is or will be impracticable and extremely difficult to ascertain the actual damage which the Owner will sustain in the event and by reason of such delays. The Contractor shall pay to the Owner liquidated damages in the sum of \$ _____ for each calendar day of delay. Any sums that may be due the Owner as liquidated damages may be deducted from any monies due or to become due the Contractor under the Contract or may be collected from the Contractor's surety.

Delete §4.5 referenced in §3.3.3.

ARTICLE 5, PAYMENTS

Insert "ten" and "10" in the appropriate spaces in the last sentence of §5.1.3.

In §5.1.6.1.2. replace the last phrase with the following:

"adequately insured and securely stored off the site..."

Insert the following sentences in §5.1.7.1:

The amount retained shall be 10% of the value of Work until 50% of the Work has been completed or a withholding of equal or greater value, such as, 5% for the full duration of the project. If 10% is held, at 50% completion, further partial payments shall be made in full to the Contractor and no additional amounts may be retained unless the Architect certifies that the Work is not proceeding satisfactorily but, amounts previously retained shall not be paid to the Contractor. At 50% completion or any time thereafter when the progress of the Work is not satisfactory, additional amounts may be retained, but in no event shall the total retainage be more than 10% of the value of Work completed.

ARTICLE 8, MISCELLANEOUS PROVISIONS

Add the following sub-section to §8.7:

§8.7.1 This Agreement shall not become effective until concurred in writing by the Agency. Such concurrence shall be evidenced by the signature of a duly authorized representative of the Agency in the space provided at the end of this Attachment to the Agreement. The concurrence so evidenced by the Agency shall in no way commit the Agency to render financial assistance to the Owner and is without liability to the Agency for any payment thereunder, but in the event such assistance is provided, the concurrence shall signify the provisions of this Agreement are consistent with Agency requirements.

ARTICLE 9, ENUMERATION OF CONTRACT DOCUMENTS

Delete §9.1.4 from the agreement where these services are not included in the scope of the Agreement.

The following Documents should be listed as follows in:

§9.1.9:

AIA A701-1997 - Instructions to Bidders
RD Instruction 1942-A, Guide 27, Attachment 2
Bid Form
RD Instruction 1942-A, Guide 19 Attachment 4 Bid Bond
Compliance Statement (Form RD 400-6)
RD Instruction 1942-A, Guide 19 Attachment 5 Performance Bond
RD Instruction 1942-A, Guide 19 Attachment 6 Payment Bond
Certification Regarding Debarment, Suspension,
Ineligibility and Voluntary Exclusion - Lower Tier
Covered Transactions (Form AD 1048)
Disclosure of Lobbying Activities (SF-LLL)
Certification for Contracts, Grants and Loans (RD
Instruction 1940-Q, Exhibit A-1)
RD Instruction 1942-A, Guide 27 Attachment 3
RD Instruction 1942-A, Guide 27 Attachment 4

Delete the signature block on page 8 of the Agreement, and substitute
the block on the following page of this Attachment:

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in duplicate on the respective dates indicated below:

OWNER:

ATTEST: _____	BY: _____
Type Name _____	Type Name _____
Title _____	Title _____
Date _____	Date _____

CONTRACTOR:

ATTEST: _____	BY: _____
Type Name _____	Type Name _____
Title _____	Title _____
Date _____	Date _____

AGENCY CONCURRENCE:

BY: _____
Type Name _____
Title _____
Date _____

The concurrence so evidenced by the Agency shall in no way commit the Agency to render financial assistance to the Owner and is without liability to the Agency for any payment hereunder, but in the event such assistance is provided, the concurrence shall signify the provisions of this Agreement are consistent with Agency requirements.

o0o

SECTION 00 6000

PROJECT FORMS

1.01 PROJECT FORMS INCLUDED

- A. Submittal Transmittal Form
- B. AIA Document G702 - 1992 Application and Certificate for Payment
- C. AIA Document G703 - 1992 Continuation Sheet
- D. AIA Document G701 - 2017 Change Order
- E. AIA Document G704 - 2017 Certificate of Substantial Completion
- F. AIA Document G706 - 1994 Contractor's Affidavit of Payment of Debts and Claims
- G. AIA Document G706A - 1994 Contractor's Affidavit of Release of Liens
- H. AIA Document G707 - 1994 Consent of Surety to Final Payment
- I. Substitution Request Form

END OF PROJECT FORMS

SUBMITTAL FORM

PROJECT:
PROJECT #: 14617

Early Head Start Facility
City Of Pocahontas
Pocahontas, Arkansas

ARCHITECT:

Brackett-Krennerich Architects
P.O. Box 1655
100 E. Huntington, Suite D
Jonesboro, Arkansas 72403-1655

**CONSTRUCTION
MANAGER:**

SUBCONTRACTOR:

SPECIFICATION DIVISION NUMBER:

SPECIFICATION SECTION NUMBER:

DESCRIPTION:

SUBMITTED: *(check one)*

<input type="checkbox"/>	As Specified:
--------------------------	---------------

<input type="checkbox"/>	Substitution for Specified Product:
--------------------------	-------------------------------------

If substitution, product is equal as follows:

Product differs from specifications in following ways:

CONTRACTOR'S STAMP

ARCHITECT'S STAMP

Application and Certificate for Payment

TO OWNER: City of Pocahontas
410 N. Marr Street
Pocahontas, AR 72455

PROJECT: Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

APPLICATION NO: 001
PERIOD TO:

FROM CONTRACTOR: Brackett-Krennerich & Associates P.A.
100 E. Huntington Ave., Suite D
Jonesboro, AR 72401

VIA ARCHITECT:

CONTRACT FOR: General Construction
CONTRACT DATE: December 01, 2017
PROJECT NOS: 14617 /

Distribution to:
OWNER: ARCHITECT:
CONTRACTOR: FIELD:
OTHER:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM \$0.00
2. NET CHANGE BY CHANGE ORDERS \$0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2) \$0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) \$0.00
5. RETAINAGE:
 - a. 0 % of Completed Work (Column D + E on G703) \$0.00
 - b. 0 % of Stored Material (Column F on G703) \$0.00
 Total Retainage (Lines 5a + 5b or Total in Column I of G703) \$0.00
6. TOTAL EARNED LESS RETAINAGE \$0.00
(Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT \$0.00
(Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE \$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE \$0.00
(Line 3 less Line 6)

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$0.00	\$0.00
Total approved this Month	\$0.00	\$0.00
TOTALS	\$0.00	\$0.00
NET CHANGES by Change Order		\$0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: _____

By: _____ Date: _____

State of: _____

County of: _____

Subscribed and sworn to before me this _____ day of _____

Notary Public: _____

My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$0.00
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT: _____

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.



AIA® Document G701™ – 2017

Change Order

PROJECT: *(Name and address)*
Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

CONTRACT INFORMATION:
Contract For:
Date:

CHANGE ORDER INFORMATION:
Change Order Number: 001
Date:

OWNER: *(Name and address)*
City of Pocahontas
410 N. Marr Street
Pocahontas, AR 72455

ARCHITECT: *(Name and address)*
Brackett-Krennerich & Associates P.A.
100 E. Huntington Ave., Suite D
Jonesboro, AR 72401

CONTRACTOR: *(Name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:

(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original Contract Sum was	\$	_____	0.00
The net change by previously authorized Change Orders	\$	_____	0.00
The Contract Sum prior to this Change Order was	\$	_____	0.00
The Contract Sum will be increased by this Change Order in the amount of	\$	_____	0.00
The new Contract Sum including this Change Order will be	\$	_____	0.00

The Contract Time will be increased by Zero (0) days.
The new date of Substantial Completion will be

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

Brackett-Krennerich & Associates P.A.

ARCHITECT *(Firm name)*

CONTRACTOR *(Firm name)*

City of Pocahontas

OWNER *(Firm name)*

SIGNATURE

SIGNATURE

SIGNATURE

PRINTED NAME AND TITLE

PRINTED NAME AND TITLE

Mayor Kary Story

PRINTED NAME AND TITLE

DATE

DATE

DATE



AIA[®] Document G704[™] – 2017

Certificate of Substantial Completion

PROJECT: *(name and address)*
 Early Head Start Facility
 City of Pocahontas
 Pocahontas, Arkansas

CONTRACT INFORMATION:
 Contract For: General Construction
 Date: December 01, 2017

CERTIFICATE INFORMATION:
 Certificate Number: 001
 Date:

OWNER: *(name and address)*
 City of Pocahontas
 410 N. Marr Street
 Pocahontas, AR 72455

ARCHITECT: *(name and address)*
 Brackett-Krennerich & Associates P.A.
 100 E. Huntington Ave., Suite D
 Jonesboro, AR 72401

CONTRACTOR: *(name and address)*

The Work identified below has been reviewed and found, to the Architect's best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.
(Identify the Work, or portion thereof, that is substantially complete.)

Brackett-Krennerich &
 Associates P.A.

ARCHITECT *(Firm Name)*

SIGNATURE

PRINTED NAME AND TITLE

DATE OF SUBSTANTIAL COMPLETION

WARRANTIES

The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED

A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:
(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within () days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: \$

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:
(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CONTRACTOR *(Firm Name)*

SIGNATURE

PRINTED NAME AND TITLE

DATE

 City of Pocahontas

OWNER *(Firm Name)*

SIGNATURE

 Mayor Kary Story

PRINTED NAME AND TITLE

DATE

AIA[®] Document G706[™] – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: <i>(Name and address)</i> Early Head Start Facility City of Pocahontas Pocahontas, Arkansas	ARCHITECT'S PROJECT NUMBER: 14617	OWNER: <input checked="" type="checkbox"/>
TO OWNER: <i>(Name and address)</i> City of Pocahontas 410 N. Marr Street Pocahontas, AR 72455	CONTRACT FOR: General Construction	ARCHITECT: <input checked="" type="checkbox"/>
	CONTRACT DATED: December 01, 2017	CONTRACTOR: <input checked="" type="checkbox"/>
		SURETY: <input type="checkbox"/>
		OTHER: <input type="checkbox"/>

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment Yes No

CONTRACTOR: *(Name and address)*

BY: _____

(Signature of authorized representative)

(Printed name and title)

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.
3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

AIA[®] Document G706A[™] – 1994

Contractor's Affidavit of Release of Liens

PROJECT: <i>(Name and address)</i> Early Head Start Facility City of Pocahontas Pocahontas, Arkansas	ARCHITECT'S PROJECT NUMBER: 14617 CONTRACT FOR: General Construction CONTRACT DATED: December 01, 2017	OWNER: <input checked="" type="checkbox"/> ARCHITECT: <input checked="" type="checkbox"/> CONTRACTOR: <input checked="" type="checkbox"/> SURETY: <input type="checkbox"/> OTHER: <input type="checkbox"/>
TO OWNER: <i>(Name and address)</i> City of Pocahontas 410 N. Marr Street Pocahontas, AR 72455		

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

 **AIA**® Document G707™ – 1994

Consent Of Surety to Final Payment

PROJECT: <i>(Name and address)</i> Early Head Start Facility City of Pocahontas Pocahontas, Arkansas	ARCHITECT'S PROJECT NUMBER: 14617	OWNER: <input checked="" type="checkbox"/>
	CONTRACT FOR: General Construction	ARCHITECT: <input checked="" type="checkbox"/>
		CONTRACTOR: <input checked="" type="checkbox"/>
TO OWNER: <i>(Name and address)</i> City of Pocahontas 410 N. Marr Street Pocahontas, AR 72455	CONTRACT DATED: December 01, 2017	SURETY: <input type="checkbox"/>
		OTHER: <input type="checkbox"/>

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of Contractor)

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall
not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, CONTRACTOR,

City of Pocahontas
410 N. Marr Street
Pocahontas, AR 72455

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

Attest:
(Seal):

(Printed name and title)

SUBSTITUTION REQUEST FORM

To: _____ Commission Number: _____
 _____ Date Received: _____
 Project: _____

Specification Section Title/Number/Paragraph: _____

Drawing/Details Affected: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Product Description: _____

Differences between proposed substitution and specified product: _____

WHY IS SUBSTITUTION BEING SUBMITTED? (SELECT 1 OF THE FOLLOWING):

- Pre-Bid Substitution (Prior Approval): Included detail analysis comparing proposed substitution against specified product, including redlined specification section showing differences.
- Specified product is not available. Explain in detail, use attached letter.
- Cost savings to Owner. Indicate cost analysis as attachment.
- Other. Explain

EFFECTS OF PROPOSED SUBSTITUTION

Answer the following questions and attach explanations.

1. Attach list of at least 3 projects where proposed substitution has been used within past 12 months include Name, address, and telephone number of Owner and Architect.
 (attachment included) (attachment not included, explain)
2. Does substitution affect dimensions indicated on Drawings?
 (No) (Yes, explain)
3. Does substitution affect work of other sections?
 (No) (Yes, explain)
4. Does substitution require modifications to design, changes to drawings, or revisions to specifications?
 (No) (Yes, explain)

CONTRACTORS'S/BIDDER'S REPRESENTATION

Undersigned accepts responsibility for coordination of proposed substitution and accepts all additional costs resulting from the incorporation of proposed substitutions into the Project per Section 01 6300. A request for substitution constitutes a representation that the Contractor/Bidder has investigated the proposed product and determined that it is equal to or superior in all respects to specified product.

The only response to this Request for Substitution will be by Addendum (if prior to award) or Supplemental Instruction (if after award, unless Change Order is necessary to reduce Contract Amount).

Submitted by: _____
Name: _____
Address: _____
Telephone: _____
Contact person of manufacturer/supplier of proposed substitution: _____
Subcontractor's signature and date: _____
Contractor's signature and date: _____

ARCHITECT'S REVIEW AND ACTION

- Substitution approved
- Substitution not approved
- No Action Required
- Submission Incomplete, not accepted
- Submission Too Late for Consideration

Reviewed by: _____ Date: _____

Additional Comments: Contractor Subcontractor Supplier Manufacturer A/E
 Other _____

SECTION 00 7200

GENERAL CONDITIONS

1.01 FORM OF GENERAL CONDITIONS

- A. AIA Document A201 – 2017 General Conditions of the Contract for Construction, included herewith, is the General Conditions between the Owner and Contractor.
- B. The AIA General Conditions and Supplementary Conditions Section 00 7300 of these specifications shall form part of the contract and apply to the contractor and all subcontractors alike.

1.02 SUPPLEMENTARY CONDITIONS

- A. Refer to Section 00 7300 for amendments to these General Conditions.

1.03 RELATED REQUIREMENTS

- A. Section 00 7300 – Supplementary Conditions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF DOCUMENT

AIA[®] Document A201[™] – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

THE OWNER:

(Name, legal status and address)

City of Pocahontas
410 N. Marr Street
Pocahontas, AR 72455

THE ARCHITECT:

(Name, legal status and address)

Brackett-Krennerich & Associates P.A.
100 E. Huntington Ave., Suite D
Jonesboro, AR 72401

TABLE OF ARTICLES

1	GENERAL PROVISIONS
2	OWNER
3	CONTRACTOR
4	ARCHITECT
5	SUBCONTRACTORS
6	CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7	CHANGES IN THE WORK
8	TIME
9	PAYMENTS AND COMPLETION
10	PROTECTION OF PERSONS AND PROPERTY
11	INSURANCE AND BONDS
12	UNCOVERING AND CORRECTION OF WORK
13	MISCELLANEOUS PROVISIONS

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503[™], Guide for Supplementary Conditions.

Init.

AIA Document A201[™] – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. WARNING: This AIA[®] Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA[®] Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:20:58 ET on 04/25/2019 under Order No.4690831037 which expires on 11/20/2019, and is not for resale.

User Notes:

(1801937529)

- 14 **TERMINATION OR SUSPENSION OF THE CONTRACT**
- 15 **CLAIMS AND DISPUTES**

Init.

INDEX

(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work

9.6.6, 9.9.3, **12.3**

Acceptance of Work

9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3

Access to Work

3.16, 6.2.1, 12.1

Accident Prevention

10

Acts and Omissions

3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2

Addenda

1.1.1

Additional Costs, Claims for

3.7.4, 3.7.5, 10.3.2, 15.1.5

Additional Inspections and Testing

9.4.2, 9.8.3, 12.2.1, **13.4**

Additional Time, Claims for

3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.6**

Administration of the Contract

3.1.3, **4.2**, 9.4, 9.5

Advertisement or Invitation to Bid

1.1.1

Aesthetic Effect

4.2.13

Allowances

3.8

Applications for Payment

4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10

Approvals

2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1

Arbitration

8.3.1, 15.3.2, **15.4**

ARCHITECT

4

Architect, Definition of

4.1.1

Architect, Extent of Authority

2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1

Architect, Limitations of Authority and Responsibility

2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2

Architect's Additional Services and Expenses

2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4

Architect's Administration of the Contract

3.1.3, 3.7.4, 15.2, 9.4.1, 9.5

Architect's Approvals

2.5, 3.1.3, 3.5, 3.10.2, 4.2.7

Architect's Authority to Reject Work

3.5, 4.2.6, 12.1.2, 12.2.1

Architect's Copyright

1.1.7, 1.5

Architect's Decisions

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2

Architect's Inspections

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4

Architect's Instructions

3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2

Architect's Interpretations

4.2.11, 4.2.12

Architect's Project Representative

4.2.10

Architect's Relationship with Contractor

1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2

Architect's Relationship with Subcontractors

1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3

Architect's Representations

9.4.2, 9.5.1, 9.10.1

Architect's Site Visits

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4

Asbestos

10.3.1

Attorneys' Fees

3.18.1, 9.6.8, 9.10.2, 10.3.3

Award of Separate Contracts

6.1.1, 6.1.2

Award of Subcontracts and Other Contracts for Portions of the Work

5.2

Basic Definitions

1.1

Bidding Requirements

1.1.1

Binding Dispute Resolution

8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1

Bonds, Lien

7.3.4.4, 9.6.8, 9.10.2, 9.10.3

Bonds, Performance, and Payment

7.3.4.4, 9.6.7, 9.10.3, **11.1.2**, 11.1.3, **11.5**

Building Information Models Use and Reliance

1.8

Building Permit

3.7.1

Capitalization

1.3

Certificate of Substantial Completion

9.8.3, 9.8.4, 9.8.5

Init.

Certificates of Payment

4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4

Certificates of Inspection, Testing or Approval
13.4.4

Certificates of Insurance
9.10.2

Change Orders

1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2

Change Orders, Definition of

7.2.1

CHANGES IN THE WORK

2.2.2, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5

Claims, Definition of

15.1.1

Claims, Notice of

1.6.2, 15.1.3

CLAIMS AND DISPUTES

3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4

Claims and Timely Assertion of Claims

15.4.1

Claims for Additional Cost

3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, 15.1.5

Claims for Additional Time

3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, 15.1.6

Concealed or Unknown Conditions, Claims for
3.7.4

Claims for Damages

3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7

Claims Subject to Arbitration

15.4.1

Cleaning Up

3.15, 6.3

Commencement of the Work, Conditions Relating to

2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, 15.1.5

Commencement of the Work, Definition of

8.1.2

Communications

3.9.1, 4.2.4

Completion, Conditions Relating to

3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2

COMPLETION, PAYMENTS AND

9

Completion, Substantial

3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2

Compliance with Laws

2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3

Concealed or Unknown Conditions

3.7.4, 4.2.8, 8.3.1, 10.3

Conditions of the Contract

1.1.1, 6.1.1, 6.1.4

Consent, Written

3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2

Consolidation or Joinder

15.4.4

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

1.1.4, 6

Construction Change Directive, Definition of
7.3.1

Construction Change Directives

1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, 7.3, 9.3.1.1

Construction Schedules, Contractor's

3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2

Contingent Assignment of Subcontracts

5.4, 14.2.2.2

Continuing Contract Performance

15.1.4

Contract, Definition of

1.1.2

CONTRACT, TERMINATION OR

SUSPENSION OF THE

5.4.1.1, 5.4.2, 11.5, 14

Contract Administration

3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating to

3.7.1, 3.10, 5.2, 6.1

Contract Documents, Copies Furnished and Use of
1.5.2, 2.3.6, 5.3

Contract Documents, Definition of

1.1.1

Contract Sum

2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, 9.1, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, 15.1.5, 15.2.5

Contract Sum, Definition of

9.1

Contract Time

1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5

Contract Time, Definition of

8.1.1

CONTRACTOR

3

Contractor, Definition of

3.1, 6.1.2

Contractor's Construction and Submittal

Schedules

3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2

Init.

Contractor's Employees
2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.3, 14.1, 14.2.1.1

Contractor's Liability Insurance
11.1

Contractor's Relationship with Separate Contractors and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4

Contractor's Relationship with Subcontractors
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2, 9.6.7, 9.10.2, 11.2, 11.3, 11.4

Contractor's Relationship with the Architect
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1

Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2

Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8

Contractor's Review of Contract Documents
3.2

Contractor's Right to Stop the Work
2.2.2, 9.7

Contractor's Right to Terminate the Contract
14.1

Contractor's Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3

Contractor's Superintendent
3.9, 10.2.6

Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4

Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1

Copies Furnished of Drawings and Specifications
1.5, 2.3.6, 3.11

Copyrights
1.5, 3.17

Correction of Work
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2, 12.3, 15.1.3.1, 15.1.3.2, 15.2.1

Correlation and Intent of the Contract Documents
1.2

Cost, Definition of
7.3.4

Costs
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14

Cutting and Patching
3.14, 6.2.5

Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4

Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4

Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2, 11.3, 14.2.4, 15.1.7

Damages for Delay
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2

Date of Commencement of the Work, Definition of
8.1.2

Date of Substantial Completion, Definition of
8.1.3

Day, Definition of
8.1.4

Decisions of the Architect
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2, 14.2.2, 14.2.4, 15.1, 15.2

Decisions to Withhold Certification
9.4.1, 9.5, 9.7, 14.1.1.3

Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1

Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1

Delays and Extensions of Time
3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5

Digital Data Use and Transmission
1.7

Disputes
6.3, 7.3.9, 15.1, 15.2

Documents and Samples at the Site
3.11

Drawings, Definition of
1.1.5

Drawings and Specifications, Use and Ownership of
3.11

Effective Date of Insurance
8.2.2

Emergencies
10.4, 14.1.1.2, 15.1.5

Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.3, 14.1, 14.2.1.1

Equipment, Labor, or Materials
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2

Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4

Init.

Extensions of Time
 3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2,
 10.4, 14.3, 15.1.6, **15.2.5**
Failure of Payment
 9.5.1.3, **9.7**, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
 Faulty Work
 (See Defective or Nonconforming Work)
Final Completion and Final Payment
 4.2.1, 4.2.9, 9.8.2, **9.10**, 12.3, 14.2.4, 14.4.3
 Financial Arrangements, Owner's
 2.2.1, 13.2.2, 14.1.1.4
GENERAL PROVISIONS
1
Governing Law
13.1
 Guarantees (See Warranty)
Hazardous Materials and Substances
 10.2.4, **10.3**
 Identification of Subcontractors and Suppliers
 5.2.1
Indemnification
 3.17, **3.18**, 9.6.8, 9.10.2, 10.3.3, 11.3
Information and Services Required of the Owner
 2.1.2, **2.2**, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5,
 9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2,
 14.1.1.4, 14.1.4, 15.1.4
Initial Decision
15.2
Initial Decision Maker, Definition of
 1.1.8
 Initial Decision Maker, Decisions
 14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
 Initial Decision Maker, Extent of Authority
 14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4
 Inspections
 3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
 9.9.2, 9.10.1, 12.2.1, 13.4
 Instructions to Bidders
 1.1.1
 Instructions to the Contractor
 3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2
Instruments of Service, Definition of
1.1.7
 Insurance
 6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, **11**
 Insurance, Notice of Cancellation or Expiration
 11.1.4, 11.2.3
Insurance, Contractor's Liability
11.1
 Insurance, Effective Date of
 8.2.2, 14.4.2
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, 11.2, 11.4, 11.5

Insurance, Stored Materials
 9.3.2
INSURANCE AND BONDS
11
 Insurance Companies, Consent to Partial Occupancy
 9.9.1
 Insured loss, Adjustment and Settlement of
 11.5
 Intent of the Contract Documents
 1.2.1, 4.2.7, 4.2.12, 4.2.13
Interest
13.5
Interpretation
 1.1.8, 1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1
 Interpretations, Written
 4.2.11, 4.2.12
 Judgment on Final Award
 15.4.2
Labor and Materials, Equipment
 1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1,
 10.2.4, 14.2.1.1, 14.2.1.2
 Labor Disputes
 8.3.1
 Laws and Regulations
 1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4,
 9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8,
 15.4
 Liens
 2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
 Limitations, Statutes of
 12.2.5, 15.1.2, 15.4.1.1
 Limitations of Liability
 3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6,
 4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3,
 11.3, 12.2.5, 13.3.1
 Limitations of Time
 2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7,
 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15,
 15.1.2, 15.1.3, 15.1.5
Materials, Hazardous
10.2.4, **10.3**
 Materials, Labor, Equipment and
 1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2,
 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2
 Means, Methods, Techniques, Sequences and
 Procedures of Construction
 3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
 Mechanic's Lien
 2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Mediation
 8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, **15.3**, 15.4.1,
 15.4.1.1
Minor Changes in the Work
 1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, 7.4

Init.

MISCELLANEOUS PROVISIONS

13

Modifications, Definition of

1.1.1

Modifications to the Contract

1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2

Mutual Responsibility

6.2

Nonconforming Work, Acceptance of

9.6.6, 9.9.3, 12.3

Nonconforming Work, Rejection and Correction of

2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2

Notice

1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2., 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2, 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1

Notice of Cancellation or Expiration of Insurance

11.1.4, 11.2.3

Notice of Claims

1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, 15.1.3, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1

Notice of Testing and Inspections

13.4.1, 13.4.2

Observations, Contractor's

3.2, 3.7.4

Occupancy

2.3.1, 9.6.6, 9.8

Orders, Written

1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1

OWNER

2

Owner, Definition of

2.1.1

Owner, Evidence of Financial Arrangements

2.2, 13.2.2, 14.1.1.4

Owner, Information and Services Required of the

2.1.2, 2.2, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4

Owner's Authority

1.5, 2.1.1, 2.3.2.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7

Owner's Insurance

11.2

Owner's Relationship with Subcontractors

1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2

Owner's Right to Carry Out the Work

2.5, 14.2.2

Owner's Right to Clean Up

6.3

Owner's Right to Perform Construction and to Award Separate Contracts

6.1

Owner's Right to Stop the Work

2.4

Owner's Right to Suspend the Work

14.3

Owner's Right to Terminate the Contract

14.2, 14.4

Ownership and Use of Drawings, Specifications and Other Instruments of Service

1.1.1, 1.1.6, 1.1.7, 1.5, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3

Partial Occupancy or Use

9.6.6, 9.9

Patching, Cutting and

3.14, 6.2.5

Patents

3.17

Payment, Applications for

4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3

Payment, Certificates for

4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4

Payment, Failure of

9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2

Payment, Final

4.2.1, 4.2.9, 9.10, 12.3, 14.2.4, 14.4.3

Payment Bond, Performance Bond and

7.3.4.4, 9.6.7, 9.10.3, 11.1.2

Payments, Progress

9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4

PAYMENTS AND COMPLETION

9

Payments to Subcontractors

5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2

PCB

10.3.1

Performance Bond and Payment Bond

7.3.4.4, 9.6.7, 9.10.3, 11.1.2

Permits, Fees, Notices and Compliance with Laws

2.3.1, 3.7, 3.13, 7.3.4.4, 10.2.2

PERSONS AND PROPERTY, PROTECTION OF

10

Polychlorinated Biphenyl

10.3.1

Product Data, Definition of

3.12.2

Product Data and Samples, Shop Drawings

3.11, 3.12, 4.2.7

Progress and Completion

4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.4

Progress Payments

9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4

Init.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:20:58 ET on 04/25/2019 under Order No.4690831037 which expires on 11/20/2019, and is not for resale.

User Notes:

(1801937529)

Project, Definition of
1.1.4
Project Representatives
 4.2.10
Property Insurance
 10.2.5, 11.2
Proposal Requirements
 1.1.1
PROTECTION OF PERSONS AND PROPERTY
10
Regulations and Laws
 1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1,
 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Rejection of Work
 4.2.6, 12.2.1
Releases and Waivers of Liens
 9.3.1, 9.10.2
Representations
 3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1
Representatives
 2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1
Responsibility for Those Performing the Work
 3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
 9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field
Conditions by Contractor
 3.2, 3.12.7, 6.1.3
Review of Contractor's Submittals by Owner and
Architect
 3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples
by Contractor
 3.12
Rights and Remedies
 1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1,
 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2,
 12.2.4, 13.3, 14, 15.4
Royalties, Patents and Copyrights
 3.17
Rules and Notices for Arbitration
 15.4.1
Safety of Persons and Property
 10.2, 10.4
Safety Precautions and Programs
 3.3.1, 4.2.2, 4.2.7, 5.3, 10.1, 10.2, 10.4
Samples, Definition of
 3.12.3
Samples, Shop Drawings, Product Data and
 3.11, 3.12, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
 9.2, 9.3.1
Schedules, Construction
 3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2

Separate Contracts and Contractors
 1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Separate Contractors, Definition of
 6.1.1
Shop Drawings, Definition of
 3.12.1
Shop Drawings, Product Data and Samples
 3.11, 3.12, 4.2.7
Site, Use of
 3.13, 6.1.1, 6.2.1
Site Inspections
 3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4
Site Visits, Architect's
 3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Special Inspections and Testing
 4.2.6, 12.2.1, 13.4
Specifications, Definition of
 1.1.6
Specifications
 1.1.1, 1.1.6, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14
Statute of Limitations
 15.1.2, 15.4.1.1
Stopping the Work
 2.2.2, 2.4, 9.7, 10.3, 14.1
Stored Materials
 6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
 5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
 1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2,
 9.6.7
Subcontractual Relations
 5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
Submittals
 3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3, 9.8,
 9.9.1, 9.10.2, 9.10.3
Submittal Schedule
 3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
 6.1.1, 11.3
Substances, Hazardous
 10.3
Substantial Completion
 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2,
 15.1.2
Substantial Completion, Definition of
 9.8.1
Substitution of Subcontractors
 5.2.3, 5.2.4
Substitution of Architect
 2.3.3
Substitutions of Materials
 3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
 5.1.2

Init.

Subsurface Conditions
3.7.4

Successors and Assigns
13.2

Superintendent
3.9, 10.2.6

Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3,
7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4

Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6,
9.10.5, 14.2.1

Surety
5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2,
15.2.7

Surety, Consent of
9.8.5, 9.10.2, 9.10.3

Surveys
1.1.7, 2.3.4

Suspension by the Owner for Convenience
14.3

Suspension of the Work
3.7.5, 5.4.2, 14.3

Suspension or Termination of the Contract
5.4.1.1, 14

Taxes
3.6, 3.8.2.1, 7.3.4.4

Termination by the Contractor
14.1, 15.1.7

Termination by the Owner for Cause
5.4.1.1, **14.2, 15.1.7**

Termination by the Owner for Convenience
14.4

Termination of the Architect
2.3.3

Termination of the Contractor Employment
14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT

14

Tests and Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
9.9.2, 9.10.1, 10.3.2, 12.2.1, **13.4**

TIME
8

Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7,
10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5

Time Limits
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2,
5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1,
9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15.1.2,
15.1.3, 15.4

Time Limits on Claims
3.7.4, 10.2.8, 15.1.2, 15.1.3

Title to Work
9.3.2, 9.3.3

UNCOVERING AND CORRECTION OF WORK
12

Uncovering of Work
12.1

Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3

Unit Prices
7.3.3.2, 9.1.2

Use of Documents
1.1.1, 1.5, 2.3.6, 3.12.6, 5.3

Use of Site
3.13, 6.1.1, 6.2.1

Values, Schedule of
9.2, 9.3.1

Waiver of Claims by the Architect
13.3.2

Waiver of Claims by the Contractor
9.10.5, 13.3.2, **15.1.7**

Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, **15.1.7**

Waiver of Consequential Damages
14.2.4, 15.1.7

Waiver of Liens
9.3, 9.10.2, 9.10.4

Waivers of Subrogation
6.1.1, **11.3**

Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2,
15.1.2

Weather Delays
8.3, 15.1.6.2

Work, Definition of
1.1.3

Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3,
13.2, 13.3.2, 15.4.4.2

Written Interpretations
4.2.11, 4.2.12

Written Orders
1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

Init.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

Init.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:20:58 ET on 04/25/2019 under Order No.4690831037 which expires on 11/20/2019, and is not for resale.

User Notes:

(1801937529)

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

Init.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

Init.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

Init.

AIA Document A201™ – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:20:58 ET on 04/25/2019 under Order No.4690831037 which expires on 11/20/2019, and is not for resale.

User Notes:

(1801937529)

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely

Init.

upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

Init.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

Init.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

Init.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

Init.

- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

Init.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

Init.

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

Init.

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during

that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

ATTACHMENT TO AIA DOCUMENT A201-2017, *General Conditions of the Contract for Construction*

The provisions of this attachment shall delete, modify and supplement the provisions contained in the "*General Conditions of the Contract for Construction*," AIA Document A201-2017 Edition. The provisions contained in this attachment will supersede any conflicting provisions of the AIA Document. The term "Agency," as used in this Attachment, shall mean the United States of America, acting through the United States Department of Agriculture.

ARTICLE 1, GENERAL PROVISIONS

Add the following subparagraph:

1.2.4 Concurrence of the Contract by the Agency is required before it is effective.

ARTICLE 2, OWNER

Delete subparagraph 2.3.6 and substitute the following:

2.3.6 The Contractor will be furnished, free of charge, _____ copies of the Drawings and Projects Manuals necessary for execution of the Work. Additional copies will be available from the Architect at the cost of reproduction and handling.

ARTICLE 4, ARCHITECT

Add the following to subparagraph 4.1.1:

The term "Architect" means the Architect, or the Engineer when the nature of the work is within the authority granted engineers by the State licensure law, or an authorized representative of the Architect or Engineer.

ARTICLE 5, SUBCONTRACTORS

Add the following to subparagraph 5.2.2:

The Contractor shall not contract with any party who is suspended or debarred by any Federal government agency from participating in Federally assisted construction projects.

ARTICLE 7, CHANGES IN THE WORK

Delete the words ", Construction Change Directive" from subparagraph 7.1.1.

Insert the words ", Agency " after the word "Owner," and delete the words "A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor" in subparagraph 7.1.2.

Delete the words "Construction Change Directive" from subparagraph 7.1.3.

Delete subparagraph 7.2.1 and substitute the following:

7.2.1 A Change Order is a written order to the Contractor utilizing Form RD 1924-7, "Contract Change Order," or AIA G-701 signed by the Owner, Architect, Contractor, and the Agency representative. It is issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. The Contractor's signing of a Change Order indicates complete agreement therein.

Add subparagraph 7.2.2:

7.2.2 Methods used in determining adjustments to the Contract Sum may include any of the following:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluating.
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon.

Add the following sentence to paragraph 7.3.1: "A Construction Change Directive may be used only for a change in response to an emergency as described in paragraph 10.4.

Delete subparagraph 7.3.2.

Add the following, where appropriate, to 7.3.3 through 7.3.10:
"When the use of a Construction Change Directive is justified"

ARTICLE 8, TIME

Add the following subparagraphs:

8.2.4 The Notice to Proceed shall be issued within twenty (20) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement of the Owner and Contractor, with the concurrence of the Agency. If the Notice to Proceed has not been issued within the twenty (20) calendar day period or within the period mutually agreed, the Contractor may terminate the Agreement without further liability on the part of either party.

8.3.4 As outlined in Article 3 of the Agreement, the Contractor agrees to pay liquidated damages to the Owner for each calendar day the Contractor shall be in default.

ARTICLE 9, PAYMENTS AND COMPLETION

Delete clause 9.3.1.1 and substitute the following:

9.3.1.1 Work performed and materials supplied under a Change Order may be included for payment only after the Change Order has been approved by all appropriate parties, including the Agency.

Add the words ", using AIA Document 702, 'Application and Certificate for Payment' or Form RD 1924-18, 'Partial Payment Estimate'," after "Certificate for Payment" in subparagraph 9.4.1.

Add the following subparagraph:

9.6.9 No progress payments will be made that deplete the retainage, nor place in escrow any funds that are required for retainage, nor invest the retainage for the benefit of the Contractor. Retainage will not be adjusted until after construction is substantially complete.

Replace the word "seven" with the words "fifteen (15)" in the first sentence, second line of subparagraph 9.7.

Delete subparagraph 9.8.5, after the first sentence, and substitute the following:

9.8.5 When the Work has been substantially completed, except for Work which cannot be completed because of weather conditions, lack of materials or other reasons, which, in the judgment of the Owner, are valid reasons for non-completion, the Owner may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the Work still to be completed. Provide a copy of the Certificate to the Agency.

Delete subparagraphs 9.9.1 and add the following:

9.9.1 The Contractor agrees to the use and occupancy of a portion or unit of the Project before formal acceptance by the Owner under the following conditions:

- .1 A "Certificate of Substantial Completion" shall be prepared and executed as provided in subparagraph 9.8.4, except that when, in the opinion of the Architect, the Contractor is chargeable with unwarranted delay in completing the Work or other Contract requirements, the signature of the Contractor will not be required. The Certificate of Substantial Completion shall be accompanied by a written endorsement of the Contractor's insurance carrier and surety permitting occupancy by the Owner during the remaining period of the Project Work. Occupancy and use by the Owner shall not commence until authorized by public authorities having jurisdiction over the Work.
- .2 Occupancy by the Owner shall not be construed by the Contractor as being an acceptance of that part of the Project to be occupied.
- .3 The Contractor shall not be held responsible for any damage to the occupied part of the Project resulting from the Owner's occupancy.
- .4 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims in behalf of the Owner or Contractor against each other.
- .5 If the Project consists of more than one building, and one of the buildings is to be

occupied, the Owner, prior to occupancy of that building, shall secure permanent property insurance on the building to be occupied and necessary permits which may be required for use and occupancy.

Add to subparagraph 9.9.3: Use and occupancy by the Owner prior to Project acceptance does not relieve the Contractor of responsibility to maintain all insurance and bonds required of the Contractor under the Contract Documents until the Project is completed and accepted by the Owner.

ARTICLE 11, INSURANCE AND BONDS

Replace the words "the Contract Documents" with the words "subparagraph 11.1.1" in the first sentence of subparagraph 11.1.2.

Add the following subparagraph:

11.1.1. Insurance shall be:

- .1 Written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident, or
- .2 Written with a combined bodily injury and damage liability of not less than \$700,000 per occurrence; and with an aggregate of not less than \$700,000 per occurrence.

Add the following sentence to the end of subparagraph 11.3.1:

The provisions of this subparagraph shall apply to the Contractor if the Contractor purchases and maintains said insurance coverage.

Delete subparagraph 11.1.2 and substitute the following:

11.1.2 The Contractor shall furnish the Owner bonds covering faithful performance of the Contract and payment of obligations arising thereunder within ten (10) calendar days after receipt of the Notice of Award. The surety company executing the bonds must hold a certificate of authority as an acceptable surety on Federal bonds as listed in Treasury Circular 570, and be authorized to transact business in the State where the Project is located. The bonds (using the forms included in the Bidding Documents) shall each be equal to the amount of the Contract Sum. The cost of these bonds shall be included in the Contract Sum

Add the following subparagraphs:

11.1.3.1 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current power of attorney.

11.1.3.2 If at any time a surety on any such bond is declared bankrupt or loses its right to do business in the State in which the work is to be performed or is removed from the list of surety companies accepted on Federal Bonds, the Contractor shall within ten (10) calendar days after notice from the Owner to do so, substitute an acceptable bond in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums of such bond shall be paid by any Contractor. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Owner.

ARTICLE 13, MISCELLANEOUS PROVISIONS

Add the following paragraphs:

13.6 LANDS AND RIGHTS-OF WAY

13.6.1 Prior to the start of construction, the Owner shall obtain all lands and rights-of-way necessary for the execution and completion of work to be performed under this contract.

13.7 EQUAL OPPORTUNITY REQUIREMENTS

Non-discrimination in Employment by Federally Assisted Construction Contractors, by Executive Order 11246.

13.7.1 This section summarizes Executive Order 11246, which prohibits employment discrimination and requires employers holding non-exempt Federal contracts and subcontracts and federally-assisted construction contracts and subcontracts in excess of \$10,000 to take affirmative action to ensure equal employment opportunity without regard to race, color, religion, sex, or national origin. The Executive Order requires, as a condition for the approval of any federally assisted construction contract, that the applicant incorporate nondiscrimination and affirmative action clauses into its non-exempt federally assisted construction contracts.

13.7.2 Executive Order 11246, is administered and enforced by the Office of Federal Contract Compliance Programs (OFCCP), an agency in the U.S. Department of Labor's Employment Standards Administration. OFCCP has issued regulations at 41 CFR chapter 60 implementing the Executive Order. The regulations at 41 CFR part 60-4 establish the procedures which the Agency, as an administering agency, must follow when making grants, contracts, loans, insurance or guarantees involving federally assisted construction which is not exempt from the requirements of Executive Order 11246. The regulations which apply to Federal or federally assisted construction contractors also are published at 41 CFR part 60-4.

13.7.3 OFCCP has established numerical goals for minority and female utilization in construction work. The goals are expressed in percentage terms for the contractor's aggregate workforce in each trade. OFCCP has set goals for minority utilization based on the percentage of minorities in the civilian labor force in the relevant area. There is

a single nationwide goal of 6.9 percent for utilization of women. The goals apply to all construction work in the covered geographic area, whether or not it is federal, federally assisted or non-federal. A notice advises bidders of the applicable goals for the area where the project is to be located.

13.7.4 Application. This section applies to all of a construction contractor's or subcontractor's employees who are engaged in on-site construction including those construction employees who work on a non-Federal or non-Federally assisted construction site.

13.7.4.1 Agency officials will notify the appropriate Regional Director of OFCCP that an Agency financed construction contract has been awarded, and that the equal opportunity clauses are included in the contract documents.

13.7.4.2 The Regional Director, OFCCP-DOL, will enforce the non-discrimination requirements of Executive Order 11246.

13.7.5 The prospective contractor or subcontractor must comply with the Immigration Reform and Control Act of 1986, by completing and retaining Form I-9, "Employment Eligibility Verification," for employees hired. This form is available from the Immigration and Naturalization Service, and Department of Justice.

13.7.6 The prospective contractor or subcontractor must submit Form RD 400-6, "Compliance Statement," to the applicant and an Agency official as part of the bid package, prior to any contract bid negotiations and comply with the Executive Order 11246 as stated in the contract documents.

13.8 STATUTES

13.8.1 The Contractor and each Subcontractor shall comply with the following statutes (and with regulations issued pursuant thereto, which are incorporated herein by reference):

13.8.1.1 Copeland Anti-Kickback Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3). This Act provides that each Contractor shall be prohibited from inducing, by any means, any person in connection with construction to give up any part of the compensation to which the person is otherwise entitled.

13.8.1.2 Clean Air Act (42 U.S.C. 7414), section 114, and Water Pollution Control Act (33 U.S.C. 1813), section 308. Under Executive Order 11738 and Environmental Protection Agency (EPA) regulations 40 C.F.R. part 15, all Contracts in excess of \$100,000 are required to comply with these Acts. The Acts require the Contractor to:

- .1 Notify the Owner of the receipt of any communication from EPA indicating that a facility to be utilized in the performance of the Contract is under consideration to be listed on the EPA list of Violating Facilities.
- .2 Certify that any facility to be utilized in the performance of any nonexempt Contractor or Subcontractor is not listed on the EPA list of Violating Facilities as of the date of the Contract Award.
- .3 Include or cause to be included the above criteria and requirements of paragraphs .1 and .2 in every nonexempt subcontract, and that the Contractor will take such action as the Government may direct as a means of enforcing such provisions.

13.8.1.3 Restrictions on Lobbying (Public Law 101-121, section 319) as supplemented in Department of Agriculture regulations (7 CFR part 3018). This statute applies to the recipients of contracts or subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. If applicable, the Contractor must complete a certification form on lobbying activities related to the specific Federal loan or grant that is a funding source for this contract. The certification and disclosure forms shall be provided by the Owner.

13.9 RECORDS

13.9.1 If the Contract is based on a negotiated Bid, the Owner, the Agency, the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the Contractor which are pertinent to a specific Federal loan program for the purpose of making audit, examination, excerpts, and transcriptions. The Contractor shall maintain records for at least three years after the Owner makes final payment and all other pending matters are closed.

13.10 ENVIRONMENTAL REQUIREMENTS

13.10.1 Mitigation Measures - The contractor shall comply with applicable mitigation measures established in the environmental assessment for the project. These may be obtained from the Agency representative.

13.10.2 The Contractor, when constructing a Project involving trenching, excavating, or other earth moving activity, shall comply with the following environmental constraints:

13.10.2.1 Endangered Species, Historic Preservation, Human Remains and Cultural Items, Hazardous Materials, and Paleontology - Any excavation or other earth moving activity by the Contractor that provides evidence of the presence of endangered or threatened species or their critical habitat, uncovers a historical or archaeological artifact, human remains or cultural items, hazardous materials, a fossil or other paleontological materials will require the Contractor to:

- .1 Temporarily stop work;
- .2 Provide immediate notice to the Architect and the Agency, and in the case of potentially hazardous materials, provide immediate notice to local first responders and take such measures as necessary to protect the public and workers;
- .3 Take reasonable measures as necessary to protect the discovered materials or protected resource;
- .4 Abide by such direction as provided by the Agency, or Agencies responsible for resource protection or hazardous materials management; and
- .5 Resume work only upon notice from the Architect and the Agency.

13.10.3 Lead-Based Paint - The Contractor and Owner shall comply with applicable Agency requirements of the Lead-Based Paint Poisoning Prevention Act, as amended (42 U.S.C. 4821), and the Residential Lead-Based Paint Hazard Reduction Act of 1992 (42 U.S.C. 4851) for rehabilitation work on residential property built prior to 1978.

13.11 DEBARMENT AND SUSPENSION

13.11.1 The Contractor shall comply with the requirements of 7 CFR part 3017, which pertains to the debarment or suspension of a person from participating in a Federal program or activity.

ARTICLE 15 CLAIMS AND DISPUTES

Add the words "may be" after "on the parties but" in the last sentence of subparagraph 15.2.5.

Replace the word "shall" with the word "may" in the first sentence, first occurrence of subparagraph 15.3.2

Add the subparagraph: 15.4.1.2 The arbitrators will select a hearing location as close to the Owner's locale as possible.

o0o

**SECTION 00 7300
SUPPLEMENTARY CONDITIONS**

PART ONE GENERAL

1.01 INTENT

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 7200 and other provisions of the Contract Documents as indicated below.
- B. All provisions which are not so amended or supplemented remain in full force and effect.
- C. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 MODIFICATIONS TO AIA A201 - 2017

- A. **ARTICLE 1 - GENERAL PROVISIONS**
 - 1. **FORM OF AGREEMENT**
 - a. 1.1., Basic Definitions, add the following subparagraph:
 - 1) 1.1.1.2, The form of agreement between owner and contractor shall be as defined in Section 00 5200 of the specifications.
 - 2. 1.1.5 THE DRAWINGS
 - a. List of drawings are enumerated in Section 00 0115 of the specifications.
- B. **ARTICLE 2 - OWNER**
 - 1. Delete 2.1.2 entirely.
 - 2. Delete 2.2.1 entirely.
 - 3. Delete 2.3.3 entirely.
- C. **ARTICLE 3 – CONTRACTOR**
 - 1. **LABOR AND MATERIALS**
 - a. Refer to the following paragraphs:
 - 1) No. 3.4 - Labor and Materials
 - 2) No. 3.6 - Taxes
 - 3) No. 3.7 - Permits, Fees, Notices and Compliance with Laws.
 - 4) No. 3.13 - Use of Site
 - b. See Specifications Section 01 1100, Summary of Work, for additional provisions on these subjects.
 - 2. **CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES**
 - a. Refer to Section 3.10; See Specifications Section 01 3216, Construction Schedules, for additional provisions on this subject.
 - 3. **DOCUMENTS AND SAMPLES AT THE SITE**
 - a. Refer to Section No. 3.11, Documents and Samples at the Site:
 - b. See Specifications Section 01 7839, Project Record Documents, for additional provisions on this subject.
 - 4. **SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES**
 - a. Refer to Section No. 3.12, Shop Drawings, Product Data, and Samples
 - b. See Specifications Section 01 3323, Submittals, for additional provisions on this subject.
 - 5. **CUTTING AND PATCHING WORK**
 - a. Refer to Section 3.14, Cutting and Patching:
 - b. See Specifications Section 01 7329, Cutting and Patching, for additional provisions on this subject.
 - 6. **CLEANING**
 - a. Refer to Section 3.15, Cleaning Up
 - b. See Specifications Section 01 7400, Cleaning, for additional provisions on this subject.

7. ACCESS TO WORK

a. Add the following paragraph:

- 1) 3.16.1 Inspection: The contractor awarded this project agrees to allow any Federal or State Inspector, acting in their official capacity, to have access to the jobsite.

D. ARTICLE 5 - SUBCONTRACTS

1. Refer to 5.2.1 and add the following subparagraph:

- a. 5.2.1.1, See Section 00 2100, of the specifications for additional requirements for subcontractors

E. ARTICLE 7 - CHANGES IN THE WORK

1. CHANGE ORDERS

a. 7.2.1, Delete in its entirety and substitute the following:

- 1) 7.2.1, The contractor shall present an itemized accounting together with appropriate supporting data for the purposes of considering additions or deductions. Supporting data shall include but is not limited to the following:
 - (a) costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and worker or workmen's compensation insurance;
 - (b) costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
 - (c) rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
 - (d) costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
 - (e) additional costs of supervision and field office personnel directly attributable to the change.
 - (f) The value of all such additions and deductions shall then be computed as set forth in Paragraph 'D'.
- 2) The burden of proof of cost rests upon the Contractor. Contractor shall be required, if called upon, to furnish the original bills and payrolls and support the statement with proper affidavits. Burden of proof of costs is upon the general contractor.
- 3) In no event shall any understanding or agreement, contract modification, change order or other matter which would constitute a deviation from the terms of this contract be effective or binding upon the owner unless expressly stated and agreed to in writing executed by the owner.

b. 7.2.1.2 Compute requests for changes be they additions or deductions as follows:

- 1) For work directly performed by the General Contractor or a Subcontractor:
 - (a) Net cost of material-----a
 - (b) State Sales Tax -----b
 - (c) Net Placing cost-----c
 - (d) W.C. Insurance Premium and FICA Tax-----d
 - (1) Subtotal-----a+b+c+d
 - (e) Overhead and profit, 12% X (a+b+c+d)-----e
 - (f) Allowable Bond Premium (if applicable)-----f
 - (1) TOTAL COST-----a+b+c+d+e+f
- 2) Credit for work omitted shall be computed as outlined in (1) "a through e" except the General Contractor or Subcontractor's share of overhead and profit percentage is 7%.
- 3) For work performed by Subcontractors the General Contractor Shall:
 - (a) Subcontractors shall compute their work as outlined in (1) "a through e". To the cost of that portion of the work (change) that is performed by the subcontractor, the general contractor shall add an overhead and profit charge of Five (5%) percent plus the allowable bond premium.

2. CONSTRUCTION CHANGE DIRECTIVES
 - a. Delete 7.3, Construction Change Directives, 7.3.1 through 7.3.10 in its entirety. Changes of work may only be accomplished through the change order process.
 - b. Delete reference to construction change directive in paragraph 7.1.2. All changes to work are to be through change order process.
- F. ARTICLE 9 - PAYMENTS AND COMPLETION
1. Refer to Section 9.2, Schedule of Values:
 - a. See Specifications Section 01 2973 Schedule of Values, for additional provisions on this subject.
 2. PAYMENTS TO CONTRACTOR
 - a. 9.3 Applications for Payment, add the following subparagraphs:
 - 1) 9.3.2.1, Act 193 of 2009 amended Arkansas Code Annotated 22-9-604 (a) concerning withholding of retention proceeds in a construction contract, provides that payment to the contractor be as follows:
 - (a) Ninety Five percent (95%) of the value of labor executed will be paid to the contractor by the owner in monthly installments as work progresses in proportion to the amount of work executed during monthly period less previous payments. Five percent (5%) will be retained by the owner until final payment. One hundred percent (100%) of all materials delivered and stored on the premises or materials stored in a bonded warehouse approved by the owner will be paid monthly with pay requests
 - b. 9.3.2.2, Arkansas Code Annotated 22-9-501, makes provisions for the contractor to withdraw before completions of the project, the retainage withheld by the owner upon deposit of approved government bonds.
 3. Add to Subparagraph 9.3.1, Applications for Payment, the following sentence:
 - a. The form of Application for payment shall be AIA Document G-702, Application and Certification for Payment, supported by AIA Document G-703, Continuation Sheet.
 4. CERTIFICATES FOR PAYMENT
 - a. 9.4.1, Add the following:
 - 1) 9.4.1.1, Deliver three (3) copies of monthly estimates to architect on form to be provided by the architect.
 - 2) 9.4.1.2, The contractor shall promptly pay each subcontractor, upon receipt of payment from the owner, out of the amount paid to the contract on account of said subcontractor's work. The contractor shall require each subcontractor to make payments to his subcontractors in similar manner. Failure to promptly pay subcontractors shall be cause to call upon the contractor's payment bond for relief.
 - 3) 9.4.1.3, The owner shall make final payment within 30 days of completion and acceptance of the work. In the event the project extends beyond 30 days, periodic payments shall be made.
 5. PAYMENT WITHHELD
 - a. 9.5, Decisions to Withhold Certification, add the following subparagraph:
 - 1) 9.5.1.1, The Owner may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in its opinion to protect the owner from loss because of:
 - (a) When periodic payments are made five percent (5%) will be withheld.
 - (b) Defective work not remedied;
 - (c) Third party claims filed or reasonable evidence indicating probable filing to such claims;
 - (d) Failure of the contractor to make payment properly to subcontractors or for labor, materials or equipment;
 - (e) Reasonable evidence that the work cannot be completed for the unpaid balance of the contract sum;
 - (f) Damage to the owner or another contractor;

- (g) Reasonable evidence that the work will not be completed within the contract time; or
 - (h) Persistent failure to carry out the work in accordance with the contract documents.
 - 6. FAILURE OF PAYMENT
 - a. Delete 9.7 entirely.
 - 7. FINAL COMPLETION AND FINAL PAYMENT
 - a. Add to 9.10.2:
 - 1) Forms for "Consent of Surety for Final Payment" and "Contractor's Affidavit of Payment of Debts and Claims," are included at the end of Section 00 6000 1, Project Forms. These forms are required to be submitted to the owner with other close-out documents prior to final payment.
- G. ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY
- 1. Delete 10.3.3 entirely.
 - 2. Delete 10.3.6 entirely.
- H. ARTICLE 11 - INSURANCE AND BONDS
- 1. CONTRACTOR'S INSURANCE AND BONDS
 - a. 11.1.1, In the first line following the word "maintain", insert the words "in a company or companies to which the owner has no reasonable objection".
 - b. 11.1.1, Add the following new subparagraph:
 - 1) 11.1.1.2, Liability insurance should include all major divisions of coverage and be on a comprehensive general basis including:
 - (a) Premises - Operation (including X-C-U)
 - (b) Owner's and Contractor's Protective
 - (c) Products and Completed Operations
 - (d) Contractual - Including specific provision for the contractor's obligation under Paragraph 11.1.
 - (e) The contractor shall purchase from and maintain such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract:
 - 1) Claims under worker's compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed.
 - 2) Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees.
 - 3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees.
 - 4) Claims for damages insured by usual personal injury liability coverage.
 - 5) Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of sue resulting therefrom.
 - 6) Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle.
 - 7) Claims for bodily injury or property damage arising out of completed operations; and
 - 8) Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.
 - 2) 11.1.1.3, The insurance required by Subparagraph 11.1.1 and 11.1.1.2 shall be written for not less than any limits of liability required by law or by those set forth below, whichever is greater, and shall include contractual liability insurance as applicable to the contractor's obligations.
 - (a) Workman's Compensation - Employer's Liability Limits of \$500,000/\$500,000/\$500,000
 - (b) General Liability - \$1,000,000 Per Occurrences/\$2,000,000 Aggregate

- a. If the Owner substantially breaches an obligation in 14.1.1 or 14.1.2 of this Contract, following seven days' written notice to the Owner, the Contractor may terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, construction equipment and machinery, including reasonable overhead, profit and damages for work performed.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

(Guide 19 - Attachment 4)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
 _____ as Principal, and
 _____ as Surety, are hereby held and
 firmly bound unto _____ as OWNER in the penal sum of
 _____ for the payment of
 which, well and truly to be made, we hereby jointly and severally bind
 ourselves, successors and assigns.

Signed, this _____ day of _____, 19_____.
 The Condition of the above obligation is such that whereas the Principal has
 submitted to _____ a certain BID,
 attached hereto and hereby made a part hereof to enter into a contract in
 writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute
 and deliver a contract in the Form of Contract attachment hereto
 (Properly completed in accordance with said BID) and shall furnish a BOND
 for faithful performance of said contract, and for the payment of all
 persons performing labor furnishing materials in connection therewith,
 and shall in all other respects perform the agreement created by the
 acceptance of said BID, then this obligation shall be void, otherwise the
 same shall remain in force and effect; it being expressly understood and
 agreed that the liability of the Surety for any and all claims hereunder
 shall, in no event, exceed the penal amount of this obligation as herein
 stated.

(1-15-79) SPECIAL PN

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal (L.S.)

Surety

By: _____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

(Guide 19 - Attachment 5)

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal,
and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, and the United States of America acting through Rural Development hereinafter referred to as the Government in the total aggregate penal sum of _____

_____ Dollars (\$_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ 19____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, or GOVERNMENT, with or without notice to the SURETY and during the one year guaranty period and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER and GOVERNMENT from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER and GOVERNMENT all outlay and expense which the OWNER and GOVERNMENT may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the liability of the PRINCIPAL AND SURETY hereunder to the GOVERNMENT shall be subject to the same limitations and defenses as may be available to them against a claim hereunder by the OWNER, provided, however, that the GOVERNMENT may, at its option, perform any obligations of the OWNER required by the contract.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER or GOVERNMENT and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER and GOVERNMENT are the only beneficiaries hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each
Number
one of which shall be deemed an original, this the _____ day of _____

ATTEST:

Principal

(Principal) Secretary

(SEAL)

By _____ (s)

(Witness as to Principal)

(Address)

(Address)

Surety

ATTEST:

Witness to Surety

BY _____
Attorney-in-Fact

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is partnership, all partners should execute BOND.
IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

oOo

(Guide 19 - Attachment 6)

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____ hereinafter called PRINCIPAL and
(Corporation, Partnership or Individual)

(Name of Surety)

hereinafter called SURETY, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER and the United States of America acting through Rural Development hereinafter referred to as GOVERNMENT, and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of _____

_____ Dollars (\$_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of _____ 19____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the PRINCIPAL shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the WORK or to the SPECIFICATIONS.

PROVIDE, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL (or with the GOVERNMENT in the event the GOVERNMENT is performing the obligations of the OWNER), shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, is being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the contract or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER or GOVERNMENT and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

(Guide 19 - Attachment 6) (Page 3)

WITNESS WHEREOF, this instrument is executed in _____ counterparts, each of
Number
which shall be deemed an original, this the _____ day of _____.

ATTEST:

(Principal) Secretary

(SEAL)

Witness as to Principal

(Address)

ATTEST:

Witness as to Surety

(Address)

Principal

By _____ (s)

(Address)

Surety

By _____
Attorney-in-Fact

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR Is partnership, all partners should execute BOND.
IMPORTANT: Surety companies executing BONDS must appear on the Treasury
Department's most current list (Circular 570 as amended) and be authorized to
transact business in the State where the Project is located.

oOo

RD Instruction 1942-A
(Guide 19 - Attachment 7)

NOTICE OF AWARD

TO: _____

PROJECT Description: _____

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 19____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 19_____.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by _____.
this the _____ day of _____, 19_____.
By _____
Title _____

NOTICE TO PROCEED

TO: _____

DATE: _____
Project: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 19__, on or before _____, 19__, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 19__.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____

this the _____, 19__

By _____

Title _____

Employer Identification
Number _____

oOo

14. Certificate of Owner's Attorney.

I, the undersigned, _____, the duly authorized and acting legal representative of _____, do hereby certify as follows

I have examined the attached contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements are adequate and have has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

Date: _____

NOTE: Delete phrase "performance and payment bonds" when not applicable.

15. Rural Development Concurrence.

As lender or insurer of funds to defray the costs of this contract, and without liability for any payments thereunder, Rural Development (Rural Development) hereby concurs in the award of this CONTRACT to

U.S. Department of Agriculture
Rural Development

By _____

Title _____

Date _____

This CONTRACT shall not be effective unless and until concurred in by the State Director of Rural Development, U.S. Department of Agriculture or a delegated representative.

COMPLIANCE STATEMENT

This statement relates to a proposed contract with _____

(Name of borrower or grantee)

who expects to finance the contract with assistance from either the Rural Housing Service (RHS), Rural Business-Cooperative Service (RBS), or the Rural Utilities Service (RUS) or their successor agencies, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor, I represent that:

1. I have have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.
2. If I have participated in such a contract or subcontract, I have, have not, filed all compliance reports that have been required to file in connection with the contract or subcontract.
 If the proposed contract is for \$50,000 or more: or if the proposed nonconstruction contract is for \$50,000 or more and I have 50 or more employees, I also represent that:
3. I have, have not previously had contracts subject to the written affirmative action programs requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I have, have not developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the RHS, RBS or RUS, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays the valid OMB control number. The valid OMB control number for this information collection is 0575-0018. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

**NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR
CERTIFICATIONS OF NON-SEGREGATED FACILITIES**

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$ 10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date _____

(Signature of Bidder or Prospective Contractor)

Address (including Zip Code)

U. S. DEPARTMENT OF AGRICULTURE

**Certification Regarding Debarment, Suspension, Ineligibility
and Voluntary Exclusion - Lower Tier Covered Transactions**

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017, Section 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS)

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name

PR/Award Number or Project Name

Name and Title of Authorized Representative(s)

Signature(s)

Date

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily exclude," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant or loan, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

(name)

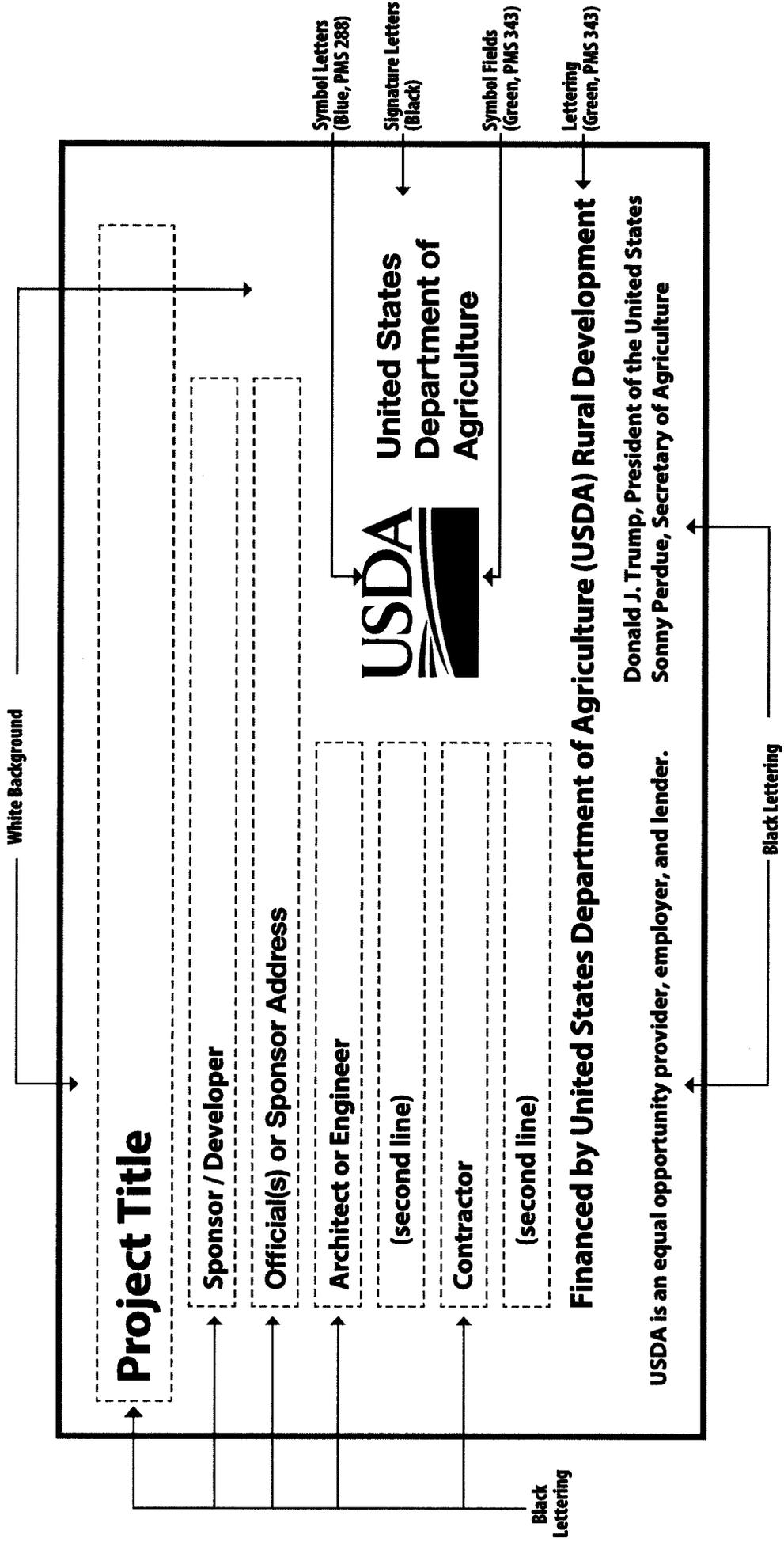
(date)

(title)

oOo

TEMPORARY CONSTRUCTION SIGN FOR RURAL DEVELOPMENT PROJECTS

Recommended Fonts: Helvetica, Arial, or Myriad Pro



SIGN DIMENSIONS : 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x ¾")
PLYWOOD PANEL (APA RATED A-B GRADE-EXTERIOR)

DIVISION 01

GENERAL REQUIREMENTS

**SECTION 01 1100
SUMMARY OF THE WORK**

PART 1 - GENERAL

1.01 WORK COVERED BY THE CONTRACT DOCUMENTS

- A. These specifications shall cover entirely all of the labor and material requirements for the project. The General Conditions of the Contract, Supplementary Conditions, Instructions to Contractor, and any Addenda issued by the architect are hereby made a part of each division or section of these specifications as if bound, repeated, or included therein.
- B. In the interest of clarity and brevity, phrases such as "The contractor shall ..." or "The contractor shall furnish and install ..." have been omitted from these specifications.
- C. The General Construction Contract shall include all construction work required to complete the total project in accordance with requirements of the contract documents and shall include all heating, air conditioning, ventilating, electrical, and mechanical.
 - 1. Scope of individual bid packages/contracts to be as defined by the Construction Manager.
- D. Contractor's Duties:
 - 1. Except as specifically noted, provide and pay for:
 - a. Labor, materials, and equipment
 - b. Tools, construction equipment, and machinery
 - c. Water, heat, and utilities required for construction
 - d. Transportation and other facilities and services necessary for proper execution and completion of work
 - 2. Pay all legally required sales, consumer, and use taxes.
 - 3. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at time of receipt of bids:
 - a. Permits
 - b. Government fees
 - c. Licenses
 - 4. Give required notices.
 - 5. Comply with laws, codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on the performance of work.
 - 6. Promptly submit written notice to the architect and engineer of observed variance of contract documents from legal requirements. It is not contractor's responsibility to make certain that drawings and specifications shall comply with codes and regulations.
 - a. Appropriate modifications to contract documents will adjust necessary changes.
 - b. Assume responsibility for work known to be contrary to such requirements without notice.
 - 7. Enforce strict discipline and good order among the employees. Do not employ on work:
 - a. Unfit persons
 - b. Persons not skilled in assigned work tasks

1.02 CONTRACTOR USE OF PREMISES

- A. Confine operations at site to areas permitted by law, ordinances, permits, and contract documents.
- B. Do not unreasonably encumber site with materials or equipment.
- C. Assume full responsibility for protection and safekeeping of products stored on premises.
- D. Move any stored products which interfere with operation of owner or other contractor.
- E. Materials may be stored in approved off-site areas when properly insured in the owner's interest.

1.03 NO SMOKING POLICY

- A. Pursuant to the Arkansas Code Annotated § 6-21-609, the Owner has a No Smoking Policy on all properties.

- B. It is the policy of the Owner that all uses of tobacco and tobacco products, including smokeless tobacco, will be prohibited on all properties.
- C. This policy applies to all Staff Members, Visitors, General Contractors, Subcontractors, and Vendors. This policy is strictly enforced without exception.

1.04 WORK SEQUENCE / PHASING

- A. The contractor is to perform all construction and contract work within the limits of the site at the contractor's schedule.
- B. All work shall be performed at the contractor's schedule and within contract time.
- C. Any work that requires the interruption of the utility service to any existing building is to be coordinated and scheduled with the owner prior to beginning the work.
- D. Any work that is to be completed outside the site is to be coordinated with the owner prior to beginning work.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

SECTION 01 1115
OWNER FURNISHED ITEMS

PART 1 GENERAL

PART 1 GENERAL

1.01 SCOPE

- A. The General Contractor is advised to pay special attention to notes on the plans and specifications indicating items to be "by owner", "owner furnished", owner furnished/owner installed (O.F.O.I.), "owner furnished/contractor installed (O.F.C.I.)". and "not in contract (N.I.C.)".
- B. Not in Contract (N.I.C.) - indicates that those items are not included in the construction contract.
- C. By Owner, Owner Furnished, and Owner Furnished/Owner Installed - indicates those items that will be furnished and delivered to the site by the owner or his agents and are to be installed by the owner's representatives or subcontractors.
- D. Owner Furnished/Contractor Installed - indicates those items that will be furnished and delivered to the site by the owner or his agents and are to be installed by the contractor.
- E. The following list of items are Owner Furnished/Owner Installed: (Unless indicated with (O.F.C.I.) designation).
 - 1. Loose Furniture (tables, desks, chairs, etc.)
 - 2. Refrigerator and Dishwasher; Kitchenette 111.
 - 3. Refrigerator; Break 104.

1.02 COORDINATION

- A. The contractor is to assist the owner in rough-in preparation for owner furnished and installed equipment by allowing timely access to the work for installation.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

**SECTION 01 2200
UNIT PRICES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- C. Defect assessment and non-payment for rejected work.

1.02 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead, profit, and taxes.

1.03 RELATED REQUIREMENTS

- A. Section 31 1000 - Site Clearing
- B. Section 31 2200 Grading
- C. Section 31 2316 Excavation
- D. Section 31 2323 Fill

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by the independent testing agency retained by the construction manager to provide soil testing services.
- C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- D. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- E. Stipulated Sum/Price Measurement: Items measured by volume as a completed item or unit of the Work.
- F. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- G. Engineer's Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

1.05 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work which is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit sum/price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected Products.

1.06 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.

B. The authority of Architect to assess the defect and identify payment adjustment is final.

1.07 SCHEDULE OF UNIT PRICES

A. Item: Undercut:

1. Cubic yard unit price to include all labor, equipment, and material for undercut, disposal, and replacement of unsuitable soils.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2973
SCHEDULE OF VALUES**

PART 1 - GENERAL

1.01 GENERAL

- A. Submit to the architect/engineer schedule of values, at least ten (10) days prior to submitting first Application for Payment.
- B. Upon request by architect/engineer, support values given with data that will substantiate their correctness.
- C. Submit quantities of designated materials.
- D. Payment for materials stored on site will be limited to those materials listed in Schedule of Unit Material Values.
- E. Use Schedule of Values only as basis for contractor's Application for Payment.

1.02 FORM OF SUBMITTAL

- A. Submit typewritten Schedule of Values on 8-1/2" x 11" white paper.
- B. Use Table of Contents of this specification as basis for format for listing costs of work for each of the sections from all divisions.
- C. Identify each line item with number and title as listed in Table of Contents of this specification (sections).

1.03 PREPARING SCHEDULE OF VALUES

- A. Itemize separate line item cost for each of the following general cost items:
 - 1. Performance and Payment Bonds
 - 2. Field Supervision and Layout
 - 3. Temporary Facilities and Controls
- B. Itemize separate line item cost for work required by each section of this specification.
- C. Breakdown installed cost into:
 - 1. Delivered cost of product, with taxes paid
 - 2. Installation cost
- D. For each line item which has installed value of more than 1%, break down costs to list major products or operations under each item.
- E. Round off figures to nearest dollar.
- F. Make sum of total costs of all items listed in schedule equal to total contract sum.

1.04 PREPARING SCHEDULE OF UNIT MATERIAL VALUES

- A. Submit separate Schedule of Unit Prices for materials to be stored on which progress payments will be made.
- B. Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values.
- C. Include in unit prices only:
 - 1. Cost of material
 - 2. Delivery and unloading at site
 - 3. Sales taxes
- D. Make sure that unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.05 REVIEW AND RESUBMITTAL

- A. After review by architect/engineer, revise and resubmit Schedule (and Schedule of Material Values) as required.
- B. Resubmit revised Schedule in same manner.

**PART 2 - PRODUCTS
NOT USED.
PART 3 - EXECUTION
NOT USED.**

END OF SECTION

**SECTION 01 2976
PROGRESS PAYMENT PROCEDURES**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Application for payments
- B. Defect Assessment

1.02 RELATED SECTIONS

- A. Section 00 7300 - 1.02,G, 3, Payments to Contractor
- B. Section 01 2973 - Schedule of Values
- C. Section 00 6000 - Project forms

1.03 APPLICATIONS FOR PAYMENT

- A. Submit four (4) copies of each application on Owner-accepted form to Owner (all copies require original signatures in blue ink).
- B. Content and Format: Utilize Schedule of Values for listing items in Periodic Pay Estimate.
- C. Submit an updated construction schedule with each Periodic Pay Estimate.
- D. Payment Period: Progress payments to be made monthly.
- E. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question.

1.04 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of the Architect/Engineer and Owner it is not practical to remove and replace the Work, the Architect/Engineer will direct an appropriate remedy or adjust payment.
- C. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of the Owner.
- D. The defective Work will be partially repaired to the instructions of the Architect/Engineer, and the unit sum/price will be adjusted to a new sum/price at the discretion of the Owner.
- E. The authority of the Owner to assess the defect and identify payment adjustment is final.
- F. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected products.

PART II—PRODUCTS

2.01 NOT USED.

PART III—EXECUTION

3.01 NOT USED.

END OF SECTION

**SECTION 01 3113
COORDINATION**

PART 1 - GENERAL

1.01 EXAMINATION

- A. Each contractor, subcontractor, or supplier shall thoroughly examine the drawings and specifications pertaining to separate contracts and include in his base bid those items for which he will be responsible and for the proper coordination of the work to be performed.

1.02 TRANSITIONS

- A. The architect accepts no responsibility for the naming of every item that may be needed to make transitions from the work of one contractor to another. All such transitions shall be the entire responsibility of the contractor, subcontractor, and materials and equipment suppliers involved.

1.03 SCHEDULES

- A. General contractor shall coordinate the scheduling of all work.

1.04 LOCATION OF WORK

- A. The contractor shall check and verify all measurements and dimensions shown on contract drawings and shop drawings of all the work as it progresses.
- B. The proper location of work of all subcontractors, including supports for equipment, shall be the final conclusive responsibility of the general contractor regardless of who is responsible for the layout of the work in the first instance.

1.05 UNLOADING AND HOISTING MATERIALS

- A. The contractor, each subcontractor, and each supplier of materials and equipment shall be responsible for the hoisting of their materials and equipment to the proper location for installation in the project.
- B. They shall also be responsible for unloading of all materials and equipment at the job site.

1.06 STORAGE OF MATERIALS

- A. General contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and equipment and coordinate the storage and execution of their work with his.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

**SECTION 01 3119
PROJECT MEETINGS**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. See Section 00 2100 – Instructions to Bidders for Pre-Bid Conference.
- B. Preconstruction Meeting
- C. Progress Meetings
- D. Pre-installation Meetings

1.02 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required: Owner, Architect, Contractor, Contractor's Superintendent, and major subcontractors.
- C. Agenda:
 - 1. Designation of personnel representing the parties in Contract and the Architect.
 - 2. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 3. Scheduling.
 - 4. Use of premises by Owner and Contractor.
 - 5. Owner's requirements.
 - 6. Construction facilities and controls provided by Owner.
 - 7. Temporary utilities.
 - 8. Security and housekeeping procedures.
 - 9. Procedures for testing.
 - 10. Maintaining record documents.
 - 11. Inspection and acceptance of equipment put into service during construction.
- D. General Contractor is to record minutes and distribute copies within two days after meeting to participants, with two copies to Architect/Engineer, and those affected by decisions made.

1.03 PROGRESS MEETINGS

- A. The General Contractor is to schedule and administer meetings throughout progress of the Work.
 - 1. Progress meetings to be held monthly until the project is eighty percent complete.
 - 2. After projection completion reaches eighty percent, progress meetings are to be held every two weeks.
- B. Make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
- C. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner, Architect/Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.

13. Other business relating to Work.

- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, and those affected by decisions made.

1.04 PREINSTALLATION MEETING

- A. When required in individual specification sections, the General Contractor is to convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four (4) days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of installation, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two (2) days after meeting to participants, with two copies to architect, owner, participants, and those affected by decisions made.

PART 2-PRODUCTS

NOT USED.

PART 3-EXECUTION

NOT USED.

END OF SECTION

**SECTION 01 3216
CONSTRUCTION SCHEDULES**

PART 1 - GENERAL

1.01 SCHEDULE

- A. Prepare and submit for architect's approval a projected construction schedule for the entire work.
- B. The schedule shall indicate the dates for the starting and completion of various stages and sequence of construction and shall be revised monthly. Submit with contractor's Application for Payment each month.

1.02 FORM

- A. Prepare schedule in the form of a horizontal bar chart providing:
 - 1. Separate horizontal bar column for each major specification section.
 - 2. Place in chronological order of beginning of each item of work.
 - 3. Identify each horizontal bar:
 - a. By major specification section
 - b. By distinct graphic delineation
 - 4. Horizontal time scale (weeks)
 - 5. Allow space for denoting of actual progress of the work.
 - 6. Minimum sheet size: 8-1/2" x 14"

1.03 SCHEDULE UPDATE

- A. Update schedules accurately indicating the progress to first day of each month and submit monthly with Application and Certificate for Payment. Updated schedules are to be distributed at monthly progress meetings to all attendees.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

SECTION 01 3223
SURVEY AND LAYOUT DATA

PART 1 – GENERAL

1.01 RELATED SECTIONS

- A. Section 00 3100 - Available Project Information

1.02 FIELD ENGINEERING

- A. Employ a land surveyor registered in the State of Arkansas and acceptable to Architect.
- B. Contractor shall locate and protect survey control and reference points. Promptly notify architect of any discrepancies discovered.
- C. Control datum for survey is that established by Owner provided survey.
- D. Verify set-backs and easements; confirm drawing dimensions and elevations.
- E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
- F. Submit a copy of certificate signed by land surveyor that the elevations and locations of the work are in conformance with the contract documents.
- G. Maintain a complete and accurate log of control and survey work as it progresses.

PART 2 – PRODUCTS

2.01 NOT USED.

PART 3 – EXECUTION

3.01 NOT USED.

END OF SECTION

SECTION 01 3323

SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Project Data
- B. Shop Drawings
- C. Samples
- D. Design Data
- E. Test Reports
- F. Certificates
- G. Manufacturer's Instructions
- H. Manufacturer's Field Reports
- I. Erection Drawings

1.02 RELATED SECTIONS

- A. Section 00 6000 - Project Forms

1.03 PROJECT DATA

- A. Manufacturer's standard schematic drawings:
 - 1. Modify drawings to delete information which is not applicable to project
 - 2. Supplement standard information to provide additional information applicable to project
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data
 - 1. Clearly mark each copy to identify pertinent materials, products, or models
 - 2. Show dimensions and clearances required
 - 3. Show performance characteristics and capacities
 - 4. Show wiring diagrams and controls

1.04 SHOP DRAWINGS

- A. Original drawings, prepared by contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work; showing fabrication, layout, setting, or erection drawings.
 - 1. Prepared by a qualified detailer
 - 2. Identify details by reference to sheet and detail numbers shown on contract document drawings
 - 3. Minimum sheet size: 8-1/2" x 11"

1.05 SAMPLES

- A. Physical examples to illustrate materials, equipment, or workmanship, and to establish standards by which completed work is judged.
 - 1. Office Samples: of sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of product or material with integrally related parts and attachment devices
 - b. Finishes

1.06 DESIGN DATA

- A. Submit for the Architect/Engineer's knowledge as contract administrator or for the owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents.

1.07 TEST REPORTS

- A. Submit for the Architect/Engineer's knowledge as contract administrator or for the owner.

- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents.

1.08 CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect/Engineer.

1.09 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing to Architect/Engineer for delivery to Owner in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for the architect/engineer's benefit as contract administrator or for the owner.
- B. Submit report in duplicate within 30 days of observation to architect/engineer for information.
- C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.11 ERECTION DRAWINGS

- A. Submit drawings for the Architect/Engineer's benefit as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by the Architect/Engineer or Owner.

PART 2—PRODUCTS

2.01 Not Used.

PART 3—EXECUTION

3.01 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, project data, and samples prior to submission.
- B. Verify:
 - 1. Field measurements
 - 2. Field construction criteria
 - 3. Catalog numbers and similar data
 - 4. Conformance with Contract Documents
 - 5. Coordination with other work.
- C. Coordinate each submittal with requirements of work, construction schedule, and of contract documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by architect/engineer's review of submittals.
- E. Contractor's responsibility for deviations in submittals from requirements of contract documents is not relieved by architect/engineer's review of submittals, unless architect/engineer gives written acceptance and deviations are clearly marked on submittals.
- F. Notify architect/engineer in writing at time of submission of deviations in submittals from requirements of contract documents.

- G. Begin no work which requires submittals until return of submittals with architect/engineer's stamp and initials or signature indicating review.
- H. Contractor is responsible for delays caused by improper submittal procedures or incomplete submittals.

3.02 SUBMISSION REQUIREMENTS

- A. Schedule submissions at least 14 working days before dates reviewed submittals will be needed.
- B. Each submittal shall be complete and accurate.
- C. Accompany submittals with a completed Submittal Transmittal Form containing the information shown in the sample form in Section 00 6000. A separate transmittal form is required for each required submittal.
- D. Incomplete or partial submittals will be rejected, without review, and require resubmittal.
- E. Submittals may be made of portions of the Work, but each Submittal shall be complete with respect to the information necessary for proper review by Architect and their consultants.
- F. Cross out non-related material in the submittal.
- G. Submittals shall be sent electronically to the Architect. This document will be stored electronically at the project site for Architect and Contractor access during construction. All documents shall be sent in PDF format and saved in the following method SD_03_3000_01.PDF. Each Shop Drawing shall have specification number and the submittal number for that specification section. The file above indicates specification section 03 3000 submittal number one. Upon completion of the project the contractor is to submit four copies on CD of all Shop Drawings during the project closeout phase. These shall be in PDF format.
- H. Submit number of samples specified in each of specifications sections.
- I. Accompany submittals with transmittal letter, in duplicate, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. The number of each shop drawing, project data, and sample submitted
 - 5. Notification of deviations from contract documents
 - 6. Other pertinent data
- J. Submittals shall include:
 - 1. Date and revision dates
 - 2. Project title and number
 - 3. The names of:
 - a. Architect/Engineer
 - b. Contractor
 - c. Subcontractor
 - d. Supplier
 - e. Manufacturer
 - f. Separate detailer when pertinent
 - 4. Identification of product or material
 - 5. Relation to adjacent structure or materials
 - 6. Field dimensions, clearly identified as such
 - 7. Specification selection number
 - 8. Applicable standards, such as ASTM number or Federal specification
 - 9. Identification of deviations from contract documents
 - 10. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, and compliance with contract documents
- K. Failure to comply with the requirements of the Section may result in return of submittal without review.

3.03 RESUBMISSION REQUIREMENTS

- A. Make corrections or changes in submittals required by Architect and resubmit when Architect's stamp requires resubmittal.
- B. Shop Drawings and Product Data:
 - 1. Clearly identify all changes made, including those requested by Architect by "clouding" or other suitable means acceptable to Architect. Only changes that are "clouded" will be reviewed on a resubmittal. Architect is not responsible for reviewing resubmittals that are not "clouded" on resubmittal.
- B. Samples: Submit new samples as required for initial submittal
- C. Contractor is responsible for delays caused by resubmittal process.

3.04 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute copies of shop drawings and project data which carry architect/engineer's stamp, or initialed approval, to:
 - 1. Contractor's file
 - 2. Job site file
 - 3. Record documents file
 - 4. Other prime contractors
 - 5. Subcontractors
 - 6. Supplier
 - 7. Fabricator
- B. Distribute samples as directed.

3.05 ARCHITECT/ENGINEER'S DUTIES

- A. Review submittals with reasonable promptness.
- B. Review for:
 - 1. Design concept of project
 - 2. Information given in contract documents
- C. Review of separate item does not constitute review of an assembly in which item functions.
- D. Affix stamp, initials, or signature certifying to review of submittal.
- E. Return submittals to contractor for distribution.

END OF SECTION

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1—GENERAL

1.01 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Tolerances
- C. References.
- D. Testing and inspection services.
- E. Examination.
- F. Preparation.

1.02 REFERENCES

- A. ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction.
- B. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- C. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.03 PRODUCT STANDARDS

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. Should specified reference standards conflict with Contract Documents, request clarification from the Architect/Engineer before proceeding.
- E. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect/Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 TESTING AND INSPECTION AGENCIES

- A. As indicated in individual specification sections, Contractor shall employ and pay for services of an independent testing agency to perform specified testing.
 - 1. Prior to start of work, submit testing laboratory name, address, and telephone number, and names of full time registered engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Testing agency selected must be approved by the owner/architect.
- C. Inspection Agency: Comply with requirements of ASTM D3740, ASTM E329, and ASTM C 1077.
- D. Laboratory: Authorized to operate in the State of Arkansas.
- E. Laboratory Staff: Maintain a full time registered engineer on staff to review services.
- F. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.
- G. Concrete Field Tests

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician Grade 1, according to ACI CP-1 or an equivalent certification program.

PART II—PRODUCTS

2.01 Not Used.

PART III—EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on Shop Drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

3.04 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.05 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instruction when necessary.
- B. Submit qualifications of observer to architect/engineer 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

- D. Refer to Section 01 3323, Shop Drawings, Project Data, and Samples, manufacturer's field reports article.

3.06 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
1. Test samples of mixes submitted by contractor.
 2. Provide qualified personnel at site. Cooperate with Architect and contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified standards.
 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify Architect and contractor of observed irregularities or non-conformance of Work or products.
 6. Perform additional tests and inspections required by Architect.
 7. Attend preconstruction meetings and progress meetings.
- C. Agency Reports: After each test promptly submit two copies of report to Brackett Krennerich Architects and contractor. When requested by architect/engineer, provide interpretation of test results. Include the following:
1. Date issued.
 2. Project title and number.
 3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product and specifications section.
 6. Location in the project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of test.
 10. Conformance with Contract Documents.
- D. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of the contractor.
 4. Agency has no authority to stop the Work.
 5. Agency has no authority to authorize additional work.
- E. Contractor's Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required for contractor's use beyond specified requirements.
 6. Testing and employment of testing agency or laboratory shall not relieve the contractor of obligation to perform work in accordance with requirements of the Contract Documents.
- F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

- G. Re-testing required because of non-conformance to specified requirements shall be paid for by the contractor. Payment for re-testing or re-inspection will be charged to the contractor by deducting testing charges from the contract sum/price .

3.07 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary heating
 - 3. Temporary ventilation
 - 4. Telephone service.
 - 5. Temporary water service.
 - 6. Temporary sanitary facilities.
- B. Construction Facilities:
 - 1. Field offices and sheds.
 - 2. Project identification.
- C. Temporary Controls:
 - 1. Barriers – Provide Projection to the Public.
 - 2. Enclosures and fencing.
 - 3. Water control.
- D. Removal of utilities, facilities, and controls.

1.02 TEMPORARY ELECTRICITY

- A. The contractor is to provide and pay for power service required from utility source as needed for construction operation.
- B. The Contractor shall be responsible for hook-up of all temporary connections to electricity.

1.03 TEMPORARY HEATING

- A. The contractor is to provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Type of heat shall be approved by the architect.

1.04 TEMPORARY VENTILATION

- A. The contractor is to ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.03 TELEPHONE/FAX SERVICE

- A. The contractor is to provide, maintain, and pay for telephone and facsimile service to field office at time of project mobilization.
- B. Cellular phone at construction site will be permitted.
 - 1. Land lines may be supplemented with a mobile phone.

1.04 TEMPORARY WATER SERVICE

- A. The contractor is to provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations.
- B. The contractor shall be responsible for hook-up of all temporary connections to water.

1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.
 - 1. Building rest rooms are not to be used during construction.
- B. Provide at time of project mobilization.

1.06 FIELD OFFICES AND SHEDS

- A. The contractor, at his expense, may erect such temporary structures on the site for offices, materials storage, and tool storage as may be required for his use and that of his subcontractors. Location shall be approved by the architect.

- B. The contractor shall furnish office for location of job telephone, plan rack, plan reference table, and filing cabinet for correspondence, specifications, and shop drawings. Office shall be well lighted, heated, and air conditioned.
- C. At the completion of the project, all such temporary structures shall be removed from the site.

1.07 PROJECT IDENTIFICATION

- A. Project Identification Signs:
 - 1. One printed sign, 96 square feet area minimum, bottom 3 feet above ground.
 - 2. Content:
 - a. Project title, logo and name of Owner as indicated on Contract Documents.
 - b. Names and titles of authorities.
 - c. Names and titles of Architect/Engineer.
 - d. Name of Prime Contractor.
 - 3. Graphic Design, Colors, Style of Lettering: Designated by Architect/Engineer.
 - a. Graphic Design will be issued to the Contractor in .pdf or .jpg format. It is the contractor's responsibility to for having the file converted for printing, if required.
- B. Sign Materials:
 - 1. Structure and Framing: New wood, structurally adequate.
 - 2. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4-inch thick, standard large sizes to minimize joints.
 - 3. Paint and Primers: Exterior quality, two coats; sign background of color as selected.
 - 4. Lettering: Exterior quality paint, contrasting colors as selected.
- C. Installation:
 - 1. Install project identification signs within 15 days after date fixed by Notice to Proceed.
 - 2. Erect at location directed by the Architect.
 - 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
 - 4. Install signs surface plumb and level, with butt joints. Anchor securely.
 - 5. Paint exposed surfaces of signs, supports, and framing.
- D. Maintenance: Maintain signs and supports clean, repair deterioration and damage.
- E. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore the area.

1.08 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

1.09 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SCOPE

- A. Under regulation of the Department of Pollution Control and Ecology, the contractor shall be responsible for implementing pollution control methods for controlling storm water run-off from the construction site.

1.02 METHODOLOGY

- A. Site of construction is less than of 1 acre and is classified as a small construction site.
- B. Best Management Practices shall be used to control sediment leaving the site.

PART 2 PRODUCTS

2.01 MATERIALS

- A. **Mulch Cover:** Straw from threshed rice, oats, wheat, barley or rye; of wood excelsior; or from hay obtained from various legumes or grasses, such as lespedeza, clover, vetch, soybeans, bermuda, carpet sedge, bahia, fescue or other legumes or grasses, or a combination thereof. Mulch shall be dry and reasonably free of Johnson grass or other noxious weeds, and shall not be excessively brittle or in an advanced state of decomposition. All materials will be inspected and approved prior to use.
- B. **Straw Bales:** Straw for barrier bales shall consist of rice, oat, barley, wheat or rye straw or of available grasses free of an excessive amount of noxious weeds. Bales shall weigh approximately 35 lbs. Straw in an advanced state of decomposition will not be acceptable.
- C. **Filter Fabric:** Typar 3401, Trevira S1115, or approved equal nonwoven polypropylene or polyester fabric.

PART 3 EXECUTION

3.01 WORKMANSHIP

- A. Ensure that earthwork and final grading in area requiring erosion control have been brought to grade as required by contract documents.
- B. **Straw Bale Filter:** Tightly bound straw bales embedded at least 4 inches into soil and each bale held in place by 2 stakes driven at least 18 inches into ground. Bales shall tightly abut adjacent bales. Strings shall not touch the ground.
- C. **Silt Fence:** Fence post spaced no more than 10 feet apart and driven a minimum of 2 feet into ground. Post shall extend minimum of 2 feet above ground. Fasten metal mesh fence with 6 inch or smaller openings to fence posts to reinforce silt fence fabric. Mesh fence to extend 2 feet above grade and 4 inches into grade. Mesh may be omitted if reinforced silt fence fabric is used or in areas of low flow.
- D. **Nonvegetative Soil Stabilization:** Utilize temporary nonvegetative soil stabilization to provide protection against excessive soil erosion over a short period of time. Required in areas that experience high water flows and high run-off velocities and at disturbed slopes steeper than 2:1.
 - 1. **Mulch:** Apply at 1.5 to 2.5 tons per acre.
 - 2. Anchor by peg and twine, mulch netting, erosion control, fabric, jute matting or mulch anchoring tool.

END OF SECTION

**SECTION 01 5719
ENVIRONMENT PROTECTION**

PART 1 GENERAL

1.01 DEFINITIONS

- A. For the purpose of these specifications, environment protection is defined as the preservation of the environment in its preconstruction state to the greatest feasible extent throughout project construction.

1.02 QUALITY CONTROL

- A. The Contractor shall inspect all environment protection operations for compliance with the contract requirements, perform all test as required, and maintain records of his quality control for all operations, including but not limited to the following: Compliance with all Federal, State and local pollution control regulations.
1. Monitoring and surveillance procedures.
 2. Site access, parking, and traffic control of equipment.
 3. Locations of temporary facilities and support activities.
 4. Handling, storage, use, and disposal of petroleum products, chemicals, and toxic materials.
 5. Solid and liquid waste disposal.
 6. Noise control, dust control, and pest control.
 7. Disposal of construction materials and other debris.
 8. A copy of these records, including all tests performed and corrective actions taken, shall be furnished to the architect/owner.

1.03 NOTIFICATION

- A. The Owner/Architect will notify the Contractor in writing of any non-compliance with any applicable Federal, State, or local laws or regulations. The Contractor shall, after receipt of such notice, immediately inform the Architect of proposed corrective action and take such action as may be approved. If the Contractor fails or refuses to comply promptly, the Owner/Architect may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time, or for excess costs or damages by the Contractor. The Architect shall be notified of any spillage of hazardous chemicals in excess of 2 gallons.

1.04 SUBCONTRACTORS

- A. Compliance with the provisions of this section by subcontractors will be the responsibility of the Contractor.

1.05 PROTECTION OF LAND RESOURCES

- A. The Contractor shall confine his construction activities to areas on the site as determined and outline at the Preconstruction Meeting.

1.06 PROTECTION OF WATER RESOURCES

- A. General:
1. The Contractor shall not pollute storm water with fuels, oil, bitumens, calcium chloride, acids, or other harmful materials. The Contractor shall investigate and comply with all applicable Federal, State, County and municipal laws concerning pollution of rivers and streams.
- B. Spillages:
1. Special measures shall be taken to prevent chemicals, fuels, oils, greases, bituminous materials, waste washings, and concrete drainage from entering storm water system.
- C. Disposal:
1. Disposal of any materials, wastes, effluents, trash, garbage, oil grease, chemicals, etc., in areas adjacent to streams shall not be permitted. Particular attention under this provision shall be given to lubricants and fuels drained from equipment and supply tanks.

1.07 DISPOSAL OF DEBRIS

- A. All materials resulting from construction operations of such as undercut material, and debris shall be disposed of off-site by the Contractor as per Arkansas Department of Environmental Quality-Solid Waste Division regulatory requirements. The Contractor shall be responsible for compliance with all Federal, State, and local laws and regulations applicable to disposal of these materials. The contractor shall disclose the disposal site in the pre-construction conference. If private property is selected as disposal site, the property owner's written consent shall be furnished to the owner/architect.
- B. Disposal of petroleum, oil, and lubricants (POL) products, chemicals, or other hazardous or toxic components, may require EPA approval or permits from the state. Where such permits are required, the Contractor shall be responsible for obtaining such permits and shall be responsible for the payment of any fines or penalties for failure to do so.

1.08 DUST CONTROL

- A. The Contractor will be required to maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which would exceed allowable limits of the standards for air pollution.

1.09 NOISE CONTROL

- A. The Contractor will be required to comply with Federal, State and local requirements for noise control of his vehicles and equipment.

1.10 EROSION CONTROL

- A. The Contractor will be required to comply with Federal, State and local requirements for erosion control. The erosion control guidelines included with the project manual and erosion control measures as shown on the plans shall be followed throughout the construction.

PART 2 PRODUCTS

2.01 NOT USED.

PART 3 EXECUTION

3.01 NOT USED.

END OF SECTION

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Product substitution procedures.

1.02 RELATED SECTIONS

- A. Section 00 2100, Instructions to Bidders - Standards of Quality.
- B. Section 01 6300 – Product Options and Substitutions

1.03 PRODUCTS

- A. Provide products of qualified manufacturers suitable for intended use. Provide products of each type by a single manufacturer unless specified otherwise.

1.04 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.05 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection. When products are stored off-site, they must be inventoried by Architect before payment can be made. Insurance certificates must name the owner as certificate holder/beneficiary.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.06 PRODUCT OPTIONS

- A. See Section 01 6300 – Product Options and Substitutions

1.07 PRODUCT SUBSTITUTION PROCEDURES

- A. See Section 01 6300 – Product Options and Substitutions

PART 2 PRODUCTS

2.01 NOT USED.

PART 3 EXECUTION

3.01 NOT USED.

END OF SECTION

SECTION 01 6300
PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Special definitions
- B. Methods of specifying
- C. Substitution procedures

1.02 RELATED SECTIONS

- A. Section 00 2100, Instructions to Bidders – Substitution Approval
- B. Section 0 6000, Project Forms – Substitution Request Form

1.03 DEFINITIONS

- A. **Standard of Quality:** Specified manufacturers, materials, products, and equipment have been used in preparing the Contract Documents and thus establish minimum qualities for performance and appropriateness.
 - 1. Materials, products, and equipment, described in the Contract Documents establish a standard of required function, dimension, appearance, and quality.
 - 2. Comply with specifications and reference standards as minimum requirements.
 - 3. Where a particular manufacturer and product is indicated, followed by a description of the product (material and equipment) including special features or performance criteria, the manufacturer shall agree to make necessary modifications to their “Standard or Custom Products” to fully comply with the product described.
- B. **Material Base Bid:** as specified.
- C. **Material Equivalency:** to be determined as stated below.
- D. Under the “Or Equal” clause, other manufacturers, and products which are equal in size, design, function, and performance are acceptable for substitution into the project only when the following requirements are complied with:
 - 1. Requests to use “Or Equal” products must be made to the Architect by indicating requested “Or Equals” on the Subcontractor/Material List. Subcontractor/Material List and all requests for “Or Equals” must be received by the Architect within 7 days prior to receipt of bids. Requests received after said date may be considered or rejected at the discretion of the Architect.
 - 2. Decisions of the Architect concerning review of “Or Equal” products are final.
- E. **Substitutions:** Requests for changes in products (materials and equipment) and methods of construction required by the Contract Documents are requests for “substitutions”.
 - 1. The following are not defined as substitutions as used herein:
 - a. Scope revisions to Contract Documents requested by Owner and Architect.
 - b. Specified product options or alternate construction methods included in Contract Documents.
 - c. Contractor’s determination of and compliance with governing regulations and orders issued by authorities having jurisdiction.

1.04 METHODS OF SPECIFYING

- A. **Reference Standard Specifications:** Where products (material and equipment) are specified only by reference standard, provide products complying with standard.
 - 1. If reference standard is followed by a description of a product’s special features, or performance criteria: Modify “Standard or Custom Products” to fully comply with the description of the specified product’s special features or performance criteria.

- B. Descriptive Specifications:** Where products (material and equipment) are specified by indicating a detailed description of the required properties, minimum attributes, special features, or performance criteria required, provide products complying with the specified description.
1. If a description of the required properties, minimum attributes, special features, or performance criteria required, provide products complying with the specified description.
 - a. If a manufacturer's standard product is listed in the specification and does not comply with the minimum description indicated, make modifications to the "Standard or Custom Product" to make the product fully comply with the description of the specified product's special features, or performance criteria.
 2. If a list of specified manufacturers includes the following statement "Comparable products of other specified manufacturers", then select product from only manufacturers listed in the Project Manual or addenda complying with the minimum attributes, special features, or performance criteria.
 3. If list of specified manufacturers includes the following statement, "Comparable products of other manufacturers", then select a product from any manufacturer that complies with the minimum attributes, special features, and performance criteria.
- C.** The design layout, space allocations, connection details, performance criteria, etc., are based on specifically identified proprietary products identified in Part 2 – Products of each specification section.
1. Other manufacturers, even if listed as "Acceptable Manufacturers", shall comply with the minimum levels of material, detailing, and dimensional restrictions established by the proprietary product.

1.05 SUBSTITUTION TIME FRAME AND CONSIDERATIONS

- A. Pre-Bid Substitutions (Prior Approval):**
1. Submittal Time Limit: Not less than 7 days before Bid opening
 2. Consideration: Substitution will only be considered if each request includes the information listed under "Consideration Requirements" Article specified below.
- B. Failure to complete "Substitution Request Form" or submit requested information is grounds for rejection.**
- C. Post-Bid/Pre-Award Substitutions; Bid Adjustment Substitutions:**
1. Substitution Time Limit: Before Award of Contract date.
 2. Consideration: Substitution will be considered if submitted by the pending Contractor and substitution request is being made because a specified product has become unavailable or potential savings to Owner.
 - a. Request shall include information listed under "Consideration Requirements" Article specified below.

1.06 SUPPORTING INFORMATION FOR SUBSTITUTIONS

- A. Include the following supporting information: Name of product (material or equipment) for which substitution is being requested and a complete description of the proposed substitute including drawings, product, performance and test data, and any other information necessary for an evaluation.**
1. Substitution Request Form: Completed Substitution Form must accompany each request for substitution.
 - a. Include a statement indicating changes in other materials, equipment, or other Work that incorporation of this substitute would require.
 - b. Alterations or changes to other Work are the responsibility of the Contractor proposing substitution, including redesign if determined by Architect.
 2. Burden of proof of the merit of the proposed substitute is upon the proposer.

- B. It is understood and agreed by bidders, Contractors, material suppliers, and tier subcontractors, that bids and contracts shall be based on products (materials and equipment) and processes as specified or as revised by addenda or modifications.

1.07 CONSIDERATION REQUIREMENTS

- A. **Substitution request will be considered by Architect when requested for review by the Owner / CM and the following conditions are satisfied:**
1. Extensive revisions to Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of Contract Documents.
 3. Substitution Request form is completed and attached. Additionally, 1 or more of the following are satisfied.
 - a. If a specified product is not available.
 - b. Specified product or method of construction cannot be provided within Contract Time. Request will not be considered if product or method cannot be provided is a result of failure to peruse the Work promptly or coordinate activities properly.
 - c. Specified product or method of construction cannot receive necessary approval by a governing authority, and requested substitution can be approved.
 - d. Substantial advantage is offered to Owner, in terms of cost, time energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear, including additional compensation to Architect for redesign and evaluation services, increased cost of other construction or separate contractors, and similar considerations.
 - e. Specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where Contractor certifies substitution will overcome incompatibility.
 - f. Specified product or method of construction cannot be coordinated with other materials, and Contractor certifies proposed substitution can be coordinated.
 - g. Specified product or method of construction cannot provide warranty required by the Contract Documents and Contractor certifies proposed substitution provides required warranty.
- B. Where proposed substitution involves more than 1 installer, installers shall cooperate to coordinate the Work, provide uniformity and consistency, and to ensure compatibility of products.
- C. Submit a separate substitution request for each product, supported with complete Product Data, Drawings, and Samples including but not limited to the following:
1. Comparison of qualities of proposed substitution with specified product.
 2. Changes required in other elements of the Work because of the substitution.
 3. Effect on construction schedule.
 4. Cost data comparing proposed substitution with specified product.
 5. License, fees, or royalties required.
 6. Availability of maintenance service, and source of replacement materials.
- D. To determine if proposed substitution complies with the function, appearance, quality, performance, and dimensional characteristics of specified item, Architect may:
1. Require Sample unit, technical Product Data, and independent test reports sufficient to establish compliance.
 - a. Cost of which shall be paid by the submitting party.

1.08 CONTRACTOR'S / BIDDER'S REPRESENTATION

- A. A request for substitution constitutes a representation that Contractor / Bidder:

1. Has investigated proposed product and determined that it is equal to or superior in all respects to specified product.
2. Will provide the same or better warranties or bonds for substitution as for the specified product.
3. Will coordinate installation of substitution, if accepted, into the Work; and make other changes as required to make the Work complete
4. Waives claims for additional cost, under his responsibility, which may subsequently become apparent.

1.09 ARCHITECT'S EVALUATION PROCESS

- A. Architect is sole judge of acceptability of proposed substitution.
- B. Architect will review requests for substitutions with reasonable promptness, and respond as follows:
 1. Request additional information or documentation necessary for evaluation.
 2. Pre Award: Notify Bidders of the decision to accept proposed substitution by written addendum.
 3. Post Award: Notify Contractor in writing of the decision to accept or reject proposed substitution.
- C. Accepted substitutions will be documented by Architect's supplemental instruction (ASI or Construction Change Directive (CCD), depending on whether it is necessary to adjust contract amount, including manufacturers' names and catalog numbers.

PART 2 PRODUCTS

2.01 NOT USED.

PART 3 EXECUTION

3.01 NOT USED.

END OF SECTION

**SECTION 01 7300
EXECUTION REQUIREMENTS**

PART 1—GENERAL

1.01 SECTION INCLUDES

- A. Closeout procedures.
- B. Starting of systems
- C. Demonstration and Instructions
- D. Testing, Adjusting and Balancing
- E. Protecting installed construction.

1.02 RELATED SECTIONS

- A. Section 01 7329, Cutting and Patching
- B. Section 01 7400, Cleaning
- C. Section 01 7800, Close-out Submittals
- D. Section 01 7839, Project Record Documents

1.03 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect's review.
- B. Provide submittals to Architect that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.04 STARTING OF SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect/Engineer seven (7) days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractors' personnel in accordance with manufacturers' instructions.
- G. Submit a written report in accordance with Section 01300 that equipment or system has been properly installed and is functioning correctly.

1.05 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two (2) weeks prior to date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season.
- C. Utilize Operation and Maintenance Manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time at the site.

1.06 TESTING, ADJUSTING AND BALANCING

- A. Contractor will appoint and employ services of an independent firm to perform testing, adjusting, and balancing. Contractor shall pay for services.

- B. See mechanical specifications for specific requirements.
- C. Reports will be submitted by the independent firm to the Architect/Engineer indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

1.07 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.08 USE OF BUILDING

- A. Contractor shall allow the owner use of the substantially completed building for placement and installation of equipment. Such use of the structure shall not signify that the owner accepts the building.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

**SECTION 01 7329
CUTTING AND PATCHING**

PART 1 GENERAL

1.01 SCOPE

- A. Execute cutting (including excavating), fitting, or patching of work required to:
 - 1. Make several parts fit properly.
 - 2. Uncover work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to the requirements of contract documents.
 - 5. Remove samples of installed work as specified for testing.
- B. Do not endanger any work by cutting or altering work or any part of it.
- C. Do not cut or alter work of another contractor without written consent of architect/engineer.

1.02 SUBMITTALS

- A. Prior to cutting which affects structural safety of project, or work of another contractor, submit written notice to architect/engineer, requesting consent to proceed with cutting, including:
 - 1. Identification of project
 - 2. Description of affected work
 - 3. Necessity for cutting
 - 4. Affect on other work, on structural integrity of project
 - 5. Description of proposed work. Designate:
 - a. Scope of cutting and patching
 - b. Contractor and trades to execute work
 - c. Products proposed to be used
 - d. Extent of refinishing
 - 6. Alternatives to cutting and patching
 - 7. Designation of party responsible for costs of cutting and patching
- B. Prior to cutting and patching done on instruction of architect/engineer, submit cost estimate.
- C. Should conditions of work, or schedule, indicate a change of materials or methods, submit written recommendation to architect/engineer, including:
 - 1. Conditions indicating change
 - 2. Recommendations for alternative materials or methods
 - 3. Submittals as required for substitutions

1.03 PAYMENT OF COSTS

- A. Costs caused by ill-timed or defective work, or work not conforming to contract documents, including costs for additional services of architect/ engineer: party responsible for ill-timed, rejected, or non-conforming work.
- B. Work done on instructions of architect/engineer, other than defective or non-conforming work: owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials for replacement of work removed shall comply with specifications for type of work to be done.

PART 3 EXECUTION

3.01 INSPECTION

- A. Inspect existing conditions of work, including elements subject to movement or damage during:
 - 1. Cutting and patching
 - 2. Excavating and backfilling
- B. After uncovering work, inspect conditions affecting the installation of new products.

3.02 PREPARATION (PRIOR TO CUTTING)

- A. Provide shoring, bracing, and support as required to maintain structural integrity of project.
- B. Provide protection for other portions of project.

3.03 PERFORMANCE

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerance, finishes.
- B. Execute excavating and backfilling by methods which will prevent damage to other work and will prevent settlement.
- C. Restore work which has been cut or removed; install new products to provide completed work in accord with requirements of contract documents.
- D. Refinish entire surfaces as necessary to provide an even finish.
 - 1. Continuous surfaces: to nearest intersections
 - 2. Assembly: entire refinishing

END OF SECTION

SECTION 01 7400

CLEANING

PART 1 GENERAL

1.01 SCOPE

- A. Maintain premises and public properties free from accumulations of waste, debris, and rubbish caused by operations.
- B. At completion of work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

1.02 RELATED SECTIONS

- A. Section 01 5719, Environment Protection
- B. Section 01 7300, Execution Requirements

1.03 SAFETY REQUIREMENTS

- A. Standards: Maintain project in accord with governing safety and insurance standards.
- B. Hazard Control:
 - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of noxious substances.
- C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn or bury rubbish and waste materials on project site.
 - 2. Do not dispose of volatile wastes such as mineral spirit, oil, or paint thinner in storm or sanitary drains.
 - 3. Do not dispose of wastes into lakes, streams, or waterways.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning materials manufacturer.

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris, and rubbish.
- C. Remove waste materials, debris, and rubbish from site and legally dispose of at public or private dumping areas off owner's property.
- D. Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on as-needed basis until building is ready for substantial completion or occupancy.
- E. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly-painted surfaces.

3.02 FINAL CLEANING

- A. Employ experienced workmen or professional cleaners for final cleaning.
- B. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces so designated to shine finish.
- C. Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces.
- D. Broom clean paved surfaces; rake clean other surfaces of grounds.

- E. Replace air conditioning filters if units were operated during construction.
- F. Maintain cleaning until project, or portion thereof, is occupied by owner.

END OF SECTION

**SECTION 01 7700
CLOSEOUT PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Required documents for final payment.

1.02 RELATED SECTIONS

- A. Section 01 7800, Closeout Submittals
- B. Section 00 6000, Project Forms
- C. Section 01 7839, Project Record Documents

1.03 REQUIRED DOCUMENTS FOR FINAL PAYMENT

- A. Contractor to notify the architect in writing that all punch list items are complete and the project is ready for acceptance by the owner.
- B. "Substantial Completion" will be issued by the architect, at which time the contractor shall submit the "Final Pay Request".

1.04 DOCUMENTS TO BE SUBMITTED WITH FINAL PAY REQUEST

- A. AIA Document G707 - 1994 Consent of Surety to Final Payment
- B. AIA Document G706 - 1994 Contractor's Affidavit of Payment of Debts and Claims
- C. AIA Document G706A - 1994 Contractor's Affidavit of Release of Liens
- D. Required Operation and Maintenance Data.
- E. Required Warranties.
- F. Project Record Documents

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

**SECTION 01 7800
CLOSE-OUT SUBMITTALS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Operation and Maintenance Data
- B. Manual for Materials and Finishes
- C. Manual for Equipment and Systems
- D. Product Warranties and Product Bonds

1.02 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 8-1/2 x 11 inch pages, two D size ring binders with durable plastic covers.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- E. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, Listing names, addresses, and telephone numbers of architect/Engineer, Contractor, Subcontractors, and major equipment. suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instruction for equipment and systems.
 - f. Maintenance instruction for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.
 - 4. Submit two sets of final volumes and two DVD's, CD's, or Flash Drive within 10 days after final inspection.
 - 5. Final pay requires will not be processed until all close-out documents are received.

1.03 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of manual within 10 days after final inspection. Manual to be as described in 1.02, A-E above.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations.
- D. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- E. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- F. Additional Requirements: As specified in individual product specification sections.
- G. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.
- H. Final pay request will not be processed until all close-out documents are received.

1.04 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two copies of manual within 10 days after final inspection. Manual to be as described in 1.02, A-E above.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- D. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications.
- E. Include color coded wiring diagrams as installed.
- F. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- G. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- H. Provide servicing and lubrication schedule, and list of lubricants required.
- I. Include manufacturer's printed operation and maintenance instructions.
- J. Include sequence of operation by controls manufacturer.
- K. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- L. Provide control diagrams by controls manufacturer as installed.
- M. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- N. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- O. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- P. Include test and balancing reports.
- Q. Additional Requirements: As specified in individual product specification sections.
- R. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- S. Final pay request will not be processed until all close-out documents are received.

1.05 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

- C. Verify that documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time Of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.

1.06 NUMBER OF MANUALS

- A. Manuals required in 1.02, 1.03, 1.04 and 1.05 may be combined into one or two manuals if volume of data will permit use of D size ring binders.

PART 2 PRODUCTS

3.01 NOT USED

PART 3 EXECUTION

4.01 NOT USED

END OF SECTION

SECTION 01 7839
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DOCUMENTS:

- A. Maintain at the job site, one copy of:
 - 1. Contract drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Reviewed shop drawings
 - 5. Change Orders
 - 6. Other modifications to contract
 - 7. Field test records
- B. Maintain one set of documents in clean, dry, legible condition; documents not to be used for construction purposes.
- C. Record all changes made during construction with red pencil.

1.02 RECORDING

- A. Label each document "Project Record" in 2" high printed letters.
- B. Keep record documents current.
- C. Do not permanently conceal any work until required information has been recorded.
- D. Contract Drawings: Legibly mark up to record actual construction:
 - 1. Horizontal and vertical location of underground utilities and appurtenances referred to permanent surface improvements.
 - 2. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - 3. Field changes of dimension and detail.
 - 4. Changes made by change order or field order.
 - 5. Details not on original contract drawings.
- E. Specifications and Addenda: Legibly mark up each section to record:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 - 2. Changes made by change order or field order.
 - 3. Other matters not originally specified.
- F. Shop Drawings: Maintain as record documents; legibly annotate following drawings to record changes made after review:
 - 1. Plumbing
 - 2. Mechanical

1.03 SUBMITTAL

- A. At completion of project, deliver documents to architect.
 - 1. One hard copy and one digital copy on DVD, CD, or Flash Drive.
- B. Record documents to be submitted with Final Pay Request.
- C. Final payment will be not be made until all closeout documents are received by the Architect.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

DIVISION 03

CONCRETE

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Floors and slabs on grade.
- C. Concrete foundations.
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads.
- G. Concrete curing.

1.02 RELATED SECTIONS

- A. Section 01 4000, Quality Requirements, for testing.
- B. Section 07 2600 - Vapor Retarder for under slabs on grade.
- C. Section 07 9005 - Joint Sealers.
- D. Section 31 2323 - Drainage fill under slabs on grade.
- E. Section 32 1313 - Concrete Paving: Sidewalks.

1.03 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004.
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- E. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 1999.
- F. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 1988.
- G. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001.
- H. ACI 315 - Details and Detailing of Concrete Reinforcing.
- I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2005.
- J. ASTM A 185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2002.
- K. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2004b.
- L. ASTM C 33 - Standard Specification for Concrete Aggregates; 2003.
- M. ASTM C 39/C 39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2009a.
- N. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete; 2004a.
- O. ASTM C 143/C 143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2003.
- P. ASTM C 150 - Standard Specification for Portland Cement; 2004a.
- Q. ASTM C 171 - Standard Specification for Sheet Materials for Curing Concrete; 2003.

- R. ASTM C 173/C 173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2001.
- S. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2001.
- T. ASTM C 330 - Standard Specification for Lightweight Aggregates for Structural Concrete; 2004.
- U. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2003.
- V. ASTM C 881/C 881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2002.
- W. ASTM C 1059 - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 1999.
- X. ASTM C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2002.
- Y. ASTM D 1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004.
- Z. ASTM E 1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2001).
- AA. ASTM E 1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers Metric; 1996 (Reapproved 2001).

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.
- C. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mix water to be withheld for later addition at Project site.
- D. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- E. Welding Certificates: Copies of certificates for welding procedures and personnel.
- F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Cementitious materials and aggregates.
 - 2. Form materials and form-release agents.
 - 3. Steel reinforcement and reinforcement accessories.
 - 4. Admixtures.
 - 5. Curing materials.
 - 6. Floor and slab treatments.
 - 7. Bonding agents.
 - 8. Adhesives.
 - 9. Vapor retarders.
 - 10. Epoxy joint filler.
 - 11. Joint-filler strips.
 - 12. Repair materials.
- G. Minutes of preinstallation conference.
- H. Reproduction of contract drawings, in any form, will not be accepted as shop drawings.
- I. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Acquire cement from same source and aggregate from same source for entire project.
- C. Follow recommendations of ACI 305R when concreting during hot weather.
- D. Follow recommendations of ACI 306R when concreting during cold weather.
- E. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
 - 1. Concrete flatwork shall be performed utilizing high quality techniques conforming to American Concrete Institute Standards provided for by ACI Publications CP-10, Concrete Flatwork Technician and Flatwork Finisher, ACI Publication CCS-1, Concrete Craftsman Series, Slabs on Grade.
- F. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.
- G. Testing Agency Qualifications: An independent testing agency; see Section 01 4000 - Quality Requirements for Testing Agency.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- H. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- I. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code-Reinforcing Steel."
- J. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1, Section 01 3119 "Project Meetings".
 - 1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixes.
 - c. Ready-mix concrete producer.
 - d. Concrete subcontractor.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.
- B. Steel Welded Wire Reinforcement: ASTM A 185, plain type.
 - 1. Mesh Size: 6 x 6.
 - 2. Wire Gage: As shown on drawings.

C. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I - Normal, Type 1A - Air Entraining; Portland type.
- B. Fine and Coarse Aggregates: ASTM C 33.
 1. Fine Aggregate: Clean, sharp, natural or manufactured sand, free from loam, clay, lumps, or other deleterious substances.
 2. Coarse Aggregate: Clean, uncoated, processed, locally available aggregate, containing no clay, mud, loam or foreign matter; maximum size of 1-1/2" at foundations and 1" at slabs.
- C. Fly Ash: ASTM C 618, Class C.
- D. Water: Clean and not detrimental to concrete.

2.04 CHEMICAL ADMIXTURES

- A. Air Entrainment Admixture: ASTM C 260.
- B. Other Admixtures: Do not use other admixtures unless approved by architect; added chlorides will not be accepted.

2.05 ACCESSORY MATERIALS

- A. Bonding Agent: ASTM C 1059, Type II acrylic non-redispersable type.
 1. Polyvinyl Acetate (Interior Only):
 - a. Euclid "Euco Weld"
 - b. L & M "Everweld"
 - c. Or approved equal.
 2. Acrylic or Styrene Butadiene:
 - a. Euclid "SBR Latex"
 - b. L & M "Everbond"
 - c. Conspec "Strongbond"
 - d. Master Builders "Acryl-Set"
 - e. Sonneborn "Sonocrete"
 - f. Or approved equal
- B. Epoxy Bonding System: ASTM C 881, type as required by project conditions.
 1. Conspec "Spec-Bond 100"
 2. Euclid "Euco Epoxy System #452 or "Dural Fast Set Epoxy System".
 3. L & M "Epabond"
 4. Master Builders "Concresive Standard Liquid"
 5. Or approved equal
- C. Underslab Vapor Retarder: See Section 07 2600.
- D. Non-Shrink Grout: ASTM C 1107/C 1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
 3. Products:
 - a. Conspec "100 Non-Shrink Grout (non-metallic)"
 - b. Euclid "NS Grout"
 - c. L & M "Crystex"
 - d. Master Builders "Masterflow 713"
 - e. W.R. Meadows "Sealtight Cg-86 Grout"
 - f. Or approved equal

- E. Moisture-Retaining Cover: ASTM C 171; clear polyethylene or white burlap-polyethylene sheet.
- F. Curing Compound: ASTM C309, Type I, Class A
 - 1. Moisture loss not more than 0.055 gr/ sq. cm when applied at 200 sq. ft. /gal.
 - 2. Conspec "Cure & Seal"
 - 3. L & M "L & M Dress and Seal".
 - 4. W. R. Meadows "Sealtight CS-309"
 - 5. Master Builders "MasterKure"
 - 6. Sonneborn "Kure-N-Seal"
- G. Concrete Sealer:
 - 1. Scofield Select Seal - Plus
 - 2. Or approved equal

2.06 BONDING AND JOINTING PRODUCTS

- A. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard or cork, complying with ASTM D 1751, 1/2 inch thick and full depth of slab less 1/2 inch.
- B. Construction Joint Forms: To be used on all construction joints in slabs on grade.
 - 1. Screed Key, Meadow Burke Concrete Accessories, Inc., Denver, Colorado.
 - 2. Use 3-1/2 inch form for 4 inch thick slab.
- C. Expansion Joint Devices: Integral extruded plastic; 1/2 inch thick, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.
- D. Sealant and Primer: As specified in Section 07 9005.

2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: As scheduled.
 - 2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
 - 3. Cement Content: See structural notes on drawings.
 - 4. Water-Cement Ratio: See structural notes on drawings.
 - 5. Total Air Content: 4 percent, determined in accordance with ASTM C 173/C 173M.
 - 6. Maximum Slump: As scheduled.

2.08 MIXING

- A. Transit Mixers: Comply with ASTM C 94/C 94M.
 - 1. Furnish batch ticket information.
 - 2. When air temperature is between 85 and 90 degrees F reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F., reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- F. Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches and seal watertight by taping edges and ends.

3.03 INSTALLING REINFORCEMENT

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 24 hours prior to commencement of placement operations.
- D. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- E. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with joint filler.
- G. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 9005 for finish joint sealer requirements.
- I. Install joint devices in accordance with manufacturer's instructions.
- J. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- K. Apply sealants in joint devices in accordance with Section 07 9005.
- L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Do not interrupt successive placement; do not permit cold joints to occur.
- O. Place floor slabs in checkerboard pattern indicated.
- P. Saw cut joints within 12 hours after placing. Use 1/8 inch thick blade, cut into 1/4 depth of slab thickness.
- Q. Screed floors level, maintaining the following minimum F(F) Floor Flatness and F(L) Floor Levelness values when measured in accordance with ASTM E 1155/ASTM E 1155M.
 - 1. F(F): Specified Overall Value (SOV) of 35; Minimum Localized Value (MLV) of 24.
 - 2. F(L): Specified Overall Value (SOV) of 25; Minimum Localized Value (MLV) of 17.

3.05 CONCRETE FINISHING

- A. Repair surface defects, immediately after removing formwork.
 - 1. Small area honeycombing less than 1 inch deep may be repaired as described below for exposed form finishes.
 - 2. Honeycombing in large areas or honeycombing 1 inch deep or greater may not be repaired. Notify the architect immediately after removal of form work. Architect will determine if concrete is to be removed or the method of repair if repair is allowed by architect.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
 - 2. Grout mixtures will not be allowed.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. "Steel trowel" (as described in ACI 301.1R) surfaces that will receive carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
 - 2. Steel trowel surfaces that will be left exposed.
 - a. Chemical Hardener: After slab has cured, apply water-diluted hardener in three coats per manufacturer's instructions, allowing 24 hours between coats.

3.06 CURING AND PROTECTION

- A. Comply with requirements of ACI 308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than 7 days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 - 2. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding or saturated burlap.
 - 3. Begin final curing after initial curing but before surface is dry.
 - a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.
 - b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
 - c. Slabs to be left exposed apply one additional coat of sealer prior to occupancy of the building.

3.07 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

- E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 75 cu yd or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.

3.08 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and the General Contractor within 24 hours of test. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Brackett Krennerich and Associates. The cost of additional testing shall be borne by the contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Brackett Krennerich and Associates for each individual area.

3.09 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. Footings: Proportion normal-weight concrete mix as follows:
 - 1. Compressive Strength (28 Days): 3000 psi.
 - 2. Slump Range: 3 to 5 inches.
- B. Slab-on-Grade, Metal Stair Treads and Landings: Proportion normal-weight concrete mix as follows:
 - 1. Compressive Strength (28 Days): 4000 psi.
 - 2. Slump Range: 3 to 5 inches.
- C. Concrete walks, curbs, paving:
 - 1. Compressive strength (28 days): 4000 psi
 - 2. Slump Range: 3 to 5 inches
 - 3. Air entrained

END OF SECTION

DIVISION 04

MASONRY

**SECTION 04 0511
MASONRY MORTARING AND GROUTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.
- C. Pigments for colored mortar.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 - Unit Masonry: Installation of mortar and grout.

1.03 REFERENCE STANDARDS

- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements For Masonry Structures; American Concrete Institute International; 2008.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM C 91 - Standard Specification for Masonry Cement; 2003a.
- D. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete; 2004a.
- E. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar; 2004.
- F. ASTM C 150 - Standard Specification for Portland Cement; 2004a.
- G. ASTM C 270 - Standard Specification for Mortar for Unit Masonry; 2004a.
- H. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout; 2004.
- I. ASTM C 476 - Standard Specification for Grout for Masonry; 2002.
- J. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.
- K. IMIAWC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C 270 is to be used.
- C. Submit color of mortar samples.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.07 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Masonry Cement: ASTM C 91, Type S, Type M.
 - 1. Acceptable product: use one brand throughout job.
- B. Portland Cement: ASTM C 150, Type II - Moderate; color as required to produce approved color sample.
- C. Mortar Aggregate: ASTM C 144.
- D. Grout Aggregate: ASTM C 404.
- E. Water: Clean and potable.
- F. Pigments for Colored Mortar: Iron or chromium oxides with demonstrated stability and colorfastness.
 - 1. Colors: As required to match Architect's color samples.
 - 2. Acceptable product: Use one brand throughout project.
 - a. Color Pigment Industries, Elgin, IL
 - b. Solomon Colors, Springfield, IL
 - c. Lone Star
- G. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.
 - 1. Acceptable Products:
 - a. W. R. Grace "Dry Mortar" additive.
 - b. BASF "Hydrocide" Powder

2.02 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C 270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.
- E. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 50 degrees F.
- F. Mortar Proportioning-Masonry Cement Mortar
 - 1. One part masonry cement and three parts sand

2.03 GROUT MIXES

- A. Cell Fill: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M or mix in accordance with ASTM C 476.
 - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.04 GROUT MIXING

- A. Mix grout in accordance with ASTM C 94/C 94M.
 - 1. Ready mixed concrete
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C 476 for fine and coarse grout.
 - 1. Site mixed grout
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
 - 1. Architect's approval required for all admixtures.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 PREPARATION

- A. Plug clean-out holes for grouted masonry with brick or block masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.03 GROUTING

- A. Perform all grouting by means of low-lift technique. Do not employ high-lift grouting.
- B. Low-Lift Grouting:
 - 1. Limit height of pours to 48 inches.
 - 2. Limit height of masonry to 48 inches above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

3.04 SCHEDULES

- A. Use Type "S" mortar for all masonry above grade.
- B. Use Type "M" mortar for all masonry below grade.
- C. Use color mortar with moisture resistant additive at split face colored concrete masonry units above grade only.

END OF SECTION

SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete Block.
- B. Reinforcement and Anchorage.
- C. Flashings.
- D. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast in Place Concrete: Reinforcing Steel
- B. Section 04 0511 - Masonry Mortaring and Grouting.
- C. Section 07 1900 - Water Repellents for Masonry Sealer.
- D. Section 07 2113 - Board Insulation: Perimeter Insulation
- E. Section 07 6500 - Flexible Flashing for Through Wall Flashing.
- F. Section 07 9005 - Joint Sealers: Backing rod and sealant at control joints.

1.03 REFERENCE STANDARDS

- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International; 2008.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2002.
- D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- E. ASTM A 641/A 641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2003.
- F. ASTM C 62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale); 2008.
- G. ASTM C 90 - Standard Specification for Loadbearing Concrete Masonry Units; 2003.
- H. ASTM C 129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2003.
- I. ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2004b.
- J. IMIABC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.
- K. IMIABC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data for fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit 2 samples of facing brick units and colored concrete block units to illustrate color, texture, and extremes of color range.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.

1.06 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized 6 feet long by 2 feet high, which includes mortar and different masonry patterns and trim.
- B. Mock-up may not remain as part of the Work.

1.07 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 x 8 inches, and nominal depths as indicated on the drawings for specific locations.
 - 2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, and other detailed conditions.
 - a. Provide rounded (bullnose) edges at exterior corners, and other locations shown on the drawings.
 - 3. Load-Bearing Units: ASTM C 90, normal weight.
 - a. Both hollow and solid block, as indicated.
 - b. Exposed faces:
 - 1) ("Standard Block") - Manufacturer's standard color and texture.
 - 2) ("Half Scored Standard Block") - Smooth, half scored face masonry units in manufacturer's standard color and texture.
 - 3) ("Half Scored Colored Block") - Smooth, half scored face masonry units with color additive equal to units manufactured with W. R. Grace "Dry Block" block additive.
 - 4) ("Burnished Face")
 - c. ASTM C-90, Grade N, Type 1.
 - d. 125 lbs. or greater for normal weight block.
 - 4. Non-Loadbearing Units: ASTM C 129.
 - a. Hollow block.
 - b. Lightweight.
- B. Split Face Concrete Masonry Units
 - 1. To be full face split normal weight concrete masonry units with color additive equal to units manufactured by Nettleton Concrete Works, Jonesboro, Arkansas.
 - 2. Units manufactured with W.R. Grace "Dry Block" additive.
 - 3. Size 16" x 8" x 4" thick units; hollow units. See drawings.
 - 4. Provide blocks with 2 faces split for corners; solid units.
 - 5. Provide solid units where indicated
 - 6. Color: To be selected; submit samples.
- C. Half Scored Face Concrete Masonry Units: (Colored)
 - 1. To be normal weight concrete smooth masonry units with color additive chosen from manufacturers deluxe color range, equal to units manufactured by Nettleton Concrete Works, Jonesboro, Arkansas.

2. Units manufactured with "Rain Block" by ACM Chemistries integral water replant.
3. Size: 16" x 8" x 4" thick units; block scored to 8" x 8" pattern.
4. Provide blocks with 2 faces for corners; solid units.
5. Color: To be selected; submit samples.

2.02 MORTAR AND GROUT MATERIALS

- A. Mortar and grout: As specified in Section 04 0511.

2.03 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
1. Dur-O-Wal: www.dur-o-wal.com.
 2. Hohmann & Barnard, Inc: www.h-b.com.
 3. Masonry Reinforcing Corporation of America: www.wirebond.com.
- B. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420) deformed billet bars; uncoated.
- C. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
1. Anchor plates: Not less than 0.105 inch thick, designed for fastening to structural backup through sheathing by two fasteners.
 2. Wire ties: Trapezoidal shape, 0.1875 inch thick.
 3. Vertical adjustment: Not less than 1-1/4 inches.
 4. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.
 5. Wire Bond - Series RJ-711 with 2401 plate and 2402 hook.
 6. Screws: 5/16 inch diameter, co-polymer coated, self-drill, self-tap; 2 screws per plate.
- D. Seismic Wire: Continuous 0.1483 inch diameter, mill galvanized, ASTM A116, Class 3.

2.04 FLASHINGS

- A. Through Wall Flashing: Copper fabric as specified in Section 07 6500.

2.05 ACCESSORIES

- A. Tape: Multi-ply polyethylene/polymer-modified asphalt membrane.
1. Use behind all veneer ties at masonry veneers to stud walls.
 2. 2 inch wide tape; 40 mil thick
 3. Manufacturer: Hohmann & Barnard, Inc., "X-Seal".
- B. Joint Filler: Closed cell polyurethane; oversized 50 percent to joint width; self-expanding; width as required x by maximum lengths available.
- C. Weeps Vents: Provide at all weep locations indicated on drawings.
1. Non-woven mesh with M-notch bottom
 2. Size: 3/8 inch x 3 1/2 inches high x full depth of masonry
 3. Color to be selected by architect to match mortar color.
 4. Manufacturer: Cavclear Weep Vents as manufactured by Archovation, Inc. P.O. Box 241, Hudson, WI 54016, (888) 436-2620.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

3.03 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.
- D. Minor deviations in location of door or window openings to make work course out will be at the contractor's discretion; major changes must have approval of architect.

3.04 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, cavity insulation vapor barrier adhesive is applied, or bitumen damp proofing is applied.

3.05 WEEPS/CAVITY VENTS

- A. Install weeps in walls at 32 inches on center horizontally above through-wall flashing, at bottom of walls, and as indicated on the drawings.

3.06 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.07 REINFORCEMENT AND ANCHORAGE - GENERAL

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
 - 1. 8" o.c. at walls below grade to be filled with concrete
- B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 16 inches horizontally and 16 inches vertically.

3.08 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

- C. Place continuous joint reinforcement in first joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 16 inches on center.
- F. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.09 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Extend metal flashings to within 1/4 inch of exterior face of masonry.
- C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

3.10 GROUTED COMPONENTS

- A. Reinforce and fill block walls with concrete as shown on the drawings.
- B. Place and consolidate grout fill without displacing reinforcing.

3.11 CONTROL JOINTS

- A. In general, do not continue horizontal joint reinforcement through control joints. . See specific notes on structural drawings.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Size control joint in accordance with Section 07 9005 for sealant performance.
- D. Form expansion joint as detailed.

3.12 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames, wood nailing strips, and anchor bolts and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 8 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

3.13 TOLERANCES

- A. Maximum Variation from Alignment of Columns and Pilasters: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.14 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.
- E. Use of acids for cleaning masonry will not be allowed.

3.16 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners which are subject to damage by construction activities.

3.17 MASONRY SEALER

- A. Treat all exposed masonry with sealer as specified in Section 07 1900.

3.18 SCHEDULES

- A. Splitface Block:
 - 1. Exterior veneer
- B. Half Scored Face Block:
 - 1. Exterior veneer
- C. Concrete Block: Load Bearing
 - 1. All block below grade

END OF SECTION

DIVISION 05

METALS

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Miscellaneous Metals:
 - 1. Structural shapes for miscellaneous.
 - 2. Miscellaneous bracing angles and support angles.
- B. Metal bollards

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2001 - Masonry Veneer: Placement of metal fabrications in masonry.
- C. Section 09 9000 - Painting and Coating: Paint finish.

1.03 REFERENCE STANDARDS

- A. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003.
- C. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2004b.
- D. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.
- E. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2004 and errata.
- G. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2000).
- H. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

- A. All fabrication to be completed by a firm regularly engaged in metal fabrications with a minimum of three years experience.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A 283.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- E. Bolts, Nuts, and Washers: galvanized to ASTM A 153/A 153M where connecting galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.

- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrication. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

- A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
 - 1. Bollards to extend above grade 48 inches unless otherwise shown on drawings.
 - 2. Bollards to extend into concrete footing a minimum of 36 inches.
 - 3. Size: 6 inch steel pipe.
- B. Miscellaneous structural framing.
 - 1. As required.
- C. Mechanical Equipment Supports:
 - 1. Sub-framing for mechanical equipment hangers shall be provided as required.
 - 2. Unless otherwise detailed on the drawings, this sub-framing shall be 3 inches x 2-1/2 inches x 1/4 inch angles, long leg vertical.
 - 3. This sub-framing shall be bolted to the structure with 1/2 inch bolts.

2.04 FINISHES - STEEL

- A. Prime paint all steel items.
 - 1. Exceptions: Items to be embedded in concrete or masonry.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.

- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Bollards are to be filled with concrete; round top of bollard.

3.04 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 05 5001
METAL GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal frames and gates at exterior dumpster enclosure.

1.02 RELATED SECTIONS

- A. Section 04 2000, Unit Masonry
- B. Section 05 5000, Metal Fabrications
- C. Section 09 9000, Painting and Coating; Paint Finish

1.03 REFERENCES

- A. ASTM A 36/A 36M – Standard Specification for Carbon Structural Steel; 2003a.
- B. ASTM A 283/A 283M – Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003.
- C. ASTM A 307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength; 2003.
- D. ASTM A 500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.
- E. AWS D1.1 – Structural Welding Code – Steel; American Welding Society; 2004.
- F. SSPC-Paint 15 – Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2000).
- G. SSPC-SP2 – Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

- A. All fabrication to be completed by a firm regularly engaged in metal fabrications with a minimum of three years experience.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A 283.
- D. Bolts and Studs: ASTM A 307.
- E. Welding Materials: AWS D1.1; type required for materials being welded.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION MATERIALS

- A. Frame: 2" x 6" steel tube
- B. Jamb Support: 4" x 4" x 1/4" steel tube extended into concrete pier minimum 3'-0".
- C. Infill Panel: 1-1/2" Type B metal deck, 20 gauge, continuous weld to steel frame, all sides; weld side laps.

- D. Provide 2" x ½" x length of hinge steel plate at each hinge.
- E. Provide heavy duty hinges each single gate. (Number to be determined by size of gate and hinge load capacity.); Provide minimum of three hinges per gate.
- F. Provide latch to receive padlock.

2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FINISHES - STEEL

- A. Prime paint all steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete or masonry and items specified for galvanized finish.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required.
 - 3. Prepare surfaces to be primed in accordance with SSPC-SP2.
 - 4. Clean surfaces of rust, scale, grease, and foreign mater prior to finishing.
 - 5. Prime Painting: One coat.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3—EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: $\frac{1}{4}$ inch per story, non-cumulative.
 - 1. Maximum Offset From True Alignment: $\frac{1}{4}$ inch.
 - 2. Maximum Out-of-Position: $\frac{1}{4}$ inch.

END OF SECTION

DIVISION 06

WOOD, PLASTICS AND COMPOSITES

**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Building Lay-out.
- B. Structural wall and roof framing.
- C. Built-up structural beams and columns.
- D. Preservative treatment of wood.
- E. Miscellaneous framing.
- F. Concealed wood blocking for support of toilet and bath accessories, wall cabinets and wood trim.
- G. Miscellaneous wood nailers and furring strips.
- H. Electrical panel boards.

1.02 RELATED REQUIREMENTS

- A. Section 01 3223 - Survey and Lay-out data.
- B. Section 06 1001 - Fasteners and Anchorage
- C. Section 06 1636 - Wood Panel Product Sheathing
- D. Section 06 1723 – Parallel Strand Lumber
- E. Section 06 1753 - Shop-Fabricated Wood Trusses.
- F. Section 07 6200 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

- A. AFPA T10 - Wood Frame Construction Manual; American Forest and Paper Association; 2001.
- B. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- C. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2005.
- D. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.
- E. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 2011.

1.04 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
 - 1. Acceptable Lumber Inspection Agencies: Any agency with rules approved by American Lumber Standards committee.
 - 2. Acceptable Lumber Inspection Agencies: SPIB and WWPA, SPIB and WWPA.
 - 3. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
- B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Grading Agency: Western Wood Products Association (WWPA).
- C. Sizes: Nominal sizes as indicated on drawings, S4S.
- D. Moisture Content: Kiln-dry or MC15.
- E. Stud Framing (Load Bearing):
 - 1. Species: SPF (Spruce-Pine-Fir)
 - 2. Grade: No. 2.
- F. Stud Framing (Non-Load Bearing):
 - 1. Species: SPF (Spruce-Pine-Fir)
 - 2. Grade: No. 2.
- G. Joist and Rafter Framing (2 x 6 through 2 x 8):
 - 1. Species: Southern Pine, No. 2 or as indicated on the structural drawings.
- H. Miscellaneous Blocking, Furring, and Nailers:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
- I. See structural drawings.

2.03 EXPOSED BOARDS

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: Kiln-dry (15 percent maximum).
- C. Surfacing: S4S.
- D. Species: Southern Pine.
- E. Grade: No. 1, 1 Common, or Select.

2.04 CONSTRUCTION PANELS

- A. See Section 06 1636 - Wood Panel Sheathing

2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Pressure Treatment of Lumber Above Grade: AWPA Use Category UC3B, Commodity Specification A (Treatment C2) using waterborne preservative to 0.25 lb. /cu ft. retention.
 - 1. Kiln dry lumber after treatment to maximum moisture content of 12 percent.
 - 2. Treat lumber in contact with masonry or concrete, or any wood exposed to weather.
 - 3. Treat lumber in other locations as indicated.

PART 3 EXECUTION

3.01 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BUILDING LAY-OUT

- A. Lay-out the building using batter boards placed not less than 4'-0" outside of building lines and left in place until all walls are above grade. No excavation shall be started until all lines have been established and dimensions are checked and finish floor elevation is checked by the architect. See Section 01 3223.
- B. Carpentry work shall include full responsibility for the accurate laying out of the building and the work of all subcontractors, mechanical and electrical contractors, and to see that their work shall not interfere with the structural parts of the building.
- C. See Section 01 3223 – Survey and Layout Data for additional requirements.

3.04 FRAMING INSTALLATION

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.
- E. Install horizontal spanning members with crown edge up and not less than 3 inches of bearing at each end.
- F. Construct double joist headers at floor and ceiling openings.
- G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.
- H. Frame openings with two or more studs at each jamb; support headers on cripple studs.
- I. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, trim, and metal railings.

3.05 NAILING/FRAMING

- A. Wood Stud Partitions:
 - 1. General: Construction to be as herein outlined.
 - a. Exterior Walls and Interior Load Bearing Walls:
 - 1) Single 2 x 6 sole plate set in full bed of caulking around complete building perimeters at first floor slab.
 - 2) 2 x 6 wood studs at 1'-4"; headers of size shown on plans, double studs at opening jambs.
 - 3) Double 2 x 6 plate. Joints must occur centered on studs, be joined with a tie plate and each be anchored to the stud over which it rests.
 - b. Interior Partitions: Non-Load Bearing
 - 1) Single 2 x 4 or 2 x 6 sole plate.
 - 2) 2 x 6 or 2 x 4 wall studs at 1'-4" on center; headers of size shown on plans, double studs at opening jambs.
 - 3) Double 2 x 4 or 2 x 6 top plate (See a., 3. above).
 - 2. Notches:
 - a. General: Do not notch bottom of wood members. Obtain architect/engineer approval for any holes in all wood members other than those required for structural assembly. Holes through sills, plates, studs, and double plates in interior bearing and sheer walls shall not exceed 1/3 of the plate width and shall be bored holes placed in the center of the stud or plate. Notching is not permitted.
 - 3. Anchorage of Stud Wall to Concrete Slabs:
 - a. See structural drawings

4. Nailing Framing, etc.:
 - a. Studs: Shall be nailed to the sole plate with 3-10d or 4-6d toenails or 2-16d end nails. Provide at exterior walls, 18 gauge galvanized steel strap at every other stud with 4-6d nails in each end of strap or use metal anchors designed for this purpose.
 - b. Top Plates: Shall be lapped at corners and intersecting partitions and nailed together with 3-10d nails or butted and tied with 18 gauge galvanized metal strap with 4-6d nails in each end of strap. End of top plate lower members shall occur over studs. Joints in upper member of plates shall occur at least 24" from joints lower member. Nail lower member of plate to each stud with 3-10d end nails. Upper plate member shall be fastened to lower member with 16d common nails at 16" on center when plates are cut more than 1/2 their width for piping and etc., reinforce with 18 gauge steel straps.
 - c. Corner Construction: Shall not be less than three 2 x 4's set to receive interior finish. Corner posts members shall be nailed to each other and to filler blocks, if used, with 16d nails not more than 24" on center in each face, with at least three nails into each filler block.
 - d. Framing Openings: Shall be framed to provide a rigid enclosure. Jamb stud shall extend in one piece from header to sole plate. Double studs shall be used at all openings. Nail inner stud to outer stud with 16d nails, 24" on center. Toenail inner stud to wall plate with 2-8d nails or end nail with 2-16d nails to top plate with 2-8d nails or end nail with 2-16d nails to top plate with 2-8d nails (toenails).
 - e. Blocking-Reinforcing: Provide solid blocking within partition to support all plumbing fixtures, counters, and cabinets, and bath accessories. All studs shall have blocking at the midpoint unless noted otherwise.
 - f. See Section 06 1001, Fasteners.
- B. Joists: Ceiling joists shall be toenailed to exterior wall plate with three 10d nails. Ends of ceiling joists shall be lapped or butted over bearing partition or beam and toenailed to bearing with four 10d nails in each pair of joists. When ceiling joists are used to provide resistance to rafter thrust, nail joists together with same nailing used to connect joist to rafter. Joists may be notched in top or bottom surface and end third of span only, not to exceed 1/4 of joist depth. Holes may be bored through joist to within 2" of edge.
- C. Rafters: Rafters shall be cut for even bearing and toenailed to plate with two 10d nails. Rafters framing between joists shall be toenailed with three 10d nails. Where rafters frame in a different direction than ceiling joists, support rafter at ridge with beam or partition or make other provisions to resist roof thrust. Rafters and ceiling joists framed in the same direction shall be nailed together to resist roof thrust. Frame rafters opposite each other at ridge. Rafters may be framed to ridge board or to each other with gusset for tie. Ridge board, if used, shall be not less in depth than end cut of rafter. Toenail rafter to ridge with three 8d nails. Where gusset at ridge is used at each rafter, nail to each rafter with four 8d nails. Where collar beam is used, locate in upper third of rafter space as follows: maximum spacing, 4 feet on center, minimum size 1 x 6 inch, nailed to each rafter with four 8d nails, or 2 x 4 inch, nailed to each rafter with three 16d nails.
- D. Pneumatic Nailing:
 1. Pneumatic nailing may be substituted for common nails under the following conditions:
 - a. Pneumatic nail substitute for 8d common nails shall have a minimum diameter of 0.131" and length of 2½".
 - b. For 10d common nails substituted pneumatic nails shall have a minimum diameter of 0.148" and length of 3".
 - c. T-head nails or staples are not acceptable.

3.06 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

- A. Coordinate installation of wood decking, truss joists, laminated structural units, and prefabricated wood trusses.

- B. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- C. Coordinate curb installation with installation of decking and support of deck openings.

3.07 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum and 1/4 inch in 30 feet maximum.

END OF SECTION

SECTION 06 1001 FASTENERS AND ANCHORS

PART I—GENERAL

1.01 SECTION INCLUDES

- A. Fasteners for connecting wood member together.
- B. Fasteners for anchoring wood framing to slabs and foundations.
- C. Special anchorage and fasteners to meet earthquake code.
- D. Fasteners as shown and detailed on the drawings.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry.
- B. Section 06 1743 - Laminated Strand Lumber
- C. Section 06 1753 - Pre-Fabricated Wood Trusses.

1.03 REFERENCES

- A. ASTM A 36/A 36M – Standard Specification for Carbon Steel.
- B. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength; 2004
- C. ASTM A 153/A 153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2003.
- D. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2003.

1.04 SUBMITTALS

- A. See Section 01 3323, Submittals, for submittal procedures.
- B. Product Data: Provide technical data and manufacturer's catalogue information on all fasteners.
- C. Installation Instructions: Provide manufacturer's printed installation instructions.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the types of products specified in this section and with minimum 10 years of documented experience.
- B. Manufacturer to provide load tables for all products based on the 2001 National Design Specifications.
- C. All connectors to meet IBC 2012 Building Code.
- D. Installer: Company with proven experience in performing installation of products under this section.

PART II—PRODUCTS

2.01 MANUFACTURERS

- A. Simpson Strong-Tie Company, Inc., Dublin, CA.
- B. Hilti, Tulsa, OK
- C. USP Structural Connectors, Indianapolis, IN

2.02 MATERIALS

- A. Steel: ASTM A-36
- B. Rods and Anchor Bolts: ASTM A307 Grade A
- C. Metal and Finish: Hot dipped galvanized steel per ASTM A153/A 153M.

- D. Nails, Screws, and Anchorage: Per manufacturer's recommendations or as shown on the drawings.

2.03 FINISH

- A. All products to be galvanized per ASTM 1 153/A 153M.
- B. All products in contact with treated wood to be G185 galvanized per ASTM A 653/A 653M.

PART III—EXECUTION

3.01 INSTALLATION

- A. Install at locations as shown on the drawings.
- B. Install fasteners in strict accordance with manufacturer's printed instructions and as detailed on the drawings.

END OF SECTION

SECTION 06 1636
WOOD PANEL PRODUCT SHEATHING

PART I—GENERAL

1.01 Section Includes

- A. Wall Sheathing
- B. Roof Sheathing
- C. Telephone and Electrical Panel Boards

1.02 Related Sections

- A. Section 06 1000, Rough Carpentry
- B. Section 06 1001, Fasteners and Anchors
- D. Section 06 1743 - Laminated Strand Lumber
- E. Section 06 1753 - Shop Fabricated Wood Trusses

1.03 References

- A. PS-1: Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995
- B. APA Trademark: The Engineered Wood Association.
- C. ASTM D-2555: Design Stresses, Group Assignment.

1.04 Quality Assurance

- A. Plywood type, grade, and species group shall be specified as outlined in the latest edition of "Voluntary Product Standard PS 1-95 for Construction and Industrial Plywood."
- B. OSB panels to be manufactured in conformance with "Voluntary Product Standard PS-2" or APA PRP-108 performance standards.
- C. All sheathing panels are to be stamped with APA Trademark showing panel grade, span rating, exposure classification, thickness, mill number, and performance-rated panel standard.

1.05 Delivery, Storage, and Handling

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- B. Prevent exposure to precipitation during shipping, storage or installation.

PART II—PRODUCTS

2.01 MATERIALS

- A. Wall Sheathing: APA Rated OSB (Oriented Strand Board)
 - 1. Structural 1
 - 2. Exposure Class: Exposure 1
 - 3. Span Rating: 24/16
 - 4. Thickness: 7/16"
- B. Roof Sheathing: APA Rated OSB (Oriented Strand Board)
 - 1. Structural 1
 - 2. Exposure Class: Exposure 1
 - 3. Span Rating: 24/16
 - 4. Thickness: 5/8"
- C. Electrical Component Mounting: Plywood
 - 1. APA rated sheathing, fire retardant treated.
- D. Adhesive/Glue
 - 1. APA AFG-01
 - 2. Waterproof

3. Water base, air cure type
4. Cartridge dispensed

2.02 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
- B. Fire Retardant Treatment:
 1. Interior Type A: AWPA Use Category UCFA, Commodity Specification H (Treatment C20 for lumber and C27 for plywood), low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E 84, with no evidence of significant combustion when test is extended for an additional 20 minutes.

PART III—EXECUTION

3.01 INSTALLATION—WALL SHEATHING

- A. Install wall sheathing vertically to wall studs.
- B. Butt joints and nail sheathing with 8d nails at 4" on center at panel edges and 6" on center at intermediate studs.

3.02 INSTALLATION—WALL SHEATHING, SHEAR PANELS

- A. See structural drawings for location of wall shear panels.
- B. Glue and nail per size and pattern as shown on structural drawings.

3.03 INSTALLATION—ROOF SHEATHING

- A. Install panels with face grain across supports, stagger end joints.
- B. Butt panel ends to a close but tight fit; allow 1/8" space.
- C. Nail panels 3/4" or less at 4" on center along panel edges and 12" on center at intermediate supports with 10d common nails or screw-type nails; unless otherwise noted on the drawings.
- D. Provide blocking at all panel edges.
- E. Provide clips at intermediate points between framing at roof sheathing; see Section 06 1001.

END OF SECTION

**SECTION 06 1723
PARALLEL STRAND LUMBER**

PART I—GENERAL

1.01 SECTION INCLUDES

- A. Parallel strand lumber structural members scheduled as "Parallam Beam" on the drawings.

1.02 RELATED SECTIONS

- A. Section 06 1000, Rough Carpentry
- B. Section 06 1001, Fasteners and Anchors

1.03 REFERENCES

- A. NES, Report No. NER-481, National Evaluation Service, Inc.
- B. ASTM D-2559 – Standard Specification for Adhesives for Structural Laminated Wood Products; 2004
- C. ASTM D-5456 – Standard Specification for Evaluation of Structural Composite Lumber Products; 2005

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Shop Drawings: Shop drawings showing lay-out and detail necessary for determining fit and placement in the building to be provided by the manufacturer.
- C. Production: Do not proceed with fabrication and/or cutting until shop drawings have been reviewed by the architect.
- D. Manufacturer's product data and load tables.

1.05 QUALITY ASSURANCE

- A. These products shall be designed and manufactured to the standards set forth in the National Evaluation Service, Inc. (NES) Report No. NER-481.
- B. Parallel strand lumber shall be manufactured in a plant recognized by the building code and under the supervision of an approved third party inspection agency. It shall be manufactured in a continuous process with all grain parallel with the length of the member.
- C. Identification: Parallel strand lumber shall be identified by a stamp indicating the product type and grade, NER report number, manufacturer's name, plant number, and the independent inspection agency's logo.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in manufacturer's original packaging with manufacturers name and product identification intact and legible.
- B. Protect products from damage due to weather and breakage.
- C. Protect members from warping or other distortion, with air circulation under coverings and around stacks.

PART II—PRODUCTS

2.01 MANUFACTURERS

- A. Parallel strand lumber to be manufactured by Trus Joist MacMillan or equal.

2.02 MATERIALS

- A. Code Reports: Materials shall comply with NES Report No. NER-481.
- B. Veneer: Wood veneers ultrasonically graded or graded by other advanced grading systems.

- C. Adhesives: Adhesives shall be of the waterproof type conforming to the requirements of ASTM D-2559.
- D. Allowable Design Stresses:
 - 1. Horizontal shear = 210psi.
 - 2. Modulus of elasticity: $E = 2.0 \times 10$ (to the 6th power) psi
 - 3. Flexural stress: $F_{sub b} = 2,900$ psi
 - 4. Tension parallel to grain = 2,400 psi
 - 5. Compressive strength = 2,900 psi
- E. Tolerances:
 - 1. Finished Length: $\pm 1/4$ "
 - 2. Depth: $\pm 1/16$ "
 - 3. Width: $\pm 1/16$ "

2.03 FABRICATION

- A. Parallel strand lumber, PSL, shall be manufactured from strands of wood fiber in a continuous process with all strands oriented to the length of the member and then fed into a press in the desired lay-up pattern. All members are to be free of finger joints or scarfs or mechanical connections in full length members.

PART III—EXECUTION

3.01 ERECTION AND INSTALLATION

- A. PSL, if stored prior to erection, shall be protected from the weather. It shall be erected and installed in accordance with the plans and manufacturer's drawings and installation suggestions which may be provided. Holes, cuts or notches not previously approved by engineering shall not be permitted. Temporary construction loads which cause stresses beyond design limits are not permitted.
- B. Connections: Lateral nail and withdrawal holding values are as provided in the code for Douglas Fir sawn lumber. Nails installed perpendicular to the glue lines on the wide face shall be installed in accordance with the code. Nails installed parallel to the glue lines on the narrow face shall not be spaced closer than 3 inches for 8-penny common nails and 4 inches for 10-penny common nails. These nailing specifications are based on a member at least $3/4$ inches thick and $3\frac{1}{2}$ inches wide. Holding power of bolts installed perpendicular to the glue lines is as provided in the code for Douglas Fir.

3.02 INSPECTION

- A. The contractor shall give notification to the manufacturer's representative prior to enclosing the PSL to provide opportunity for inspection of the installation.

END OF SECTION

SECTION 06 1753
SHOP-FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated wood trusses for roof framing.
- B. Bridging, bracing, and anchorage.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry.
- B. Section 06 1001 – Fasteners and Anchors.
- C. Section 09 2116 - Gypsum Board Assemblies.

1.03 REFERENCE STANDARDS

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2008.
- B. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2013.
- C. TPI 1 - National Design Standard for Metal Plate Connected Wood Truss Construction; Truss Plate Institute; 2014 (ANSI/TPI 1).
- D. TPI DSB-89 - Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses; Truss Plate Institute; 1989.
- E. BCSI 1 - Building Component Safety Information Booklet: The Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses; joint publication of the Truss Plate Institute and the Wood Trust Council of America; 2003.

1.04 DESIGN REQUIREMENTS

- A. Comply with applicable code for structural loading criteria.
 - 1. Arkansas Fire Prevention Code, International Building Code 2012.
- B. Working Stresses and Connector Loads: National Design Specification for Stress Grade Lumber and its fastenings, National Forest Products Association (NFPA).
- C. Design Specifications: Design Specifications for Light Metal Plate Connected Wood Trusses, Truss Plate Inst.
- D. Design, Fabrication, and Erection: Conform to Southern Standard Building Code and H.U.D Manual 4950.2 "Design Criteria for Trussed Rafters".
- E. See design requirements on structural drawings.

1.05 SUBMITTALS

- A. See Section 01 3323- Submittals, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on plate connectors, bearing plates, and metal bracing components.
- C. Shop Drawings: Show truss configurations, sizes, spacing, size and type of plate connectors, cambers, framed openings, bearing and anchor details, and bridging and bracing.
 - 1. Include identification of engineering software used for design.
 - 2. Provide shop drawings stamped or sealed by design engineer.
 - 3. Submit design calculations.

1.06 QUALITY ASSURANCE

- A. Truss Design, Fabrication, and Installation: In accordance with TPI 1, TPI DSB-89, and BCSI 1.
- B. Fabricator Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

- C. Designer Qualifications: Perform design by or under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the state of Arkansas.
 - 1. Shop drawings prepared and stamped by engineer.
 - 2. Certify that seismic requirements are included.
- D. See design load requirements on structural drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle and erect trusses in accordance with BCSI 1.
- B. Store trusses in vertical position resting on bearing ends.

1.08 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Lumber:
 - 1. Species: Southern Pine.
 - 2. Grade: SPIB (GR), Grade No. 2 or better (no #3 lumber will be allowed).
 - 3. Moisture Content: Between 7 and 9 percent.
 - a. Kiln dried.
 - 4. Lumber fabricated from old growth timber is not permitted.
- B. Steel Connectors: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M Structural Steel (SS) Grade 33/230, with G90/Z275 coating; die stamped with integral teeth; thickness to be 20 gauge minimum.
 - 1. Minimum size of plate (3 inches x 5 inches) or (4 inches x 4 inches) each side of truss at all joints each side of truss.
 - 2. Minimum contact areas for truss plates to be 3.75 square inches on each member at all joints each side of truss.

2.02 ACCESSORIES

- A. Wood Blocking: As specified in Section 06 1000.

2.03 FABRICATION

- A. Fabricate trusses to achieve structural requirements specified and to accurate lengths, angle, and size as shown and detailed on the drawings.
- B. Brace wood trusses in accordance with TPI DSB-89 and BCSI 1.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that supports and openings are ready to receive trusses.

3.02 PREPARATION

- A. Coordinate placement of bearing items.

3.03 ERECTION

- A. Install trusses in accordance with manufacturer's instructions and TPI DSB-89 and BCSI 1.
- B. Set members level and plumb, in correct position.
- C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in true alignment until completion of erection and installation of permanent bracing.
- D. Do not field cut or alter structural members without approval of Brackett Krennerich and Associates.
- E. Place permanent bridging and bracing.
- F. Place headers and supports to frame openings required.
- G. Frame openings between trusses with lumber in accordance with Section 06 1000.

H. Coordinate placement of decking with work of this section.

3.04 TOLERANCES

A. Framing Members: 1/2 inch maximum, from true position.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Wood Trim and Wood Window Sills
- C. Door installation.

1.02 RELATED REQUIREMENTS

- A. Section 08 1416 – Flush Wood Doors
- B. Section 09 9000 - Painting and Coating: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2003.
- B. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2003.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.
- B. Grade materials in accordance with the following:
 - 1. Lumber Grading Agency: Certified by ALSC.
 - 2. Plywood: Certified by the American Plywood Association.
 - 3. Hardwood Lumber Grading: NHLA Grading Rules.
- C. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect work from moisture damage.

1.06 PROJECT CONDITIONS

- A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- B. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

PART 2 PRODUCTS

2.01 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.

2.02 LUMBER MATERIALS

- A. Hardwood Lumber: Red Oak species, plain sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
 - 1. Grading: In accordance with NHLA Grading Rules; www.nathardwood.org.
 - 2. K.D., S4S, Grade 1, 1 x material
- B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece, full length.

2.03 SHEET MATERIALS

- A. Hardwood Plywood: HPVA HP-1, Grade AA, Type II; Veneer core and MDF core, type of glue recommended for application.
 - 1. Red Oak face species, rotary cut, at closet shelving.

2. 1/2 inch thick.

2.04 ACCESSORIES

- A. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.06 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.
- C. See Section 06 1000-Rough Carpentry for installation of recessed wood blocking.

3.02 INSTALLATION

- A. Set and secure materials and components in place, plumb and level.
- B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 9000.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 WORKMANSHIP

- A. General: All work shall be accurately and neatly installed without hammer marks or any defacement. All finish nailing shall be set below the surface of finish, all cuts, miters and connections to adjacent work shall be accurately fitted and scribed into place. All lumber of finish carpentry work shall be belt sanded on faces and edges before use. Trim and molding shall be sanded before fitting into place. Doors shall be hand sanded. Cabinet doors, drawers, and shelving shall have faces, edges and interior sanded before placing on job. All items of finished carpentry shall be thoroughly sanded when installed.
- B. Wood Doors: Trim and fit all doors to hang and operate without binding. Carefully install hardware to close doors without forcing and to prevent rattle. After hanging doors, remove, sand top and bottom edges and have painter paint top and bottom with clear varnish sealer.
- C. Finish Hardware: Receive, store, and assume responsibility for finish hardware. Tag and file all keys for owner. Fit hardware accurately, apply securely and adjust carefully. Leave all hardware in working order and free from defects.

3.05 ERECTION TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.06 SCHEDULE

A. All interior trim: Use hardwood lumber as specified.

END OF SECTION

**SECTION 06 4116
LAMINATE CLAD MILLWORK**

PART 1—GENERAL

1.01 SECTION INCLUDES

- A. Fabrication and installation of fixed modular and flexible rail mounted laminate clad casework and components.
- B. Fixed and modular countertops and related products.
- C. Includes all items shown on drawings as millwork; designated "MW".

1.02 RELATED SECTIONS

- A. Sinks and service fixtures, service and waste lines and all connections, vents, electrical service fixtures, hoods and ducting within or adjacent to millwork or otherwise required: Furnished and installed under Mechanical and Electrical Divisions 22 and 26.
- B. Base Molding: Furnished and installed under Finishes Division 9 or wood under Division 6.
- C. Section 06 4117, Cabinet Hardware.
- D. Section 06 6116 - Solid Surface Fabrications.

1.03 REFERENCES

- A. NEMA LD 3 – High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2000
- B. ANSI A208.2 – American National Standard for Medium Density Fiberboard for Interior Use; 2002.
- C. ANSI A208.1 – American National Standard for Particleboard; 1999.
- D. ANSI A161.1 – Testing Standards; current year.
- E. AWI 1600 – Architectural Woodwork Institute, Standards for Modular Cabinets.

1.04 SUBMITTALS

- A. See Section 01 3323 – Submittals, for submittal procedures.
- B. Samples:
 - 1. Submit samples of millwork manufacturer's standard decorative laminate colors, patterns and textures for exposed and semi-exposed materials for architect's selection. Samples of other materials or hardware will be available if requested.
 - 2. Architect may request representative full-size samples for evaluation prior to approval. Samples may be impounded by architect/owner until completion of project to ensure compliance with specifications.
- C. Shop Drawings: Submit shop drawings for architect's approval prior to fabrication of millwork. Drawings to include dimensional lay-out, construction details, cabinet elevations, and shelving elevations.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with AWI-1600 – Standards for modular cabinets.
- B. Products meeting or exceeding ANSI A161.1 – Testing Standards.
- C. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver completed laminate clad millwork, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 25 percent to 55 percent.

- B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 JOB CONDITIONS

- A. Environmental Requirements: Do not install millwork until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.
 - 1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
 - 2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.
 - 3. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 WARRANTY

- A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

PART 2—PRODUCTS

2.01 MATERIALS

- A. Core Materials:
 - 1. Particleboard: Medium density 45-50 pound industrial grade particleboard of fir or pine meeting or exceeding ANSI A 208.1, M-3 requirements. Thicknesses used is ¾".
 - 2. Nailer strips: 1/4" Dunnage. Preferably Hardboard or MDF
- B. Decorative Laminates:
 - 1. High-pressure decorative laminate GP28 (.028), NEMA; TEST LD-3-1995
 - 2. High-pressure decorative laminate GP50 (.050), NEMA; TEST LD-3-1995
 - 3. High-pressure decorative laminate PF42 (.042), NEMA; TEST LD-3-1995
 - 4. High-pressure cabinet liner CL20 (.020), NEMA; TEST LD-3-1995
 - 5. Thermally Fused Melamine laminate tested to meet NEMA TEST LD-3-1995
 - 6. High-pressure backer BK20 (.020)
- C. Laminate Color Selection:
 - 1. Selections for cabinet surfaces, grade GP28, to be selected from the current year Wilsonart, Nevamar, Formica series. A maximum of one (1) color to be selected per unit face and five (5) colors per project. Standard colors in standard finishes.
 - 2. Selections for countertop grades, GP50 and PF42, shall be selected from the current year Wilsonart, Nevamar, Formica standard solid and pattern offering. A maximum of five (5) colors per project. Standard colors in standard finishes.
 - 3. Basic cabinet body color to include surfaces of all components, including drawer boxes in white to match Metabox slides, to be covered with melamine laminate as a minimum requirement.
- D. Edging Materials:
 - 1. 1/2mm PVC banding on cabinet faces and upper and lower edge of wall cabinet end panels, machine applied with waterproof hot melt adhesive.
 - 2. 3mm PVC banding, machine applied with waterproof hot melt adhesive machine profiled to 1/8" radius for safety.
 - 3. 3mm banding to be used on external edges, outside edges of door and drawer fronts, counter tops, and all exposed shelves.

2.02 FABRICATION

- A. Fabricate millwork, countertops and related products to dimensions, profiles, and details shown.
- B. Cabinet Body Construction:
 - 1. Tops and bottoms are joined to cabinet ends and internal cabinet components such as fixed horizontals, rails and verticals using 8mm diameter industrial grade hardwood dowels, laterally fluted with chamfered ends, securely glued and clamped under pressure

- during assembly to secure joints and cabinet squareness. A minimum of six (6) dowels at each joint for 24" deep cabinets and a minimum of four (4) dowels at each joint for 12" deep cabinets are used.
2. Unless specifically indicated, core is 3/4" thick particleboard. Edging and surface finishes as indicated herein.
 3. Cabinet backs are 3/4" thick melamine. Cabinets are provided with 1/4" x 4" dunnage mounting strip behind cabinet back to secure the cabinet to the wall. Exposed back on fixed or movable cabinets is 3/4" particleboard with the exterior surface finished in GP28 laminate as selected.
 4. All fixed under counter and tall units have an individual factory applied base, constructed of 3/4" A.C. Grade plywood. Base 96mm (nominal 4") high unless otherwise indicated on the drawings.
 5. All end panels and vertical dividers are prepared to receive adjustable shelf hardware at 32mm (approximately 1-1/4") line boring centers. Door hinges, drawer slides and pull-out shelves mount in the line boring to assure consistent alignment of components.
 6. All exposed and semi-exposed edges of basic cabinet components are factory edged with PVC banding, machine applied with waterproof hot melt adhesive. Edging is 1/2mm PVC.
 7. Adjustable shelf core is 3/4" thick particleboard up to 30" wide. Provide adjustable shelf holes in cabinet back over 30" wide. Front edge is factory applied 1/2mm PVC.
 8. Interior Finish/Units with Open Interiors:
 - a. Sides, top, bottom, horizontal, and vertical members, and adjustable shelving faced with HPL Laminate with matching prefinished back.
 - b. Janitor and Storage Units not in Open view: Sides, top, bottom, horizontal members, vertical members, and adjustable shelving faced with thermally fused melamine laminate with matching back.
 9. Interior Finish/Units with Closed Interiors: Sides, top, bottom, horizontal and vertical members, and adjustable shelving faced with thermally fused melamine laminate with matching back.
 10. Exposed Ends: Faced with high-pressure decorative laminate GP28 (.028) color from casework manufacturer's full range offering, from Wilsonart, Nevamar, and Formica, standard grades and finish.
 11. Wall Unit Bottom: Faced with thermally fused melamine laminate.
 12. Wall and Tall Unit Tops: The top edge and bottom edge of all wall and tall unit end panels are factory edged with 1/2mm PVC. Top surface is laminated with thermally fused melamine laminate.
 13. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), will not be permitted. No exceptions.
- C. Drawers:
1. Backs and bottoms are 3/4" thermally fused melamine laminate. The back and bottom are attached to Metabox sides with 5mm screws. Top edge is banded with 1/2mm PVC
 2. Painted finishes on drawer sides and/or bottom will not be permitted.
- D. Door/Drawer Fronts:
1. Core for all doors and applied drawer fronts is 3/4" thick particle core. All edges at exposed shelving, doors and drawers are to be edged as indicated herein.
 2. Double doors are used on all cabinets in excess of 24" wide.
 3. Exterior faces are laminated with high-pressure decorative laminate GP28, color as selected. Interior face is thermally fused melamine laminate.
 4. All door/drawer edges are finished with 3mm PVC, machine applied with waterproof hot melt adhesive. External edges and outside corners are machine profiled to 1/8" radius.
- E. Miscellaneous Shelving:
1. Core material is 3/4" thermally fused melamine laminate.
 2. Exterior faced with high-pressure decorative laminate GP28 if in open view.

3. Edges finished with 3mm PVC, machine applied with waterproof hot melt adhesive. External edges and outside corners are machine profiled to 1/8" radius.

2.03 DECORATIVE LAMINATE COUNTERTOPS

- A. All nominal 1-1/4" thick laminate clad countertops shown on drawings are constructed with 1-1/8" particleboard core laminated top face with GP50 (.050) high-pressure decorative laminate, with BK20 backer underside. Provide tight joint fasteners where needed. All exposed edges, including edges with backsplash where used, have 3mm PVC banding, machine applied with waterproof hot melt adhesive. Exposed edges and corners are machine profiled to 1/8" radius for safety.

PART 3—EXECUTION

3.01 INSPECTION

- A. The installer must examine the job site and the conditions under which the work under this section is to be performed, and notify the contractor in writing of unsatisfactory conditions.
- B. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION

- A. Condition millwork to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION

- A. Install millwork with factory-trained supervision authorized by manufacturer. Erect casework plumb, level, true and straight with no distortions. Shim as required. Where laminate clad millwork abuts other work, scribe and cut to accurate fit.
- B. Adjust millwork and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- C. Install fire rated countertops in strict accordance with manufacturer's instructions.

3.04 CLEANING AND PROTECTION

- A. Repair or remove and replace defective work as directed upon completion of installation.
- B. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts or units.
- C. Advise contractor of procedures and precautions for protection of casework and tops from damage by other trades until acceptance of the work by the owner.

END OF SECTION

**SECTION 06 4117
CABINET HARDWARE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Door and drawer pulls, door hinges, adjustable shelf hardware, locks, and all miscellaneous cabinet hardware.

1.02 RELATED SECTIONS

- A. Section 06 4116, Laminate Clad Millwork and Related Products.

1.03 SUBMITTALS

- A. See Section 01 3323 – Submittals, for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature for each specified product; include recommended installation accessories for project conditions.
- C. Samples: One item of each specified product; label items with manufacturer's name and model number of item.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Blum
- B. Hafele
- C. National Lock
- D. Knappe and Vogt

2.02 MATERIALS

- A. Hinges: Five knuckle, institutional grade, 2-3/4" overlay type with hospital tip. Steel is minimum .095" thick and has a minimum of nine (9) edge and leaf fastenings and epoxy coated finish. Hinges pass ANSI-BHMA standard A 156.9, Grade 1 requirement for both vertical and horizontal set and sag (pair of hinges will hold minimum of 310 pounds); copy of test result provided upon request. Hinges are secured with specifically engineered screws. Doors 48" and over in height have three (3) hinges per door. Magnetic door catch with minimum five (5) pound pull provided, attached with screws and slotted for adjustment.
- B. Pulls: Door and drawer front pulls are epoxy powder coated metal wire style, 4 inch spacing on fasteners. Pull design is compatible with the Americans with Disability Act (ADA), Federal Register Volume 567, No. 144, specifically paragraph 4.27.4.
- C. Drawer Slides:
 - 1. Regular use and knee space drawers are Blum Style Metabox 320 metal drawer system and are epoxy powder coated. Slides have a 100-pound load rating at full extension and a built-in, positive stop both directions, with self-closing feature.
 - 2. File drawer slides are full extension; Blum Style Metabox 330 metal drawer system and are epoxy powder coated with Metafile rails.
 - 3. Slides have a lifetime warranty as offered by the slide manufacturer.
- D. Adjustable Shelf Supports: Injection molded polycarbonate, clear color to blend with selected interior finish, friction fit into cabinet end panels and vertical dividers, readily adjustable on 32mm (approximately 1-1/4") centers. Each shelf support has two (2) integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The supports automatically adapt to 3/4" or 1" thick shelving and provide non-tip feature for shelving. Supports are designed to readily permit field fixing of shelf if desired. Structural load tests shall show loading to 1,040 pounds (260 pounds per support) without failure.
- E. Locks:

1. For doors and drawers as shown on drawings are National Lock #M4-7054C, removable core, disc tumbler, cam style lock with strike. Each lock is furnished with two (2) keys. Each lock is furnished with two (2) keys. Lock for sliding 3/4" doors is a disc type plunger lock, sliding door type with strike. Lock for sliding glass/acrylic doors is a ratchet type sliding showcase lock. Or equivalent.
 2. Key each room differently.
- F. Metafile File Suspension Rails: All file drawers include a pair of 14-gauge steel Metafile file suspension rails, epoxy powder coated. File followers, or other split bottom hardware, are not acceptable.
- G. Leveling Guide:
1. Sugastone, Lamp Brand, "MKPS" Series Leveling Guide.
 2. Provide leveling guides on millwork as shown in the drawings.

PART 3—EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

END OF SECTION

SECTION 06 6116
SOLID SURFACING FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Solid Surface
 - 1. Counter Top

1.02 REFERENCES

- A. American National Standards Institute (ANSI)
- B. American Society for Testing and Materials (ASTM)
- C. National Electrical Manufacturers Association (NEMA)
- D. Federal Specifications (FS)

1.03 SUBMITTALS

- A. Samples: Submit minimum 2" x 2" (50mm x 50mm) samples. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.
- B. Product data: Indicate product description, fabrication information and compliance with specified performance requirements.
- C. Maintenance data: Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in project close-out documents.

1.04 QUALITY ASSURANCE

- A. Allowable tolerances:
 - 1. Variation in component size: + 1/8" (3mm).
 - 2. Location of openings: + 1/8" (3mm) from indicated location.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation. Store components indoors prior to installation.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.06 WARRANTY

- A. Provide manufacturer's 10 year warranty against defects in materials. Warranty shall provide material and labor to repair or replace defective materials. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Aristech Surfaces L.L.C.; www.aristechsurfaces.com
- B. Corian, DuPont Company, Wilmington, Delaware
- C. Surell, Formica; www.Formica.com

2.02 MATERIALS

- A. Homogeneous filled acrylic; not coated, laminated or of composite construction; meeting ANSI Z124.3 & .6, Type Six, and Fed. Spec. WW-P-541E/GEN.
- B. Thickness: ½ inch
- C. Color: To be selected.
- D. Product equal to: Aronite Surface – Studio Collection – Price Group "G"; gloss finish.

2.03 ACCESSORIES

- A. Joint adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous, nonporous joints, with a chemical bond.
- B. Sealant: Manufacturer's standard mildew-resistant, FDA/UL® recognized silicone sealant in color-matching or clear formulations.

2.04 FABRICATION - COUNTER TOPS

- A. 1/2" thick solid polymer material, adhesively joined with inconspicuous seams.
- B. Edge: Eased smooth edges.
- C. Finish: as selected by Architect.
- D. Solid Polymer top over 3/4" plywood.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings and product installation details.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.
- C. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Components shall be clean on Date of Substantial Completion.
- D. Protect surfaces from damage until Date of Substantial Completion. Repair or replace damaged work that cannot be repaired to architect's satisfaction and invoice for the cost of repairs. Architect to pre-approve cost estimate before repairs are made.

END OF SECTION

DIVISION 07

THERMAL AND MOISTURE PROTECTION

**SECTION 07 1310
ROOF UNDERLAYMENT MEMBRANE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof underlayment membrane to be applied in areas as shown on roof plan.
- B. As shown and detailed on the drawings.

1.02 RELATED SECTIONS

- A. Section 06 1636 – Wood Panel Product Sheathing: Roof Deck
- B. Section 07 2510 - Bituminous Vapor Barrier: Roofing Felt
- C. Section 07 3113 - Asphalt Shingles

1.03 REFERENCES

- A. ASTM D903 – Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
- B. ASTM D1876 – Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)
- C. ASTM D1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
- D. ASTM D5147 – Standard Test Methods for sampling and Testing Modified Bituminous Sheet Material
- E. ASTM D5602 – Standard Test Method for Static Puncture Resistance for Roofing Membrane Specimens

1.04 WARRANTY

- A. Underlayment Membrane to be part of the asphalt shingle roofing system.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General: Roof underlayment membrane to be a self-adhesive roofing membrane composed of glass fleece reinforcement and SBS modified bitumen.

2.02 MEMBRANE MATERIALS

- A. Thickness: 60 mils
- B. Weight: 76 lbs.
- C. Performance Properties:
 - 1. Strain energy: 0.9/0.7 inch-16/m2, ASTM D5147
 - 2. Breaking strength: 46/35 lb/in, ASTM D5147
 - 3. Elongation: 4/4, ASTM D5147
 - 4. Static Puncture: 22.5 lb, ASTM D5602
 - 5. Lap adhesion: 7lb/in, ASTM D1876
 - 6. Peel resistance on plywood: 16lb/in, ASTM D903
 - 7. Low temperature flexibility: -31°F, ASTM D1970
 - 8. Heat resistant: 260° F
- D. Primer: Self-adhesive primer recommended by manufacturer.

2.03 MANUFACTURERS

- A. "TW" metal & tile underlayment as manufactured by TAMKO.
- B. "Lastobond—HT" as manufactured by SOPREMA, Wadsworth, OH.
- C. "Grace Ice & Water Shield" as manufactured by GCP Applied Technologies, www.gcpat.com

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in strict accordance with manufacturer's printed instructions.
- B. Install directly to roof deck by removing the silicone release film.
- C. Use primer at locations recommended by the manufacturer.
- D. Side laps 3" and laps 6".
- E. Turn up walls and parapets minimum of 1'-0" where shown on drawings.

END OF SECTION

SECTION 07 1900
WATER REPELLENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water repellents applied to exterior masonry surfaces.
 - 1. All exterior masonry veneer.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 - Unit Masonry
- B. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

- A. ASTM D 5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes, and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments; 1991 (Reapproved 2002).
- B. ASTM D 3278 - Standard Test Methods for Flash Point of Liquids.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide product description and physical characteristics.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

1.06 MOCK-UP

- A. Prepare a representative surface 48 x 48 inch in size using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
- B. Locate where directed.
- C. Mockup may remain as part of the Work.

1.07 FIELD CONDITIONS

- A. Protect liquid materials from freezing.
- B. Do not apply water repellent when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.

1.08 WARRANTY

- A. Installer's two year guarantee against defects, water penetrations, efflorescence, discoloring, etc.
- B. Manufacturer's ten year non-prorated labor and materials warranty for moisture penetration.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Water Repellents:
 - 1. "Weather Seal Siloxane WB" as manufactured by Prosoco, Inc., Kansas City, Kansas.
 - 2. "Enviroseal Clear Double 7" as manufactured by Hydrozo, Inc.

2.02 MATERIALS

- A. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
 - 1. Applications: Vertical surfaces and non-traffic horizontal surfaces.

- B. Water Repellent: Solvent-free blend of silanes and oligomeric alkoxyloxyloxanes.
 - 1. Form: Clear amber liquid.
 - 2. Specific Gravity: .96
 - 3. Active Content: 100%
 - 4. pH: Not applicable.
 - 5. Weight/Gallon: 7.9 lbs.
 - 6. Flash Point: 69 degrees F (21 degrees C) concentrate ASTM D 3278
 - a. 140 degrees F (60 degrees C) in 1:9 dilution
 - b. 145 degrees F (62 degrees C) in 1:14 dilution
 - 7. Freeze Point: < -22 degrees F (<-30 degrees C)
 - 8. VOC Content: Complies with national, state, and district AIM VOC regulations at recommended dilutions. Low VOC per ASTM D5095.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify joint sealants are installed and cured.
- C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

3.02 PREPARATION

- A. Prepare surfaces to be coated as recommended by water repellent manufacturer for best results.
- B. Do not start work until masonry mortar substrate is cured a minimum of 60 days.
- C. Remove loose particles and foreign matter.

3.03 APPLICATION

- A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended for best results.
 - 1. Follow manufacturer's recommended dilution ratios.
- B. Vertical Application Instructions
 - 1. For best results, apply diluted protective treatment "wet-on-wet" to a visibly dry and absorbent surface.
 - 2. Alternate application methods.
 - a. Spray: Saturate from the bottom up, creating a 4" to 8" (15 to 20 cm) rundown below the spray contact point. Let the first application penetrate for 2-3 minutes. Resaturate. Less material will be needed for the second application.
 - b. Brush or Roller: Saturate Uniformly. Let diluted protective treatment penetrate for 2 to 3 minutes. Brush out heavy runs and drips that do not penetrate.
- C. Product must be applied within 24 hours of dilution for maximum effectiveness.
 - 1. Product should be applied within 8 hours of dilution.
- D. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

3.04 PROTECTION OF ADJACENT WORK

- A. Protect adjacent landscaping, property, and vehicles from drips and overspray.
- B. Protect adjacent surfaces not intended to receive water repellent.
- C. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION

SECTION 07 2113
BOARD INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board Insulation:
 - 1. Perimeter foundation wall

1.02 RELATED SECTIONS

- A. Section 04 2000 - Unit Masonry

1.03 REFERENCES

- A. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties.
- B. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2004a.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. "Formular CW 25" as manufactured by Owens Corning.
- B. "CM" insulation board as manufactured by Green Guard, Pactive Building Products
- C. Styrofoam, "Cavity Mate" as manufactured by Dow Chemical Company.

2.02 BOARD INSULATION MATERIALS

- A. Extruded Polystyrene Board Insulation: ASTM C 578, Type X; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
 - 1. Board Size: 16 x 96 inch
 - 2. Board Thickness: 1 inch
 - 3. Board Edges: Square.
 - 4. Thermal Conductivity (k factor) at 25 degrees F: 0.18.
 - 5. Thermal Resistance: R-value, R-5.0 per inch; ASTM C 518.
 - 6. Compressive Resistance: 25 psi.
 - 7. Board Density: 1.3 lb. /cu ft.
 - 8. Water Absorption, maximum: 0.3 percent volume.
 - 9. Surface Burning Characteristics: Flame spread/Smoke developed index of 5/165, when tested in accordance with ASTM E 84.
- B. Adhesive: Type recommended by insulation manufacturer for application.
 - 1. Sonneborn 200 Adhesive

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Install boards horizontally on foundation perimeter and exterior cavity.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.
 - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 PROTECTION OF FINISHED WORK

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 2116
BLANKET INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Batt insulation and vapor retarder in exterior wall construction where detailed.
- B. Batt insulation at roof structure.
- C. Batt insulation at interior partitions.
- D. Miscellaneous batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry: Supporting construction for batt insulation.
- B. Section 06 1636 – Wood Panel Product Sheathing.
- C. Section 06 1753 - Shop Fabricated Wood Trusses

1.03 REFERENCES

- A. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2001.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- C. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2004.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Owens Corning, Toledo, Ohio
- B. Johns Manville, Denver, Colorado
- C. Certain Teed Corporation, Valley Forge, Pennsylvania

2.02 BATT INSULATION MATERIALS

- A. Batt Insulation: ASTM C 665; preformed glass fiber batt; friction fit, conforming to the following:
 - 1. Surface Burning Characteristics: Flame spread index of 25 or less; smoke developed index of 450 or less, when tested in accordance with ASTM E 84.
 - 2. Combustibility: Non-combustible when tested in accordance with ASTM E 136, except for facing, if any.
 - 3. Provide insulation made without formaldehyde.
 - 4. Thermal Resistance: See 3.03 Schedules.
 - 5. Thickness: See 3.03 Schedules.
 - 6. Facing: Unfaced.
 - a. ASTM C 665; Federal Specification HH-1-521F, Type I.
 - 7. Facing: Kraft faced, one side.
 - a. ASTM C 665; Federal Specification HH-1-521F, Type II.

2.03 ACCESSORIES

- A. Provide cardboard baffles to hold insulation and create vent space at soffits.

PART 3 EXECUTION

3.01 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members and attach to framing.
- F. Secure facing flanges in place at maximum 6 inches on center.
- G. Tape seal all butt ends, lapped flanges, and tears or cuts in membrane.
- H. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.
- I. Install layers at roof structure with first layer installed between wood trusses; staple vapor retarder to bottom of trusses. Install second layer perpendicular to first layer; lay over top of bottom chord and over first layer of insulation.

3.02 PROTECTION OF FINISHED WORK

- A. Do not permit installed insulation to be damaged prior to its concealment.

3.03 SCHEDULES

- A. Exterior Walls:
 - 1. Kraft Faced
 - a. 6-1/4 inch thick, R-Value R-19.
- B. Interior Walls:
 - 1. 3-1/2", and 6-1/4 inch thick, un-faced, R-Value varies.
- C. Above ceiling at roof Attic Space: Insulation to be installed in 2 - layers.
 - 1. First Layer: To be 5-1/2" thick fiberglass batts or rolls, Kraft – faced, R Value, R-19.
 - 2. Second Layer: To be 5-1/2" thick fiberglass batts or rolls, un-faced, R Value, R-19.
 - 3. Total R-value: R-38.

END OF SECTION

SECTION 07 2501
WEATHER RESISTANT MEMBRANES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Weather resistant membranes for light commercial buildings (Building Wrap).

1.02 RELATED SECTIONS

- A. Section 06 1636 - Wood Panel Product Sheathing

1.03 REFERENCES

- A. AATCC Test Method 127 – Water Resistance: Hydrostatic Pressure test; 1998.
- B. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials; 2000
- C. ASTM E 1677 – Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls; 1995 (Reapproved 2000).

1.04 SUBMITTALS

- A. See Section 01 3323 – Submittals, for submittal procedures.
- B. Test Results: Submit copies of test results showing performance characteristics equaling or exceeding those specified.
- C. Submit manufacturer's installation instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. "Tyvek", "Commercial wrap". Dupont Company, Wilmington, DE.
 - 2. "Ultra-Wrap", Green Guard, Atlanta, GA.
- B. Provide all weather resistant membranes from a single manufacturer.

2.02 MATERIALS

- A. Tyvek® Water Resistant Barrier: Spunbonded olefin, nonwoven, non-perforated:
 - 1. Classification: ASTM E 1677, Type I, air leakage of 25 mph wind pressure less than 0.06 cubic feet per minute per square foot.
 - 2. Water Vapor Transmission: Greater than 20 perms, when tested in accordance with ASTM E 96 Procedure B.
 - 3. Water Penetration Resistance: Minimum 78.7 inches per AATCC Test Method 127.
- B. Sealing Tape: DuPont Contractor Tape.
- C. Fasteners:
 - 1. Steel Framing: Rust-resistant screws with washers.
- D. Flashing Tape: Dupont Tyvek "Flex wrap" or "Straight Flash".

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install weather resistant membranes in accordance with manufacturer's instructions over exterior sheathing.
 - 1. Create a complete wall wrap system.
- B. Seal joints and penetrations through weather resistant membranes with tape and fasteners before installation of finish material.
- C. Ensure that weather resistant membranes are air tight, free from holes, tears, and punctures.
- D. Tape all window and door penetrations in accordance with manufacturer's instructions.
 - 1. Use "Flex wrap" per manufacturer's instructions; odd or custom shapes.
 - 2. Use "straight flash" per manufacturer's instructions; square shapes.

END OF SECTION

**SECTION 07 2510
BITUMINOUS VAPOR BARRIER**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor barrier under asphalt shingle roofing.

1.02 RELATED SECTIONS

- A. Section 06 1636 - Wood Panel Product Sheathing
- B. Section 07 1310 - Roof Underlayment Membrane
- C. Section 07 3113 – Asphalt Shingles.

1.03 REFERENCES

- A. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Roofing Felt used in roofing and waterproofing; 1997a.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Underlayment: Asphalt-saturated organic roofing felt, unperforated, complying with ASTM D 226, Type II, No. 30
- B. See Section 07 1310 for Roof Underlayment at Roofs with Low Slope.

PART 3 EXECUTION

3.01 UNDERLAYMENT INSTALLATION

- A. Apply one layer of 30 pound felt under roofing; half lapped.
 - 1. Install horizontally, stapling paper to sheathing (temporarily).
 - 2. Start at bottom of roof with half sheet then lap each layer below minimum 1/2 roll in a manner to shed water downward.
 - 3. End laps minimum 6".
 - 4. If roofing will not be applied within 72 hours, fasten all felts with 1-1/2" round metal disks and screws depending on substrate. Permanent fastening should be 18" o.c. both directions.
 - 5. Care should be taken not to damage building paper during installation or other construction operations. Tears or punctures in building paper will constitute cause for replacement.

END OF SECTION

SECTION 07 2600 VAPOR RETARDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor retarders under concrete floor slabs on grade.
 - 1. All Interior floor slabs.
 - 2. All exterior slabs covered by roof including entry slabs.
- B. Tape to seal joints and repair vapor retarder.
- C. Accessories.

1.02 RELATED SECTIONS

- A. Section 03 3000 - Cast-in-Place Concrete: Slabs on grade.

1.03 REFERENCES

- A. ASTM D 882 - Tensile Properties of Thin Plastic Sheeting; 2002.
- B. ASTM D 1709 - Standard Specification for Impact Resistance of Plastic Film by the Free-Falling Dart Method; 2004.
- C. ASTM E 96 - Water Vapor Transmission of Materials; 2000.
- D. ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete slabs; 1998.
- E. ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under concrete slabs; 1997 (Reapproved 2004).

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
 - 1. Store products in manufacturer's unopened packaging until ready for installation.
 - 2. Store materials in a clean, dry area in accordance with manufacturer's instructions.
- C. Handling: Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Stego Wrap (15 mil) Vapor Barrier by Stego Industries LLC, San Juan Capistrano, CA (877) 464-7834 www.stegoindustries.com.
- B. Griffolyn T-85 by Reef Industries

2.02 VAPOR RETARDERS - UNDER CONCRETE SLABS

- A. Polyolefin Geomembrane
 - 1. Water Vapor Barrier: ASTM E 1745; meets or exceeds Class A.
 - 2. Thickness: 15 mil
 - 3. Water Vapor Permeance: 0.01 or less perms when tested in accordance with ASTM E 96.
 - 4. Tensile Strength: 79.6 lbf./in. when tested in accordance with ASTM D 882.
 - 5. Puncture Resistance: 2326 grams when tested in accordance with ASTM D 1709.

2.03 ACCESSORIES

- A. General: Accessories are to be from same manufacturer as reinforced vapor retarders.
- B. Self-Adhesive Repair Tape: High density polyethylene tape with pressure sensitive adhesive, 4 inches wide; under slab membrane only.
- C. Pipe Boots: Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions; under slab membrane only.
- D. Mastic: Stego Mastic

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces and areas to receive reinforced vapor retarders. Notify Architect in writing defects of work and other unsatisfactory site condition that would cause defective installation of vapor retarders. Do not begin installation until unacceptable conditions have been corrected.
- B. Verify site dimensions.
- C. Commencement of work will imply acceptance of substrate.

3.02 INSTALLATION - UNDER CONCRETE SLABS

- A. Install vapor retarders in accordance with manufacturer's instructions and ASTM E 1643 at concrete slabs.
- B. Install vapor retarders continuously at locations as indicated on the drawings. Ensure there are no discontinuities in vapor retarder at seams and penetrations.
- C. Install vapor retarders in largest practical widths.
- D. Ensure surface beneath vapor retarder is smooth with no sharp projections.
- E. Join sections of vapor retarder and seal penetrations in vapor retarder with mastic tape.
- F. Insure vapor retarder surfaces to receive mastic tape are clean and dry.
- G. Immediately repair holes in vapor retarder with self-adhesive repair tape.
- H. Seal around pipes and other penetrations in vapor retarder with pipe boots in accordance with manufacturer's instructions.

3.03 PROTECTION

- A. Protect vapor retarders from damage during installation of reinforcing steel and utilities and during placement of granular materials or concrete slab.
- B. Immediately repair damaged vapor retarder in accordance with manufacturer's instructions.

3.04 SCHEDULES

- A. Under all concrete slabs:
 - 1. STEGO Wrap, 15 mil vapor barrier.

END OF SECTION

**SECTION 07 3113
ASPHALT SHINGLES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Asphalt shingle roofing.

1.02 RELATED REQUIREMENTS

- A. Section 06 1636 – Wood Panel Sheathing: Roof Sheathing
- B. Section 07 1310 - Roof Underlayment Membrane
- C. Section 07 2510 - Bituminous Vapor Barrier: Roofing Felts
- D. Section 07 6200 - Sheet Metal Flashing and Trim: Edge flashings
- E. Section 07 7226 – Roof Ventilators

1.03 REFERENCE STANDARDS

- A. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules; 2003.
- B. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method); 2003b.
- C. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2000.
- D. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data indicating material characteristics.
- C. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.
- D. Manufacturer's Instructions: Indicate installation criteria and procedures.

1.05 QUALITY ASSURANCE

- A. Roofer Qualifications
 - 1. Roofing contractor must specialize in asphalt shingle roof system application, equipment, and requirements.
 - 2. Minimum of five years experience.
 - 3. Contractors shall provide a list of three roof projects equal in size and scope, completed under the current company name.

1.06 FIELD CONDITIONS

- A. Do not install shingles when surface temperatures are below 45 degrees F.

1.07 WARRANTY

- A. Manufacturer's standard 20 year warranty.
- B. Installer's warranty for a period of two years; printed and signed on contractor's letterhead and include:
 - 1. Expiration date two years after date of owner's final acceptance of the roof work.
 - 2. Signed by the company's owner or corporation president.
 - 3. Guarantor shall agree to repair or replace defective roofing materials and/or workmanship to keep roof system free of leaks or defects for a period of two years from the date of final acceptance.

PART 2 PRODUCTS

2.01 SHINGLES

- A. Manufacturers:
 - 1. Tamko, "Heritage Premium", fiberglass/asphalt shingles
 - 2. GAF Materials Corporation: www.gaf.com.
 - 3. Certaineed Corporation
- B. Shingles: Comply with ASTM D 3018, Type I and D 3161, Type I and meet Class A Fire Resistant and UL Wind Resistant Standards.
 - 1. ASTM D 3018/UL 790 Class A Fire Resistant
 - 2. ASTM D 3161/UL 997 Type I, Class F Wind Resistance
 - 3. 20 year manufacturer's warranty
 - 4. Class A fire resistant; UL wind resistant
 - 5. Material: Fiberglass, asphalt, ceramic granules
 - 6. Color: To be selected.

2.02 ACCESSORIES

- A. Nails: Standard round wire shingle type, of hot dipped zinc coated steel, minimum 3/8 inch head diameter and 0.105 inch shank diameter, 1-1/4 inch long; 12 gauge.
- B. Plastic Cement: ASTM D 4586, asphalt roof cement.
- C. Roof Edge Trim: See Section 07 6200.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.
- B. Verify that deck is of sufficient thickness to accept fasteners.
- C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- D. Verify roof openings are correctly framed.
- E. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.02 PREPARATION

- A. Broom clean deck surfaces before installing underlayment or eave protection.
- B. Install eave edge flashings tight with fascia boards. Weather lap joints 2 inches and seal with plastic cement. Secure flange with nails spaced 24 inches on center.

3.03 INSTALLATION - SHINGLES

- A. Install shingles in accordance with manufacturer's instructions.
- B. Place shingles in straight coursing pattern with 5 inch weather exposure to produce double thickness over full roof area. Provide double course of shingles at eaves.
- C. Project first course of shingles 3/4 inch beyond fascia boards.
- D. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
- E. Extend shingles on one slope across valley and fasten. Trim shingles from other slope 2 inches from valley center line to achieve closed cut valley, concealing the valley protection.
- F. Cap hips with individual shingles, maintaining 5 inch weather exposure. Place to avoid exposed nails.
- G. Coordinate installation of roof mounted components or work projecting through roof with weather tight placement of counterflashings.
- H. Complete installation to provide weather tight service.

3.04 PROTECTION

- A. Do not permit traffic over finished roof surface.

END OF SECTION

**SECTION 07 4618
EXTERIOR METAL SOFFITS**

PART 1—GENERAL

1.01 SECTION INCLUDES

- A. Manufactured Metal Soffit Panels
- b. Suspension System

1.02 RELATED SECTIONS

- A. Section 07 9005 – Joint Sealers

1.03 REFERENCES

- A. ASTM A 653/A653M – Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process; 2003

1.04 SUBMITTALS

- A. See Section 01 3323 – Submittals, for submittal procedures.
- B. Submit manufacturer's data sheets.
- C. Submit sample color chart for color selection.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND PROTECTION

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that may cause discoloration or staining of products.

PART 2—PRODUCTS

2.01 MANUFACTURERS

- A. Metal Soffit: Equal to "Artisan I, Series L, 12 inch soffit panels as manufactured by MBCI, Hernando, Mississippi.

2.02 MATERIALS

- A. Pre-Coated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M structural steel with G90/Z275 coating with specified finish coating.

2.03 MANUFACTURED PANELS

- A. Metal Soffit – Solid:
 - 1. 1 inch deep, 12 inch wide panels, 26 gauge.
 - 2. Concealed fastening system
 - 3. Finish: Kynar 500
 - 4. Color: To be selected from standard colors.
- B. Metal Soffit – Perforated:
 - 1. 1 inch deep, 12 inch wide panels, 26 gauge.
 - 2. Concealed fastening system
 - 3. Finish: Kynar 500
 - 4. Color: To be selected from standard colors

2.04 ACCESSORIES

- A. Provide all trim to make a complete installation as shown on the drawings.

- B. Fasteners:
 - 1. Per manufacturer's recommendations.
- C. Provide suspension system at soffits suspended as shown on drawings.
 - 1. 1-1/2" USG main support channels (4'-0" o.c.)
 - 2. Use furring channels for secondary support (2'-0" o.c.)

2.05 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest practicable lengths.

PART 3—EXECUTION

3.01 INSTALLATION

- A. Install panels at soffits in accordance with manufacturer's instructions
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- C. Fasten panels to structural supports; aligned, level, and plumb.
- D. Locate perforated panels as shown on the drawings.
- E. Locate joints over supports. Lap panel ends minimum 2 inches.
- F. Provide expansion joints where indicated.
- G. Use concealed fasteners unless otherwise approved by architect.

3.02 TOLERANCES

- A. Maximum offset from true alignment between adjacent members butting or in line: 1/16 inch.
- B. Maximum variation from plane or location indicated on drawings: ¼ inch

3.03 CLEANING

- A. Remove site cuttings from finish surfaces.
- B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION

**SECTION 07 4646
FIBER CEMENT SIDING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood-fiber cement siding.
- B. Accessories and trim.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry:
- B. Section 06 1636 - Wood Panel Product Sheathing
- C. Section 07 2501 – Weather Barriers – Weather barrier under siding.
- D. Section 07 6200 - Sheet Metal Flashing and Trim
- E. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

- A. ASTM C 1186 - Standard Specification for Flat Non-Asbestos Fiber Cement Sheets; 2002.
- B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 1998.
- C. ASTM C 1185 - Standard Test Methods for Sampling and Testing Non-Asbestos Fiber Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards; 1999.
- D. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 1998.
- E. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 1999.
- F. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials; 1995.
- G. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C; 1999.
- H. ASTM E 228 - Standard Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer; 1995.
- I. ASTM G 26 - Standard Practice for Operating Light-Exposure Apparatus (Xeon-Arc Type) With and Without Water Exposure of Nonmetallic Materials; 1996.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Manufacturer's requirements for related materials to be installed by others.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods, including nail patterns.
- C. Maintenance Instructions: Periodic inspection recommendations and maintenance procedures.
- D. Warranty: Submit copy of manufacturer's warranty, made out in Owner's name showing that it has been registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Siding Manufacturer: Firm with manufacturing and delivery capacity required for project. Manufacturer shall have successfully completed at least 5 projects of the type, scope, and quality required within the past five years.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section with minimum 3 years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products under waterproof cover and elevated above grade, on a flat surface.

1.07 WARRANTY

- A. Register manufacturer's warranty, made out in Owner's name, with copy to owner.
- B. Manufacturer to warranty trim for a period of 2 years to fully repair or replace trim proven to be defective during the first 2 years after installation.
- C. Factory finish to have manufacturer's standard 15 year minimum warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Lap Siding: 6¼" (5" exposure) "Select Cedarmill" lap fiber cement siding with factory applied "Color Plus" finishing system as manufactured by James Hardie Building Products, Mission Viejo, CA. Provide all factory pre-finished "XLD Trim" and accessories as required for a complete installation as shown and detailed on the drawings. Color to be selected from the 23-color Color-Plus Collection.
- B.. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIDING

- A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C 1186 Type A Grade II; with machined edges, for nail attachment.
1. Style: Cedar lap siding.
 2. Texture: Cedar Profile.
 3. Length: 12 ft, nominal.
 4. Width (Height): 6-1/4 inches with 5 inch exposure.
 5. Thickness: 5/16 inch, nominal.
 6. Finish: Factory applied finishing system.
 7. Warranty: 15 year limited; transferable.
 8. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 6, maximum; when tested in accordance with ASTM E 84 (Class I/A).
 9. Flammability: Noncombustible, when tested in accordance with ASTM E 136.
 10. Flexural Strength: At least 1,450 psi (10 MPa) when in equilibrium condition, and at least 1,015 psi (7 MPa) when in wet condition, tested in accordance with ASTM C 1185.
 11. Coefficient of Thermal Expansion: Less than 1×10^{-5} /inch/inch/degree F (0.5×10^{-5} /degree C), when tested in accordance with ASTM E 228.
 12. Water Vapor Transmission: Less than 7.0 perm-inch (10 ng/(Pa s m), when tested in accordance with ASTM E 96.
 13. Freeze Thaw Resistance: At least 80 percent flexural strength retained, when tested in accordance with ASTM C 1185.
 14. UV Resistance: No cracking, checking, or erosion, when tested for 2,000 hours in accordance with ASTM G 26.
 15. Water Tightness: No water droplets on underside, when tested in accordance with ASTM C 1185.
- B. Trim:
1. Thickness: 5/4"; 1" actual
 2. Length: 12'-0"
 3. Widths: As required on the drawings.
 4. Style: Smooth trim
 5. Finish: Trim to be primed for field finish.

2.03 SOFFIT

- A. Non-vented smooth soffit panel:
1. Thickness: 1/4"
 2. Length: 8'-0"

3. Widths: As required on the drawings.
4. Style: Smooth (non-vented)
5. Finish: Soffit to be primed for field finish.

2.04 ACCESSORIES

- A. Starter Strips: Treated
- B. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch.
- C. Joint Sealer: As specified in Section 07 9005.
- D. Flashing: As specified in Section 07 6200.

PART 3 EXECUTION

3.01 PREPARATION

- A. Examine substrate and clean and repair as required to eliminate conditions that would be detrimental to proper installation.
- B. Verify that water-resistive barrier has been installed over substrate completely and correctly.
- C. Do not begin until unacceptable conditions have been corrected.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 FLASHING

- A. Install sheet metal flashing:
 1. Above door and window trim and casings.
 2. Above horizontal trim in field of siding.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.
 1. Read warranty and comply with all terms necessary to maintain warranty coverage.
 2. Install in accordance with conditions stated in model code evaluation report applicable to location of project.
 3. Use trim details indicated on drawings.
 4. Touch up all field cut edges before installing.
 5. Pre-drill nail holes if necessary to prevent breakage.
- B. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.
- C. Allow space between both ends of siding panels that butt against trim for thermal movement; seal joint between panel and trim with exterior grade sealant.
- D. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.
- E. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.

3.04 CLEANING AND PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings and miscellaneous flashing.
 - 1. Roof edge
 - 2. Step flashing (roof to siding)
- B. Metal trim (cladding) at fascia board as shown and detailed on the drawings.
- C. Miscellaneous flashings at fiber cement siding.

1.02 RELATED REQUIREMENTS

- A. Section 07 3113 - Asphalt Shingles
- B. Section 07 4646 - Fiber Cement Siding
- C. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2004a.
- B. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with three years of documented experience.
- C. Flashing and trim that is part of the roofing system is a part of roofing warranty.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials which may cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A653/A 653M, with G90/Z275 zinc coating; minimum 24 gauge thick base metal, shop pre-coated with Kynar 500 coating.
- B. Finish: Prefinished Kynar 500; color to be determined by Architect.

2.02 ACCESSORIES

- A. Fasteners: Lapped and riveted.
- B. Provide all accessories essential to completeness of installation.
- C. Sealant: Type as specified in Section 07 9005.
- D. Provide all clips and concealed fasteners at coping system to make complete installation.

2.03 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Metal flashings shall lap a minimum of 6 inches each joint and shall lap over a bead or brushing of non-setting caulking compound and be riveted.

- D. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- E. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
- F. See details on drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- B. Seal metal joints watertight.

END OF SECTION

SECTION 07 6500
FLEXIBLE FLASHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Laminated metal flashings and counterflashings.
 - 1. Through wall flashing at masonry

1.02 RELATED SECTIONS

- A. Section 04 2000 - Unit Masonry.

1.03 REFERENCES

- A. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's data sheets showing product characteristics and including installation instructions.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company with at least five years of successful experience in weathertight installation of flashing.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in manufacturer's sealed containers and packaging, bearing manufacturer's name and product identification.
- B. Stack flashing materials to avoid twisting, bending, and abrasion. Protect materials from weather before installation.
- C. Store mastic materials in sealed containers under cover.

1.07 WARRANTY

- A. To be warranted to be free of defects in manufacture for five (5) years. Material will be provided at no charge to replace any defective product.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Hohmann and Barnard, Inc.; 30 Rasons Court, Hauppauge, NY 11788. Tel: (631) 234-0600.

2.02 MATERIALS

- A. Flexible Flashing: Copper fabric flashing; laminated sheet comprised of copper sheet, asphalt mastic coated on both sides, bonded under pressure between two layers of asphalt saturated, woven glass fabric.
 - 1. Copper weight: 5 oz. /sq. ft.
 - 2. Size: 36" x 25'-0".
- B. Mastic: Cut-back asphalt containing long fibered material, in trowel grade consistency.
 - 1. Sandell's Trowel Mastic

2.03 ACCESSORIES

- A. Termination Bar:
 - 1. Provide metal termination bar at top of flashing at attachment of flexible flashing to sheeting.

2.04 FABRICATION

- A. Forming: Fabricate flashings true to shape and accurate in dimension. Form pieces in longest possible lengths to minimize joints. Fold flashing at corners and at ends of pans instead of cutting.
- B. Joints: Provide not less than 4 inches of overlap at flashing joints.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to receive flashing are thoroughly dry, free from loose materials, and reasonably smooth, with no sharp edges or projections.

3.02 INSTALLATION

- A. General: Comply with recommendations of SMACNA Architectural Sheet Metal Manual.
 - 1. Lap joints minimum of 4 inches and seal watertight with mastic.
 - 2. Carry flashing vertically as detailed, but not less than 8 inches above horizontal plane
 - 3. Extend head and sill flashings not less than 6 inches beyond edges of openings and turn up to form watertight pan; seal with mastic.
- B. Coordination: Interface flashing work with adjacent and adjoining work to ensure best possible weather resistance and durability of completed flashing.
- C. Masonry Flashing: Comply with requirements of sections where masonry installation is specified.
- D. Masonry Flashing: Lay horizontal flashing in slurry of fresh mortar and top with fresh full bed of mortar to receive masonry units. At vertical surfaces, spot flashing with mastic to hold in place until masonry has set.
 - 1. Carry flashing through wall and leave exposed for inspection.
 - 2. After inspection, cut flashing flush with surface of masonry.
 - 3. Remove mortar or other obstructions from weep holes at flashing locations.
 - 4. Flashing around corners to be continuous.
 - 5. Spandrel and Shelf Angles: Entire faces to be flashed.
 - 6. Sills: Place through wall flashing under all sills and from end dam at all terminations to form a continuous water deterrent seal.
 - 7. Flashing at Vertical Supports: When application requires puncturing or slitting, make sure all openings in the flashing are tightly sealed and that that flashing is terminated onto the supports with mastic.
 - 8. Weep Holes: In order to properly drain any water collected from properly applied flashing, weep holes must be provided immediately above the flashing at all flashing locations. In general, weep holes should be ¼" diameter, and should be spaced no further than 24" horizontally.
 - 9. Cleaning of all Excess Mortar: It is also necessary to clean out all excess mortar that may have dropped onto the flashing to ensure clear passage way for water to drain off flashing to the weep holes and out the exterior of the wall.
- E. Installing Flashing: Thru wall flashing membrane is installed at locations requiring flashing to channel water out of cavity wall system through weep holes. If exterior drip edge is required terminate flashing 1" on stainless drip edge. Thru Wall Flashing is installed on base of walls, spandrel beams, ledges, window and door headers and other penetrations/interruptions of wall system. Use of drip edge is strongly recommended where flashing is being installed over a bridge course (to avoid efflorescence) or over concrete masonry (to avoid leaving CMU's holes exposed).

END OF SECTION

SECTION 07 7123

MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pre-finished aluminum gutters and downspouts.

1.02 RELATED SECTIONS

- A. Section 07 3113 - Asphalt Shingles.
- B. Section 07 6200 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
- B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2004.
- C. ASTM B 209M – Standard Specifications for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2004
- D. CDA A4050 - Copper in Architecture - Handbook; Copper Development Association, Inc.; Edition date unknown.
- E. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 DESIGN REQUIREMENTS

- A. Conform to SMACNA Architectural Sheet Metal Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.
- B. Conform to applicable code for size and method of rain water discharge.
- C. Maintain one copy of each document on site.

1.05 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- C. Product Data: Provide data on prefabricated components.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- B. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.07 PROJECT CONDITIONS

- A. Coordinate length of downspout with finish grade.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gutters and Downspouts:
 - 1. ATAS International, Inc.: www.atas.com
 - 2. Cheney Flashing Co.: www.cheneyflashing.com.
 - 3. Perimeter Systems: www.perimeter-systems.com.

2.02 MATERIALS

- A. Pre-Finished Aluminum Sheet: ASTM B 209 (ASTM B 209M) 0.032 inch thick.
 - 1. Finish: Plain, shop pre-coated with modified silicone coating.
 - 2. Color: To be selected.

2.03 COMPONENTS

- A. Gutters: CDA rectangular style profile.
- B. Downspouts: CDA Rectangular profile.
- C. Anchors and Supports: Profiled to suit gutters and downspouts.
 - 1. Anchoring Devices: In accordance with CDA requirements.
 - 2. Gutter Supports: Brackets.
 - 3. Downspout Supports: Brackets; minimum four (4) per downspout.

2.04 FABRICATION

- A. Form gutters and downspouts of profiles and size indicated.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.

2.05 FACTORY FINISHING

- A. Factory Finished, Kynar 500
- B. Color to be selected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that surfaces are ready to receive work.

3.02 PREPARATION

- A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.

END OF SECTION

SECTION 07 7226
ROOF VENTILATORS

PART I—GENERAL

1.01 SECTION INCLUDES

- A. Roof ridge line ventilators for attic ventilation.

1.02 RELATED SECTIONS

- A. Section 06 1753 - Shop Fabricated Wood Trusses
- B. Section 07 3113 - Asphalt Shingles
- C. Section 07 2116 - Blanket Insulation

1.03 SUBMITTALS

- A. See Section 01 3323 – Submittals for submittal procedures.
- B. Manufacturer's product data sheets.

PART II—PRODUCTS

2.01 RIDGE VENT

- A. Manufacturers:
 - 1. "Ridgemaster Plus" as manufactured by Mid-America Building Products, Plymouth, Michigan.
 - 2. Model OR-20, "OmniRoll Roll-Out Shingle Over Ridge Vent" as manufactured by Lomanco, Jacksonville, Arkansas.
- B. Materials:
 - 1. Size: 11-1/4" wide x 1" deep x longest length possible.
 - 2. Provide end plugs.
 - 3. 18 square inch net free area per lineal foot.
 - 4. Omni baffles-air flow from any direction.

2.02 ATTIC RAFTER VENT

- A. Manufacturers:
 - 1. "raft-R-mate" attic rafter vent by Owens Corning Foam Insulation, LLC, Toledo, Ohio.
 - 2. Or equal
- B. Materials:
 - 1. Size: 48" x width required to fit between rafters.
 - 2. Extruded polystyrene rigid foam.

PART III—EXECUTION

3.01 WORKMANSHIP

- A. See roof plans for locations.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 07 9005
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Hollow gaskets.

1.02 RELATED REQUIREMENTS

- A. Section 07 - 6500: Sealants required in conjunction with through wall flashing.
- B. Section 08 8000 - Glazing: Glazing sealants and accessories.
- C. Section 09 3000 - Tiling: Sealant used as tile grout.

1.03 REFERENCE STANDARDS

- A. ASTM C 510 - Standard Test Method for Staining and Color Change of Single or Multicomponent Joint Sealers
- B. ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cuclick Movement (Hockman Cycle).
- C. ASTM C 794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
- D. ASTM C 834 - Standard Specification for Latex Sealants; 2010.
- E. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2002.
- F. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005.
- G. ASTM D 1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2000.
- H. ASTM D 1667 - Standard Specification for Flexible Cellular Materials--Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam); 1997.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal requirements.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.
 - 1. Install only when atmosphere temperature or joint surface temperature is above 40 degrees F.

1.07 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a three year period after Date of Substantial Completion.

- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sealants
1. Tremco, Sealant/Weatherproofing Division, Beachwood, Ohio. www.tremcosealants.com
 2. Dow Corning Corporation, Midland, Michigan
 3. Degussa Building Systems/Sonneborn; www.chemrex.com
 4. Bostik, Inc.; www.bostik-us.com
 5. Pecora Corporation; www.pecora.com

2.02 SEALANTS

- A. Type A - General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.
1. Color: Standard colors matching finished surfaces.
 2. Product: Vulkem manufactured by Tremco.
 3. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
- B. Type B - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
1. Product: Butyl Sealant manufactured by Tremco.
 2. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.
- C. Type C - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
1. Color: Standard colors matching finished surfaces.
 2. Product: Trademate manufactured by Dow Corning.
- D. Type D - Bathtub/Tile Sealant: White silicone; ASTM C 920, Uses I, M and A; single component, mildew resistant.
1. Product: Tremsil 200 manufactured by Tremco.
 2. Applications: Use for:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between kitchen and bath countertops and wall surfaces.
- E. Type E - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Class 25, Uses T, I, M and A; single component.
1. Color: Gray.
 2. Product: Sonolastic SL-1 manufactured by Sonneborn.
 3. Applications: Use for:
 - a. Joints in sidewalks and vehicular paving.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width; "Rescor" manufactured by W. R. Meadows.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Sealant System Backing: "Backer-Rod" as manufactured by W. R. Meadows.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C 1193.
- C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
 - 1. Width/depth ratio of 2:1.
 - 2. Neck dimension no greater than 1/3 of the joint width.
 - 3. Surface bond area on each side not less than 75 percent of joint width.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.
- H. Apply caulking compound with hand gun having proper sized nozzles to fit joints and with sufficient pressure to completely fill voids and joints.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Protect sealants until cured.

3.06 SCHEDULE

- A. Control and Expansion Joints in Paving: Type E.
- B. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type A.
- C. Lap Joints in Exterior Sheet Metal Work: Type B.
- D. Fiber Cement Trim: Type A.
- E. Under Exterior Door Thresholds: Type B.
- F. Interior Joints for Which No Other Sealant is Indicated: Type C; colors as selected.
- G. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type D.
- H. Any location not listed: According to manufacturer's recommendations.

END OF SECTION

DIVISION 08

OPENINGS

SECTION 08 1113 HOLLOW METAL FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-rated steel frames.
- B. Steel-frames for wood doors.
- C. Non-rated steel glazing frames.
- D. Accessories

1.02 RELATED REQUIREMENTS

- A. Section 08 1416 - Flush Wood Doors.
- B. Section 08 7100 - Door Hardware.
- C. Section 08 8000 – Glazing: Glass for hollow metal frames.
- D. Section 09 9000 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 1998.
- B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames; 1999.
- C. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- D. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998.
- E. ASTM C 236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box; 1989 (Reapproved 1993).
- F. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 1997.
- G. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
- H. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).
- I. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 1999.
- J. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 1999.
- K. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- L. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Doors and Frames:
 - 1. Ceco Door Products: www.cecodoor.com.
 - 2. Republic Builders Products: www.republicdoor.com.
 - 3. Steelcraft: www.steelcraft.com.
 - 4. Amweld Building Products, Garrettsville, Ohio.

2.02 FRAMES

- A. Requirements for All Frames:
 - 1. Accessibility: Comply with ANSI/ICC A117.1.
 - 2. Door Top Closures: Flush with top of faces and edges.
 - 3. Hardware Preparation: In accordance with DHI A115 Series, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
 - 4. Finish: Factory primed, for field finishing.

2.03 STEEL FRAMES

- A. General:
 - 1. Comply with the requirements of grade specified for corresponding door, except:
 - a. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 2, 16 gage
 - 2. Finish: Factory primed, for field finishing.
- B. Interior Door Frames, Non Fire-Rated: Face welded type, seamless with joints filled.
 - 1. Finish: Factory primed, for field finishing.
- C. Frames for Interior Glazing: Construction and face dimensions to match door frames and as shown on the drawings.
- D. Frames for Pocket Door: To be custom frame with open pocket as indicated on drawings.

2.04 ACCESSORY MATERIALS

- A. Provide glazing stops for all glazed frames.
- B. Glazing: As specified in Section 08 8000.
- C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- D. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.05 FINISH MATERIALS

- A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. Coordinate frame anchor placement with wall construction.

- C. Coordinate installation of hardware.
- D. Coordinate installation of glazing.
- E. Coordinate installation of electrical connections to electrical hardware items.

3.03 ERECTION TOLERANCES

- A. Clearances Between Door and Frame: As specified in ANSI A250.8.
- B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.04 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.05 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

**SECTION 08 1416
FLUSH WOOD DOORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush configuration; non-rated.
- B. Flush wood doors with lite.

1.02 RELATED REQUIREMENTS

- A. Section 06 2000 – Finish Carpentry.
- B. Section 08 1113 - Hollow Metal Frames.
- C. Section 08 7100 - Door Hardware.
- D. Section 09 9000 – Painting and Coating.

1.03 REFERENCE STANDARDS

- A. AWII/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2003.
- B. ICC (IBC) - International Building Code; 2012.
- C. WDMA NWWDA I.S.1-A - Architectural Wood Flush Doors; Window and Door Manufacturers Association (formerly NWWDA); 2004.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Specimen warranty.
- D. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special blocking for hardware.
- E. Warranty, executed in Owners name.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.
- D. Store flat on level surface in a clean, dry, well ventilated area protected from sunlight.
- E. Doors should not be subjected to extremes of heat and/or humidity. Relative humidity should not be less than 25% nor more than 55%.
- F. Store doors in closed-in building.
- G. Cover doors to keep clean, but allow air circulation.
- H. Seal at earliest possible moment. Edge sealing is particularly important.
- I. Lift or carry door. Do not drag one door against another.
- J. Handle doors with clean hands or clean gloves.

1.07 PROJECT CONDITIONS

- A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Provide warranty for the following term:
 - 1. Interior Doors: Life of installation.
- D. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
- B. Veneer Doors:
 - 1. Eggers Industries: www.eggersindustries.com.
 - 2. Southwood: www.southwooddoor.com.
 - 3. Mohawk Flush Doors, Inc.: www.mohawkdoors.com.
 - 4. Graham Wood Doors: www.grahamdoors.com
 - 5. Haley Brothers: www.haleybros.com.
 - 6. Marshfield Door Systems, Inc.: www.marshfielddoors.com.

2.02 DOORS

- A. All Doors: See drawings for locations and additional requirements.
 - 1. Quality Standard: WDMA I.S. 1-A, Custom Grade, Extra Heavy Duty performance.
 - a. A Grade veneer
 - 2. Quality Standard: AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1300, Custom Grade.
 - 3. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at all locations.
 - 2. Provide vision panels as scheduled on the drawings.
 - 3. Red Oak veneer facing for factory finishing.
 - a. Plain sliced

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core Doors: Type particleboard core (PC), plies and faces as indicated above.

2.04 DOOR FACINGS

- A. Wood Veneer Facing for Transparent Factory Finish: Species as specified above, veneer grade as specified by quality standard, plain sliced, book veneer match, running assembly match; unless otherwise indicated.
 - 1. Vertical Edges: Any option allowed by quality standard for grade.
 - 2. Pairs: Pair match each pair; set match pairs within 10 feet of each other when doors are closed.
- B. Facing Adhesive: Type I - waterproof.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Provide solid blocks at lock edge for hardware reinforcement.
 - 1. Provide solid blocking for other through bolted hardware.
- C. Fit door edge trim to edge of stiles after applying veneer facing.

- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Adjust width of non-rated doors by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to a maximum of 3/4 inch (19 mm).
- D. Use machine tools to cut or drill for hardware.
- E. Coordinate installation of doors with installation of frames and hardware.
- F. Coordinate installation of glazing.

3.03 INSTALLATION TOLERANCES

- A. Conform to specified quality standard for fit and clearance tolerances.
- B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.05 SCHEDULE - See Drawings

END OF SECTION

**SECTION 08 4313
ALUMINUM ENTRANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum doors and frames.
- B. Weatherstripping.
- C. Perimeter sealant.

1.02 RELATED REQUIREMENTS

- A. Section 07 2501 - Weather Barriers: Perimeter air and vapor seal between glazing system and adjacent construction.
- B. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.
- C. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
- D. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2004.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
- C. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2004.
- D. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2004.
- E. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2004a.
- F. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2004.
- G. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- H. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000.

1.04 PERFORMANCE REQUIREMENTS

- A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - 1. Design Wind Loads: Comply with requirements of IBC code 2006.
 - 2. Positive Design Wind Load: 20 lbf/sq. ft.
 - 3. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
- C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft./min/sq. ft. of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.

- D. **Water Leakage:** None, when measured in accordance with ASTM E 331 with a test pressure difference of 2.86 lbf/sq. ft.
- E. **System Internal Drainage:** Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- F. **Air and Vapor Seal:** Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.
- G. **Expansion/Contraction:** Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

1.05 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. **Product Data:** Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.
- C. **Shop Drawings:** Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. **Hardware Schedule:** Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- E. **Warranty:** Submit manufacturer warranty and ensure forms have been completed in owners name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. **Manufacturer and Installer:** Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond to aluminum when exposed to sunlight or weather.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Kawneer ; Product Tri-Fab II.
 - 1. Tri-Fab II-451, screw spline for 1 inch glazing
- B. Other Acceptable Manufacturers:
 - 1. United States Aluminum Corp: www.usalum.com.
 - 2. Vistawall Architectural Products: www.oldcastlebe.com.

2.02 COMPONENTS

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Unitized, shop assembly.
 - 2. Finish: Fluropon, Kynar 500
 - 3. Color: To be determined by Architect.
- B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 2. Glazing stops: Flush.
 - 3. Cross-Section: 2 x 4-1/2 inch nominal dimension for 1" glazing.
- C. Doors: Glazed aluminum.
 - 1. Thickness: 1-3/4 inches.
 - 2. Top Rail: 4 inches wide.
 - 3. Vertical Stiles: 4-1/2 inches wide.
 - 4. Bottom Rail: 6 inches wide.
 - 5. Glazing Stops: Beveled.
 - 6. Finish: Fluropon, Kynar 500; Color to be determined by Architect.
 - 7. Provide internal muntin (3/16" x 9/16"); grid pattern as shown on the drawings.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M).
- B. Sheet Aluminum: ASTM B 209 (ASTM B209M).
- C. Fasteners: Stainless steel.
- D. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
- E. Concealed Flashings: 0.018 inch thick galvanized steel.
- F. Perimeter Sealant: Type specified in Section 07 9005 or as approved by architect.
- G. Glass: As specified in Section 08 8000.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- I. Glazing Accessories: As specified in Section 08 8000.

2.04 FINISHES

- A. Fluropon, Kynar 500; Color to be determined by Architect.
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.05 HARDWARE

- A. Door Hardware: As specified in Section 08 7100; for all hardware.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all exterior doors only.

2.06 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.

- E. Reinforce components internally for door hardware.
- F. Reinforce framing members for imposed loads.
- G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Set thresholds in bed of mastic and secure.
- J. Install glass and infill panels in accordance with Section 08 8000, using glazing method required to achieve performance criteria.
- K. Install perimeter sealant in accordance with Section 07 9005.

3.03 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft. non-cumulative or 1/16 inches per 10 ft., whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.05 CLEANING AND PROTECTION

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.
- D. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- E. Protect finished work from damage.

END OF SECTION

**SECTION 08 5113
ALUMINUM WINDOWS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fixed Extruded aluminum windows with operating sash and nailing fin.
- B. Factory glazing.
- C. Operating hardware.
- D. Screens.

1.02 RELATED REQUIREMENTS

- A. Section 07 2501 - Weather Resistant Membranes: Perimeter air and vapor seal between window frame and adjacent construction.
- B. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors; American Architectural Manufacturers Association; 2008.
- B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; 2002.
- C. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2004.
- D. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.
- E. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes Metric; 2007.
- F. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- G. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- H. IBC - International Building Code, 2006

1.04 PERFORMANCE REQUIREMENTS

- A. Design and size windows to withstand the following load requirements, when tested in accordance with ASTM E 330 using test loads equal to 1.5 times the design wind loads with 10 second duration of maximum load:
 - 1. Design Wind Loads: Comply with requirements of IBC 2012 code.
 - 2. Positive Design Wind Load: 20 lbf/sq ft.
 - 3. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- B. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
- C. Air Infiltration: Limit air infiltration through assembly to 0.06 cubic feet per lineal foot of sash crack measured at a reference differential pressure across assembly to meet requirements as in accordance with ASTM E 283
- D. Water Leakage: None, when measured in accordance with ASTM E 331 and ASTM E 547, using a static pressure of 12 psf.
- E. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly; not to exceed 0.06 cu. ft. per lin. ft.; ASTM E 283

- F. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system.
- G. Forced Entry Resistance: Conform to ASTM F 588 requirements for performance level 10 for window type A.

1.05 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations, and installation requirements.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of AAMA 101 Designation F-HC50.
- B. Manufacturer and Installer Qualifications: Company specializing in fabrication of residential aluminum windows of types required, with not fewer than three years of experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Quaker; Series K200, single-hung window. Quaker Windows, Freeburg, Missouri 65035, phone (573)744-5211.
- B. Manko
- C. Peerless

2.02 WINDOWS

- A. Windows: Tubular aluminum sections, factory fabricated, factory finished, vision glass, related flashings, anchorage and attachment devices.
 - 1. Performance Requirements: AAMA/WDMA/CSA 101/I.S.2/A440-08-"C50"
- B. Single-hung Type:
 - 1. Glazing: 3/4 inch thick sealed insulating clear; transparent with Low E and Argon
 - 2. Exterior Finish: Paint Coating; ANSA/AAMA 2605 Powder Coat Finish
 - 3. Interior Finish: Paint Coating; ANSA/AAMA 2605 Powder Coat Finish
 - 4. Color to be determined by Architect.
 - 5. Internal applied simulated divided lites: (as indicated on drawings)
 - a. 3/4 inch x 1/4 inch; "M36-04" – Interior Applied. Powder Coat Finish.

2.03 COMPONENTS

- A. Frames: 2-7/8 inch wide x 2-3/8 inch deep profile, 0.062 inches minimal wall thickness, flush glass stops of snap-in type; provide with integral nail-fin with closed corner construction.
- B. Operable Sash Weatherstripping: Resilient plastic; permanently resilient profiled to achieve effective weather seal.
- C. Fasteners: All screws and fastening devices shall be coated with Zinc or Cadmium in conformance with ASTM B 633-85 (1994) and/or ASTM B 766-86 (1993).
- D. Weatherstripping: All window gaps between frame and sash members shall be weatherstripped to prevent air infiltration and to prevent sliding contact between metal components. Weatherstrip shall be a poly pile type with an integral polyethylene fin and shall conform to AAMA 701-92 and 702-92.
- E. Finish: Windows should be furnished with a baked on powder coat finish meeting ANSA/AAMA 2604 and 2605.
- F. Sealant and Backing Materials: As specified in Section 07 9005.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M), 6063 alloy, T-6 extruded aluminum.

2.05 HARDWARE

- A. Moving sash shall be fitted with spring activated, extruded lock on sash bottom rail.
- B. Moving sash shall be equipped with block and tackle balance system which will hold the sash stationary at any open position and also be removable for easy re-glazing.
- C. Hardware: All hardware components that come in contact with aluminum shall be a non-corrosive material. Other hardware shall be coated in conformance with one or more of the following standards: ASTM A 123-89a, ASTM A 641-92, ASTM B 456-94, ASTM B 633-85 (1994), ASTM B 766-86 (1993).

2.06 SCREENS

- A. Extruded Aluminum Frames
- B. Aluminum Wire Mesh Screen.
- C. Screen: All screens shall be half window type sufficient to cover the opening provided by the vent sash. Screen frames are roll formed aluminum. Screen fabric shall be aluminum wire mesh. Screens shall conform to ANSI-AAMA 1004-1987.

2.07 FABRICATION

- A. Fabricate components with smallest possible clearances and shim spacing around perimeter of assembly that will enable window installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
 - 1. Integral screw spline
- C. Prepare components to receive anchor devices.
- D. Arrange fasteners and attachments to ensure concealment from view.
- E. Provide internal drainage of glazing spaces to exterior through weep holes.
- F. Factory glaze window units.
- G. Provide internal simulated lites as specified.

2.08 FINISHES

- A. Powder Coat Finish
- B. Color to be selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.

3.02 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Install window assembly in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
- C. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- D. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- F. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.
- G. Install perimeter sealant in accordance with requirements specified in Section 07 9005.

3.03 TOLERANCES

- A. Maximum Variation from Level or Plumb: 1/16 inches every 3 ft non-cumulative or 1/8 inches per 10 ft, whichever is less.

3.04 ADJUSTING AND CLEANING

- A. Adjust hardware for smooth operation and secure water tight closure.
- B. Remove protective material from factory finished aluminum surfaces.
- C. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
- D. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

3.05 SCHEDULE

- A. See drawings for window size and internal lite configuration.

END OF SECTION

**SECTION 08 7100
DOOR HARDWARE**

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. This Section includes commercial door hardware for the following:
1. Swinging doors.
 2. Pocket doors.
 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
1. Mechanical door hardware.
 2. Electromechanical door hardware.
 3. Cylinders specified for doors in other sections.
- C. Related Sections:
1. Division 08 7100 "Door Hardware Schedule".
 2. Division 08 1113 "Hollow Metal Frames".
 3. Division 08 1416 "Flush Wood Doors".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 2. ICC/IBC - International Building Code.
 3. NFPA 70 - National Electrical Code.
 4. NFPA 80 - Fire Doors and Windows.
 5. NFPA 101 - Life Safety Code.
 6. NFPA 105 - Installation of Smoke Door Assemblies.
 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
1. ANSI/BHMA Certified Product Standards - A156 Series
 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. **Product Data:** Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. **Door Hardware Schedule:** Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. **Format:** Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. **Organization:** Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. **Content:** Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Door and frame sizes and materials.
 - g. Warranty information for each product.
 - 4. **Submittal Sequence:** Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. **Shop Drawings:** Details of electrified access control hardware indicating the following:
 - 1. **Wiring Diagrams:** Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Wiring instructions for each electronic component scheduled herein.

2. **Electrical Coordination:** Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. **Keying Schedule:** After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. **Informational Submittals:**
 1. **Product Test Reports:** Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. **Operating and Maintenance Manuals:** Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. **Manufacturers Qualifications:** Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. **Installer Qualifications:** A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. **Door Hardware Supplier Qualifications:** Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. **Source Limitations:** Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. **Templates:** Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. **Door Hardware and Electrical Connections:** Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. **Door and Frame Preparation:** Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. **General Warranty:** Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. **Warranty Period:** Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. **Standard Warranty Period:** One year from date of Substantial Completion, unless otherwise indicated.
- D. **Special Warranty Periods:**
 - 1. Five years for cylindrical (bored) locks and latches.
 - 2. Five years for exit hardware.
 - 3. Five years for motorized electric latch retraction exit devices.
 - 4. Two years for electromechanical door hardware.

1.8 MAINTENANCE SERVICE

- A. **Maintenance Tools and Instructions:** Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide hinges as directed in Door Hardware Sets.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for any out-swinging exterior doors.

5. Manufacturers:

- a. Hager Companies (HA).
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

- a. Hager Companies (HA).
- b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

C. Sliding and Folding Door Hardware: Hardware is to be of type and design as specified and should comply with ANSI/BHMA A156.14.

1. Manufacturers:

- a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
- b. Hager Companies (HA).

2.3 POWER TRANSFER DEVICES

A. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

- a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

- a. Hager Companies (HA) - Quick Connect.
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 5. Manufacturers:
 - a. Hager Companies (HA).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Keyway: To be determined.
 5. Manufacturers:
 - a. Sargent Manufacturing (SA)
 - b. No Substitution.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 3. New System: Key locks to a new key system as directed by the Owner.

- E. Key Quantity: Provide the following minimum number of keys:
1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
- F. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
1. Manufacturers:
 - a. Lund Equipment (LU).
 - b. MMF Industries (MM).
 - c. Telkee (TK).

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 2 (Standard Duty): ANSI/BHMA A156.2, Series 4000, Grade 2 certified.
1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" throw brass or stainless steel latchbolt.
 2. Locks are to be non-handed and fully field reversible.
 3. Extended cycle test: Locks to meet or exceed 2-1/2 times the cycle requirements of ANSI/BHMA 156.2 grade 2.
 4. Manufacturers:
 - a. Sargent Manufacturing (SA) – 7 Line.
 - b. No Substitution.

2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
- B. Standards: Comply with the following:
1. Strikes for Bored Locks and Latches: BHMA A156.2.

2.8 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.
 6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 9. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Manufacturers:
 - a. Sargent Manufacturing (SA) - 80 Series.

b. No Substitution.

C. Narrow Profile Aluminum Removable Mullions: ANSI/BHMA A156.3 removable mullions with malleable-iron top and bottom retainers and clear anodized finish.

1. Provide stabilizers and mounting brackets as required.

2. Manufacturers:

a. Sargent Manufacturing (SA) – 650A Series.

2.9 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:

- a. Sargent Manufacturing (SA) - 351 Series.
- b. No Substitution.

2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Manufacturers:
 - a. Hager Companies (HA).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.11 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.12 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to

operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

SCHEDULED DOOR HARDWARE

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. SA - Sargent
5. AD - Adams Rite
6. RF - Rixson
7. SE - Securitron
8. OT - OTHER

Hardware Sets

Set: 1

Doors: 100

Description: ALUMINUM ENTRANCE

2 Continuous Hinge	CFM__HD1 x SER12	PE	↘
1 Removable Mullion	650A	US28	SA
1 Exit Device – Rim (nightlatch)	55-56-8504 x 862	US32D	SA ↘
1 Exit Device – Rim	55-56-8510 x 862	US32D	SA ↘
2 Door Closer	351 CPS	EN	SA
2 Drop Plate	351D	EN	SA
2 Electrolynx Harness	QC-C1500P	MK	↘
2 Electrolynx Harness	QC-C006	MK	↘
1 Power Supply	BPS-24-2	SE	↘
1 Threshold	Furnished by Door Mfg	-	OT
1 Weatherstrip	Furnished by Door Mfg	-	OT
2 Sweeps	Furnished by Door Mfg	-	OT

NOTE: Balance of access control components by Security Provider

Set: 2

Doors: 115A, 115B

Description: ALUMINUM ENTRANCE

1 Continuous Hinge	CFM__HD1	PE	
1 Electric Strike	74R1	130	AD ↘
1 Exit Device-Rim	8504 x 862	US32D	SA
1 Door Closer	351 CPS	EN	SA
1 Drop Plate	351D	EN	SA
1 Power Supply	BPS-24-1	SE	↘
1 Threshold	Furnished by Door Mfg		OT
1 Weatherstrip	Furnished by Door Mfg	-	OT
1 Sweeps	Furnished by Door Mfg	-	OT

NOTE: Balance of access control components by Security Provider

Set: 3

Doors: 125B

Description: ALUMINUM ENTRANCE

1 Continuous Hinge	CFM_HD1	PE
1 Lockset (Storeroom Function)	28-7G04 LL	US26D SA
1 Electric Strike	7140-510	US28 AD
1 Door Closer	351 CPS	EN SA
1 Drop Plate	351D	EN SA
1 Threshold	Furnished by Door Mfg -	OT
1 Weatherstrip	Furnished by Door Mfg -	OT
2 Sweeps	Furnished by Door Mfg -	OT

NOTE: Balance of access control components by Security Provider

Set: 4

Doors: 116B, 120B, 121B

Description: ALUMINUM ENTRANCE

1 Continuous Hinge	CFM_HD1	PE
1 Storeroom Lock	28-7G04 LL	US26D SA
1 Door Closer	351 CPS	EN SA
1 Drop Plate	351D	EN SA
1 Threshold	Furnished by Door Mfg	OT
1 Weatherstrip	Furnished by Door Mfg	OT
1 Sweep	Furnished by Door Mfg	OT

NOTE: Balance of access control components by Security Provider

Set: 5

Doors: 101, 102, 104, 108, 110, 111, 116A, 120A, 121A, 125A

3 Hinges	TA2714 4.5" x 4.5"	US26D MK
1 Lockset (Office Function)	28-7G05 LL	US26D SA
1 Wall Stop	409	US32D RO
3 Silencers	608	RO

Set: 6

Doors: 107, 109, 112, 113, 114

3 Hinges	TA2714 4.5" x 4.5"	US26D MK
1 Lockset (Storeroom Function)	28-7G04 LL	US26D SA
1 Wall Stop	406	US32D RO
3 Silencers	608	RO

Set: 7

Doors: 117A, 117B, 119A, 119B, 122A, 122B, 124A, 124B

1 Pocket Frame Kit	PF28200A7254-2x6	PE
1 1 3/4" Door Adapter	PF134 Kit	PE
1 Pocket Door Pull (1 3/4" door)	890	US26D RO

Set: 8

Doors: 105, 106

3 Hinges	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Latchset (Privacy Function)	28-7U65 LL	US26D SA
1 Wall Stop	409	US32D RO
3 Silencers	608	RO

Set: 9

Doors: 118A, 118B, 123A, 123B

4 Hinge	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Latchset (Passage Function)	28-7U15 LL	US26D SA
1 Wall Stop	406	US32D RO
4 Silencers	608	RO
1 Dutchdoor Bolt	630-4	US26D RO

END OF SECTION 087100

SECTION 08 8000

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass.
 - 1. Glass for aluminum doors.
 - 2. Glass for hollow metal frames.
 - 3. Glass for wood doors.
- B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 08 1113 – Hollow Metal Frames.
- B. Section 08 1416 – Flush Wood Doors: Glazed Doors.
- C. Section 08 4313 - Aluminum Entrances.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 1999 (Reapproved 2005).
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2010.
- D. ASTM C 1036 - Standard Specification for Flat Glass; 2001.
- E. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- F. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass; 2009.
- G. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005.
- H. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.
- I. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.
- J. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2004.
- K. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 2008.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
 - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
 - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
 - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

1.05 CODE REQUIREMENTS

- A. IBC-2012, Sec. 2403 – Each lite shall bear manufacturer's label designating the type and thickness of the glass. Each unit of tempered glass shall be permanently identified by the manufacturer. The identification shall be etched or ceramic fired on the glass and be visible when the unit is glazed.
- B. IBC-2012, Sec. 2406 – Individual glazed areas in hazardous locations shall pass the test requirements of 'Safety Standard for Architectural Glazing Materials' Consumer Product Safety Commission (CPSC) 16 CFR 1201 or by comparative test shall be proved to produce at least equivalent performances.

1.06 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

1.07 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five (5) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
- C. Provide a five (5) year warranty to include coverage for delamination of laminated glass and replacement of same.

PART 2 PRODUCTS

2.01 GLAZING TYPES

2.02 FLAT GLASS MATERIALS

- A. Manufacturers:
 - 1. AGC, Flat Glass North America, Inc., www.afgglass.com
 - 2. TGP, Technical Glass Industries, Kirkland, Washington
 - 3. Sumiglass, Columbus, Ohio
 - 4. PPG Industries, Inc.: www.ppgglazing.com.
- B. Float Glass: All glazing is to be float glass unless otherwise indicated.
 - 1. Annealed Type: ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
 - 2. Heat-Strengthened and Fully Tempered Types: ASTM C 1048.
 - 3. Tinted Types: Color and performance characteristics as indicated.
 - 4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- C. Clear Float Glass: Clear, annealed.
 - 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
- D. Tempered Safety Glass: Clear; fully tempered with horizontal tempering.
 - 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
 - 2. Comply with 16 CFR 1201 test requirements for Category II.
 - 3. Provide this type of glazing in the locations required by code.
 - a. Glazed lites in doors.

2.03 SEALED INSULATING GLASS MATERIALS

- A. Manufacturers:
 - 1. Any of the manufacturers listed under Flat Glass Materials.

- B. Insulated Glass Units: Double pane with glass to elastomer edge seal.
 - 1. Outer pane of clear glass, inner pane of Low E glass.
 - 2. Comply with ASTM E 774 and E 773, Class CBA.
 - 3. Purge interpane space with dry hermetic air.
 - 4. Total unit thickness of 1 inch minimum.
- C. Edge Seal Construction: Aluminum, bent and soldered corners.
- D. Edge Seal Material: Black color.

2.04 GLAZING COMPOUNDS

- A. Manufacturers:
 - 1. Bostik, Inc.: www.bostik-us.com.
 - 2. GE Plastics: www.geplastics.com.
 - 3. Pecora Corporation: www.pecora.com.
 - 4. Sonneborn, ChemRex, Inc.: www.chemrex.com
- B. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; Shore A Hardness Range 20 to 35; color as selected.
- C. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.
 - 1. Glass to metal
 - 2. Glass to glass

2.05 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one face.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
 - 1. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
 - b. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

- A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

3.05 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

3.06 SCHEDULE

- A. Fixed Glass at Exterior Aluminum Doors
 - 1. Glass to be 1" thick insulating units.
 - 2. Inner Layer: 1/4 inch thick clear float glass, annealed, heat strengthened
 - 3. Outer Layer: 1/4" thick clear float glass, annealed, heat strengthened with Low E coating on No. 2 surface.
 - 4. Tempered safety glass where required by code.
- B. Fixed Glass at Interior Hollow Metal Frames
 - 1. 1/4 inch clear float glass, annealed.
 - 2. Tempered safety glass where required by code.
- C. Interior Wood Door Lites
 - 1. 1/4 inch clear float glass, annealed at non-rated doors.
 - 2. Tempered safety glass where required by code.

END OF SECTION

DIVISION 09

FINISHES

**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Gypsum wallboard.
- B. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Building framing.
- B. Section 06 1636 - Wood Panel Product Sheathing
- C. Section 07 2116 - Blanket Insulation: Exterior and interior wall insulation
- D. Section 09 9000 - Painting and Coating

1.03 REFERENCE STANDARDS

- A. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 1999.
- B. ANSI A118.9 - American National Standard Specifications for Cementitious Backer Units; 1999.
- C. ASTM C 475/C 475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002.
- D. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board; 2004a.
- E. ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2009.
- F. ASTM C 1396/C 1396M - Standard Specification for Gypsum Board; 2004.
- G. GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association; 1996.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

1.05 QUALITY ASSURANCE

- A. Perform in accordance with ASTM C 840.
- B. Applicator Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 3 years of documented experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C 840 and GA-216.

2.02 GYPSUM BOARD MATERIALS

- A. Manufacturers:
 - 1. G-P Gypsum Corporation: www.gp.com/gypsum.
 - 2. National Gypsum Company: www.nationalgypsum.com.
 - 3. USG: www.usg.com.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
 - 1. Regular Type:
 - a. Application: Use for vertical surfaces, unless otherwise indicated.
 - b. Thickness: 5/8 inch.
 - c. Edges: Tapered.
- C. Water-Resistant Gypsum Board: ASTM C 1396/C 1396M; ends square cut.

1. Application: Bottom of wood trusses at ceiling, vertical surfaces in toilets, laundry, and janitor closets.
2. Core Type: Regular.
3. Thickness: 5/8 inch.
4. Edges: Tapered.

2.03 ACCESSORIES

- A. Finishing Accessories: ASTM C 1047, galvanized steel or rolled zinc, unless otherwise indicated.
 1. Types: As detailed or required for finished appearance.
 2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.
- B. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.
- C. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
 1. 1" type S bugle head for single layer of 5/8" gypsum board to wood studs.
 2. 1-5/8" type S bugle head for 2 layers of gypsum board to wood studs.
- D. Adhesive for Multi-Layer Partitions: USG Durbond joint compound or USG ready mix joint compound for multi-layer partitions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 GYPSUM BOARD INSTALLATION

- A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints.
- C. Single-Layer Non-Rated: Install gypsum board parallel to framing, with ends and edges occurring over firm bearing.
- D. Screw Application (Power Tool):
 1. Set adjustment for proper screw depth prior to beginning.
 2. Screw head must be driven slightly below face of panel, but not break paper.
 3. Screw must enter perpendicular to panel face.
 4. Drive screws at least 3/8" from ends or edges of panel to provide a uniform dimple not over 1/32" deep.
 5. When screw head is driven solidly against panel and clutch disengaged, remove screwdriver instantly or motor will re-engage and chew up screw head or force it below surface of panel.
 6. Operate electric screwdriver constantly during usage.
 7. Screw Spacing:
 - a. 8" on center staggered at vertical abutting edges.
 - b. 12" on center in field of gypsum board panel.
- E. Multi-Layer Construction:
 1. At multi-layer partitions attach base layer in perpendicular application as described above.
 2. Second layer to be applied with adhesive evenly applied to first layer; second layer to have joints which are offset at least 10" from base layer joints.
 3. Base layer joints on opposite side of framing to be staggered.
 4. Base layer to be nailed 8" o.c. Face layer to be nailed at 8" o.c.
 5. Nail length for each layer to be long enough to penetrate stud 3/4".
 6. Follow recommendations for Gypsum Association Publication GA-216.
- F. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.

3.03 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. Or as indicated on plans.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
 - 1. Edge trim to be:
 - a. 200 - B metal trim with L-shaped channel by "Sheetrock".
 - b. #200 - A metal U trim with U-shaped channel by "Clark Dietrich".
 - c. Edge of gyp. board to be finished by way of feathering joint compound to required finish as scheduled.
 - d. 401/402 (j-stop) metal trim by "Sheetrock" will not be allowed.

3.04 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed all-purpose joint compound and finished with ready-mixed all-purpose joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C 840, as follows:
 - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
- C. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840 and as scheduled below.
 - 1. Walls and Ceilings to receive semi-gloss or eggshell Paint Finish: Level 3.
 - a. All joints and interior angles have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free from tool marks and ridges. The prepared surface is to be coated with drywall a primer prior to the application of final finishes.
- D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.05 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.06 FINISH LEVEL SCHEDULE

- A. Level 4: All walls and ceilings
 - 1. ASTM C840, GA214; Level 4 finish
 - a. Tape in joint compound at joints and interior angles.
 - b. Three (3) separate coats of compound at joints, angles, fasteners, and accessories. Compound shall be smooth and free of tool marks and ridges.

END OF SECTION

SECTION 09 3000

TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for wall applications.
- B. Accessories

1.02 RELATED REQUIREMENTS

- A. Section 07 9005 - Joint Sealers.
- B. Section 09 2116 - Gypsum Board Assemblies; for cementitious backing boards.

1.03 REFERENCE STANDARDS

- A. ANSI A108 Series/A118 Series/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 1999.
 - 1. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999.
 - 2. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 1999.
 - 3. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 1988.
- B. TCA (HB) - Handbook for Ceramic Tile Installation; Tile Council of North America, Inc.; 2005.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Provide product samples for color selection.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.
- B. Installer Qualifications: Company specializing in performing tile installation, with minimum of 3 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers:
 - 1. Crossville Ceramics Company, Crossville, Tennessee.
 - 2. American Olean: www.americanolean.com
 - 3. Dal-Tile: www.daltile.com
 - 4. Summitville Tiles, Inc: www.summitville.com.
- B. Glazed Wall Tile: ANSI A137.1
 - 1. Size and Shape: 4 inch square.
 - 2. Edges: Square.

3. Surface Finish: High gloss.
4. Colors: To be selected.

2.02 TRIM AND ACCESSORIES - METAL

- A. Manufacturer: Metal Transitions
 1. Schluter Systems L.P., Plattsburgh, New York
 2. Futura Industries: www.futuraind.com
- B. Transition Schedule:
 1. See drawings.
- C. Finish-All Transitions: Satin Anodized Aluminum

2.03 TRIM AND ACCESSORIES - CERAMIC

- A. Ceramic Trim: Matching bullnose, double bullnose, shapes in sizes coordinated with field tile.
 1. Applications: Use in the following locations:
 - a. Open Edges: Bullnose.
 2. Manufacturer: Same as for tile.

2.04 MORTAR MATERIALS

- A. Manufacturers:
 1. Laticrete International, Inc.; www.laticrete.com
 - a. Mortar for Floors only: Laticrete LHT
 - b. Mortar for Floors and Walls: Laticrete 4-XLT
- B. Meet ANSI A118.4.

2.05 GROUTS

- A. Manufacturers:
 1. Bostik, Inc.; Product: "True Color", pre-mixed, urethane grout.
- B. Meets ANSI A118.3.
 1. Color: As selected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and The Tile Council of North America Handbook recommendations.
- B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly.
- C. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- D. Form internal angles square and external angles bullnosed.
- E. Sound tile after setting. Replace hollow sounding units.
- F. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- G. Grout tile joints.

H. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 CLEANING

A. Clean tile and grout surfaces.

END OF SECTION

SECTION 09 5100 ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 RELATED REQUIREMENTS

- A. Section 21 000 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
- B. Section 23 3713 - Air Outlets and Inlets: Air diffusion devices in ceiling.
- C. Section 26 5113 - Interior Lighting: Light fixtures in ceiling system.
- D. Section 26 0548: Vibration and Seismic Controls: For seismic connections to ceiling system.

1.03 REFERENCE STANDARDS

- A. ASTM C 423 - Standard Text Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.
- C. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2013.
- D. ASTM D 3273 - Standard Test Method for Resistance to Growth Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016
- E. ASTM E 580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2017.
- F. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 2014.
- G. ASTM E 1477 - Standard Test Method for Luminous Reflectance factor of Acoustical Materials by Use of Integrating -Sphere Reflectometers; 2017.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 4 x 4 inch in size illustrating material and finish of acoustical units.
- D. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner, and perimeter molding.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.07 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

- B. Install acoustical units after interior wet work is dry.

1.08 EXTRA MATERIALS

- A. Provide 5 percent of total acoustical unit area of each type of acoustical unit for Williams Baptist College's use in maintenance of project.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

- A. Manufacturers:
1. Armstrong World Industries, Inc.: www.armstrong.com.
 2. BPB Celotex; Product Capaul: www.bpb-na.com.
 3. USG: www.usg.com.
 4. Certain Teed Ceilings: www.certainteed.com
- B. Acoustical Units - General: ASTM E 1264, Class A.
- C. Acoustical Panels Type A: Painted mineral fiber, ASTM E 1264 Type III, with the following characteristics:
1. Size: 24 x 24 inches.
 2. Thickness: 5/8 inches.
 3. Composition: Wet formed.
 4. Light Reflectance: 85 percent, determined as specified in ASTM E1264.
 5. NRC Range: 0.55, determined as specified in ASTM E1264.
 6. Ceiling Attenuation Class (CAC): 33, determined as specified in ASTM E1264.
 7. Edge: Square.
 8. Surface Color: White.
 9. Performance: No visible sag under conditions not to exceed 90 degrees F. and 90 percent humidity.
 10. Product: "Fine Fissured 1728 by Armstrong.
- D. Acoustical Panels Type B: Vinyl, faced mineral fiber, ASTM E 1264 Type IV, with the following characteristics:
1. Size: 24 x 24 inches.
 2. Thickness: 5/8 inches.
 3. Composition: Wet formed.
 4. Light Reflectance: 80 percent, determined as specified in ASTM E1264.
 5. NRC Range: .10 to .20, determined as specified in ASTM E1264.
 6. Ceiling Attenuation Class (CAC): 40-44, determined as specified in ASTM E1264.
 7. Edge: Square.
 8. Surface Color: White.
 9. Surface Pattern: Smooth.
 10. Product: Capaul Vinyl Shield A by BPB Celotex.

2.02 SUSPENSION SYSTEM

- A. Manufacturers:
1. Same as for acoustical units.
- B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, and perimeter moldings as required.
- C. Exposed Steel Suspension System – Type A: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.
1. Profile: Tee; Double flange, for square edge panels, 15/16 inch wide face.
 2. Construction: Double web.
 3. Finish: White painted.
 4. Product: Prelude ML by Armstrong.
- D. Exposed Aluminum Suspension System Moisture Resistant: Type B: Formed galvanized steel, commercial quality cold rolled; Heavy Duty; ASTM C635.

1. Extruded aluminum; prefinished capping
2. Profile: Tee; Double flange, for square edge panels, 15/16 inch wide face.
3. Finish: Painted White.
4. Product: Prelude XL, with white aluminum cap; 730/WA by Armstrong.

2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Touch-up Paint: Type and color to match acoustical tile and grid.
- D. Provide hold down clips at ceiling tiles at entry foyers/vestibules.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
- B. Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C635 and ASTM C636, earthquake resistant bracing/tying.
 1. Note: All suspended ceiling grid to be supported in accordance with ASTM Design E 580-78 (R84) for Zone 3, seismic; see detail on drawings.
- C. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- D. Locate system on room axis according to reflected plan.
- E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- J. Do not eccentrically load system or induce rotation of runners.
- K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 1. Use longest practical lengths.
 2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.

- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.
- G. Where round obstructions occur, provide preformed closures to match perimeter molding.
- H. Install hold-down clips on panels within 10 ft. of an exterior door.

3.04 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.05 SCHEDULE

- A. Typical 24" x 24" ceiling scheduled as "Type A, susp. acoust. tile".
 - 1. Acoustical panels: Type A.
 - 2. Suspension grid: Type A
- B. Moisture resistive 24" x 24" ceiling scheduled as "Type B, susp. acoust. tile".
 - 1. Acoustical panels: Type B
 - 2. Suspension grid: Type B

END OF SECTION

**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient base.
- D. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- B. Section 03 3000 - Cast-in-Place Concrete

1.03 REFERENCE STANDARDS

- A. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2004.
- B. ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2005.
- C. ASTM F 1066 - Standard Specification for Vinyl Composition Floor Tile; 2004.
- D. ASTM F - 1700 - Standard Specification for Solid Vinyl Tile
- E. ASTM F - 1514 - Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change.
- F. ASTM E - 925 - Standard Test Method for Resistance to Chemicals of Resilient Flooring.
- G. ASTM F 1861 - Standard Specification for Resilient Wall Base; 2002.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Selection Samples: Submit manufacturers complete set of color samples for Brackett Krennerich and Associates' initial selection.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect roll materials from damage by storing on end.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 MATERIALS - TILE FLOORING

- A. Luxury Vinyl Plank – (LVT1)
 - 1. Equal to LVT "Framework" tile as manufactured by J+J Flooring Group
 - 2. 9" x 48" tile with square edges.
 - 3. Tile Thickness: 5mm
 - 4. ASTM F-1700 Class 3, Type B
 - 5. Heat Stability: Passes ASTM F-1514
 - 6. Stain and Chemical Stability: passes ASTM F-925
 - 7. Radiant Panel: passes ASTM E-648

8. Smoke Chamber: passes ASTM E-662
9. Static Load Limit: passes ASTM F-970
- B. Luxury Vinyl Tile – (LVT2)
 1. Equal to LVT "Divergent" tile as manufactured by Mannington Commercial
 2. 18" x 18" tile with beveled edges.
 3. Tile Thickness: 2.5mm with 30 mil wear layer
 4. ASTM F-1700 Class 3, Type B
 5. Heat Stability: Passes ASTM F-1514
 6. Stain and Chemical Stability: passes ASTM F-925
 7. Radiant Panel: passes ASTM E-648, Class 1,
 8. Smoke Chamber: passes ASTM E-662, less than 450
 9. Static Load Limit: 750 PSI

2.03 MATERIALS - BASE

- A. Resilient Base: ASTM F 1861, Type TP, rubber; top set Style B, Cove, and as follows:
 1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648.
 2. Height: 4 inch.
 3. Thickness: 0.125 inch thick.
 4. Finish: Satin.
 5. Length: Roll.
 6. Color: Color as selected from manufacturer's standards.
 7. Accessories: Premolded external corners and end stops.
 8. Manufacturers:
 - a. Armstrong World Industries.
 - b. Johnsonite, Inc.: www.johnsonite.com.
 - c. Roppe Corp.: www.roppe.com.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
- C. Moldings and Edge Strips: Rubber/Metal.
 1. See details on drawings for type of transition strips.
 - a. Vinyl tile to epoxy flooring
 - b. Vinyl tile to concrete
- D. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesive materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F 710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Prepare sub-floor surfaces as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

- C. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION - TILE FLOORING

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- F. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure metal strips after installation of flooring with stainless steel screws.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- I. Install feature strips and floor patterns where indicated. Fit joints tightly.
- J. Install LVP (LVTI) in an 1/3 Drop Pattern.
- K. Install (LVT2) in an Ashlar Pattern.

3.05 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.
- C. Note: sealing and waxing of resilient flooring products will be performed by the owner.

3.07 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.08 SCHEDULE

- A. See Finish schedule on the drawings.

END OF SECTION

**SECTION 09 6700
EPOXY FLOORING**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Epoxy Flooring
- B. Epoxy Cove Base
- C. Accessories

1.02 SUBMITTALS

- A. Submit manufacturer's data sheets and product technical information.
- B. Submit samples for color selection.
- C. Prior to commencing work at architect's discretion, a 4' x 4' mockup must be installed on jobsite to show color, thickness, and texture before contract is to be awarded to epoxy flooring contractor and when approved, this will serve as the standard for the entire project. The person who installed the mockup must be the lead man for the duration of the job.
- D. Submit applicator's experience qualifications as required in 1.03, Quality Assurance below.

1.03 QUALITY ASSURANCE

- A. All materials must be recommended and manufactured by a single supplier to insure compatibility and proper chemical and mechanical bond.
- B. Surfacing shall be applied by a surfacing applicator approved by the Architect, with a minimum of seven (7) years experience installing the brand of surfacing in similar size and function projects. A list of ten (10) completed projects using the specified materials must be submitted proving seven (7) years experience by the lead mechanic.
- C. Surfacing applicator shall provide to the architect a completed list of jobs including the names of the Architect, General Contractor, and Owner, telephone numbers of all concerned, materials used, quantity installed and date completed on similar projects.
- D. Surfacing applicator must provide a written joint guarantee for materials and workmanship between applicator and surfacing manufacturer for one (1) year.
- E. Surfacing applicator or manufacturer seeking approval of products other than what is specified must supply samples, full product information, technical data with specifications, and certification from an independent testing laboratory that the product being submitted for approval meets all requirements of the performance properties specified within this specification, installation instructions and comply with the above quality assurances in writing.

1.04 PRODUCT STORAGE AND ENVIRONMENTAL CONDITIONS

- A. Material temperatures shall be a minimum of 60 F before use.
- B. Work on seamless flooring shall not commence until the building can be maintained at a minimum temperature of 60 F for 48 hours before, during and 48 hours after application. Areas shall also be broom clean and reasonably dust free and shall have adequately controlled ventilation with bright, uniform lighting.

1.05 PROJECT CONDITIONS

- A. Before commencing work, ensure environmental and site conditions are suitable for application and curing.
- B. Surfaces shall be acceptable in accordance with flooring manufacturer's recommendations.
- C. Notify Architect and Contractor in writing of unsuitable surfaces and conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

1.06 PROTECTION

- A. Protect adjacent surfaces from damage resulting from work of this trade. If necessary, mask and/or cover adjacent surfaces, fixtures, cabinet work, equipment, etc. by suitable means.

1.07 WARRANTY

- A. Applicator shall notify manufacturer of project requirements before bidding. An officer of the manufacturing company shall provide written statement before bidding; to the Architect, that they accept single source warranty for entire installation including labor for one year. By agreeing to sign warranty and supply product, manufacturer waives all rights of sellers' liability of warranty and limitation. Warranty shall include removal and replacement if proven defective. Defective items are, but not limited to debonding, regionalized discoloration, excessive wear and staining bodily fluids. Non-acceptance of above by manufacturer is grounds for rejection of product.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Flooring to be equal to "Cremona TG" using Grade 11 aggregate as supplied by Desco Coatings, Inc., (800) 426-4164.

2.02 SYSTEM DESCRIPTION

- A. A 3/16" thick, seamless, trowel-applied, 100% solids consisting of a combination of epoxies and multi-colored ceramic aggregates. **Broadcast systems are not accepted.**
- B. Provide 4" high base with 1" radius cove as scheduled on the drawings.
- C. Binder and all successive grout and top coats shall be 100% solids clear/epoxy resin. Ceramic coated quartz aggregates as supplied by Desco Coatings are to be used to achieve all color. No pigmented epoxy base or top coats allowed.

2.03 SURFACE TEXTURE

- A. Texture to be selected by architect.

2.04 MATERIAL PHYSICAL PROPERTIES

	TYPE TEST	TEST METHOD	TYPICAL VALUE
1	COMPRESSIVE STRENGTH	ASTM C-579	10,700 PSI (73.8 MPA)
2	TENSILE STRENGTH	ASTM D-638-91	6,800 PSI (46.9 MPA)
3	IMPACT RESISTANCE	GARDNER IMPACT TESTER	>160 IN./LB.
4	ABRASION RESISTANCE	ASTM D-4060	0.085 GM
5	FLAMMABILITY	ASTM D-635	SELF EXTINGUISHING
6	WATER ABSORPTION	ASTM C-413-88	0.3%
7	COEFFICIENT OF THERMAL EXPANSION	ASTM C-531-90	2.3 X 10 (5TH POWER) IN/IN/DEGREES F
8	FLEXURAL STRENGTH	ASTM C-580-90	3,520 PSI (24.3 MPA)
9	CURING SHRINKAGE	ASTM D-531-90	5.0 X 10 (4TH POWER) IN/IN
10	SHORE D HARDNESS	ASTM D-2240-91	80

PART 3 - EXECUTION

3.01 FLOORING PREPARATION

- A. Surface must be clean, sound and dry.
- B. Effectively remove concrete laitance on accessible floor surfaces by mechanical shot blast. Acid etching is not acceptable.

3.02 FLOORING APPLICATION

- A. Epoxy flooring to be installed prior to wall partitions. Epoxy flooring to be continuous under all partitions.
- B. Apply flooring in accordance with manufacturer's printed instructions, employing lead mechanic qualified under the quality assurance portion of this specification, using equipment specifically designed for this purpose.
- C. Minimums: Primer coat as recommended by Desco. Trowel body coat to be a 3 part mix of resin, activation, and aggregates. Grout coats (minimum of two) to fill porosity of body coat. If all porosity is not filled after two coats, a third is required. Topcoat as recommended by Desco with a medium sheen and stipple finish.
- D. Thickness: Desco Quartz Cremond TG is a hand troweled Grade 11 Desco quartz aggregate with 20% of grade 28 as a filler. The system should be hand troweled to 3/16" thickness over epoxy primer.
- E. Install integral cove base to height of 6" with 1/4" radius cove. See finish schedule on the drawings.
 - 1. Trowel apply vertical cove base.
 - 2. Hand sand cove base.
 - 3. Apply three coats of resin to assure a smooth surface and cove.
 - 4. Do not allow resin to puddle in cove.
- F. Finished work shall match approved samples; be uniform in thickness, sheen, color, pattern, and texture; and be free from defects detrimental to performance.

3.03 PROTECTION

- A. After completion of flooring the General Contractor shall protect flooring from damage by other trades.

END OF SECTION

**SECTION 09 9000
PAINTING AND COATING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, varnishes, and other coatings.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- D. Do Not Paint or Finish the Following Items:
 - 1. See Schedule- Surfaces To Be Finished, at end of section.
 - 2. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
 - 3. Items indicated to receive other finishes.
 - 4. Items indicated to remain unfinished.
 - 5. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 6. Floors, unless specifically so indicated.
 - 7. Glass.
 - 8. Concealed pipes, ducts, and conduits.
 - 9. Fiber cement lap siding (to have factory finish).
- E. See Schedule - Surfaces to be finished, at end of Section.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 – Unit Masonry.
- B. Section 05 5000 – Metal Fabrications for Shop Primed Items.
- C. Section 05 5001 – Metal Gates: Shop Primed Items.
- D. Section 07 4646 – Fiber Cement Siding: Factory Primed Trim.
- E. Section 08 1113 – Hollow Metal Frames.
- F. Section 08 1416 – Flush Wood Doors.
- G. Section 09 2116 – Gypsum Board Assemblies.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2003.

1.04 DEFINITIONS

- A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.05 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft. candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Sherwin-Williams Paints
 - 2. Pratt & Lambert
 - 3. Pittsburgh Paint
 - 4. Farrell-Calhoun
 - 5. Approved Equals

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
 - 2. Supply each coating material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Volatile Organic Compound (VOC) Content:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
- D. All materials to be first line, best quality, of the manufacturer.
- E. Chemical Content: The following compounds are prohibited:
 - 1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Cementitious Trim, three coats of latex enamel:
 1. One coat SW Loxon Exterior Acrylic Masonry Primer, LX2 series.
 2. Second and third coat SW Duration Exterior Gloss, K34-250 series.
- B. Ferrous Metals, Unprimed, Alkyd, 3 Coat:
 1. One coat of alkyd primer. SW Kem Kromik Metal Primer
 2. Gloss: Two coats of alkyd enamel; SW Industrial Enamel, Series B54Z.
- C. Ferrous Metals, Primed, Alkyd, 2 Coat:
 1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
 2. Gloss: Two coats of alkyd enamel; SW Industrial Enamel, Series B 54Z.
- D. Galvanized Metals, Alkyd, 3 Coat:
 1. One coat galvanize primer.
 2. Gloss: Two coats of alkyd enamel; SW Industrial Enamel B54Z.

2.04 PAINT SYSTEMS - INTERIOR

- A. Wood, Opaque, Latex, 3 Coat:
 1. One coat of latex primer sealer. SW Preprite Classic Latex Primer
 2. Semi-gloss: Two coats of latex enamel; SW Proclassic, Waterborne Acrylic Satin, Series B20.
- B. Wood, Transparent, Varnish, Stain:
 1. One coat of stain; SW Wood Classics Oil Stain, Series A 49-200.
 2. One coat sealer; SW Wood Classics Sanding Sealer, Series B26V43.
 3. Satin: Two coats of varnish; SW Wood Classics Oil Varnish, Series A66-300.
- C. Ferrous Metals, Unprimed, Alkyd, 3 Coat:
 1. One coat of alkyd primer. SW Kem Kromik Metal Primer
 2. Gloss: Two coats of alkyd enamel; SW Industrial Enamel, Series B54Z.
- D. Ferrous Metals, Primed, Alkyd, 2 Coat:
 1. Touch-up with alkyd primer.
 2. Gloss: Two coats of alkyd enamel; SW Industrial Enamel, Series B54Z.
- E. Gypsum Board, Latex, 3 Coat:
 1. One coat of primer sealer SW Preprite Classic Latex Wall Primer.
 2. Semi-gloss: Two coats of latex enamel; Duration Interior Latex.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces which affect work of this section.
- E. Marks: Seal with shellac those which may bleed through surface finishes.
- F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- H. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
- I. Interior Wood Items to Receive Opaque Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- J. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- K. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
- L. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Use paint systems defined for the substrates to be finished.
- B. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.

3.05 FIELD QUALITY CONTROL

- A. The painting contractor shall be responsible for any damage done to the work of other contractors, repairing same to the satisfaction of the architect. At the completion of work, this contractor shall clean off all paint spots, oil, and stain from floors, woodwork, glass, hardware, etc., and leave the entire building in satisfactory condition as far as his work is concerned.

- B. All work shall be performed by skilled mechanics. Provide drop clothes and protections for all surfaces not to be painted. All paints, stains, varnishes, and other finishes shall be evenly spread and flowed on and shall be free of runs, sags, and other defects. Each coat shall be thoroughly dry before applying succeeding coats. To product smooth and even finishes, all enamel or varnish applied to wood or metals shall be sanded between coats with fine sand paper. No exterior painting will be allowed during rainy, damp, or freezing weather. No interior painting will be permitted when temperature is below 50 degrees F. No painting will be permitted until all surfaces to be painted are dry.

3.06 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 SCHEDULE - SURFACES TO BE FINISHED

- A. Paint the surfaces described below under Schedule - Paint Systems and as indicated in the Finish Schedule on the drawings.
- B. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

3.08 SCHEDULE - PAINT SYSTEMS

- A. Gypsum Board: Finish all surfaces exposed to view.
- B. Wood: Finish all surfaces exposed to view.
- C. Wood Doors: All surfaced.
- D. Steel Frames
- E. Shop-Primed Metal Items: Finish all surfaces exposed to view.
 - 1. Finish the following items:
 - a. Exposed surfaces.
 - b. Pipe Bollards.
 - c. Metal Gates.
- F. Fiber Cement Trim and Fascia: Finish all surfaced exposed to view.
- G. Fiber Cement Soffit: Finish all surfaces exposed to view.

3.09 SCHEDULE - COLORS

- A. A complete Color Schedule will be issued by the architect.

END OF SECTION

**SECTION 09 9656
EPOXY COATINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Two component epoxy coating system.
- B. Accessories

1.02 RELATED SECTIONS

- A. Section 09 9000 – Painting and coating

1.03 REFERENCES

- A. ASTM D 3730 – Standard guide for testing high-performance interior architectural wall coatings.

1.04 SUBMITTALS

- A. See Section 01 3323 – Submittals
- B. Product Data: Provide data on all finishing products, including VOC content.

1.05 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, clean-up requirements, color designation, and instructions for mixing and reducing.
- C. Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Minimum Application Temperatures minimum 55 degrees F unless required otherwise by manufacturer's instructions, maximum 100 degrees F.
- C. Relative humidity: 85% maximum.
- D. Provide lighting level of 80 ft. candles measured mid-height at substrate surface

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The Sherwin-Williams Company; product; water-based catalyzed epoxy, series B70-200.

2.02 MATERIALS

- A. Description: two-component water based, catalyzed, epoxy resin coating formulated for high performance use in industrial and commercial environments.
- B. Performance
 - 1. Meets performance requirements of ASTM D3730
 - 2. Corrosion and chemical resistant
 - 3. Impact and abrasion resistant
 - 4. Flash rust resistant
 - 5. Suitable for USDA Inspected facilities
 - 6. Low odor and non-flammable
 - 7. Low VOC
 - 8. Tested for nuclear irradiation and decontamination, level II
- C. Characteristics
 - 1. Finish: Semi-gloss
 - 2. Color: to be selected

3. solids: 39 percent, plus or minus 2 percent, mixed.
4. Weight solids: 47 percent, plus or minus 2 percent, mixed.
5. VOC: 209 g/l; 1.74 lb. /gal., mixed.
6. Mix ratio: 2 component; 4:1 by volume
7. Recommended spreading rate per coat:
 - a. Wet mils: 6.5 – 8.0
 - b. Dry mils: 2.5 – 3.0
 - c. Coverage: 200 – 250 sq.ft./gal. approximate.
8. Flash Point: 201 degrees F, PMCC, mixed

2.03 ACCESSORIES

- A. Provide all accessories required for a complete application.

PART 3 EXECUTION

3.01 PREPARATION

- A. Follow all requirements of Section 09 9000, Painting and Coating, paragraph 3.02

3.02 APPLICATION

- A. Maintain temperature requirements as specified.
- B. Do not exceed manufacturer's recommended pot life of materials.
- C. Follow manufacturer's printed application instructions.

3.03 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.04 FIELD QUALITY CONTROL

- A. Follow all requirements of Section 09 9000, Painting and Coating, Paragraph 3.05

3.05 SCHEDULE – SURFACES TO BE FINISHED

- A. Coat the surfaces as indicated in the finish schedule on the drawings.

3.06 COATING SYSTEM

- A. Gypsum Board
 1. First coat: SW Preprite 200 Latex Primer at 1.0 – 1.4 mils dft.
 2. Second and third coat: SW Water based catalyzed epoxy at 3.0 mils dft.

END OF SECTION

DIVISION 10
SPECIALTIES

**SECTION 10 1416
BRONZE PLAQUE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bronze Plaque

1.02 SUBMITTALS

- A. See Section 01 3323 – Submittals, for submittal procedures.
- B. Submit lay-out of proposed plaque for approval by architect prior to actual casting. Include fastening details, border details, etc.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide bronze plaque with textured background, ground face, beveled border with ribbon letters, for blind fastening to exterior siding.
- B. Lettering and lay-out to be determined; custom logos required.
- C. Size: 16" x 20"

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install at the direction of the architect; see drawings.
- B. Install in strict accordance with manufacturer's instructions for blind fastening to gypsum board.

END OF SECTION

SECTION 10 1419
CAST ALUMINUM LETTERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sign – Individual letters

1.02 SUBMITTALS

- A. See Section 01 3323 – Submittals, for submittal procedures.
- B. Provide manufacturer's data lettering material, finish and mounting.
- C. Shop drawing showing layout and length required for signage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gemini Incorporated, Cannon Falls, MN.
- B. A.R.K. Ramos, Oklahoma City, OK.
- C. Metal Arts, Mandan, North Dakota.

2.02 MATERIALS

- A. Letters:
 - 1. Cast aluminum individual letters; minimum 1" thick.
 - 2. Style: Garamond
 - 3. Size: 6" high letters
 - 4. Finish: Baked on Enamel Finish
 - 5. Mounting: to Fiber Cement Board
- B. Lettering: The following lettering is required and reads as follows:
 - 1. 6 inch tall lettering to read: **POCAHONTAS BLACK RIVER HEAD START EARLY HEAD START CHILD DEVELOPMENT CENTER**

PART 3 EXECUTION

3.01 WORKMANSHIP

- A. Install in accordance with manufacturer's instructions for mounting to Fiber Cement Board.

END OF SECTION

SECTION 10 1425
DOOR AND ROOM SIGNS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Door Signs.

1.02 REFERENCES

- A. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; US Architectural and Transportation Barriers Compliance Board; 2004.

1.03 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature for sign types specified, including components and accessories.
- C. Selection Samples: Two sets of color chips representing manufacturer's full range of available colors.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Sign types to comply with ADAAG requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store products of this section in manufacturer's unopened packaging until installation.
- B. Maintain dry, heated storage area for products of this section until installation of products.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Kroy Sign Systems, Scottsdale, Arizona
- B. Best Sign Systems, Montrose, Colorado
- C. Mohawk Sign Systems, Schenectady, New York.
- D. Archway Graphics, Little Rock, Arkansas

2.02 MANUFACTURED UNITS

- A. Braille Signs:
 - 1. Acceptable product: Acrylic Graphic Braille Signs.
 - 2. Colors: Face color to be selected; graphics and letter color white.
 - 3. Colors: Selected by Brackett Krennerich Architects from manufacturer's full range of available colors.
 - 4. Sign size: 6-1/2" wide x 6-1/2" tall, See graphic layout at end of section.
 - 5. Graphics: International symbols for indicated information.
 - 6. Lettering: 5/8 inch and 1" high, raised 1/32 inch, with grade II braille coding
 - 7. Provide pictograms at all restroom doors.
 - 8. Unframed signs; edges polished or finished.
 - 9. 1" Metal Paper Holder - Satin Nickle
- B. Lettering Style: Helvetica Medium
- C. Accessories: Installation accessories specified in manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to receive signs have been finished, and that finishes are dry and correctly cured.

3.02 INSTALLATION

- A. Install room and door signs in accordance with manufacturer's printed installation instructions.

B. Sign mounting: See drawings for standard mounting heights.

3.03 SCHEDULES

- A. A complete list of door signage wording will be provided to the contractor prior to fabrication of signs.
1. Provide one (1) sign per door.

END OF SECTION

**SECTION 10 1453
HANDICAPPED SIGNS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Handicapped parking signs as shown and detailed on the drawings.
- B. One sign is required for each handicapped parking space.

1.02 REFERENCES

- A. ATBCB ADAAG – American with Disabilities Act Accessibility Guidelines; US Architectural and Transportation Barriers Compliance Board.

1.03 SUBMITTALS

- A. See Section 01 3323 – Submittals for submittal procedures.
- B. Manufacturers Data: Provide manufacturer's data on sign layout, colors, and sign materials.

1.04 REGULATORY REQUIREMENTS

- A. Signs must be fabricated and installed per ATBCB ADAAG standards.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Sign: .080" thick steel, screen printed sign as shown on the drawings.
- B. Post: 1-1/2" diameter galvanized steel pipe to be set and tack welded in metal sleeve. Metal sleeve by general contractor.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Sign to be fastened to steel pipe with 2-1/4" round head bolts.
- B. Sign to be free of nick and edge burrs.
- C. Sign Colors: To be green border and legend and blue/white international symbol of accessibility equal to R7-8 from the Manual of Uniform Traffic Control Devices.
- D. Provide cap at top of sign pipe.
- E. Provide additional "van accessible" sign at each handicapped sign, where applicable.

END OF SECTION

**SECTION 10 2813
TOILET ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Toilet Room Accessories.
- B. Utility Room Accessories.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry
- B. Section 09 2116 - Gypsum Board Assemblies.

1.03 REFERENCES

- A. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; US Architectural and Transportation Barriers Compliance Board; 2004.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's product data for products specified, indicating selected options and accessories.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum five (5) years of documented experience producing products of the types specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Factory-apply strippable protective vinyl coating to sight-exposed surfaces after finishing of products; ship products in manufacturer's standard protective packaging.
- B. Storage and Protection: Store products in manufacturer's protective packaging until installation.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's standard warranty against defects in product workmanship and materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Bobrick Washroom Equipment, Los Angeles, California.
- B. Bradley Corporation, Menomonee Falls, Wisconsin.
- C. Gamco, Franklin Brass, Durant, OK.
- D. Supply all products of this section from a single manufacturer.

2.02 MATERIALS

- A. Stainless Steel Sheet: ASTM A 240/A 240M, Type 304, 18-8 alloy.

2.03 TOILET ACCESSORIES

- A. Toilet Paper Holder: Model B-76857, Bobrick.
- B. Towel Dispenser: Model B-4262 Bobrick.
- C. Grab Bar: Model B-6897 and Model B-6806 Bobrick
 - 1. Sizes and configurations: as indicated on the drawings.
- D. Soap Dispenser, Wall Mounted: Model B-2111 Bobrick
- E. Baby Changing Station: Model B-2210, Bobrick
- F. Mop Holder: Model B-223 Bobrick

2.04 MIRRORS

- A. Mirror: Model B-290; Bobrick
 - 1. Frame: Angle, Type 304 stainless
 - 2. Mirror: Plate glass
 - 3. Size: As indicated on drawings
 - 4. Finish: No. 4 satin stainless steel
- B. Angle Mirror Frames: Fabricated from 0.050 inch stainless steel, formed to 3/4 by 5/8 inch angle; heliarc-welded corners, finished to match sheet finish; concealed "H" type mounting bracket with tamper-proof fasteners.
- C. Plate Glass Mirror: 1/4 inch thick polished plate glass, ASTM C1036, Type I, Class 1, quality Q1 mirror select; silver-coated, hermetically sealed with uniform electrolytically-deposited copper plating.

2.05 GRAB BARS

- A. Grab Bars - Basic Requirements: Fabricated to comply with ASTM F 446 and to withstand a 900 pound force, from ASTM A 554 stainless steel tubing, 0.050 inch, Type 304, 18-8 alloy; formed 1-1/2 inch radius return to wall at each end; each end heliarc-welded to minimum 11 gage stainless steel circular flange; welds finished to match tube finish.
- B. Grab Bars: Series B-6806; Bobrick.
 - 1. Sizes and configurations: As indicated on drawings.
- C. Grab Bar Concealed Mounting Flanges: Stainless steel, 3 inch diameter by 1/2 inch deep, with 0.0897 inch steel tenon plate for concealed attachment using three set screws.
- D. Grab Bar Snap-On Mounting Flanges: Snap on stainless steel cover, 0.0313 inch, 3 inch diameter by 1/2 inch deep, for concealing grab bar mounting flange.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install toilet accessories plumb and level in accordance with manufacturer's printed installation instructions.
- B. Locate toilet accessories at heights specified by Americans with Disabilities Act (ADA).

3.02 CLEANING

- A. Remove manufacturer's protective vinyl coating from sight-exposed surfaces 24 hours before final inspection.
- B. Clean surfaces in accordance with manufacturer's recommendations.

3.03 PROTECTION OF INSTALLED PRODUCTS

- A. Protect products from damage caused by subsequent construction activities.
- B. Field repair of damaged product finishes is prohibited; replace products having damaged finishes caused by subsequent construction activities.

3.04 SCHEDULE (CONTRACTOR TO VERIFY QUANTITIES FROM PLANS)

- A. Toilet 105 to have:
 - 1. 1 Toilet Paper Holder (TPH)
 - 2. 1 Towel Dispenser (TD)
 - 3. 1 Soap Dispenser (SD)
 - 4. 1 Mirror (M-2)

- B. Toilet 106 to have:
 - 1. 1 Toilet Paper Holder (TPH)
 - 2. 1 Towel Dispenser (TD)
 - 3. 1 Soap Dispenser (SD)
 - 4. 1 Mirror (M-2)
 - 5. 1 Grab Bar (18") (GB-18)
 - 6. 1 Grab Bar (GB-1)
 - 7. 1 Baby Changing Station (DT-1)
- C. Classroom 116, 120, 121, and 125, each to have:
 - 1. 1 Towel Dispenser (TD)
 - 2. 1 Soap Dispenser (SD)
- D. Toilet and Changing 118 and 123, each to have:
 - 1. 2 Toilet Paper Holder (TPH)
 - 2. 2 Towel Dispenser (TD)
 - 3. 2 Soap Dispenser (SD)
 - 4. 1 Grab Bar (24") (GB-2)
 - 5. 1 Grab Bar (42") (GB-3)
 - 6. 1 Mirror (M-1)
- E. Janitor 112 to have:
 - 1. 1 Mop Holder (MH-1)

END OF SECTION

**SECTION 10 4116
EMERGENCY KEY CABINETS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Emergency Key Cabinets

1.02 RELATED SECTIONS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Provide manufacturer's data and test results.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. KNOX Company, Phoenix, AZ; Series 1650 Knox-Box

2.02 PERFORMANCE

- A. Holds 2 Key in interior compartment
- B. High Security U.L. listed lock
- C. Resists moist conditions with a weather resistant door
- D. Exterior Dimensions: 5" H x 4" W x 27/16" D
- E. Color: Black
- F. Weight: 7 lbs.
- G. Mounting: Surface Mount

2.03 MATERIALS

- A. 1/4" Steel plate housing.
- B. 1/4" thick steel door with interior gasket seal and stainless steel door hinge.
- C. Lock to have 1/8" thick dust cover with tamper seal mounting capability.
- D. Lock: UL Listed. Double-action rotating tumblers and hardened steel pins accessed by biased cut key.

2.04 ACCESSORIES

- A. Provide 5/16" Grade 5 bolts with large heavy steel washers for through wall fastening

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in stick accordance with manufacturer's printed instructions.
- B. Install at location shown on the drawings.

3.02 SCHEDULE

- A. Provide one (1) Knox-box cabinet; where indicated on drawings.
- B. Cabinet to hold 1 key for electrical shunt trip and 1 building access key.

END OF SECTION

**SECTION 10 4400
FIRE PROTECTION SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.

1.02 REFERENCE STANDARDS

- A. NFPA 10 - Standard for Portable Fire Extinguishers; National Fire Protection Association; 2002.

1.03 PERFORMANCE REQUIREMENTS

- A. Conform to NFPA 10.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide extinguisher operational features.

1.05 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers, Cabinets and Accessories:
 - 1. JL Industries, Inc.: www.jlindustries.com.
 - 2. Larsen's Manufacturing Co.: www.larsensmfg.com.
 - 3. Potter-Roemer: www.potterroemer.com.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
- B. Dry Chemical Type: Painted steel tank, with pressure gage.
 - 1. Class: A, B, C.
 - 2. Size 10.
 - 3. Finish: Baked enamel.

2.03 FIRE EXTINGUISHER CABINETS

- A. Metal: Formed factory painted steel sheet; 0.036 inch thick base metal.
- B. Cabinet Configuration: Semi-recessed type.
 - 1. Sized to accommodate accessories.
 - 2. Form cabinet enclosure with right angle inside corners and seams. Form perimeter trim and door stiles.
- C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
- D. Door Glazing: Plastic, clear, 1/4 inch thick acrylic. Set in resilient channel gasket glazing.
- E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- F. Weld, fill, and grind components smooth.
- G. Finish of Cabinet Exterior Trim and Door: Factory painted.
- H. Finish of Cabinet Interior: White enamel.

- I. J.L. Industries: "Panorama" Model 1016, C10; semi-recessed.
 1. Provide Fire-FX option on all extinguisher cabinets.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, See drawings.
- C. Secure rigidly in place.
- D. Place extinguishers and accessories in cabinets.
- E. Contractor is responsible for filling and servicing extinguishers ready for building occupancy.

3.03 SCHEDULES

- A. Fire extinguishers and cabinets located on the drawings and shown as "F.E.C."
- B. Fire Extinguisher located on the drawings and shown as F.E.

END OF SECTION

DIVISION 31

EARTH WORK

SECTION 31 1000 SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clearing and protection of vegetation.
- B. Removal of existing debris.

1.02 RELATED REQUIREMENTS

- A. Section 01 1100 - Summary: Limitations on contractor's use of site and premises.
- B. Section 01 1100 - Summary: Sequencing and staging requirements.
- C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- D. Section 01 5713 - Temporary Erosion and Sediment Control.
- E. Section 01 7300 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.
- F. Section 02 4100 - Demolition: Removal of built elements and utilities.
- G. Section 31 2200 - Grading: Topsoil removal.
- H. Section 31 2200 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
- I. Section 31 2323 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

1.03 PROJECT CONDITIONS

- A. The contractor is to visit the site to examine and thoroughly familiarize himself with the existing conditions before submitting his bid.
- B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- C. Comply with other requirements specified in Section 01 7000.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SITE CLEARING

- A. Comply with other requirements specified in Section 01 7000.
- B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not disrupt utilities to the owner's existing facilities without scheduling and coordinating with the owner and architect.
- E. Demolish and remove from the site all existing drives, curbs, and walks from:
 - 1. Areas to be covered by building, drives, walks, and exterior slabs.
 - 2. As noted on drawings to be removed.
- F. Protect existing structures and other elements that are not to be removed.

3.03 VEGETATION

- A. **Scope:** Remove trees, shrubs, brush, stumps, paving, light poles, drives, site furnishings, and fencing in areas to be covered by building structure, paving, lawns, and planting beds.
- B. **Vegetation Removed:** Do not burn, bury, landfill, or leave on site.
 - 1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.

END OF SECTION

SECTION 31 2200 GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal and storage of topsoil.
- B. Rough grading and excavating the site for site structures, building pads, and paving.
- C. Finish grading.

1.02 RELATED REQUIREMENTS

- A. Section 31 1000 - Site Clearing.
- B. Section 31 2316 - Excavation.
- C. Section 31 2323 - Fill: Filling and compaction.

1.03 PROJECT CONDITIONS

- A. Protect above- and below-grade utilities that remain.
- B. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from grading equipment and vehicular traffic.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil:
 - 1. Topsoil brought onto site must meet the following requirements; source of topsoil subject to architect's approval.
 - 2. Graded.
 - 3. Free of roots, rocks larger than ½ inch, subsoil, debris, large weeds, and foreign matter.
 - 4. Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds and roots.
 - 5. pH value of minimum 5.4 and maximum 7.0.
- B. Other Fill Materials: See Section 31 2323.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect from damage above-and below-grade utilities to remain.
- D. Notify utility company to remove and relocate utilities.

3.03 ROUGH GRADING

- A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
- B. Do not remove topsoil when wet.
- C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.
- D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.
- E. When excavating through roots, perform work by hand and cut roots with sharp axe.
- F. See Section 31 2323 for filling procedures.

- G. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key fill material to slope for firm bearing.
- H. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.04 SOIL REMOVAL and STOCKPILING

- A. Stockpile topsoil to be re-used on site; remove remainder from site.
- B. Stockpile subsoil to be re-used on site; remove remainder from site.
- C. Stockpiles to be re-used on site: Pile depth not to exceed 8 feet; protect from erosion.

3.05 FINISH GRADING

- A. Before Finish Grading:
 - 1. Verify building and trench backfilling have been inspected.
 - 2. Verify subgrade has been contoured and compacted.
- B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove soil contaminated with petroleum products.
- C. Where topsoil is to be placed, scarify surface to depth of 6 inches.
- D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 6 inches.
- E. Place topsoil in areas where seeding, sodding, and planting are indicated.
- F. Place topsoil where required to level finish grade.
- G. Place topsoil to the following compacted thicknesses:
 - 1. Areas to be Sodded: 6 inches to 2 inches below finish grade.
 - 2. Planting Beds: 12 inches deep to 4 inches below finish grade to allow for mulch.
- H. Place topsoil during dry weather.
- I. Remove roots, weeds, rocks, and foreign material while spreading.
- J. Near plants and buildings spread topsoil manually to prevent damage.
- K. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.
- L. Lightly compact placed topsoil.
- M. Finish grading to be below weep holes where masonry walls occur.

3.06 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.
- B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).
- C. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.
- D. Top Surface of Finish Grade: Plus or minus 1/2 inch.

3.07 FIELD QUALITY CONTROL

- A. See Section 31 2323 for compaction density testing.

3.08 CLEANING

- A. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 31 2316 EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Excavating for building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.
- B. Trenching for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS

- A. Section 01 5713: Erosion control.
- B. Section 31 2200 - Grading: Grading.
- C. Section 31 2323 - Fill: Fill materials, filling, and compacting.

1.03 PROJECT CONDITIONS

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Protect plants, lawns, and other features to remain.
- C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 2200 for additional requirements.

3.02 EXCAVATING

- A. Excavate to accommodate new structures and construction operations.
- B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. Slope banks of excavations deeper than 4 feet to no greater than the angle of repose or unless shored to meet OSHA Requirements.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Cut utility trenches wide enough to allow inspection of installed utilities.
- F. Hand trim excavations. Remove loose matter.
- G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2323.
- H. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- I. Remove excavated material that is unsuitable for re-use from site.
- J. Remove excess excavated material from site.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

3.04 PROTECTION

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 31 2316.13

TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Backfilling and compacting for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Site Grading

1.03 REFERENCES

- A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001 (2004).
- B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.
- C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2000a.
- D. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2002.
- E. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2006.
- F. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.
- G. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.
- C. Materials Sources: Submit name of imported materials source.
- D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- E. Compaction Density Test Reports.

1.05 PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site:
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the Work are as indicated.
- D. Protect plants, lawns, and other features to remain.
- E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. General Fill: Subsoil excavated on-site or imported borrow.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

3. Conforming to ASTM D 2487 Group Symbol CL.
- B. Structural Fill - Fill Type Class 7: Conforming to State of Arkansas Highway Department standard.
- C. Concrete for Fill: Flowable Fill; maximum compressive strength of 2500 psi.
- D. Granular Fill: Fill Type Pipe Bedding - AHTD Class 8 Crushed Limestone (3/4" minus): conforming to State of Arkansas Highway Department standard.
- E. Granular Fill - Fill Type Class 7: Angular crushed washed stone; free of shale, clay, friable material and debris.
 1. Graded in accordance with AASHTO T 11 and T 27, within the following limits:
 - a. 1-1/2 inch sieve: 100 percent passing
 - b. 3/4 inch sieve: 50 to 90 percent passing.
 - c. No. 4 sieve: 25 to 55 percent passing.
 - d. No. 40: 10 to 30 percent passing.
 - e. No. 200: 3 to 10 percent passing.
- F. Topsoil: See Section 31 2200.

2.02 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.
- B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.
- C. Notify utility company to remove and relocate utilities.
- D. See Section 31 2200 for additional requirements.

3.02 TRENCHING

- A. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Cut trenches wide enough to allow inspection of installed utilities.
- E. Hand trim excavations. Remove loose matter.
- F. Remove excavated material that is unsuitable for re-use from site.
- G. Remove excess excavated material from site.

3.03 PREPARATION FOR UTILITY PLACEMENT

- A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.04 BACKFILLING

- A. Fill up to subgrade elevations unless otherwise indicated.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from building minimum 2 inches in 10 ft., unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- F. Correct areas that are over-excavated.
 - 1. Thrust bearing surfaces: Fill with concrete.
 - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density within a water content range above optimum; ASTM D-1557, Modified Proctor.
- G. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under paving, slabs-on-grade, and similar construction: Flowable Fill to sub-grade plus Structural Fill base per details for asphalt and concrete paving.
 - 2. At other locations: General Fill at 95 percent of maximum dry density within a water content range above optimum; ASTM D-1557, modified proctor.
- H. Reshape and re-compact fills subjected to vehicular traffic.

3.05 BEDDING AND FILL AT SPECIFIC LOCATIONS

- A. Use general fill unless otherwise specified or indicated.
- B. Utility Piping and Conduits:
 - 1. Bedding: Use granular fill (3/4" minus crushed limestone).
 - 2. Cover with general fill.
 - 3. Fill up to subgrade elevation.
 - 4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density standard proctor.
- C. At Pipe Culverts and Storm Drainage Piping:
 - 1. Bedding: Use granular fill.
 - 2. Cover with general fill.
 - 3. Fill up to subgrade elevation.
 - 4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density standard proctor.
- D. At paved parking lots, driveways, concrete walks and other site paving:
 - 1. Bedding: Use granular fill (3/4" minus crushed limestone).
 - 2. Cover to approximately 12 inches above pipe or conduit with granular fill.
 - 3. Use Flowable Fill Concrete for fill up to subgrade.

3.06 TOLERANCES

- A. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.07 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

3.08 CLEAN-UP

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Any removed or displaced strippings, topsoil, or excavation material that is to be removed from the site as a result of work required by this specification section is to be stockpiled on campus at a location to be determined by the owner.

- C. Spreading or dressing of stockpiled material deposited at the above location will be by the owner.

END OF SECTION

SECTION 31 2323

FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural fill for building pad.
- B. Filling, backfilling, and compacting for building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.
- C. Backfilling and compacting for utilities outside the building to utility main connections.
- D. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Removal and handling of soil to be re-used.
- B. Section 31 2200 - Grading: Site grading.
- C. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.
- D. Section 03 3000 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

- A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2009
- B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 2006.
- C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)) 2007.
- D. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2007.
- E. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2006.
- F. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.
- G. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.
- C. Materials Sources: Submit name of imported materials source.
- D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- E. Compaction Density Test Reports.

1.05 DELIVERY STORAGE AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where indicated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the work are as indicated.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. General Fill: Subsoil excavated on-site.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
 - 3. Conforming to ASTM D 2487 Group Symbol GC, SC, CL, GP, GM AND SM.
 - 4. May be soil removed from excavations.
 - 5. Alternate material if approved by architect.
- B. Structural Fill: Imported borrow.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
 - 3. Conforming to ASTM D 2487 Group Symbol CL.
 - a. Liquid limit no greater than 45; ASTM D 4318.
 - b. Plasticity index less than 25; ASTM D 4318.
- C. Concrete for Fill: As specified in Section 03 3000; compressive strength of 2500 psi.
- D. Granular Fill - Fill Type AHTD Class 7: Angular crushed washed stone; free of shale, clay, friable material and debris.
 - 1. Graded in accordance with AASHTO T 11 and T 27, within the following limits:
 - a. 1-1/2 inch sieve: 100 percent passing.
 - b. 3/4 inch sieve: 50 to 90 percent passing
 - c. No. 4 sieve: 25 to 55 percent passing
 - d. No. 40: 10 to 30 percent passing
 - e. No. 200: 3 to 10 percent passing.
- E. Topsoil: See Section 31 2200.

2.02 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.
- B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- C. If tests indicate materials do not meet specified requirements, change material and retest.
- D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 2200 for additional requirements.

3.02 PREPARATION

- A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 CUT AND FILL

- A. Site may require cut and fill.
- B. Contractor shall assume that potential undercutting and fill may be required below building and paving based on recommendations found in the geotechnical report. Therefore, a price is to be included in the base bid for **250 cubic yards** total of undercut and fill; this is to be included in the base bid.
- C. No undercut is to be completed without prior written approval from the architect.

3.04 FILLING

- A. Fill to subgrade elevations unless otherwise indicated.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain moisture content of fill materials to attain required compaction density as specified in the geotechnical report.
- E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- G. Slope grade away from building minimum 2.4 inches in 10 ft. unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- H. Correct areas that are over-excavated.
 - 1. Load-bearing foundation surfaces: Fill with concrete or flowable fill.
 - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density within a water content above optimum; ASTM D-1557 modified proctor..
- I. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under paving and slabs-on-grade: 95 percent of maximum dry density within a water content range above optimum; ASTM D-1557 modified proctor.
 - 2. At other locations: 95 percent of maximum dry density within a water content range above optimum; ASTM D 1557 modified proctor.
- J. Reshape and re-compact fills subjected to vehicular traffic.

3.05 FILL AT SPECIFIC LOCATIONS

- A. Use general fill unless otherwise specified or indicated.
- B. Structural Fill at all areas to be covered by paving and area to be covered by building:
 - 1. Fill to subgrade elevations.
 - 2. Maximum depth per lift: 6 inches, compacted.
 - 3. Compact to minimum 95 percent of maximum dry density within a water content range above optimum; ASTM D1557 modified proctor.
 - 4. Structural fill required at undercut areas.
- C. Under Interior Slabs-On-Grade:
 - 1. Use granular fill.
 - 2. Depth: 4 inches deep.
- D. At Foundation Walls:
 - 1. Use general fill.
 - 2. Fill to subgrade elevation.
 - 3. Compact each lift to 95 percent of maximum dry density within a water content range above optimum; ASTM D1557 modified proctor. .
 - 4. Do not backfill against unsupported foundation walls.
 - 5. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- E. Over Buried Utility Piping and Conduits in Trenches:
 - 1. Bedding: Use granular fill.
 - 2. Cover with general fill.
 - 3. Fill to subgrade elevation.
 - 4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density within a water content range above optimum; ASTM D1557 modified proctor.
- F. At Lawn Areas:

1. Use general fill.
 2. Fill to 8 inches below finish grade elevations.
 3. Compact to 90 percent of maximum dry density within a water content range above optimum; ASTM D1557 modified proctor. .
 4. See Section 31 2200 for topsoil placement.
- G. At Planting Beds:
1. Use general fill.
 2. Fill to 16 inches below finish grade elevations.
 3. Compact to 90 percent of maximum dry density.
 4. See Section 32 9300 - Plants, for topsoil mix and composition and placement.
- H. At Over-Excavated Footings:
1. Use concrete fill or flowable fill.

3.06 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch from required elevations.
- C. Top Surface of Filling under Floor Slabs: +/- 1/8 inch from required elevation.

3.07 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests:
 1. Tests shall be made every day fill is being placed and representative lifts tested.
 2. At least one test per 2,500 sq. ft. under buildings and structural areas.
 3. At least one test per 5,000 sq. ft. under paved areas.
 4. At least one test per 10,000 sq. ft. in general areas.
 5. Contractor shall notify architect when fill work is in progress.
 6. Test locations will be selected at random by architect with an effort made to select areas of questionable compaction.
- F. Proof roll compacted fill at surfaces that will be under slabs-on-grade and paving.

3.08 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 31 3116 TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Chemical soil treatment.

1.02 REFERENCE STANDARDS

- A. Title 7, United States Code, 136 through 136y - Federal Insecticide, Fungicide and Rodenticide Act; United States Code; 1947 (Revised 1996).
- B. Arkansas State Plant Board Requirements.

1.03 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Warranty: Submit warranty and ensure that forms have been completed in Williams Baptist College's name.

1.04 QUALITY ASSURANCE

- A. Installer: Company specified by & currently under contract with owner.
 - 1. Adams Pest Control, 1001 S. Main, Searcy, Arkansas, (501) 268-8623
 - 2. Licensed in the State of Arkansas.

1.05 SEQUENCING

- A. Apply toxicant 12 hours prior to installation of vapor barrier under slabs-on-grade.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year installer's warranty against damage to building caused by termites.
 - 1. Include coverage for repairs to building and to contents damaged due to building damage. Repair damage and, if required, re-treat.
 - 2. Inspect annually and report in writing to Williams Baptist College. Provide inspection service for 5 years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.
- B. Diluent: Recommended by toxicant manufacturer.

2.02 MIXES

- A. Mix toxicant to manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.
- B. Verify final grading is complete.

3.02 APPLICATION

- A. Spray apply toxicant in accordance with manufacturer's instructions.
- B. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.
- C. Re-treat disturbed treated soil with same toxicant as original treatment.
- D. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

3.03 PROTECTION

- A. Do not permit soil grading over treated work.

END OF SECTION

DIVISION 32

EXTERIOR IMPROVEMENTS

**SECTION 32 1123
AGGREGATE BASE COURSES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aggregate base course.

1.02 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Preparation of site for base course.
- B. Section 31 2323 - Fill: Compacted fill under base course.
- C. Section 32 1216 - Asphalt Paving: Binder and finish asphalt courses.
- D. Section 32 1313 - Concrete Paving: Finish concrete surface course.
- E. Section 31 2323 - Fill: Topsoil fill at areas adjacent to aggregate base course.

1.03 REFERENCE STANDARDS

- A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses; American Association of State Highway and Transportation Officials; 1965 (2004).
- B. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2010
- C. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.
- D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012.
- E. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2012.
- F. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.
- G. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2004.
- H. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.
- I. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2010.
- J. Standard Specifications for Highway Construction, Arkansas State Highway and Transportation Dept., Edition 2003

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Samples: 10 lb sample of each type of aggregate; submit in air-tight containers to testing laboratory.
- C. Materials Sources: Submit name of imported materials source.
- D. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- E. Compaction Density Test Reports.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When aggregate materials need to be stored on site, locate stockpiles where indicated.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
2. Prevent contamination.
3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey bench marks and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Coarse Aggregate Type Arkansas Highway and Transportation Department Sec. 303, Class 7: Angular crushed stone; free of shale, clay, friable material and debris.
1. Graded in accordance with ASTM D2487 Group Symbol GW.
 2. Graded in accordance with ASTM C136, within the following limits:
 - a. 1-1/2 inch sieve: 100 percent passing.
 - b. 3/4 inch sieve: 50 to 90 percent passing.
 - c. No. 4 sieve: 25 to 55 percent passing.
 - d. No. 40: 10 to 30 percent passing.
 - e. No. 200: 3 to 10 percent passing.

2.02 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of aggregate materials.
- B. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

- A. Under Bituminous Concrete Paving:
 1. Place coarse aggregate to a total compacted thickness of a minimum of 8 inches.
 2. Compact to 98 percent of maximum dry density.
 3. Compaction to be based on modified proctor curve.
- B. Place aggregate in maximum 7 inch layers and roller compact to specified density.
- C. Level and contour surfaces to elevations and gradients indicated.
- D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- E. Add water to assist compaction. If excess water is apparent, aerate to reduce moisture content and remove if determined necessary by architect.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted aggregate base course in accordance with ASTM D2922 and ASTM D3017.

- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 1557.
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests:
 - 1. Tests shall be made every day aggregate is being placed and representative lifts tested.
 - 2. At least one test per lift per 5,000 sq. ft.
 - 3. Contractor shall notify architect when aggregate work is in progress.
 - 4. Test locations will be selected at random by architect with an effort made to select areas of questionable compaction.

3.06 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

**SECTION 32 1216
ASPHALT PAVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single course bituminous concrete paving.

1.02 REFERENCE STANDARDS

- A. ASTM D 946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 1982 (Reapproved 2005).
- B. Standard Specifications for Highway Construction, Arkansas State Highway and Transportation Department, 1993.

1.03 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Preparation of site for paving and base.
- B. Section 31 2323 - Fill: Compacted subgrade for paving.
- C. Section 32 1124 - Aggregate Base Courses: Steel Slag
- D. Section 32 1723.13 - Painted Pavement Markings.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Submit design mixes of all paving for architect's review and approval.

1.05 PERFORMANCE REQUIREMENTS

- A. Design paving and subbase at streets and drives for light duty commercial vehicle traffic.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Arkansas Highways standard.
- B. Mixing Plant: Conform to State of Arkansas Highways standard.
- C. Obtain materials from same source throughout.

1.07 REGULATORY REQUIREMENTS

- A. Conform to Arkansas Highway and Transportation Department code for paving work on State Owned property.

1.08 FIELD CONDITIONS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Asphalt Cement: ASTM D 946 and AASHTO M 226.
- B. Aggregate for Binder Course-Gravel: or angular crushed, washed stone; free of shale, clay, friable material and debris.
 - 1. Graded in accordance with ASTM C 136, within the following limits:
 - a. 1-1/2 inch sieve: 100 percent passing.
 - b. 1 inch sieve: 90 to 100 percent passing.
 - c. 3/4 inch sieve: 90 percent maximum passing.
 - d. 8 sieve: 19 to 45 percent passing.
 - e. No. 200: 1 to 7 percent passing.
- C. Aggregate for Surface Course: Angular crushed washed stone; free of shale, clay, friable material and debris.

1. Graded in accordance with ASTM C 136, within the following limits:
 - a. 1/2 inch sieve: 100 percent passing
 - b. No. 4 sieve: 60 to 80 percent passing.
 - c. No. 10 sieve: 40 to 60 percent passing.
 - d. No. 20 sieve: 22 to 47 percent passing.
 - e. No. 40 sieve: 15 to 40 percent passing.
 - f. No. 80 sieve: 8 to 24 percent passing
- D. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
- E. Primer: In accordance with State of Arkansas Highways standards.
- F. Tack Coat: Homogeneous, medium curing, liquid asphalt.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

- A. Surface Course: Section 407, Standard Specifications for Highway Construction, Arkansas State Highway and Transportation Department, Edition of 1993 (Type II Marshall Mix).
 1. Fines to Asphalt Ratio: 0.60 to 1.4.
 2. Asphalt Content: 4.5 to 7.5 percent
 3. No. of Blows: 50
 4. Minimum Marshall Stability: 1,000 lbs.
 5. Marshall Flow (1/100"): 7 to 16
 6. Percent Air Voids: 2.0 to 5.0
 7. Minimum Percent VMA: 15
 8. Minimum Water Sensitivity Ratio: 70 percent
- B. Super-Pave Mix will not be allowed on this project. Material will be tested by the owner and if Super-Pave is found it will be removed at the Contractor's expense.

2.03 SOURCE QUALITY CONTROL

- A. Test mix design and samples in accordance with Arkansas Highway and Transportation Department Standard Specifications, 1993.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that compacted subgrade is dry and ready to support paving and imposed loads (proof roll with a fully loaded tri-axle dump truck).
- B. Verify gradients and elevations of base are correct.

3.02 BASE COURSE

- A. Section 32 1123 - Aggregate Base Courses.

3.03 PREPARATION - PRIMER

- A. Apply primer in accordance with manufacturer's instructions.
- B. Apply primer on aggregate base or subbase at uniform rate of 0.3 to 0.10 gal/sq yd.
- C. Apply primer to contact surfaces of curbs, gutters, and other concrete or asphalt joints.

3.04 PREPARATION - TACK COAT

- A. Apply tack coat in accordance with manufacturer's instructions.
- B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 0.03 to 0.10 gal/sq yd.
- C. Apply tack coat to contact surfaces of curbs, gutters and concrete drainage structures.
- D. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.05 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Install Work in accordance with State of Arkansas Highways standards.
- B. Place asphalt within 24 hours of applying primer or tack coat.
- C. Place to 2.0 inch compacted thickness at light duty paving.
- D. Install gutter drainage grilles and frames, manhole frames, and drainage items in correct position and elevation.
- E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- F. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.06 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Variation from True Elevation: Within 1/2 inch.

3.07 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for quality control.
- B. Provide field inspection and testing. Take samples and perform tests in accordance with AASHTO T-164.
- C. Provide Lab test results from hot mix samples pulled and tested at the production plant according to AHTD standard specifications.

3.08 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 7 days or until surface temperature is less than 140 degrees F.

END OF SECTION

**SECTION 32 1313
CONCRETE PAVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete sidewalks, integral curbs, gutters, and Accessories.
- B. Concrete paving at ADA parking spaces and dumpster pad.
- C. Mechanical Pads.

1.02 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Preparation of site for paving and preparation of subsoil at pavement perimeter for planting.
- B. Section 31 2323 - Fill: Compacted subbase for paving.
- C. Section 32 1123 - Aggregate Base Courses: Base course.
- D. Section 03 3000 - Cast-in-Place Concrete.
- E. Section 07 9005 – Joint sealers: Sealant for joints.
- F. Section 32 1723.13 – Pavement Markings.

1.03 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- D. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
- E. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
- F. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- G. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.
- H. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- I. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.
- J. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2012.
- K. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2012.
- L. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- M. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2010b.
- N. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- O. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- P. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2011.
- Q. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide data on joint filler, admixtures, and curing compound.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain cementitious materials from same source throughout.
- C. Follow recommendations of ACI 305R when concreting during hot weather.
- D. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.01 FORM MATERIALS

- A. Form Materials: Conform to ACI 301.
- B. Wood or steel form material, profiled to suit conditions.
- C. Joint Filler: Preformed; non-extruding bituminous type (ASTM D 1751).
 - 1. Thickness: 1/2 inch.
- D. Curb machine/slip form to detailed profile must be used for curbs and gutters.

2.02 REINFORCEMENT

- A. Reinforcing Steel and Welded Wire Reinforcement: Types specified in Section 03 2000.
- B. Reinforcing Steel: ASTM A615/A615M Grade 40 (280); deformed billet steel bars; unfinished finish.
- C. Steel Welded Wire Reinforcement: Plain type, ASTM A 185/A 185M; in coiled rolls; unfinished.
- D. Dowels: ASTM A615/A615M Grade 40 (280); deformed billet steel bars; unfinished finish.

2.03 CONCRETE MATERIALS

- A. Concrete Materials: As specified in Section 03 3000.
- B. Cement: ASTM C150/C150M Normal - Type I portland type, grey color.
- C. Fine and Coarse Mix Aggregates: ASTM C33.
- D. Fly Ash: ASTM C618, Class C.
- E. Water: Clean, and not detrimental to concrete.
- F. Air Entrainment Admixture: ASTM C260.

2.04 ACCESSORIES

- A. Curing Compound: ASTM C 309, Type 1, Class A.

2.05 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
 - 1. Admixtures may only be added upon approval of architect.
- D. Concrete Properties:

1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 psi.
2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
3. Water-Cement Ratio: Maximum 35 percent by weight for concrete with air.
4. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
5. Maximum Slump: 6 inches.

2.06 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.02 SUBBASE

- A. See Section 32 1123 for construction of base course for work of this Section.

3.03 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.04 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 REINFORCEMENT

- A. Place reinforcement at midheight of slabs-on-grade.
 1. Use reinforcement only where detailed on drawings.
- B. Place reinforcement as indicated.
- C. Interrupt reinforcement at contraction and expansion joints.
- D. Place dowels or reinforcement to achieve pavement and curb alignment as detailed.

3.06 PLACING CONCRETE

- A. Place concrete as specified in Section 03 3000.
- B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints.

3.07 JOINTS

- A. Align curb, gutter, and sidewalk joints.
- B. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components.
 1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
 2. Secure to resist movement by wet concrete.
- C. Provide scored or sawn joints:
 1. At 6 feet intervals.
 2. Between sidewalks and curbs.
- D. Provide keyed joints as indicated.

- E. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.08 FINISHING

- A. Area Paving: Light broom, texture perpendicular to pavement direction.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.

3.09 JOINT SEALING

- A. See Section 07 9005 for joint sealer requirements.

3.10 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

3.11 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000.
 - 1. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - 2. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of concrete operations.
 - 3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- B. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of concrete placed.
 - 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - 2. Perform one slump test for each set of test cylinders taken.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.12 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit vehicular traffic over pavement for 7 days minimum after finishing.

END OF SECTION

**SECTION 32 1713
PARKING BUMPERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Precast concrete parking bumpers and anchorage.

1.02 REFERENCE STANDARDS

- A. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- B. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.
- C. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- D. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- E. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete; 2009.

1.03 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide unit configuration, dimensions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Parking Bumpers: Precast concrete, conforming to the following:
 - 1. Nominal Size: 6 inches high, 8 inches wide, 6 feet long.
 - 2. Profile: As detailed on the drawings.
 - 3. Cement: ASTM C150, Portland Type I - Normal; gray color.
 - 4. Concrete Materials: ASTM C 33 aggregate, water, and sand.
 - 5. Reinforcing Steel: ASTM A615/A615M, deformed steel bars; unfinished finish, strength and size commensurate with precast unit design.
 - 6. Air Entrainment Admixture: ASTM C260.
 - 7. Concrete Mix: Minimum 4000 psi, 28 day strength, air entrained to 4 percent.
 - 8. Use rigid molds, constructed to maintain precast units uniform in shape, size and finish. Maintain consistent quality during manufacture.
 - 9. Embed reinforcing steel, and drill or sleeve for two dowels.
 - 10. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
 - 11. Minor patching in plant is acceptable, providing appearance of units is not impaired.
- B. Dowels: Steel, unfinished; 1/2 inch diameter, 24 inch long, pointed tip.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install units without damage to shape or finish. Replace or repair damaged units.
- B. Install units in alignment with adjacent work.
- C. Fasten units in place with 2 dowels per unit.

END OF SECTION

**SECTION 32 1723.13
PAINTED PAVEMENT MARKINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Parking lot markings, including parking bays, and diagonal lines
- B. Handicapped symbols

1.02 REFERENCE STANDARDS

- A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.
- B. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; <http://mutcd.fhwa.dot.gov>; current edition.

1.03 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.05 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint:
 - 1. Parking Lots: chrome type, rapid drying meeting Federal Specification TT-P-115a.
 - 2. **Note:** Verify colors with owner prior to painting.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
 - 1. Clean existing asphalt paving as required for installation of new paint.
- B. If substrate preparation is the responsibility of another installer, notify Brackett-Krennerich Architects of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean surfaces thoroughly prior to installation.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
- D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each

application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

- E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

3.03 INSTALLATION

- A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
- B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
- C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- D. Comply with FHWA MUTCD manual (<http://mutcd.fhwa.dot.gov>) for details not shown.
- E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
- F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
 - 1. Apply paint in one coat only.
 - 2. Wet Film Thickness: 0.015 inch, minimum.
 - 3. Length Tolerance: Plus or minus 1/2 inch.
 - 4. Width Tolerance: Plus or minus 1/8 inch.
- G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
 - 1. Mark the International Handicapped Symbol at indicated parking spaces.
 - 2. Hand application by pneumatic spray is acceptable.
- H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

3.04 DRYING, PROTECTION, AND REPLACEMENT

- A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.
- B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
- C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
- D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
- E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.
- F. Replace removed markings at no additional cost to Arkansas State University.

END OF SECTION

SECTION 32 9213

HYDROMULCHING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Seeding and fertilizing by the hydromulching method finish-graded slopes and areas disturbed by construction work.

1.02 RELATED WORK

- A. Section 31 2200 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.
- B. Section 31 2323 – Fill: Topsoil Material

1.03 REFERENCES

- A. Federal Specifications (FS):
 1. FS-O-F-241 – Fertilizers, Mixed, Commercial.

1.04 QUALITY ASSURANCE

- A. Furnish seed labeled in accordance with current rules and regulations of Arkansas Plant board.

1.05 SUBMITTALS

- A. Submit results of soil analysis of samples taken from seeding area and/or imported topsoils.
- B. Submit labels from seed bags, lime and fertilizers.
- C. Submit sample of mulching material.
- D. Submit soil stabilizer information.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver grass seed in original containers showing analysis of seed mixture, percentage or pure seed, year of production, net weight, date of packaging, and location of packaging. Damaged packages are not acceptable.
- B. Deliver fertilizer and lime in waterproof bags showing net weight, chemical analysis, and name of manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Topsoil: Use topsoil excavated from the site only if conforming to the specified requirements.
 1. Existing Topsoil: Natural, fertile agricultural soil capable of sustaining vigorous plant growth, not frozen or muddy condition, containing not less than 3% organic matter, and corrected to PH value of 5.9 to 7.0. Free from sub-soil, slag, clay, stone, lumps, live plants, roots, sticks, crabgrass, coughgrass, noxious weeds, and foreign matter.
 2. Imported Topsoil: Natural, fertile agricultural soil typical of locality, capable of sustaining vigorous plant growth, from well-drained site free of flooding, not frozen or muddy condition, not less than 3% organic matter, and PH value of 5.9 to 7.0. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, coughgrass, noxious weeds, and foreign matter.
 3. Have topsoils analyzed and submit written analysis stating the nitrogen, phosphorous, and potassium requirements, organic matter content, and ph value of the soil.
 4. Incorporate 15% compost by volume into existing and/or imported topsoil prior to planting or backfill mix preparation.
- B. Fertilizers: FS O-F-241 commercial type:

1. Proportions: 10N-20P-10K
- C. Lime: Lime if required, shall be agricultural grade ground limestone ground to pass an 8-meshed sieve with 25 percent passing a 100-meshing sieve. Calcareous limestone shall contain not less than 50 percent calcium oxide, and dolomitic limestone shall contain not less than 40 percent magnesium oxide. Coarser materials will be accepted provided the specified rates of application are increased proportionality; on the basis of quantities passing the 8 and 100 mesh sieves, but no additional payment will be made for the increase quantity.
- D. Seed, General:
 1. Labeled in accordance with current rules and regulations of Arkansas State Plant Board.
 2. Minimum 98% pure seed and 85% germination by weight.
 3. Allowable noxious weed seeds: 50 per pound of seed with no Johnson grass, wild onion, wild garlic, field bindweed, or nut grass seed allowed in any amount whatsoever.
 4. Furnish seed in sealed, standard containers.
- E. Seed Varieties: Refer to seed mix control schedule in subsection 2.2 – A of this section.
- F. Mulching material/soil stabilizer:
 1. Virgin wood cellulose fiber combined with COHEREX, as manufactured by Witco Chemical, Golden Bear Division, Bakersfield, CA or
 2. CONWED 2000, as manufactured by Conwed Corporation, Environmental Products Division, St Paul, MN.

2.02 MIXING

- A. Seed Mix: Seed shall be composed of the varieties and amount by weight as shown below.
 1. Turf Type Seeding 60 lbs/Acre
 - a. Common Bermudagrass –Hulled (Cynodon dactylon)
- B. Hydromulching Mixture:
 1. 2000 lbs. of virgin wood cellulose fiber per acre: COHEREX in proportion as recommended by manufacturer for mixing with cellulose fiber.
 2. Fertilizer: Minimum 600 lbs. per acre.
 3. CONWED 2000 in proportion to rest of mixture as recommended by manufacturer.
 4. Seed: As specified for type of seed or seed mixture and time of application.
 5. Water.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Have the seeding areas tested for lime and fertilizer requirements by the County Extension Agent, other public service agency, or private testing service at Contractor's expense. At least three soil samples shall be taken from each area. Submit a report of the soil analysis and recommendation to the Architect/Engineer.
- B. Verify that seeding area has been cleaned up and dressed to final shape.

3.02 INSTALLATION

- A. Subgrade Preparation:
 1. Fine grade sub-grade, eliminating uneven areas and low spots. Maintain lines, levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas and rake until smooth.
 2. Remove foreign materials, undesirable plants and their roots, stones and debris. Do not bury foreign material beneath areas to be hydromulched.

3. Remove subsoil which has been contaminated with petroleum products.
4. Scarify and pulverizing sub-soil to a depth of 3 inches where topsoil is to be placed. Repeat pulverizing in areas where equipment used for hauling and spreading topsoil has compacted subsoil.
5. If lime is required, apply at rate determined by soil analysis, uniformly spreading on areas prior to their being scarified. Thoroughly mix lime with sub –soil to the scarified depth.

B. PLACING TOPSOIL:

1. Spread topsoil to the minimum depth stated on the drawings over all areas to be seeded.
2. Place topsoil during dry weather and on dry, unfrozen subgrade.
3. Remove stones, roots, grass weeds, debris, and other foreign non-organic material while spreading.
4. If lime is required, apply at rate determined by soil analysis, uniformly spreading on topsoiled areas. Thoroughly mix lime with topsoil layer.

C. Hydromulching:

1. Prior to hydromulching, lightly firm seeding areas with a cultipacker.
2. Verify that seeding area is ready to receive hydromulching and notify architect/engineer of schedule for application.
3. Apply mixture of mulch, seed, fertilizer, soil stabilizer, and water with the proper equipment to achieve complete coverage at the specified rate.

3.03 MAINTENANCE

- A. Maintain hydromulching areas by watering, fertilizing, reseeding, and repairing as necessary for a period of 30 days after germination, to provide a healthy, growing stand of grass. Water seeded areas to maintain adequate moisture levels for vigorous germination and growth. Apply additional granular or liquid fertilizer 30 days after germination.
- B. Mow turf grass areas to a height of 3 to 4 inches when height of grass reaches 6 inches. Mowing is not required in areas designated for erosion control seeding.
- C. Repair and reseed damaged ground surfaces outside of normal work areas due to negligence of the Contractor.
- D. It is intended that an established live and growing stand of grass be provided with no bare spots. The contractor shall re-seed areas as necessary to obtain this result.
- E. The time required for maintenance after the Contract Time ends will not be assessed as liquidated damages provided all other work under the contract has been completed.

END OF SECTION

TABLE OF CONTENTS

DIVISION 22 - PLUMBING

- 22 0200 PLUMBING GENERAL REQUIREMENTS
- 22 0519 METERS AND GAUGES FOR PLUMBING PIPING
- 22 0548 VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
- 22 0553 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
- 22 0719 PLUMBING PIPING INSULATION
- 22 1005 PLUMBING PIPING
- 22 1006 PLUMBING PIPING SPECIALTIES

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

- 23 0200 HVAC GENERAL REQUIREMENTS
- 23 0513 COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
- 23 0548 VIBRATION AND SEISMIC CONTROLS FOR HVAC DUCTWORK PIPING AND EQUIPMENT
- 23 0553 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
- 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC
- 23 0713 DUCT INSULATION
- 23 0719 HVAC PIPING INSULATION
- 23 0993 SEQUENCE OF OPERATIONS FOR HVAC CONTROLS
- 23 2300 REFRIGERANT PIPING
- 23 3100 HVAC DUCTS AND CASINGS
- 23 3300 AIR DUCT ACCESSORIES
- 23 3423 HVAC POWER VENTILATORS
- 23 3700 AIR OUTLETS AND INLETS
- 23 4000 HVAC AIR CLEANING DEVICES
- 23 7413 PACKAGED OUTDOOR CENTRAL-STATION AIR-HANDLING UNITS
- 23 8126.13 SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

DIVISION 26 - ELECTRICAL

- 26 0200 ELECTRICAL GENERAL REQUIREMENTS
- 26 0519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
- 26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
- 26 0529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
- 26 0533.13 CONDUIT FOR ELECTRICAL SYSTEMS
- 26 0533.16 BOXES FOR ELECTRICAL SYSTEMS
- 26 0548 VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS
- 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
- 26 0583 WIRING CONNECTIONS
- 26 0923 LIGHTING CONTROL DEVICES
- 26 2100 LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE
- 26 2416 PANELBOARDS
- 26 2726 WIRING DEVICES
- 26 2816.16 ENCLOSED SWITCHES



Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

26 2913 ENCLOSED CONTROLLERS
26 5100 INTERIOR LIGHTING
26 5600 EXTERIOR LIGHTING

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 4600 FIRE DETECTION AND ALARM

**SECTION 22 0200
PLUMBING GENERAL REQUIREMENTS**

PART 1 - GENERAL

1.01 CONDITIONS OF THE CONTRACT

- A. The conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.
- B. This Section is a Division 22 0000 Basic Materials and Methods Section and is a part of each Division [] Section.
- C. The Contractor shall be responsible for construction coordination of all work described in this section with the work specified in other sections of the specifications and shown on the Drawings. In advance of construction, coordinate and work out any minor problems with other trades to avoid conflicts therewith. However, if other minor problems are encountered, bring these problems to the attention of the Architect, who will make the final decisions as to correction.
 - 1. All references and notations pertaining to coordination by the Contractor shall apply to constructions coordination. The Architect and Engineers have, to the best of their ability, coordinated the drawing and specifications to avoid conflicts between specified equipment and space required for such, and between architectural and engineering disciplines.
 - 2. If substituted equipment (approved-equal) is to be used, the Contractor shall revise the 1/8" = 1'-0" & 1/4" = 1'-0" scale floor plans shown on the Drawings, indicating to scale, the equipment to be used. The purpose of these revised scale plans is to identify any problems with substituted equipment, and access and clearance requirements are maintained. These revised scale plans are to be submitted with the substituted equipment submittals.

1.02 WORK INCLUDED

- A. This section consists of General Requirements and Standard Specifications covering certain parts of work under Division 22 0000 and is supplemented by other Division [] sections covering additional work, requirements, and materials specifically applicable to the work of each section.

1.03 CODE AND REGULATORY AGENCY COMPLIANCE

- A. Provide work and materials in full accordance with the latest rules and regulations of the following:
 - 1. Occupational Safety and Health Administration.
 - 2. International Plumbing Code, Current Adopted Edition.
 - 3. Uniform Plumbing Code, Current Adopted Edition.
 - 4. International Fuel Gas Code, Current Adopted Edition.
 - 5. Architectural Barriers Act of 1968: Public Law 90-480.
 - 6. ICC/ANSI-A117.1.
 - 7. International Fire Code, Current Adopted Edition.
 - 8. National Fire Protection Association 101, Life Safety Code.
 - 9. ADA Code.
 - 10. Other applicable state and local laws and codes.

1.04 QUALITY ASSURANCE

- A. Manufacturers: Only firms regularly engaged in manufacturing of the mechanical services, equipment and specialties of types and sizes required, whose products have been in satisfactory use in similar service shall be used on this project.
- B. Installers Qualifications: Only firms with successful installation experience on projects with work similar to that required for this project shall perform work on this project.

1.05 SUBMITTALS

- A. Provide six copies of each type of equipment material or information for installation. Comply with division 01.
- B. Substitutions and/or systems designed and manufactured by other manufacturers will be considered under the terms described for substitutions with the following exceptions:
 - 1. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Substitution requests will be considered only if received at least 10 days prior to the bid date.
 - 3. Substitution requests will be considered only if required submittal data is complete; see article SUBMITTALS above.
 - 4. Contractor (not equipment supplier) shall certify that the use of the substitute system and equipment will not require changes to other work or re-design.
 - 5. Contractor shall certify that the substitute system will achieve the performance specified.

1.06 SITE EXAMINATION

- A. Examine site, verify dimensions and locations against Drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.
- B. Information shown relative to existing services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation for new piping or its installation. Verify existing conditions, pipe and equipment sizes, elevations and locations within the building prior to commencement of work.

1.07 PLACEMENT OF EQUIPMENT AND WORK

- A. The placement of substituted (approved equal) equipment in the locations shown on the drawings shall be the Contractor's responsibility. The Contractor shall verify that all substituted equipment will fit, operate and have clearances and accessibility for maintenance, inspections, and operation within the space shown on the drawings. If the Contractor determines that substituted equipment will not fit and/or operate within the space shown on the Drawings and/or clearances and accessibility cannot be achieved, he shall bring these problems to the attention of the Architect who will make the final decision as to the method of correction. Corrections to work already completed and in-place shall not constitute an increase in the contract amount. The Contractor shall be responsible and incur any cost to allow for 36" clearance on two adjacent sides of equipment or on all sides of electrical access is required.
- B. Move equipment and/or work into spaces through openings provided or located in the spaces during constructions, as required.
- C. Do disassembling and reassembling of equipment or other work necessary to accomplish this requirement without extra cost to the Owner. Do not disassemble or reassemble any equipment in order to locate it in the space.

1.08 MAINTENANCE AND OPERATING INSTRUCTIONS

- A. Incorporate complete operating instructions including starting, stopping, and description of emergency manual operation methods for the following:
 - 1. Plumbing Systems
 - 2. Provide charts and diagrams as required.
 - 3. Provide operating manual for any equipment listed in individual sections of the specifications.
- B. Provide maintenance instructions for each item of individual equipment covering pertinent maintenance data, such as lubricants to be used, frequency of lubrications, inspections required, adjustments, belt and pulley sizes, etc.

- C. Provide parts bulletins containing manufacturer's bulletins with parts numbers, instructions, etc., for each item of equipment. Strip bulletins so that useless bulk is avoided.
- D. Post service telephone numbers and/or addresses in an appropriate place as designated by the Architect.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Mention herein or on Drawings requires that this Contractor provide each item listed of quality noted or acceptable equal. All material shall be new, full weight, standard in all respects, and in first-class condition. Provide materials of the same brand of manufacture throughout for each class of material or equipment where possible. Materials shall be tested within the Continental United States by independent, nationally recognized testing agency and shall be listed in accordance with testing agency requirements.
- B. The grade or quality of materials desired is indicated by the trade names or catalog numbers stated herein. The catalog numbers and specification are for bidding purposes only. Actual equipment submitted and ordered shall be verified to be appropriate for indicated use.
- C. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permissions of the Architect/Engineer.

2.02 MATERIALS FURNISHED

- A. Identify all materials and equipment by manufacturer's name and model number. Remove unidentified materials and equipment from site.
- B. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.
- C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new equipment. Variance for this permitted only with written consent.

PART 3 - EXECUTION

3.01 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, ductwork, equipment, etc., are shown on Drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work.
- B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid conflict therewith. Any change in rerouting ductwork, piping and equipment shall not be cause for additional cost.
- C. The Sub-Contractor shall verify that the measurement of constructed rooms, spaces and areas are as shown on the Drawings. Any measurement deviation and/or discrepancies shall be brought to the attention of the Architect who will make the final decision as to the method of correction. Corrections to work already completed and in place shall be done at the Contractor's expense.
- D. In addition, obtain all necessary information from the other trades regarding centers of partitions, walls, location of plumbing mains, fire sprinkler mains, and electrical conduits, ducts, pipes, etc., in order that pipes, equipment, and ductwork may be placed in their correct positions.
- E. Execute any work or apparatus shown on the Drawings and not mentioned in the specifications, or vice versa, the same as if specifically mentioned by both. Omission from Drawings or specifications of any minor details of construction, installation, materials or essential specialties does not relieve this Contractor from furnishing same in place complete.

- F. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system.
- G. Furnish materials and work at proper time to avoid delay of the work.

3.02 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested, Contractor shall uncover work at own expense. After it has been inspected and tested, make repairs necessary to restore work of other Contractors to condition in which it was found at time of cutting.

3.03 PROJECT MODIFICATIONS

- A. During the process of construction, if such conditions arise that require revisions, modifications, or relocations to any mechanical equipment mechanical ductwork, mechanical piping, plumbing piping or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review to the Architect prior to actual revision of work in the field. There shall be no additional cost incurred for these changes.
- B. Two (2) sets of Drawings showing all revisions shall be immediately presented to Architect for his records. Maintain additional copies on the project as necessary to comply with "RECORD DRAWINGS" requirement of the General Requirements.
- C. Incorporate all revisions into record Drawings. These drawings shall be up to date at the end of every week and shall be available to Architect or Engineer at any time for inspection.

3.04 GUARANTEE

- A. Be responsible for work done and material installed under these plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show itself within one (1) year of filing of Notice of Completion and be responsible for damage to other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to Owner.
- B. Be responsible for damage to any part of premises during guarantee period caused by leaks or breaks in work furnished and/or installed under this section.
- C. Replace refrigerant, lubricants, or gases lost as result of defects, breaks, or leaks in work.

3.05 RECORD DRAWINGS

- A. In addition, furnish one (1) tracing showing all outside utility connections, piping, etc., installed under this contract. Locate and dimension all work with reference to permanent landmarks.
- B. Match all symbols and designations used in contract Drawings when preparing "Record" Drawings.
- C. Indicate clearly and correctly all work installed differently from that shown, and maintain records up to date as work progresses. Include invert elevations of pipes below grade of floor, the floor lines, plugged wyes, tees, caps, exact locations and sizing of piping, location of valves, and the like. Dimension locations from structural points.
- D. Properly identify all stubs for future connections as to locations and use by setting of concrete marker at finished grade in manner suitable to Architect.

3.06 MAINTENANCE DATA

- A. Submit maintenance data and parts lists for all mechanical systems materials and products. Include product data, shop drawings, and Record Drawings in the maintenance manual all in allowance with the requirements of Division 01.

3.07 CLEANING UP

- A. Comply with Supplementary General Conditions.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 22 0519
METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Positive displacement meters.
- B. Flow meters.
- C. Pressure gauges and pressure gauge taps.
- D. Thermometers and thermometer wells.

1.02 REFERENCE STANDARDS

- A. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2013.
- B. ASTM E1 - Standard Specification for ASTM Liquid-in-Glass Thermometers; 2014.
- C. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers; 2014.
- D. AWWA C700 - Cold-Water Meters -- Displacement Type, Metal Alloy Main Case; 2015.
- E. AWWA M6 - Water Meters -- Selection, Installation, Testing, and Maintenance; 2012.
- F. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 FIELD CONDITIONS

- A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

PART 2 PRODUCTS

2.01 POSITIVE DISPLACEMENT METERS (LIQUID)

- A. AWWA C700, positive displacement disc type suitable for fluid with bronze case and cast iron frost-proof, breakaway bottom cap, hermetically sealed register, remote reading to AWWA C706.
- B. Meter: Brass body turbine meter with magnetic drive register.

2.02 PRESSURE GAUGES

- A. Pressure Gauges: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background.
 - 1. Case: Steel with brass bourdon tube.
 - 2. Size: 3-1/2 inch (90 mm) diameter.
 - 3. Mid-Scale Accuracy: One percent.
 - 4. Scale: Psi and kPa.

2.03 PRESSURE GAUGE TAPPINGS

- A. Gauge Cock: Tee or lever handle, brass for maximum 150 psi (1034 kPa).
- B. Needle Valve: Brass, 1/4 inch (6 mm) NPT for minimum 150 psi (1034 kPa).

2.04 STEM TYPE THERMOMETERS

- A. Thermometers - Fixed Mounting: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish.
 - 1. Size: 9 inch (225 mm) scale.
 - 2. Window: Clear Lexan.

3. Accuracy: 2 percent, per ASTM E77.
 4. Calibration: Degrees F.
- B. Thermometers - Adjustable Angle: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device; adjustable 360 degrees in horizontal plane, 180 degrees in vertical plane.
1. Size: 9 inch (225 mm) scale.
 2. Window: Clear Lexan.
 3. Accuracy: 2 percent, per ASTM E77.
 4. Calibration: Degrees F.

2.05 DIAL THERMOMETERS

- A. Thermometers - Fixed Mounting: Dial type bimetallic actuated; ASTM E1; stainless steel case, silicone fluid damping, white with black markings and black pointer, hermetically sealed lens, stainless steel stem.
1. Size: 3-1/2 inch (90 mm) diameter dial.
 2. Lens: Clear glass.
 3. Accuracy: 1 percent.
 4. Calibration: Degrees F.
- B. Thermometers - Adjustable Angle: Dial type bimetallic actuated; ASTM E1; stainless steel case, adjustable angle with front recalibration, silicone fluid damping, white with black markings and black pointer, hermetically sealed lens, stainless steel stem.
1. Size: 3 inch (75 mm) diameter dial.
 2. Lens: Clear Lexan.
 3. Accuracy: 1 percent.
 4. Calibration: Degrees F.

2.06 THERMOMETER SUPPORTS

- A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain.
- B. Flange: 3 inch (75 mm) outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install positive displacement meters with isolating valves on inlet and outlet to AWWA M6. Provide full line size valved bypass with globe valve for liquid service meters.
- C. Provide one pressure gauge per pump, installing taps before strainers and on suction and discharge of pump. Pipe to gauge.
- D. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch (60 mm) for installation of thermometer sockets. Ensure sockets allow clearance from insulation.
- E. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- F. Adjust gauges and thermometers to final angle, clean windows and lenses, and calibrate to zero.

END OF SECTION

SECTION 22 0548

VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

**REFER TO SECTION 23 0548 VIBRATION AND SEISMIC CONTROLS FOR HVAC DUCTWORK,
PIPING, AND EQUIPMENT FOR VIBRATION AND SEISMIC CONTROL REQUIREMENTS RELATED
TO THIS SECTION**

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 22 0553

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Pipe markers.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

- A. Major Control Components: Nameplates.
- B. Piping: Pipe markers.
- C. Pumps: Nameplates.
- D. Small-sized Equipment: Tags.
- E. Tanks: Nameplates.
- F. Valves: Metal Tags..
- G. Water Treatment Devices: Nameplates.

2.02 NAMEPLATES

- A. Description: Laminated three-layer plastic with engraved letters.

2.03 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch (40 mm) diameter.
- B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch (40 mm) diameter with smooth edges.

2.04 PIPE MARKERS

- A. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- B. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- C. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches (150 mm) wide by 4 mil (0.10 mm) thick, manufactured for direct burial service.
- D. Color code as follows:
 - 1. Potable, Cooling, Boiler, Feed, Other Water: Green with white letters.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install plastic pipe markers in accordance with manufacturer's instructions.
- C. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- D. Install underground plastic pipe markers 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried pipe.
- E. Use tags on piping 3/4 inch (20 mm) diameter and smaller.
 - 1. Identify service, flow direction, and pressure.
 - 2. Install in clear view and align with axis of piping.
 - 3. Locate identification not to exceed 20 feet (6 m) on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- F. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 22 0719
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.
- B. Jackets and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2014.
- E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2015.
- F. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2013).
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.07 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER

- A. Manufacturers:

1. CertainTeed Corporation: www.certainteed.com.
 2. Johns Manville Corporation: www.jm.com.
 3. Knauf Insulation: www.knaufusa.com.
 4. Owens Corning Corporation: www.ocbuildingspec.com/sle.
 5. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
1. K (Ksi) Value: ASTM C177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
 2. Maximum Service Temperature: 650 degrees F (343 degrees C).
 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches (0.029 ng/Pa s m).

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Manufacturer:
1. Armacell LLC; AP Armaflex: www.armacell.us/#sle.
 2. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
1. Minimum Service Temperature: Minus 40 degrees F (Minus 40 degrees C).
 2. Maximum Service Temperature: 220 degrees F (104 degrees C).
 3. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.04 JACKETS

- A. PVC Plastic.
1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F (Minus 18 degrees C).
 - b. Maximum Service Temperature: 150 degrees F (66 degrees C).
 - c. Moisture Vapor Permeability: 0.002 perm inch (0.0029 ng/Pa s m), maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil (0.25 mm).
 - e. Connections: Brush on welding adhesive.
- B. Canvas Jacket: UL listed 6 oz/sq yd (220 g/sq m) plain weave cotton fabric treated with dilute fire retardant lagging adhesive.
- C. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
1. Thickness: 0.016 inch (0.40 mm) sheet.
 2. Finish: Smooth.
 3. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
 4. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.

- C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 - 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. For hot piping conveying fluids 140 degrees F (60 degrees C) or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- F. For hot piping conveying fluids over 140 degrees F (60 degrees C), insulate flanges and unions at equipment.
- G. Glass fiber insulated pipes conveying fluids above ambient temperature:
 - 1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- H. Inserts and Shields:
 - 1. Application: Piping 1-1/2 inches (40 mm) diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert Location: Between support shield and piping and under the finish jacket.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 8400.
- J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with canvas jacket sized for finish painting.
- K. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
- L. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil (0.025 mm) thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.
- M. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULES

- A. Plumbing Systems:
 - 1. Domestic Hot Water Supply:
 - a. Glass Fiber Insulation:
 - 1) Minimum Thickness: 1 inch (____ mm).
 - b. Flexible Elastomeric Cellular Foam Insulation:
 - 1) Minimum Thickness: 1 inch (____ mm).
 - 2. Domestic Hot Water Recirculation:
 - a. Glass Fiber Insulation:
 - 1) Minimum Thickness: 1 inch (25 mm).
 - b. Flexible Elastomeric Cellular Foam Insulation:

- 1) Minimum Thickness: 1 inch (____ mm).
3. Domestic Cold Water:
 - a. Glass Fiber Insulation:
 - 1) Minimum Thickness: 1/2 inch.
 - b. Flexible Elastomeric Cellular Foam Insulation:
 - 1) Minimum Thickness: 1/2 inch (____ mm).
4. Plumbing Vents Within 10 Feet (3 Meters) of the Exterior:
 - a. Glass Fiber Insulation:
 - 1) Minimum Thickness: 1 inch (25 mm).
 - b. Flexible Elastomeric Cellular Foam Insulation:
 - 1) Minimum Thickness: 1 inch (____ mm).

END OF SECTION

**SECTION 22 1005
PLUMBING PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pipe, pipe fittings, specialties, and connections for piping systems.
 - 1. Sanitary sewer.
 - 2. Domestic water.
 - 3. Storm water.
 - 4. Condensate drain.
 - 5. Gas.
 - 6. Flanges, unions, and couplings.
 - 7. Pipe hangers and supports.
 - 8. Valves.
 - 9. Flow controls.
 - 10. Check.
 - 11. Water pressure reducing valves.
 - 12. Relief valves.
 - 13. Strainers.

1.02 RELATED REQUIREMENTS

- A. Section 09 9123 - Interior Painting.
- B. Section 22 0516 - Expansion Fittings and Loops for Plumbing Piping.
- C. Section 22 0553 - Identification for Plumbing Piping and Equipment.
- D. Section 22 0516 - Expansion Fittings and Loops for Plumbing Piping.

1.03 REFERENCE STANDARDS

- A. ANSI Z21.22 - American National Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems; 1999, and addenda A&B (R2004).
- B. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2011.
- C. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.
- D. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.
- E. ASME B31.1 - Power Piping; 2014.
- F. ASME B31.9 - Building Services Piping; 2014.
- G. ASME BPVC-IV - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers; 2015.
- H. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Qualifications; 2015.
- I. ASSE 1003 - Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems; 2009.
- J. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- K. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2015.
- L. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- M. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2015.
- N. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

- O. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2015a.
- P. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2014.
- Q. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2013.
- R. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2010.
- S. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2002 (Reapproved 2010).
- T. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2014.
- U. ASTM D2239 - Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter; 2012.
- V. ASTM D2513 - Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings; 2014.
- W. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2012.
- X. ASTM D2609 - Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe; 2002 (Reapproved 2009).
- Y. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2014.
- Z. ASTM D2683 - Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing; 2014.
- AA. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 1996 (Reapproved 2010).
- AB. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2015.
- AC. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing; 2013a.
- AD. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems; 2011.
- AE. ASTM F1281 - Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe; 2011.
- AF. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2010.
- AG. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings; 2012.
- AH. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2012.
- AI. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2009.
- AJ. AWWA C550 - Protective Interior Coatings for Valves and Hydrants; 2013.
- AK. AWWA C651 - Disinfecting Water Mains; 2005.
- AL. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications; 2009.
- AM. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2011.
- AN. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.
- AO. MSS SP-67 - Butterfly Valves; 2011.
- AP. MSS SP-71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends; 2011.

- AQ. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.
- AR. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.
- AS. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).
- AT. NSF 372 - Drinking Water System Components - Lead Content; 2011.
- AU. PPI TR-4 - PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB), and Minimum Required Strength (MRS) Ratings For Thermoplastic Piping Materials or Pipe; 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.07 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 SANITARY SEWER PIPING, BURIED BEYOND 5 FEET (1500 MM) OF BUILDING

- A. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Cast Iron Pipe: ASTM A74 extra heavy weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.
- B. Cast Iron Pipe: CISPI 301, hubless.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.
- C. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.

2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.04 SANITARY SEWER PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
 1. Fittings: Cast iron.
 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. PVC Pipe: ASTM D2665.
 1. Fittings: PVC.
 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.05 CONDENSATE DRAIN PIPING, ABOVE GRADE

- A. Copper Pipe: ASTM B 42.
 1. Fittings: ASME B16.23, cast bronze, or ASME B16.29, wrought copper.
 2. Joints: ASTM B 32, alloy Sn50 solder.
- B. PVC Pipe: ASTM D 2729.
 1. Fittings: PVC.
 2. Joints: Solvent welded, with ASTM D 2564 solvent cement.

2.06 DOMESTIC WATER PIPING, BURIED BEYOND 5 FEET (1500 MM) OF BUILDING

- A. Ductile Iron Pipe: AWWA C151/A21.51.
 1. Fittings: AWWA C110/A21.10, ductile or gray iron, standard thickness.
 2. Joints: AWWA C111/A21.11, styrene butadiene rubber (SBR) or vulcanized SBR gasket with 3/4 inch (19 mm) diameter rods.
- B. Copper Pipe: ASTM B42, hard drawn.
 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
 2. Joints: ASTM B 32, alloy Sn95 solder.
- C. PE Pipe: ASTM D2239.
 1. Fittings: ASTM D2609, PE.
 2. Joints: Mechanical with stainless steel clamp.

2.07 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Copper Pipe: ASTM B42, hard drawn.
 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
 2. Joints: ASTM B 32, alloy Sn95 solder.
- B. Ductile Iron Pipe: AWWA C151/A21.51.
 1. Fittings: Ductile or gray iron, standard thickness.
 2. Joints: AWWA C111/A21.11, styrene butadiene rubber (SBR) or vulcanized SBR gasket with 3/4 inch (19 mm) diameter rods.

2.08 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 2. Joints: ASTM B32, alloy Sn95 solder.
- B. PEX Cross-Linked Polyethylene Pipe: ASTM F876 or ASTM F877.
 1. PPI TR-4 Pressure Design Basis:
 - a. 100 psig (689 kPa) at maximum 180 degrees F (82 degrees C).
 2. Fittings: Brass and copper.
 3. Joints: Brass and PEX mechanical compression fittings.

2.09 STORM WATER PIPING, BURIED BEYOND 5 FEET (1500 MM) OF BUILDING

- A. Cast Iron Pipe: ASTM A74 extra heavy weight.
 1. Fittings: Cast iron.
 2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.

- B. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.10 STORM WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.11 STORM WATER PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.12 NATURAL GAS PIPING, BURIED BEYOND 5 FEET (1500 MM) OF BUILDING

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 - 1. Fittings: ASTM A234/A234M, wrought steel welding type, with AWWA C105/A21.5 polyethylene jacket or double layer, half-lapped 10 mil (0.25 mm) polyethylene tape.
 - 2. Joints: ASME B31.1, welded.
- B. Polyethylene Pipe: ASTM D2513, SDR 11.
 - 1. Fittings: ASTM D2683 or ASTM D2513 socket type.
 - 2. Joints: Fusion welded.

2.13 NATURAL GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 - 1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
 - 2. Joints: Threaded or welded to ASME B31.1.
- B. Corrugated Stainless Steel Tubing: ASTM A240 type 300.
 - 1. Fittings: Brass double flare type.
 - 2. Jacketing: UV resistant polyethylene: comply with ASTM E84 for flame spread and smoke density requirements.

2.14 FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 Inches (80 mm) and Under:
 - 1. Ferrous pipe: Class 150 malleable iron threaded unions.
 - 2. Copper tube and pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Size Over 1 Inch (25 mm):
 - 1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
 - 2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.15 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.

1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 4. Vertical Pipe Support: Steel riser clamp.
 5. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
 - a. Bases: High density polypropylene.
 - b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - c. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 - d. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
 - e. Height: Provide minimum clearance of 6 inches (150 mm) under pipe to top of roofing.
- B. Plumbing Piping - Drain, Waste, Vent and Condensate:
1. Conform to ASME B31.9.
 2. Hangers for Pipe Sizes 1/2 Inch (15 mm) to 1-1/2 Inches (40 mm): Malleable iron, adjustable swivel, split ring.
 3. Hangers for Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.
 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 5. Wall Support for Pipe Sizes to 3 Inches (80 mm): Cast iron hook.
 6. Wall Support for Pipe Sizes 4 Inches (100 mm) and Over: Welded steel bracket and wrought steel clamp.
 7. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
1. Conform to ASME B31.9.
 2. Hangers for Pipe Sizes 1/2 Inch (15 mm) to 1-1/2 Inches (40 mm): Malleable iron, adjustable swivel, split ring.
 3. Hangers for Cold Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.
 4. Hangers for Hot Pipe Sizes 2 Inches (50 mm) to 4 Inches (100 mm): Carbon steel, adjustable, clevis.
 5. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.

2.16 BALL VALVES

- A. Manufacturers:
1. Tyco Flow Control: www.tycoflowcontrol.com.
 2. Nibco, Inc: www.nibco.com.
 3. Milwaukee Valve Company: www.milwaukeevalve.com.
 4. Watts Water Technologies Company: www.watts.com
 5. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Construction, 4 Inches (100 mm) and Smaller: MSS SP-110, Class 150, 400 psi (2760 kPa) CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder ends with union.

2.17 BUTTERFLY VALVES

- A. Manufacturers:
1. Tyco Flow Control: www.tycoflowcontrol.com.
 2. Milwaukee Valve Company: www.milwaukeevalve.com.

3. Watts Water Technologies Company: www.watts.com
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Construction 1-1/2 Inches (40 mm) and Larger: MSS SP-67, 200 psi (1380 kPa) CWP, cast or ductile iron body, nickel-plated ductile iron disc, resilient replaceable EPDM seat, wafer ends, extended neck, 10 position lever handle.
- C. Provide gear operators for valves 8 inches (150 mm) and larger, and chain-wheel operators for valves mounted over 8 feet (2400 mm) above floor.

2.18 FLOW CONTROLS

- A. Manufacturers:
1. Tyco Flow Control: www.tycoflowcontrol.com.
 2. ITT Bell & Gossett: www.bellgossett.com.
 3. Taco, Inc: www.taco-hvac.com.
 4. Caleffi Hydronic Solutions: www.caleffi.com.
 5. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Construction: Class 125, Brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.
- C. Calibration: Control flow within five percent of selected rating, over operating pressure range of ten times minimum pressure required for control, maximum minimum pressure 3.5 psi (24 kPa).

2.19 SWING CHECK VALVES

- A. Manufacturers:
1. Tyco Flow Control: www.tycoflowcontrol.com.
 2. Nibco, Inc: www.nibco.com.
 3. Milwaukee Valve Company: www.milwaukeevalve.com.
 4. Watts Water Technologies Company: www.watts.com
 5. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Up to 2 Inches (50 mm):
1. 1, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder ends.
- C. Over 2 Inches (50 mm):
1. 1, Class 125, iron body, bronze swing disc, renewable disc seal and seat, flanged or grooved ends.

2.20 SPRING LOADED CHECK VALVES

- A. Manufacturers:
1. Tyco Flow Control: www.tycoflowcontrol.com.
 2. Watts Water Technologies Company: www.watts.com
 3. Milwaukee Valve Company: www.milwaukeevalve.com.
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Class 125, iron body, bronze trim, stainless steel springs, bronze disc, Buna N seals, wafer style ends.

2.21 WATER PRESSURE REDUCING VALVES

- A. Manufacturers:
1. Amtrol Inc: www.amtrol.com.
 2. Cla-Val Company: www.cla-val.com.
 3. Watts Regulator Company: www.wattsregulator.com.
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Up to 2 Inches (50 mm):
1. ASSE 1003, bronze body, stainless steel, and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded single union ends.

- C. Over 2 Inches (50 mm):
 - 1. ASSE 1003, cast iron body with interior lining complying with AWWA C550, bronze fitted, elastomeric diaphragm and seat disc, flanged.

2.22 RELIEF VALVES

- A. Pressure Relief:
 - 1. Manufacturers:
 - a. Tyco Flow Control: www.tycoflowcontrol.com.
 - b. Cla-Val Company: www.cla-val.com.
 - c. Watts Regulator Company: www.wattsregulator.com.
 - d. Substitutions: See Section 22 0200 - Plumbing General Requirements.
 - 2. 1 certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.
- B. Temperature and Pressure Relief:
 - 1. Manufacturers:
 - a. Cla-Val Company: www.cla-val.com.
 - b. Watts Regulator Company: www.wattsregulator.com.
 - c. Substitutions: See Section 22 0200 - Plumbing General Requirements.
 - 2. 2 certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F (98.9 degrees C), capacity 1 certified and labelled.

2.23 STRAINERS

- A. Size 1-1/2 inch (40 mm) to 4 inch (100 mm):
 - 1. Class 125, flanged iron body, Y pattern with 1/16 inch (1.6 mm) stainless steel perforated screen.

2.24 GAS SOLENOID VALVE

- A. Manufacturers:
 - 1. Jefferson Solenoid Valves USA, Inc.: www.jeffersonvalves.com
 - 2. ASCO Valve, Inc.: www.ascovalve.com
 - 3. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Size 3 inch and Under:
 - 1. CSA certified for automatic gas safety shutoff applications, aluminum body, normally closed - powered open, automatic, direct electrically actuated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.

- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 22 0516.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed.
- I. Establish elevations of buried piping outside the building to ensure not less than 3 ft (1 m) of cover.
- J. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
- K. Provide support for utility meters in accordance with requirements of utility companies.
- L. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting.
- M. Install valves with stems upright or horizontal, not inverted. Refer to Section 22 0523.
- N. Pipe vents from gas pressure reducing valves to outdoors and terminate in weather proof hood.
- O. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- P. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- Q. Sleeve pipes passing through partitions, walls and floors.
- R. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Install hangers to provide minimum 1/2 inch (15 mm) space between finished covering and adjacent work.
 - 3. Place hangers within 12 inches (300 mm) of each horizontal elbow.
 - 4. Use hangers with 1-1/2 inch (40 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 - 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 7. Provide copper plated hangers and supports for copper piping.
 - 8. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.04 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- C. Install globe valves for throttling, bypass, or manual flow control services.
- D. Provide lug end butterfly valves adjacent to equipment when provided to isolate equipment.
- E. Provide spring loaded check valves on discharge of water pumps.
- F. Provide flow controls in water recirculating systems where indicated.

3.05 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch (10 mm) vertically of location indicated and slope to drain at minimum of 1/8 inch per foot (1:100) slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot (1:400) and arrange to drain at low points.

3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed and clean.

- B. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.07 SERVICE CONNECTIONS

- A. Provide connection to sanitary sewer services. Before commencing work check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.
- B. Provide connection to water service including double check backflow preventer and, and sand strainer.
- C. Provide connection to water service.
 - 1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
 - 2. Provide 18 gage (1.20 mm) galvanized sheet metal sleeve around service main to 6 inch (150 mm) above floor and 36 inches minimum below grade. Size for minimum of 2 inches (50 mm) of loose batt insulation stuffing.
- D. Provide connection to gas service. Gas service distribution piping to have initial minimum pressure of 7 inch wg (1.75 kPa). Provide regulators on each line serving end use appliances, sized in accordance with equipment.

3.08 SCHEDULES

- A. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Pipe Size: 1/2 inches (15 mm) to 1-1/4 inches (32 mm):
 - 1) Maximum hanger spacing: 6 ft (2 m).
 - 2) Hanger Rod Diameter: 3/8 inches (9 mm).
 - b. Pipe Size: 1-1/2 inches (40 mm) to 2 inches (50 mm):
 - 1) Maximum Hanger Spacing: 10 ft (3 m).
 - 2) Hanger Rod Diameter: 3/8 inch (9 mm).
 - c. Pipe Size: 2-1/2 inches (65 mm) to 3 inches (75 mm):
 - 1) Maximum Hanger Spacing: 10 ft (3 m).
 - 2) Hanger Rod Diameter: 1/2 inch (13 mm).
 - d. Pipe Size: 4 inches (100 mm) to 6 inches (150 mm):
 - 1) Maximum Hanger Spacing: 10 ft (3 m).
 - 2) Hanger Rod Diameter: 5/8 inch (15 mm).
 - 2. Plastic Piping:
 - a. All Sizes:
 - 1) Maximum hanger spacing: 4 ft (1.8 m).
 - 2) Hanger Rod Diameter: 3/8 inch (9 mm).

END OF SECTION

SECTION 22 1006
PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Drains.
- B. Cleanouts.
- C. Hydrants.
- D. Washing machine boxes and valves.
- E. Refrigerator valve and recessed box.
- F. Double check valve assemblies.
- G. Water hammer arrestors.
- H. Mixing valves.
- I. Thermal expansion tanks.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASME A112.6.3 - Floor and Trench Drains; 2001 (R2007).
- B. ASSE 1012 - Backflow Preventer with Intermediate Atmospheric Vent; 2009.
- C. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2011.
- D. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).
- E. NSF 372 - Drinking Water System Components - Lead Content; 2011.
- F. PDI-WH 201 - Water Hammer Arresters; 2010.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- C. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- D. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
- E. Certificates: Certify that grease interceptors meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS

- A. Manufacturers:
 - 1. Zurn Industries, LLC: www.zurn.com.
 - 2. Wade: www.wadedrains.com.

3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Floor Drain (FD-1):
1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and adjustable nickel-bronze strainer.
- C. Floor Sink (FS-2):
1. Round lacquered cast iron body with integral seepage pan, epoxy coated interior, aluminum dome strainer, clamp collar, half grate.

2.03 CLEANOUTS

- A. Manufacturers:
1. Zurn Industries, LLC: www.zurn.com.
 2. Wade: www.wadedrains.com.
 3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Cleanouts at Exterior Surfaced Areas:
1. Round cast iron tractor-type access frame and non-skid cover.
- C. Cleanouts at Exterior Unsurfaced Areas:
1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.
- D. Cleanouts at Interior Finished Floor Areas:
1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
- E. Cleanouts at Interior Finished Wall Areas:
1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.
- F. Cleanouts at Interior Unfinished Accessible Areas:
1. Threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.04 HYDRANTS

- A. Manufacturers:
1. Zurn Industries, LLC: www.zurn.com.
 2. Woodford Manufacturing Company: www.wcmind.com.
 3. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Wall Hydrants:
1. ASSE 1019; freeze resistant, self-draining type with chrome plated wall plate hose thread spout, handwheel, and integral vacuum breaker.

2.05 WASHING MACHINE BOXES AND VALVES

- A. Box Manufacturers:
1. IPS Corporation/Guy Gray: www.ipscorp.com.
 2. Oatey Supply Chain Services, Inc: www.oatey.com.
 3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Valve Manufacturers:
1. IPS Corporation/Guy Gray: www.ipscorp.com.
 2. Zurn Industries, LLC: www.zurn.com.
 3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
 4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

- C. Description: Metal or ABS preformed rough-in box with brass valves with single lever handle, socket for 2 inch (50 mm) waste, slip in finishing cover.

2.06 REFRIGERATOR / ICE MAKER VALVE AND RECESSED BOX

A. Box Manufacturers:

1. IPS Corporation/Guy Gray: www.ipscorp.com.
2. Oatey Supply Chain Services, Inc: www.oatey.com.
3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Valve Manufacturers:

1. IPS Corporation/Guy Gray: www.ipscorp.com.
2. Zurn Industries, LLC: www.zurn.com.
3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

- C. Description: Metal or ABS preformed rough-in box with brass valves with wheel handle, slip in finishing cover.

2.07 DOUBLE CHECK VALVE ASSEMBLIES

A. Manufacturers:

1. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
2. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Double Check Valve Assemblies:

1. ASSE 1012; Bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves. Provide intermediate atmospheric vent when indicated on plan.

2.08 WATER HAMMER ARRESTORS

A. Manufacturers:

1. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
2. Zurn Industries, LLC: www.zurn.com.
3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Water Hammer Arrestors:

1. Stainless steel construction, piston type sized and located in accordance with PDI-WH 201, precharged suitable for operation in temperature range -100 to 300 degrees F (-73 to 149 degrees C) and maximum 250 psi (1700 kPa) working pressure.

2.09 MIXING VALVES

A. Thermostatic Mixing Valves:

1. Manufacturers:

- a. Leonard Valve Company: www.leonardvalve.com.
- b. Lawler Manufacturing Company, Inc.: www.lawlervalve.com.
- c. Holby Valve, Inc.: www.holby.com.
- d. Substitutions: See Section 22 0200 - Plumbing General Requirements.

2. Valve: Cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment.

3. Accessories:

- a. Check valve on inlets.
- b. Volume control shut-off valve on outlet.
- c. Stem thermometer on outlet.
- d. Strainer stop checks on inlets.

2.10 THERMAL EXPANSION TANKS

- A. Manufacturers:
 - 1. Amtrol, Inc.: www.amtrol.com
 - 2. Zurn Industries, Inc: www.zurn.com.
 - 3. Substitutions: See Section 22 0200 - Plumbing General Requirements.
- B. Tank:
 - 1. The outer shell shall be high grade steel with exterior coating. The bladder shall be FDA approved butyl rubber and prevent water from contact with shell interior. The assembly shall incorporate a schrader valve for adjusting air pre-charge and a stainless steel system connection. The tank shall be sized in accordance with the manufacturer's approved sizing criteria for the system served.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.
- F. Pipe relief from backflow preventer to nearest drain.
- G. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories, sinks, washing machine outlets, water closets, urinals, and at all quick closing solenoid valve locations.
- H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom) where water hammer arrestors are not required. Fabricate same size as supply pipe or 3/4 inch (20 mm) minimum, and minimum 18 inches (450 mm) long.

END OF SECTION

**SECTION 23 0200
HVAC GENERAL REQUIREMENTS**

PART 1 - GENERAL

1.01 CONDITIONS OF THE CONTRACT

- A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements are hereby made a part of this Section.
- B. This Section is a Division 23 0000 Basic Materials and Methods Section and is a part of each Division 23 Section.
- C. The Contractor shall be responsible for construction coordination of all work described in this section with the work specified in other sections of the specifications and shown on the drawings. In advance of construction, coordinate and work out any minor problems with other trades to avoid conflicts therewith. However, if other minor problems are encountered, bring these problems to the attention of the Architect, who will make the final decisions as to correction.
 - 1. All references and notations pertaining to coordination by the Contractor shall apply to construction coordination. The Architect and Engineers have, to the best of their ability, coordinated the drawing and specifications to avoid conflicts between specified equipment and space required for such, and between architectural and engineering disciplines.
 - 2. If substituted equipment (approved-equal) is to be used, the Contractor shall revise the 1/8" = 1'-0" & 1/4" = 1'-0" scale floor plans shown on the Drawings, indicating to scale, the equipment to be used. The purpose of these revised scale plans is to identify any problems with substituted equipment, and access and clearance requirements are maintained. These revised scale plans are to be submitted with the substituted equipment submittals.

1.02 WORK INCLUDED

- A. This section consists of General Requirements and Standard Specifications covering certain parts of work under Division 23 0000 and is supplemented by other Division 23 sections covering additional work, requirements, and materials specifically applicable to the work of each section.

1.03 CODE AND REGULATORY AGENCY COMPLIANCE

- A. This section consists of General Requirements and Standard Specifications covering certain parts of work under Division 23 0000 and is supplemented by other Division 23 sections covering additional work, requirements, and materials specifically applicable to the work of each section.
 - 1. Occupational Safety and Health Administration.
 - 2. Arkansas Mechanical Code, 2010 Edition.
 - 3. Architectural Barriers Act of 1968: Public Law 90-480.
 - 4. ICC/ANSI-A117.1.
 - 5. NFPA 1 Fire Code.
 - 6. National Fire Protection Association 101, Life Safety Code.
 - 7. ADA Code.
 - 8. Other applicable state and local laws and codes.

1.04 QUALITY ASSURANCE

- A. Manufacturers: Only firms regularly engaged in manufacturing of the HVAC services, equipment and specialties of types and sizes required, whose products have been in satisfactory use in similar service shall be used on this project.
- B. Installers Qualifications: Only firms with successful installation experience on projects with work similar to that required for this project shall perform work on this project.

1.05 SUBMITTALS

- A. Provide six copies of each type of equipment material or information for installation.
- B. Substitutions and/or systems designed and manufactured by other manufacturers will be considered under the terms described for substitutions with the following exceptions:
 - 1. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Substitution requests will be considered only if received at least 10 days prior to the bid date.
 - 3. Substitution requests will be considered only if required submittal data is complete.
 - 4. Contractor (not equipment supplier) shall certify that the use of the substitute system and equipment will not require changes to other work or re-design.
 - 5. Contractor or HVAC subcontractor shall certify that the substitute system will achieve the performance specified.

1.06 SITE EXAMINATION

- A. Examine site, verify dimensions and locations against Drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.
- B. Information shown relative to existing services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation for new piping or its installation.

1.07 PLACEMENT OF EQUIPMENT AND WORK

- A. The placement of substituted (approved equal) equipment and specified equipment in the locations shown on the drawings shall be the Contractors responsibility. The Contractor shall verify that all substituted and specified equipment will fit, operate, and have clearances and accessibility for maintenance, inspections, and operation within the space shown on the drawings. If the Contractor determines that substituted equipment or specified equipment will not fit and/or operate within the space shown on the Drawings and/or clearances and accessibility cannot be achieved, the contractor shall bring these problems to the attention of the Architect who will make the final decision as to the method of correction. Corrections to work already completed and in-place shall not constitute an increase in the contract amount. The Contractor shall be responsible and incur any cost to allow for the manufacturer's recommended or the code required clearance on all sides of equipment.
- B. Move equipment and/or work into spaces through openings provided or located in the spaces during construction, as required.
- C. Do disassembling and reassembling of equipment or other work necessary to accomplish this requirement without extra cost to the Owner. Do not disassemble or reassemble any equipment more than is intended by the equipment manufacturer in order to locate it in the space.
- D. All ductwork exposed to view in finished spaces shall have a primed and painted sheet metal exterior finish. If the duct is scheduled to have exterior insulation the contractor shall install a continuous sheet metal wrap around the insulation or provide double-wall insulated spiral duct.

1.08 MATERIAL LIST AND SUBSTITUTIONS

- A. Comply with Supplementary General Conditions.

1.09 MAINTENANCE AND OPERATING INSTRUCTIONS

- A. Incorporate complete operating instructions including starting, stopping, and description of emergency manual operation methods for the following:
 - 1. Heating Systems
 - 2. Ventilating Systems
 - 3. Air Conditioning Systems
 - 4. Provide charts and diagrams as required.

5. Provide operating manual for any equipment listed in individual sections of the specifications.
- B. Provide maintenance instructions for each item of individual equipment covering pertinent maintenance data, such as lubricants to be used, frequency of lubrications, inspections required, adjustments, belt and pulley sizes, etc.
- C. Provide parts bulletins containing manufacturer's bulletins with parts numbers, instructions, etc., for each item of equipment. Strip bulletins so that useless bulk is avoided.
- D. Post service telephone numbers and/or addresses in an appropriate place as designated by the Architect.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Mention herein or on Drawings requires that this Contractor provide each item listed of quality noted or acceptable equal. All material shall be new, full weight, standard in all respects, and in first-class condition. Provide materials of the same brand of manufacture throughout for each class of material or equipment where possible. Materials shall be tested within the Continental United States by independent, nationally recognized testing agency and shall be listed in accordance with testing agency requirements.
- B. The grade or quality of materials desired is indicated by the trade names or catalog numbers stated herein. The catalog numbers and specification are for bidding purposes only. Actual equipment submitted and ordered shall be verified to be appropriate for indicated use.
- C. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permissions of the Architect/Engineer.

2.02 MATERIALS FURNISHED

- A. Identify all materials and equipment by manufacturer's name and model number. Remove unidentified materials and equipment from site.
- B. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.
- C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new equipment. Variance for this permitted only with written consent.

2.03 TEMPORARY HEATING, VENTILATING, AND AIR CONDITIONING

- A. The general contractor shall provide, maintain and pay for all temporary ventilation of enclosed work areas to cure materials, disperse humidity, remove fumes, and to prevent accumulation of dust, irritants, or gases.
- B. It is the responsibility of the general contractor to maintain manufacturer required levels of room and/or space temperature, humidity and ventilation necessary to install products, materials and/or systems of the work.
- C. The general contractor shall remove, extend and/or relocate temporary heating and ventilating systems as rapidly as required in order to provide for progress of the Work.
- D. The permanent HVAC system will not be allowed to be operated until construction has reached Substantial Completion and dust generating work is completed.

PART 3 - EXECUTION

3.01 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, ductwork, equipment, etc., are shown on Drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work.

- B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid conflict therewith. Any change in rerouting ductwork, piping and equipment shall not be cause for additional cost.
- C. The Sub-Contractor shall not fabricate ductwork off-site prior to field verification of actual conditions. Any changes and corrections required shall be done at the Contractor's expense.
- D. The Sub-Contractor shall verify that the measurement of constructed rooms, spaces and areas are as shown on the Drawings. Any measurement deviation and/or discrepancies shall be brought to the attention of the Architect who will make the final decision as to the method of correction. Corrections to work already completed and in place shall be done at the Contractor's expense.
- E. In addition, obtain all necessary information from the other trades regarding centers of partitions, wall, location of plumbing mains, fire sprinkler mains, and electrical conduits, ducts, pipes, etc., in order that pipes equipment, and ductwork may be placed in their correct positions.
- F. Execute any work or apparatus shown on the Drawings and not mentioned in the specifications, or vice versa, the same as if specifically mentioned by both. Omission from Drawings or specifications of any minor details of construction, installation, materials or essential specialties does not relieve this contractor from furnishing same in place complete.
- G. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system.
- H. Furnish materials and work at proper time to avoid delay of the work.

3.02 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested, Contractor shall uncover work at own expense. After it has been inspected and tested, make repairs necessary, to restore work of other Contractor's to condition in which it was found at time of cutting.

3.03 PROJECT MODIFICATIONS

- A. During the progress of construction, if such conditions arise that require revisions, modifications, or relocations to any HVAC equipment, HVAC ductwork, HVAC piping, plumbing piping, or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review by the Architect prior to actual revision work in the field. There shall be no additional cost incurred for these changes.
- B. Two (2) sets of Drawings showing all revisions shall be immediately presented to Architect for his records. Maintain additional copies on the project as necessary to comply with "RECORD DRAWINGS" requirement of the General Requirements.
- C. Incorporate all revisions into record Drawings. These drawings shall be up to date at the end of every week and shall be available to Architect or Engineer at any time for inspection.

3.04 GUARANTEE

- A. Be responsible for work done and material installed under these plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show itself within one (1) year of filing of Notice of Completion and be responsible for damage to other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to Owner.
- B. Be responsible for damage to any part of premises during guarantee period caused by leaks or breaks in work furnished and/or installed under this section.
- C. Replace refrigerant, lubricants, or gases lost as result of defects, breaks, or leaks in work.

3.05 RECORD DRAWINGS

- A. In addition, furnish one (1) tracing showing all outside utility connections, piping, etc., installed under this contract. Locate and dimensions all work with reference to permanent landmarks.
- B. Match all symbols and designations used in contract Drawings when preparing "Record" Drawings.
- C. Indicate clearly and correctly all work installed differently from that shown, and maintain records up to date as work progresses. Include invert elevations of pipes below grade of floor, the floor lines, plugged wyes, tees, caps, exact locations and sizing or piping, location of valves, and the like. Dimension locations from structural points.
- D. Properly identify all stubs for future connections as to locations and use by setting of concrete marker at finished grade in manner suitable to Architect.

3.06 MAINTENANCE DATA

- A. Submit maintenance data and parts lists for all HVAC systems materials and products. Include product data, shop drawings, and Record Drawings in the maintenance manual all in allowance with the requirements of Division 1.

3.07 CLEANING UP

- A. Comply with Supplementary General Conditions.

END OF SECTION

SECTION 23 0513

COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General construction and requirements.
- B. Applications.
- C. Single phase electric motors.
- D. Three phase electric motors.

1.02 REFERENCE STANDARDS

- A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015.
- B. IEEE 112 - IEEE Standard Test Procedure for Polyphase Induction Motors and Generators; 2004.
- C. NEMA MG 1 - Motors and Generators; 2014.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacture of electric motors for Heating, Ventilating, and Cooling use, and their accessories, with minimum three years documented product development, testing, and manufacturing experience.
- B. Comply with NFPA 70.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty for motors larger than 10 horsepower and for all inverter-duty motors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Leeson Electric Corporation: www.leeson.com.
- B. Regal-Beloit Corporation (Century): www.centuryelectricmotor.com.
- C. Baldor: www.baldor.com.
- D. General Electric: www.ge.com.
- E. Westinghouse: www.tecowestinghouse.com.
- F. Marathon: www.marathonelectric.com.

- G. US Motors: www.usmotors.com.
- H. Siemens: www.usa.siemens.com
- I. Toshiba: www.toshiba.com
- J. Substitutions: See Section 23 0200 - HVAC General Requirements.

2.02 GENERAL CONSTRUCTION AND REQUIREMENTS

- A. Construction:
 - 1. Open drip-proof type except where specifically noted otherwise.
 - 2. Design for continuous operation in 104 degrees F (40 degrees C) environment.
 - 3. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
- B. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
- C. Wiring Terminations:
 - 1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
 - 2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

2.03 APPLICATIONS

- A. Single phase motors for shaft mounted fans or blowers: Permanent split capacitor type.
- B. Single phase motors for fans, pumps, blowers, and air compressors: Capacitor start type.
- C. Motors located in exterior locations, wet air streams downstream of sprayed coil dehumidifiers, draw through cooling towers, air cooled condensers, humidifiers, direct drive axial fans, roll filters, explosion proof environments, and dust collection systems: Totally enclosed type.
- D. Whenever variable frequency drives are installed to control AC motors, a maintenance free, circumferential shaft grounding ring shall be installed on the AC motor to discharge currents to ground.
- E. Whenever variable frequency drives are installed to control AC motors, motors shall be inverter duty rated per NEMA MG-1 part 31.
- F. The following electric motor applications shall be provided with variable frequency drives, regardless of the intent to vary motor operating speed:
 - 1. All pumps 10 HP or larger.
 - 2. All pumps noted to have their operating speed varied.
 - 3. All fan systems 10 HP or larger.
 - 4. All fan systems noted to have their operating speed varied.
- G. For mechanical systems in which complete equipment redundancy will not be provided, associated variable frequency drives shall be provided with three-contactor by-pass function.

2.04 SINGLE PHASE POWER - SPLIT PHASE MOTORS

- A. Starting Torque: Less than 150 percent of full load torque.
- B. Starting Current: Up to seven times full load current.
- C. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.
- D. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

2.05 SINGLE PHASE POWER - PERMANENT-SPLIT CAPACITOR MOTORS

- A. Starting Torque: Exceeding one fourth of full load torque.

- B. Starting Current: Up to six times full load current.
- C. Multiple Speed: Through tapped windings.
- D. Open Drip-proof or Enclosed Air Over Enclosure: Class A (50 degrees C temperature rise) insulation, minimum 1.0 Service Factor, prelubricated sleeve or ball bearings, automatic reset overload protector.

2.06 SINGLE PHASE POWER - CAPACITOR START MOTORS

- A. Starting Torque: Three times full load torque.
- B. Starting Current: Less than five times full load current.
- C. Pull-up Torque: Up to 350 percent of full load torque.
- D. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.
- E. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve bearings.
- F. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

2.07 THREE PHASE POWER - SQUIRREL CAGE MOTORS

- A. Starting Torque: Between 1 and 1-1/2 times full load torque.
- B. Starting Current: Less than six times full load current.
- C. Power Output, Locked Rotor Torque, Breakdown or Pull Out Torque: NEMA Design B characteristics.
- D. Design, Construction, Testing, and Performance: Comply with NEMA MG 1 for Design B motors.
- E. Insulation System: NEMA Class B or better.
- F. Testing Procedure: In accordance with IEEE 112. Load test motors to determine free from electrical or mechanical defects in compliance with performance data.
- G. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
- H. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid state control relay for wiring into motor starter; refer to Section 26 2913.
- I. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum ABMA STD 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- J. Sound Power Levels: To NEMA MG 1.
- K. Nominal Efficiency: As indicated at full load and rated voltage when tested in accordance with IEEE 112.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 23 0548

VIBRATION AND SEISMIC CONTROLS FOR HVAC DUCTWORK PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vibration isolators.
- B. Seismic snubber assemblies.
- C. Seismic restraints for suspended components and equipment.

1.02 RELATED REQUIREMENTS

- A. Section 01 4533 - Code-Required Special Inspections.
- B. Section 03 3000 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- B. ASHRAE (HVACA) - ASHRAE Handbook - HVAC Applications; 2015.
- C. FEMA 412 - Installing Seismic Restraints for Mechanical Equipment; 2002.
- D. FEMA 413 - Installing Seismic Restraints for Electrical Equipment; 2004.
- E. FEMA 414 - Installing Seismic Restraints for Duct and Pipe; 2004.
- F. FEMA E-74 - Reducing the Risks of Nonstructural Earthquake Damage; 2011.
- G. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- H. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems; Sheet Metal and Air Conditioning Contractors' National Association; 2008.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data:
 - 1. Provide manufacturer's product literature documenting compliance with PART 2 PRODUCTS.
 - 2. Include seismic rating documentation for each isolator and restraint component accounting for horizontal, vertical, and combined loads.
- C. Shop Drawings:
 - 1. Provide schedule of vibration isolator type with location and load on each.
 - 2. Fully dimensioned fabrication drawings and installation details for vibration isolation bases, member sizes, attachments to isolators, and supported equipment.
 - 3. Include auxiliary motor slide bases and rails, base weights, inertia bases, concrete weights, equipment static loads, support points, vibration isolators, and detailed layout of isolator location and orientation with static and dynamic load on each isolator.
 - 4. Include selections from prescriptive design tables that indicate compliance with the applicable building code and the vibration isolator manufacturer's requirements.
 - 5. Clearly indicate the load and capacity assumptions selected. Include copies of any calculations.
 - 6. Include the calculations that indicate compliance with the applicable building code for seismic controls and the vibration isolator manufacturer's requirements.
 - 7. Include the seal of the Professional Structural Engineer registered in the State of Arkansas in which the Project is located, on the drawings and calculations which at a minimum include the following:

- a. Seismic Restraint Details: Detailed drawings of seismic restraints and snubbers including anchorage details that indicate quantity, diameter, and depth of penetration, edge distance, and spacing of anchors.
 - b. Equipment Seismic Qualification Certification: Certification by the manufacturer or responsible party that each piece of equipment provided will withstand seismic force levels as specified in the applicable building code for seismic controls.
 - 1) Basis for Certification: Indicate whether the withstand certification is based on actual testing of assembled components, on calculations, or on historic data.
 - 2) Indicate equipment to be sufficiently durable to resist design forces and remain functional after the seismic event.
 - c. Dimensioned outline drawings of equipment identifying center of gravity, locations, and provisions for mounting and anchorage.
 - d. Detailed description of the equipment anchorage devices on which the certifications are based.
 - e. Statement of Special Inspections: Prepared by the registered design professional in responsible charge.
- D. Manufacturer's Instructions: Indicate installation instructions with special procedures and setting dimensions.

1.05 QUALITY ASSURANCE

- A. Comply with applicable building code.
- B. Perform design and installation in accordance with applicable codes.
- C. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and registered and licensed in the State in which the Project is located.
- D. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
 - 1. Member of Vibration Isolation and Seismic Control Manufacturers Association (VISCMA).
- E. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.
- F. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Kinetics Noise Control, Inc: www.kineticsnoise.com.
- B. Mason Industries: www.mason-ind.com.
- C. M.W. Saussé & Co., Inc. (Vibrex): www.vibrex.net
- D. Vibration Eliminator Company, Inc: www.veco-nyc.com.
- E. Vibro-Acoustics: www.vibro-acoustics.com
- F. The VMC Group: www.thvmcgroup.com
- G. Substitutions: See Section 23 0200 - HVAC General Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. General:
 - 1. All vibration isolators, base frames and inertia bases to conform to all uniform deflection and stability requirements under all operating loads.
 - 2. Steel springs to function without undue stress or overloading.

3. Steel springs to operate in the linear portion of the load versus deflection curve over deflection range of not less than 50 percent above specified deflection.
4. Lateral to vertical stiffness ratio to not exceed 0.08 with spring deflection at minimum 75 percent of specified deflection.
5. All equipment mounted on vibration isolated bases to have minimum operating clearance of 2 inches (50 mm) between the base and floor or support beneath unless noted otherwise.

2.03 VIBRATION ISOLATORS

A. Non-Seismic Type:

1. All Elastomeric-Fiber Glass Pads:
 - a. Configuration: Flat or molded.
 - b. Thickness: 0.25 inch (6 mm) minimum.
 - c. Assembly: Single or multiple layers using bonded, galvanized sheet metal separation plate between each layer with load plate providing evenly distributed load over pad surface.
2. Elastomeric Mounts:
 - a. Material: Oil, ozone, and oxidant resistant compounds.
 - b. Assembly: Encapsulated load transfer plate bolted to equipment and base plate with anchor hole bolted to supporting structure.
3. Steel Springs:
 - a. Assembly: Freestanding, laterally stable without housing.
 - b. Leveling Device: Rigidly connected to equipment or frame.
4. Restrained Steel Springs:
 - a. Housing: Rigid blocking during rigging prevents equipment installed and operating height from changing during temporary weight reduction.
 - b. Equipment Wind Loading: Adequate means for fastening isolator top to equipment and isolator base plate to supporting structure.
5. Elastomeric Hangers:
 - a. Housing: Steel construction containing elastomeric isolation element to prevent rod contact with housing and short-circuiting of isolating function.
 - b. Incorporate steel load distribution plate sandwiching elastomeric element to housing.
6. Spring Hanger:
 - a. Housing: Steel construction containing stable steel spring and integral elastomeric element preventing metal to metal contact.
 - b. Bottom Opening: Sized to allow plus/minus 15 degrees rod misalignment.
7. Combination Elastomeric-Spring Hanger:
 - a. Housing: Steel construction containing stable steel spring with elastomeric element in series isolating upper connection of hanger box to building structure.
 - b. Bottom Opening: Sized to allow plus/minus 15 degrees rod misalignment.
8. Thrust Restraints:
 - a. Housing: Steel construction containing stable steel spring and integral elastomeric element installed in pairs to resist air pressure thrusts.
 - b. Bottom Openings: Sized to allow plus/minus 15 degrees rod misalignment.

B. Seismic Type:

1. Coil Springs Consisting of Single Elements:
 - a. Housing: Manufactured from cast iron material.
 - b. Ductile Material: Designed and rated for seismic applications.
 - c. Spring: Restrained by housing without significant degradation of vibration isolation capabilities during normal equipment operating conditions.

- d. Resilient Snubbing Grommet System: Incorporated and designed with clearances of no more than 0.25 inch (6 mm) in any direction preventing direct metal-to-metal contact between supported member and fixed restraint housing.
- e. Resilient Pad: Located in series with spring.
- f. Coil Springs: Color coded elements to have a lateral stiffness greater than 0.8 times the rated vertical stiffness with 50 percent overload capacity.
- g. Finish: Suitable for the application.
- 2. All Directional Elastomeric:
 - a. Material: Molded from oil, ozone, and oxidant resistant compounds.
 - b. Operating Parameters: Designed to operate within the isolator strain limits providing maximum performance and service life.
 - c. Attachment Method: Encapsulated load transfer plate bolted to equipment and base plate with anchor hole bolted to supporting structure.
 - d. Rating: Cast iron and aluminum housings rated for seismic restraint applications.
 - e. Minimum Operating Static Deflections: Deflections indicated in project documents are not to exceed published load capacities.

2.04 SEISMIC SNUBBER ASSEMBLIES

- A. Comply with:
 - 1. ASHRAE (HVACA) Handbook - HVAC Applications.
 - 2. FEMA 412.
 - 3. FEMA 413.
 - 4. FEMA 414.
 - 5. FEMA E-74.
 - 6. SMACNA (SRM).
- B. All Directional External:
 - 1. Application: Minimum three (3) snubbers are required for each equipment installation, oriented properly to restrain isolated equipment in all directions.
 - 2. Construction: Interlocking steel construction attached to the building structure and equipment in a manner consistent with anticipated design loads.
 - 3. Performance: Equipment movement at each snubber location limited to a maximum of 0.25 inches (6 mm) in any direction without significantly degrading the vibration isolation capability of the isolator during normal operating conditions.
 - 4. Resilient Pad: Minimum 0.25 inch (6 mm) thick cushions any impact and prevents metal-to-metal contact.
- C. Lateral External:
 - 1. Application: Minimum three (3) snubbers are required for each stable equipment installation, oriented properly to restrain isolated equipment in all lateral directions where uplift forces are zero or addressed by other restraints.
 - 2. Construction: Steel construction attached to the building structure and equipment in a manner consistent with anticipated design loads.
 - 3. Performance: Equipment movement at each snubber location limited to a maximum of 0.25 inches (6 mm) in any direction without significantly degrading the vibration isolation capability of the isolator during normal operating conditions.
 - 4. Resilient Pad: Minimum 0.25 inch (6 mm) thick cushions any impact and prevents metal-to-metal contact.
- D. Omni Directional External:
 - 1. Application: Minimum four (4) snubbers are required for each stable equipment installation, oriented properly to restrain isolated equipment in all lateral directions.
 - 2. Construction: Steel construction attached to the building structure and equipment in a manner consistent with anticipated design loads.

3. Performance: Equipment movement at each snubber location limited to a maximum of 0.25 inches (6 mm) in any direction without significantly degrading the vibration isolation capability of the isolator during normal operating conditions.
 4. Resilient Pad: Minimum 0.25 inch (6 mm) thick cushions any impact and prevents metal-to-metal contact.
- E. Horizontal Single Axis External:
1. Application: Minimum four (4) snubbers are required for each stable equipment installation, oriented properly to restrain isolated equipment in all lateral directions where uplift forces are zero or addressed by other restraints.
 2. Construction: Steel construction attached to the building structure and equipment in a manner consistent with anticipated design loads.
 3. Performance: Equipment movement at each snubber location limited to a maximum of 0.25 inches (6 mm) in any direction without significantly degrading the vibration isolation capability of the isolator during normal operating conditions.
 4. Resilient Pad: Minimum 0.25 inch (6 mm) thick cushions any impact and prevents metal-to-metal contact.

2.05 SEISMIC RESTRAINTS FOR SUSPENDED COMPONENTS AND EQUIPMENT

- A. Comply with:
1. ASHRAE (HVACA) Handbook - HVAC Applications.
 2. FEMA 412.
 3. FEMA 413.
 4. FEMA 414.
 5. FEMA E-74.
 6. SMACNA (SRM).
- B. Cable Restraints:
1. Wire Rope: Steel wire strand cables sized to resist seismic loads in all lateral directions.
 2. Protective Thimbles: Eliminates potential for dynamic cable wear and strand breakage.
 3. Size: Based on the lesser of cable capacity or anchor load taking into account bracket geometry.
 4. Connections:
 - a. Use overlapping wire rope U clips, cable clamping bolts, swaged sleeves or seismically rated tool-less wedge insert lock connectors.
 - b. Internally brace clevis hanger bracket cross bolt to prevent deformation.
 5. Vertical Suspension Rods: Attach required bracing of sufficient strength to prevent rod buckling from vertical compression forces utilizing series of attachment clips.
- C. Rigid Restraints:
1. Structural Element: Sized to resist seismic loads in all lateral directions and carry both compressive and tensile loading.
 2. Size: Based on the lesser of cable capacity or anchor load taking into account bracket geometry.
 3. Connections: Internally brace clevis hanger bracket cross bolt to prevent deformation.
 4. Static Support System: Anchorage capable of carrying additional tension loads generated by the vertical component of the rigid brace compression which is additive to any static load requirements on the system.
 5. Vertical Suspension Rods: Attached required bracing of sufficient strength to prevent rod buckling from vertical compression forces utilizing series of attachment clips.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Install in accordance with manufacturer's instructions.

- B. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- C. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- D. Provide pairs of horizontal limit springs on fans with more than 6.0 inches WC (1.5 kPa) static pressure, and on hanger supported, horizontally mounted axial fans.
- E. Support piping connections to equipment mounted on isolators using isolators or resilient hangers as follows:
 - 1. Up to 4 Inches (100 mm) Pipe Size: First three points of support.
 - 2. Select three hangers closest to vibration source for minimum 1.0 inch (25 mm) static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch (25 mm) static deflection or 1/2 static deflection of isolated equipment.

3.02 INSTALLATION - SEISMIC

- A. Comply with:
 - 1. ASHRAE (HVACA) Handbook - HVAC Applications.
 - 2. FEMA 412.
 - 3. FEMA 413.
 - 4. FEMA 414.
 - 5. FEMA E-74.
 - 6. SMACNA (SRM).
- B. Seismic Snubbers:
 - 1. Provide on all isolated equipment, piping and ductwork.
 - 2. Provide minimum of four seismic snubbers located close to isolators.
 - 3. Snub equipment designated for post-disaster use to 0.05 inch (1.5 mm) maximum clearance.
 - 4. Snub all other equipment between 0.15 inch (4 mm) and 0.25 inch (7 mm) clearance.
- C. Floor and Base-Mounted Equipment, Vibration Isolated Equipment and associated Vibration and Seismic Controls for Connections:
 - 1. Install equipment anchorage items designed to resist seismic design force in any direction.
 - 2. Install vibration and seismic controls designed to include base and isolator requirements.
 - 3. Provide flexible connections between equipment and interconnected piping.
 - 4. Provide isolators and restraints designed for amplified code forces per ASCE 7 and with demonstrated ability to resist required forces including gravity, operational and seismic forces.
 - 5. Where equipment is not designed to be point loaded, provide base capable of transferring gravity and seismic demands from equipment to isolator base plate anchorage.
 - 6. Where concrete floor thickness is less than required for expansion anchor installation, install through bolt in lieu of expansion anchor.
 - 7. Where timber/wood floor or other substrate is inadequate for installation of lag bolts, screws or other mechanical fasteners, install supplemental framing or blocking to transfer loads to structural elements.
- D. Suspended Mechanical Equipment:
 - 1. Provide supports and bracing to resist seismic design force in any direction.
 - 2. Provide flexible connections between equipment and interconnected piping.
 - 3. Brace equipment hung from spring mounts using cable or other bracing that will not transmit vibration to the structure.

4. Use of proprietary restraint systems with a certificate of compliance, verified and listed by an accredited inspection body is acceptable (pending shop drawing approval), as an alternative to project specific seismic bracing design.
- E. Wall mounted Mechanical Equipment:
1. Provide support and bracing to resist seismic design force in any direction.
 2. Install backing plates or blocking as required to deliver load to primary wall framing members.
 3. Anchoring to gypsum wallboard, plaster or other wall finish that has not been engineered to resist imposed loads is not permitted.
- F. Piping:
1. Provide seismic bracing in accordance ASCE 7.
 2. Provide supports, braces, and anchors to resist gravity and seismic design forces.
 3. Provide flexible connections between floor mounted equipment and suspended piping; between unbraced piping and restrained suspended items; as required for thermal movement; at building separations and seismic joints; and wherever relative differential movements could damage pipe in an earthquake.
 4. Brace resiliently supported pipe with cable bracing or alternate means designed to prevent transmission of vibrations and noise to the structure.
 5. Brace every run 5.0 feet (1.5 m) or more in length with two transverse and one longitudinal bracing locations.
 6. Pipes and Connections Constructed of Ductile Materials (copper, ductile iron, steel or aluminum and brazed, welded or screwed connections):
 - a. Provide transverse bracing at spacing not more than 40.0 feet (12.2 m) on center.
 - b. Provide longitudinal bracing at spacing not more than 80.0 feet (24.4 m) on center.
 7. Pipes and Connections Constructed of Non Ductile Materials (cast iron, no-hub, plastic or non-UL listed grooved coupling pipe):
 - a. Provide transverse bracing at spacing not more than 20.0 feet (6.1 m) on center.
 - b. Provide longitudinal bracing at spacing not more than 40.0 feet (12.2 m) on center.
 8. Provide lateral restraint for risers at not more than 30 feet (9.1 m) on center or as required for horizontal runs, whichever is less.
 9. Piping Explicitly Exempt from Seismic Bracing Requirements:
 - a. Provide flexible connections between piping and connected equipment, including in-line devices such as VAV boxes and reheat coils.
 - b. Install piping consistent with ASCE 7, such that swinging of the pipes will not cause damaging impact with adjacent components, finishes, or structural framing while maintaining clear horizontal distance of 67 percent of the hanger length between subject components.
 - c. Provide swing restraints as required to control potential impact due to limited space between subject components.
 10. Use of proprietary restraint systems with a certificate of compliance, verified and listed by an accredited inspection body is acceptable (pending shop drawing approval), as an alternative to project specific seismic bracing design.
 11. Re-use of Existing Hangers:
 - a. Re-using existing hangers at locations of seismic bracing are to be judged on a case-by-case basis by the registered project design professional.
 - b. Unless otherwise shown on drawings, it is assumed all hangers supporting new piping, located at a seismic brace, will be new.
- G. Ductwork:
1. Provide seismic bracing for ducts with cross sectional area greater than 6 sq ft (0.56 sq m) (independent of duct contents).
 2. Provide seismic bracing for all ducts containing hazardous materials.

3. Provide supports, braces, and anchors to resist gravity and seismic design forces.
 4. Install ducts and duct risers designed to accommodate interstory drift.
 5. Independently support in-line devices weighing more than 20 pounds (9.07 kg).
 6. Independently support and brace all in-line devices weighing more than 75 pounds (34 kg).
 7. Provide unbraced piping attached to braced in-line equipment with adequate flexibility to accommodate differential displacements.
 8. Positively attach dampers, louvers, diffusers and similar appurtenances to ductwork with mechanical fasteners.
 9. Install duct supports designed to resist not less than 150 percent of the duct weight.
 10. The use of power driven fasteners is prohibited in the hanging of ducts weighing over 10 pounds (4.54 kg) per lineal foot (m) for seismic design categories D, E, and F.
 11. Use of proprietary restraint systems with a certificate of compliance, verified and listed by an IAS AC172 accredited inspection body or otherwise accepted by applicable codes is acceptable (pending shop drawing approval), as an alternative to project specific seismic bracing design.
- H. Tanks:
1. Install tank anchorage, tank legs and/or supporting structure designed to resist design force.
 2. Provide flexible connections between tank and interconnected piping.
- I. Install seismic restraints for piping as follows:
1. Seismically restrain piping, with an $I_p = 1.0$, located in boiler rooms, mechanical equipment rooms and refrigeration equipment rooms that is 1¼" I.D. and larger. Type V seismic cable restraints or resilient single arm braces shall be used if piping is isolated. Type V seismic cable restraints or Type VI single arm braces may be used on non-isolated piping.
 2. Seismically restrain all other piping 2½" diameter and larger. Type V seismic cable restraints or resilient single arm braces shall be used if piping is isolated. Type VI seismic cable restraints or single arm braces may be used on nonisolated piping.
 3. See Table D on drawings for maximum seismic bracing distances.
 4. Multiple runs of pipe on the same support shall have distance determined by calculation.
 5. Rod braces shall be used for all rod lengths as listed in Table E on drawings.
 6. Clevis hangers shall have braces placed inside of hanger at seismic brace locations.
 7. Where thermal expansion is a consideration, guides and anchors may be used as transverse and longitudinal restraints provided they have a capacity equal to or greater than the restraint loads in addition to the loads induced by expansion or contraction.
 8. Transverse restraint for one pipe section may also act as longitudinal restraint for a pipe section of the same or smaller size connected perpendicular to it if the restraint is installed within 24" of the centerline of the smaller pipe or combined stresses are within allowable limits at longer distances.
 9. Hold down clamps must be used to attach pipe to all trapeze members before applying restraints. Use Type V or VI restraint, if trapeze is smaller than 48" long.
 10. Where pipe passes through a fire-rated, seismic gypsum wall, the wall can act as a lateral/transverse brace for pipe sizes up to and including 6," provided fire stopping material is tight to the pipe.
 11. Branch lines may not be used to restrain main lines or cross-mains.
 12. Where pipe passes through a seismic block or concrete wall, the wall can act as a lateral/transverse brace.
 13. Where horizontal pipe crosses a building's drift expansion joint, allowance shall be part of the design to accommodate differential motion.
 14. Exemptions are as follows:
 - a. All high deformability pipe or conduit 3" or less in diameter suspended by individual hanger rods where $I_p = 1.0$.

- b. High deformability pipe or conduit in Seismic Design Category C, 2" or less in diameter suspended by individual hanger rods where $l_p = 1.5$.
 - c. High deformability pipe or conduit in Seismic Design Category D, E or F, 1" or less in diameter suspended by individual hanger rods where $l_p = 1.5$.
 - d. All clevis supported pipe or conduit runs installed less than 12" from the top of the pipe to the underside of the support point and trapeze supported pipe suspended by hanger rods having a distance less than 12" in length from the underside of the pipe support to the support point of the structure.
 - e. Piping systems, including their supports, designed and constructed in accordance with ASME B31.
 - f. Piping systems, including their supports, designed and constructed in accordance with NFPA, provided they meet the force and displacement requirements of Section 13.3.1 and 13.3.2 (ASCE 7-05).
- J. Install seismic restraints for ductwork per the following:
- 1. Restrain rectangular ductwork with cross sectional area of 6 square feet or larger. Type V seismic cable restraints or Type VI single arm braces shall be used on this duct. Duct that serves a life safety function or carries toxic materials in an "Essential or High Hazard Facility" must be braced with no exceptions regardless of size or distance requirements.
 - 2. Restrain round ducts with diameters of 28" or larger. Type V seismic cable restraints or Type VI single arm braces.
 - 3. Restrain flat oval ducts the same as rectangular ducts of the same nominal size.
 - 4. See Table D on drawings for maximum seismic bracing distances.
 - 5. Duct must be reinforced at the restraint locations. Reinforcement shall consist of an additional angle on top of the ductwork that is attached to the support hanger rods. Ductwork is to be attached to both upper angle and lower trapeze. Additional reinforcing is not required if duct sections are mechanically fastened together with frame bolts and positively fastened to the duct support suspension system.
 - 6. A group of ducts may be combined in a larger frame so that the combined weights and dimensions of the ducts are less than or equal to the maximum weight and dimensions of the duct for which bracing details are selected.
 - 7. Walls, including gypsum board non-bearing partitions, which have ducts running through them, may replace a typical transverse brace. Provide channel framing around ducts and solid blocking between the duct and frame.
 - 8. If ducts are supported by angles, channels or struts, ducts shall be fastened to it at seismic brace locations in lieu of duct reinforcement.
 - 9. Exemptions are as follows: (Applies to $l_p = 1.0$ only)
 - a. Rectangular, square, and oval air handling ducts less than six square feet in cross sectional area.
 - b. Round air handling duct less than 28 inches in diameter.
 - c. Duct runs supported at locations by two rods less than 12 inches in length from the structural support to the structural connection to the ductwork.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect isolated equipment after installation and submit report. Include static deflections.
- C. Perform testing and inspections of the installation in accordance with Section 01 4533.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

23 HEATING, VENTILATING,
AND AIR-CONDITIONING
(HVAC)

23 0548 - 10

VIBRATION AND SEISMIC
CONTROLS FOR HVAC
DUCTWORK PIPING AND
EQUIPMENT

SECTION 23 0553
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Adhesive-backed duct markers.
- D. Pipe markers.
- E. Ceiling tacks.

1.02 REFERENCE STANDARDS

- A. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2013.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

- A. Air Handling Units: Nameplates.
- B. Automatic Controls: Tags. Key to control schematic.
- C. Control Panels: Nameplates.
- D. Dampers: Ceiling tacks, where located above lay-in ceiling.
- E. Heat Transfer Equipment: Nameplates.
- F. Instrumentation: Tags.
- G. Major Control Components: Nameplates.
- H. Piping: Pipe markers.
- I. Pumps: Nameplates.
- J. Tanks: Nameplates.
- K. Thermostats: Nameplates.
- L. Valves: Tags and ceiling tacks where located above lay-in ceiling.

2.02 NAMEPLATES

- A. Description: Laminated three-layer plastic with engraved letters.
 - 1. Letter Color: White.
 - 2. Letter Height: 1/4 inch (6 mm).
 - 3. Background Color: Red.
 - 4. Plastic: Comply with ASTM D709.

2.03 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved white letters on light contrasting background color. Tag size minimum 1-1/2 inch (40 mm) diameter.
- B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch (40 mm) diameter with smooth edges.

2.04 ADHESIVE-BACKED DUCT MARKERS

- A. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch (0.76 mm); printed with UV and chemical resistant inks.
- B. Style: Multiple Markers on a Roll.

2.05 PIPE MARKERS

- A. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- B. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- C. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches (150 mm) wide by 4 mil (0.10 mm) thick, manufactured for direct burial service.
- D. Color code as follows:
 - 1. Heating, Cooling, and Boiler Feedwater: Green with white letters.
 - 2. Toxic and Corrosive Fluids: Orange with black letters.
 - 3. Compressed Air: Blue with white letters.

2.06 CEILING TACKS

- A. Description: Steel with 3/4 inch (20 mm) diameter color coded head.
- B. Color code as follows:
 - 1. HVAC Equipment: Yellow.
 - 2. Fire Dampers and Smoke Dampers: Red.
 - 3. Heating/Cooling Valves: Blue.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Install plastic pipe markers in accordance with manufacturer's instructions.
- D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- E. Install ductwork with Adhesive-Backed Duct Markers. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
- F. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Testing, adjustment, and balancing of air systems.
- B. Testing, adjustment, and balancing of domestic hot water recirculation systems.
- C. Measurement of final operating condition of HVAC systems.

1.02 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2008.
- C. NEBB (TAB) - Procedural Standards for Testing Adjusting Balancing of Environmental Systems; 2005, Seventh Edition.
- D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2002.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
 - 1. Include at least the following in the plan:
 - a. List of all air flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - c. Discussion of what notations and markings will be made on the duct drawings during the process.
 - d. Final test report forms to be used.
 - e. Details of how TOTAL flow will be determined; for example:
 - 1) Air: Sum of terminal flows via control system calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations.
 - 2) Water: Pump curves, circuit setter, flow station, ultrasonic, etc.
 - f. Procedures for formal deficiency reports, including scope, frequency and distribution.
- C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 - 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
 - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 5. Units of Measure: Report data in I-P (inch-pound) units only.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:

1. AABC (NSTSB), AABC National Standards for Total System Balance.
 2. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 2. Having minimum of three years documented experience.
 3. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
 - c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.
- E. TAB Supervisor Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
1. Systems are started and operating in a safe and normal condition.
 2. Temperature control systems are installed complete and operable.
 3. Proper thermal overload protection is in place for electrical equipment.
 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 5. Duct systems are clean of debris.
 6. Fans are rotating correctly.
 7. Fire and volume dampers are in place and open.
 8. Air coil fins are cleaned and combed.
 9. Access doors are closed and duct end caps are in place.
 10. Air outlets are installed and connected.
 11. Duct system leakage is minimized.
 12. Hydronic systems are flushed, filled, and vented.
 13. Pumps are rotating correctly.
 14. Service and balance valves are open.
- B. Beginning of work means acceptance of existing conditions.

3.03 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.04 RECORDING AND ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

- C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- E. Check and adjust systems approximately six months after final acceptance and submit report.

3.05 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

3.06 WATER SYSTEM PROCEDURE

- A. Adjust water systems to provide required or design quantities.
- B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gages to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.

3.07 SCOPE

- A. Test, adjust, and balance the following:
 - 1. Plumbing Pumps.
 - 2. Forced Air Furnaces.
 - 3. Air Cooled Refrigerant Condensers.
 - 4. Packaged Roof Top Heating/Cooling Units.
 - 5. Air Handling Units.
 - 6. Fans.
 - 7. Air Inlets and Outlets.

3.08 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
 - 1. Manufacturer.
 - 2. Model/Frame.
 - 3. HP/BHP.
 - 4. Phase, voltage, amperage; nameplate, actual, no load.
- B. Pumps:
 - 1. Identification/number.
 - 2. Manufacturer.
 - 3. Size/model.
 - 4. Impeller.
 - 5. Service.
 - 6. Design flow rate, pressure drop, BHP.
 - 7. Actual flow rate, pressure drop, BHP.
 - 8. Discharge pressure.
 - 9. Suction pressure.
 - 10. Total operating head pressure.
- C. Air Cooled Condensers:
 - 1. Identification/number.
 - 2. Manufacturer.
 - 3. Model number.
 - 4. Serial number.
 - 5. Entering DB air temperature, design and actual.
 - 6. Leaving DB air temperature, design and actual.
 - 7. Number of compressors.
- D. Cooling Coils:
 - 1. Identification/number.
 - 2. Location.
 - 3. Service.
 - 4. Manufacturer.
 - 5. Air flow, design and actual.
 - 6. Entering air DB temperature, design and actual.
 - 7. Entering air WB temperature, design and actual.
 - 8. Leaving air DB temperature, design and actual.
 - 9. Leaving air WB temperature, design and actual.
 - 10. Air pressure drop, design and actual.
- E. Heating Coils:
 - 1. Identification/number.
 - 2. Location.
 - 3. Service.
 - 4. Manufacturer.
 - 5. Air flow, design and actual.
 - 6. Air pressure drop, design and actual.
- F. Air Moving Equipment:
 - 1. Identification/Location
 - 2. Manufacturer.
 - 3. Model number.
 - 4. Serial number.
 - 5. Air flow, specified and actual.
 - 6. Return air flow, specified and actual.

7. Outside air flow, specified and actual.
 8. Total static pressure (total external), specified and actual.
 9. Fan RPM.
- G. Return Air/Outside Air:
1. Identification/location.
 2. Design return air flow.
 3. Actual return air flow.
 4. Design outside air flow.
 5. Actual outside air flow.
- H. Exhaust Fans:
1. Identification/Location
 2. Manufacturer.
 3. Model number.
 4. Serial number.
 5. Air flow, specified and actual.
 6. Total static pressure (total external), specified and actual.
 7. Fan RPM.
- I. Duct Traverses:
1. System zone/branch.
 2. Duct size.
 3. Area.
 4. Design velocity.
 5. Design air flow.
 6. Test velocity.
 7. Test air flow.
 8. Duct static pressure.
- J. Air Distribution Tests:
1. Air terminal number.
 2. Room number/location.
 3. Terminal type.
 4. Terminal size.
 5. Area factor.
 6. Design velocity.
 7. Design air flow.
 8. Test (final) velocity.
 9. Test (final) air flow.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

23 HEATING, VENTILATING,
AND AIR-CONDITIONING
(HVAC)

23 0593 - 6

TESTING, ADJUSTING, AND
BALANCING FOR HVAC

SECTION 23 0713
DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Duct insulation.
- B. Duct liner.
- C. Insulation jackets.

1.02 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- C. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2017.
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2014.
- E. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.
- F. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2014.
- G. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2012.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- I. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- J. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
- K. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.
- L. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.06 FIELD CONDITIONS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, FLEXIBLE

- A. Manufacturer:
1. Johns Manville: www.jm.com.
 2. Owens Corning Corporation: www.ocbuildingspec.com.
 3. CertainTeed Corporation: www.certainteed.com.
 4. Substitutions: See Section 23 0200 - HVAC General Requirements.
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
1. 'K' ('Ksi') value: 0.29 at 75 degrees F (0.042 at 24 degrees C), when tested in accordance with ASTM C518.
 2. Maximum Service Temperature: 450 degrees F (232 degrees C).
 3. Maximum Water Vapor Absorption: 5.0 percent by weight.
- C. Vapor Barrier Jacket:
1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 2. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/Pa s m), when tested in accordance with ASTM E96/E96M.
 3. Secure with pressure sensitive tape.

2.03 POLYSTYRENE BOARD, RIGID

- A. Manufacturers:
1. Dow Chemical Co: www.dow.com.
 2. Owens Corning Corp: www.owenscorning.com.
 3. Pactiv Building Products: greenguard.pactiv.com.
 4. Substitutions: See Section 23 0200 - HVAC General Requirements.
- B. Insulation: Extruded Polystyrene Board Insulation: ASTM C 578, Type X; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E 84.
 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
 3. Thermal Conductivity (k factor) at 25 degrees F (-3.9 degrees C): 0.18 (0.31).
 4. Compressive Resistance: 25 psi (173 kPa).
- C. Vapor Barrier Jacket:
1. Rubberized Bitumen Membrane.
 2. Moisture Vapor Permeability: .0053 perms, when tested in accordance with ASTM E 96/E96M
 3. Peel and stick application.
 4. Self-healing and UV stable.

2.04 JACKETS

- A. Canvas Jacket: UL listed 6 oz/sq yd (220 g/sq m) plain weave cotton fabric treated with dilute fire retardant lagging adhesive.
- B. Aluminum Jacket: ASTM B209 (ASTM B209M).
1. Thickness: 0.016 inch (0.40 mm) sheet.
 2. Finish: Smooth.
 3. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
 4. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.

5. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.015 inch (0.38 mm) thick aluminum.

2.05 DUCT LINER

- A. Manufacturers:
 1. Knauf Insulation: www.knaufinsulation.com.
 2. Johns Manville: www.jm.com.
 3. Owens Corning Corp: www.owenscorning.com.
 4. CertainTeed Corporation: www.certainteed.com.
 5. Armacell LLC: www.armacell.us
 6. Substitutions: See Section 23 0200 - HVAC General Requirements.
- B. Elastomeric Foam Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
 1. Minimum Service Temperature: Minus 40 degrees F (Minus 40 degrees C).
 2. Maximum Service Temperature: 180 degrees F (82 degrees C).
 3. Fungal Resistance: No growth when tested according to ASTM G21.
 4. Connection: Waterproof vapor barrier adhesive.
- C. Glass Fiber Insulation: Non-corrosive, incombustible glass fiber complying with ASTM C1071; flexible blanket, rigid board, and preformed round liner board; impregnated surface and edges coated with poly vinyl acetate polymer, acrylic polymer, or black composite.
 1. Fungal Resistance: No growth when tested according to ASTM G21.
- D. Insulation: Incombustible glass fiber complying with ASTM C 1071; flexible blanket, rigid board, and preformed round liner board; impregnated surface and edges coated with poly vinyl acetate polymer or acrylic polymer shown to be fungus and bacteria resistant by testing to ASTM G 21.
 1. Apparent Thermal Conductivity: Maximum of 0.25 at 75 degrees F (0.036 at 24 degrees C).
 2. Service Temperature: Up to 250 degrees F (121 degrees C).
 3. Rated Velocity on Coated Air Side for Air Erosion: 5,000 fpm (25.4 m/s), minimum.
 4. Minimum Noise Reduction Coefficients:
 - a. 1/2 inch (13 mm) Thickness: 0.30.
 - b. 1 inch (25 mm) Thickness: 0.45.
- E. Adhesive: Waterproof, fire-retardant type, ASTM C916.
- F. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that ducts have been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Insulated ducts conveying air below ambient temperature:
 1. Provide insulation with vapor barrier jackets.
 2. Finish with tape and vapor barrier jacket.
 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Ducts Exposed in Finished Spaces: Finish with primed and painted metal exterior.
- D. Ducts Exposed in Mechanical Equipment Rooms: Finish with metal exterior.
- E. External Duct Insulation Application:

1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 2. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
 3. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
 4. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
- F. Duct and Plenum Liner Application:
1. Adhere insulation with adhesive for 90 percent coverage.
 2. Secure insulation with mechanical liner fasteners as required. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible for spacing.
 3. Seal and smooth joints. Seal and coat transverse joints.
 4. Seal liner surface penetrations with adhesive.
 5. Duct dimensions indicated are sheet metal dimensions.

3.03 SCHEDULES

- A. Rectangular Return and Supply Ducts in Conditioned Interior Spaces:
1. Flexible Glass Fiber Duct Liner Insulation: Minimum R-Value (4).
 2. Flexible Elastomeric Duct Insulation: Minimum R-Value (4).
- B. Round Return and Supply Supply Ducts in Conditioned Interior Spaces:
1. Flexible Glass Fiber Duct Insulation: Minimum R-Value (4).
- C. Return and Supply Air Ducts installed in Unconditioned Interior Spaces:
1. Flexible Glass Fiber Duct Insulation: Minimum R-Value (6).
- D. Return and Supply Air Ducts installed in a Building Envelope Assembly, but exposed to exterior air conditions (i.e. vented crawlspace, vented attic):
1. Climate Zones 1-4: Minimum R-Value (8).
 - a. Flexible Glass Fiber Duct Insulation.
 - b. Extruded Polystyrene Board.
 - c. Rigid Phenolic Duct (Refer to Section 23 3100 HVAC Ducts and Casings)
 2. Climate Zones 5-8: Minimum R-Value (12).
 - a. Flexible Glass Fiber Duct Insulation.
 - b. Extruded Polystyrene Board.
 - c. Rigid Phenolic Duct (Refer to Section 23 3100 HVAC Ducts and Casings)
- E. Ducts Exposed to Outdoors:
1. Climate Zones 1-4: Minimum R-Value (8).
 - a. Extruded Polystyrene Board.
 - b. Rigid Phenolic Duct (Refer to Section 23 3100 HVAC Ducts and Casings)
 2. Climate Zones 5-8: Minimum R-Value (12).
 - a. Extruded Polystyrene Board.
 - b. Rigid Phenolic Duct (Refer to Section 23 3100 HVAC Ducts and Casings)
- F. Exhaust Ducts:
1. Flexible Glass Fiber Duct Insulation: Minimum R-Value (4).
- G. Outside Air Intake Ducts:
1. Flexible Glass Fiber Duct Insulation: Minimum R-Value (8).

END OF SECTION

SECTION 23 0719
HVAC PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.
- B. Flexible removable and reusable blanket insulation.
- C. Jackets and accessories.
- D. Engineered wall outlet seals and refrigerant piping insulation protection.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2014.
- E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2015.
- F. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2014.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.07 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, RIGID

- A. Manufacturers:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Johns Manville Corporation: www.jm.com.
 - 3. Knauf Insulation: www.knaufinsulation.com.
 - 4. Owens Corning Corporation: www.ocbuildingspec.com.
 - 5. Substitutions: See Section 23 0200 - HVAC General Requirements.
- B. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
 - 1. K (Ksi) Value: ASTM C177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
 - 2. Maximum Service Temperature: 650 degrees F (343 degrees C).
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches (0.029 ng/Pa s m).

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Manufacturer:
 - 1. Aeroflex USA, Inc: www.aeroflexusa.com.
 - 2. Armacell LLC: www.armacell.us.
 - 3. K-Flex USA LLC: www.kflexusa.com.
 - 4. Substitutions: See Section 23 0200 - HVAC General Requirements.
- B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
 - 1. 'K' ('Ksi') value: ASTM C 177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
 - 2. Minimum Service Temperature: Minus 40 degrees F (Minus 40 degrees C).
 - 3. Maximum Service Temperature: 180 degrees F (82 degrees C).
 - 4. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.04 JACKETS

- A. PVC Plastic.
 - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F (minus 18 degrees C).
 - b. Maximum Service Temperature: 150 degrees F (66 degrees C).
 - c. Moisture Vapor Permeability: 0.002 perm inch (0.0029 ng/Pa s m), maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil (0.25 mm).
 - e. Connections: Brush on welding adhesive.
- B. Canvas Jacket: UL listed 6 oz/sq yd (220 g/sq m) plain weave cotton fabric treated with dilute fire retardant lagging adhesive.
- C. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
 - 1. Thickness: 0.016 inch (0.40 mm) sheet.
 - 2. Finish: Smooth.
 - 3. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
 - 4. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.

2.05 ENGINEERED WALL OUTLET SEALS AND REFRIGERANT PIPING INSULATION PROTECTION

- A. Basis of Design: Airex Manufacturing, Inc; www.airexmfg.com.

1. Pipe Penetration Wall Seal: Airex Titan Outlet.
 2. Refrigeration Pipe Insulation Protection System: Airex E-Flex Guard.
 3. Pipe Penetration Wall Seal and Insulation Protection System: Airex Pro-System Kit.
- B. Pipe Penetration Wall Seal: Seals HVAC piping wall penetrations with compression gasket wall mounted rigid plastic outlet cover.
1. Outlet Cover Color: Gray.
- C. Insulation Protection System: Refrigerant piping insulation PVC protective cover.
1. PVC Insulation Cover Color: Black with full-length velcro fastener.
 2. Flame Spread and Smoke Development Rating of 24/450: Comply with ASTM E84 or UL 723.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulated pipes conveying fluids below ambient temperature; insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 1. Provide vapor barrier jackets, factory-applied or field-applied; secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. For hot piping conveying fluids 140 degrees F (60 degrees C) or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- F. For hot piping conveying fluids over 140 degrees F (60 degrees C), insulate flanges and unions at equipment.
- G. Glass fiber insulated pipes conveying fluids above ambient temperature.
 1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- H. Inserts and Shields:
 1. Application: Piping 1-1/2 inches (40 mm) diameter or larger.
 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 3. Insert location: Between support shield and piping and under the finish jacket.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 8400.
- J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with canvas jacket sized for finish painting.
- K. Exterior Applications: Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULE

- A. Cooling Systems:
 - 1. Condensate Drains from Cooling Coils:
 - a. Flexible Elastomeric Cellular Foam Insulation
 - b. Minimum Thickness: 1/2 inch.
 - 2. Refrigerant Piping:
 - a. Flexible Elastomeric Cellular Foam Insulation:
 - b. Minimum Thickness: 1/2 inch (13 mm).

END OF SECTION

SECTION 23 0993
SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other sections.
- B. Sequence of operation for:
 - 1. Single Zone Split Systems (HVAC-1, 2).
 - 2. Single Zone Packaged Systems (HVAC-3).
 - 3. Exhaust / Transfer Fans (EF-1 thru 7, TF-1)

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SINGLE ZONE SPLIT SYSTEMS (HVAC-1, 2)

- A. Under normal operating conditions the system shall be started and stopped by the thermostat control system and operation shall be based on an adjustable occupied / unoccupied schedule coordinated with the owner's requirements. The outdoor air control damper shall open when the system is in occupied mode and operating in cooling or heating mode. The outside air damper shall open without a call for heating or cooling only if sufficient ventilation is not achieved during heating or cooling operation and the damper shall remain closed at all other times.
- B. Operational Modes:
 - 1. Heating: The unit shall provide modulating gas heat to maintain the space temperature at the programmed setpoint.
 - 2. Cooling: The unit shall provide single stage cooling to maintain the space temperature at the programmed setpoint.
 - 3. Dehumidification: The system shall operate in cooling mode with decreased fan speed to increase latent cooling and decrease sensible cooling. The system shall under cool the space by a user defined setting to provide dehumidification.
 - 4. Unoccupied Setback: The system shall automatically switch to setback temperature programming when operating in unoccupied mode. The system shall have an available override feature to operate the system to maintain the occupied space temperature setpoint for a period of 1 hour (adj.).

3.02 SINGLE ZONE PACKAGED SYSTEMS (HVAC-3)

- A. Under normal operating conditions the system shall be started and stopped by the DDC system and operation shall be based on an adjustable occupied / unoccupied schedule coordinated with the owner's requirements. The outdoor air control damper shall open when the system is in occupied mode and shall close when the system is in unoccupied mode.
- B. Operational Modes:
 - 1. Heating: The unit shall provide modulating gas heat to maintain the space temperature at the programmed setpoint.
 - 2. Cooling: The unit shall provide modulating capacity cooling with hot gas reheat to maintain the space temperature at the programmed setpoint.
 - 3. Economizer: When the outside air enthalpy is below the return air enthalpy, shut down compressor operation and modulate outside air and return air dampers to maintain the space temperature at the programmed setpoint.
 - 4. Dehumidification: Modulating DX cooling shall maintain a cooling coil discharge temperature of 55 degrees Fahrenheit. The hot gas reheat coil shall modulate to maintain the space temperature at the programmed setpoint.

5. Unoccupied Setback: The system shall automatically switch to setback temperature programming when operating in unoccupied mode. The system shall have an available override feature to operate the system to maintain the occupied space temperature setpoint for a period of 1 hour (adj.).
 6. Remote Sensors: The system shall include two remote temperature sensors to provide a space temperature averaging network. Space humidity levels shall be determined by a return air humidity sensors installed in the system return air ductwork upstream of the introduction of outside air.
- C. A smoke detector in the unit return air ductwork shall signal a fire alarm event upon the detection of smoke and shall shutdown the unit.
 - D. A fan stop signal from the building fire alarm panel shall shutdown the unit.

3.03 EXHAUST AND TRANSFER AIR FANS (EF-1 THRU 7, TF-1)

- A. Refer to Equipment Schedule on the plan documents for control requirements.

END OF SECTION

SECTION 23 2300
REFRIGERANT PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping.
- B. Refrigerant.
- C. Moisture and liquid indicators.
- D. Valves.
- E. Strainers.
- F. Check valves.
- G. Filter-driers.
- H. Expansion valves.
- I. Flexible connections.

1.02 RELATED REQUIREMENTS

- A. Section 08 3100 - Access Doors and Panels.
- B. Section 23 0719 - HVAC Piping Insulation.

1.03 REFERENCE STANDARDS

- A. AHRI 750 - Standard for Thermostatic Refrigerant Expansion Valves; 2007.
- B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2013.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.
- D. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2013.
- E. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2013.
- F. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2011-AMD 1.

1.04 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.
- B. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.
- C. Valves:
 - 1. Use service valves on suction and discharge of compressors.
 - 2. Use gauge taps at compressor inlet and outlet.
 - 3. Use check valves on compressor discharge.
 - 4. Use check valves on condenser liquid lines on multiple condenser systems.
- D. Refrigerant Charging (Packed Angle) Valve: Use in liquid line between receiver shut-off valve and expansion valve.
- E. Strainers:
 - 1. Use line size strainer upstream of each automatic valve.
 - 2. Use shut-off valve on each side of strainer.
- F. Filter-Driers:
 - 1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.
 - 2. Use a filter-drier on suction line just ahead of compressor.

3. Use sealed filter-driers in lines smaller than 1/2 inch (13 mm) outside diameter.
 4. Use sealed filter-driers in low temperature systems.
 5. Use sealed filter-driers in systems utilizing hermetic compressors.
 6. Use replaceable core filter-driers in lines of 1/2 inch (13 mm) outside diameter or greater.
 7. Use replaceable core liquid-line filter-driers in systems utilizing receivers.
- G. Flexible Connectors: Utilize at or near compressors where piping configuration does not absorb vibration.

1.05 SUBMITTALS

- A. Product Data: Provide general assembly of specialties, including manufacturers catalogue information. Provide manufacturers catalog data including load capacity.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design piping system under direct supervision of a Professional Engineer experienced in design of this type of work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store piping and specialties in shipping containers with labeling in place.
- B. Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.
- C. Dehydrate and charge components such as piping and receivers, seal prior to shipment, until connected into system.

PART 2 PRODUCTS

2.01 PIPING

- A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
1. Fittings: ASME B16.22 wrought copper.
 2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.
- B. Pipe Supports and Anchors:
1. Conform to ASME B31.5.
 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch (13 to 38 mm): Malleable iron adjustable swivel, split ring.
 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 4. Vertical Support: Steel riser clamp.
 5. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
 6. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
 7. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.02 REFRIGERANT

- A. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.

2.03 MOISTURE AND LIQUID INDICATORS

- A. Indicators: Single port type, UL listed, with copper or brass body, flared or solder ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum temperature of 200 degrees F (93 degrees C) and maximum working pressure of 500 psi (3450 kPa).

2.04 VALVES

- A. Ball Valves:
1. Two piece bolted forged brass body with teflon ball seals and copper tube extensions, brass bonnet and seal cap, chrome plated ball, stem with neoprene ring stem seals; for

maximum working pressure of 500 psi (3450 kPa) and maximum temperature of 300 degrees F (149 degrees C).

- B. Service Valves:
 - 1. Forged brass body with copper stubs, brass caps, removable valve core, integral ball check valve, flared or solder ends, for maximum pressure of 500 psi (3450 kPa).

2.05 STRAINERS

- A. Straight Line or Angle Line Type:
 - 1. Brass or steel shell, steel cap and flange, and replaceable cartridge, with screen of stainless steel wire or monel reinforced with brass; for maximum working pressure of 430 psi (2960 kPa).

2.06 CHECK VALVES

- A. Straight Through Type:
 - 1. Brass body and disc, phosphor-bronze or stainless steel spring, neoprene seat; for maximum working pressure of 500 psi (3450 kPa) and maximum temperature of 200 degrees F (93 degrees C).

2.07 FILTER-DRIERS

- A. Performance:
 - 1. Pressure Drop: 2 psi (14 kPa), maximum, when operating at full connected evaporator capacity.
 - 2. Design Working Pressure: 350 psi (2410 kPa), minimum.
- B. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, activated charcoal, and filtration to 40 microns, with secondary filtration to 20 microns; of construction that will not pass into refrigerant lines.
- C. Construction: UL listed.
 - 1. Replaceable Core Type: Steel shell with removable cap.
 - 2. Sealed Type: Copper shell.
 - 3. Connections: As specified for applicable pipe type.

2.08 EXPANSION VALVES

- A. Angle or Straight Through Type: AHRI 750; design suitable for refrigerant, brass body, internal or external equalizer, bleed hole, adjustable superheat setting, replaceable inlet strainer, with non-replaceable capillary tube and remote sensing bulb and remote bulb well.
- B. Selection: Evaluate refrigerant pressure drop through system to determine available pressure drop across valve. Select valve for maximum load at design operating pressure and minimum 10 degrees F (6 degrees C) superheat. Select to avoid being undersized at full load and excessively oversized at part load.

2.09 ELECTRONIC EXPANSION VALVES

- A. Evaporation Control System:
 - 1. Electronic microprocessor based unit in enclosed case, proportional integral control with adaptive superheat, maximum operating pressure function, preselection allowance for electrical defrost and hot gas bypass.

2.10 FLEXIBLE CONNECTORS

- A. Corrugated stainless steel hose with single layer of stainless steel exterior braiding, minimum 9 inches (230 mm) long with copper tube ends; for maximum working pressure of 500 psi (3450 kPa).

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

- A. Install refrigeration specialties in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and avoid interference with use of space.
- D. Group piping whenever practical at common elevations and locations. Slope piping one percent in direction of oil return.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.5.
 - 2. Install hangers to provide minimum 1/2 inch (13 mm) space between finished covering and adjacent work.
 - 3. Place hangers within 12 inches (300 mm) of each horizontal elbow.
 - 4. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 5. Provide copper plated hangers and supports for copper piping.
- G. Arrange piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.
- H. Provide clearance for installation of insulation and access to valves and fittings.
- I. Provide access to concealed valves and fittings. Coordinate size and location of access doors with Section 08 3100.
- J. Insulate piping and equipment; refer to Section and Section 23 0716.
- K. Follow ASHRAE Std 15 procedures for charging and purging of systems and for disposal of refrigerant.
- L. Provide replaceable cartridge filter-driers, with isolation valves and valved bypass.
- M. Fully charge completed system with refrigerant after testing.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Test refrigeration system in accordance with ASME B31.5.
- C. Pressure test system with dry nitrogen to 200 psi (1380 kPa). Perform final tests at 27 inches (92 kPa) vacuum and 200 psi (1380 kPa) using halide torch. Test to no leakage.

END OF SECTION

SECTION 23 3100
HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal ductwork.
- B. Nonmetal ductwork.

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- D. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2013.
- E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.
- F. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2015.
- G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.
- H. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; current edition, including all revisions.

1.03 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A standards.

1.04 FIELD CONDITIONS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS

2.01 DUCT ASSEMBLIES

- A. Regulatory Requirements: Construct ductwork to comply with NFPA 90A standards.
- B. Ducts: Galvanized steel, unless otherwise indicated.
- C. Low Pressure Supply (Heating Systems): 1/2 inch w.g. (125 Pa) pressure class, galvanized steel.
- D. Low Pressure Supply (System with Cooling Coils): 1/2 inch w.g. (125 Pa) pressure class, galvanized steel.
- E. Medium and High Pressure Supply: 1 inch w.g. (250 Pa) pressure class, galvanized steel.
- F. Return and Relief: 1/2 inch w.g. (125 Pa) pressure class, galvanized steel.
- G. General Exhaust: 1/2 inch w.g. (125 Pa) pressure class, galvanized steel.
- H. Outside Air Intake: 1/2 inch w.g. (125 Pa) pressure class, galvanized steel.
- I. Ducts Exposed to Exterior Conditions: 1 inch w.g. pressure class, rigid phenolic.

2.02 MATERIALS

- A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.

1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
 2. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
- C. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
- D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 2. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
- E. Insulated Flexible Ducts:
1. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire; fiberglass insulation; polyethylene vapor barrier film.
 - a. Pressure Rating: 10 inches WG (2.50 kPa) positive and 1.0 inches WG (250 Pa) negative.
 - b. Maximum Velocity: 4000 fpm (20.3 m/sec).
 - c. Temperature Range: -20 degrees F to 210 degrees F (-28 degrees C to 99 degrees C).

2.03 DUCTWORK FABRICATION

- A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.
- B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline
- D. Provide turning vanes when rectangular elbows must be used.
- E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- F. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).
- G. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.04 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Double Wall Insulated Rigid Phenolic Ducts for Exterior Duct Applications: CFC/HCFC-free rigid phenolic insulation core. A closed cell structure highly resistant to moisture penetration. Panels jacketed on both sides with a protective low vapor permeability 1 mil aluminum foil reinforced with a 0.2" glass scrim.
 1. Insulation K Value: 0.146
 2. Thickness: 1-3/4"
 3. Insulation Density: 3.5 pcf
- C. Flexible Ducts: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire.
 1. Pressure Rating: 10 inches WG (2.50 kPa) positive and 1.0 inches WG (250 Pa) negative.
 2. Maximum Velocity: 4000 fpm (20.3 m/sec).
 3. Temperature Range: Minus 20 degrees F to 210 degrees F (Minus 28 degrees C to 99 degrees C).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. Install in accordance with manufacturer's instructions.
- C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- D. Duct sizes indicated are sheet metal dimensions. For lined ducts, sheet metal duct sizes indicated on drawings include inside lining.
- E. Ductwork shall not be fabricated off-site prior to field verification of space available for proper installation and clearances. Any changes and corrections required shall be done at the Contractor's expense.
- F. Install and seal metal and flexible ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- G. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

3.02 CLEANING

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 23 3300
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air turning devices/extractors.
- B. Backdraft dampers.
- C. Duct access doors.
- D. Flexible duct connections.
- E. Volume control dampers.

1.02 RELATED REQUIREMENTS

- A. Section 23 0548 - Vibration and Seismic Controls for HVAC Ductwork Piping and Equipment.
- B. Section 23 3100 - HVAC Ducts and Casings.
- C. Section 23 3600 - Air Terminal Units: Pressure regulating damper assemblies.

1.03 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide for shop fabricated assemblies including volume control dampers. Include electrical characteristics and connection requirements.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect dampers from damage to operating linkages and blades.

PART 2 PRODUCTS

2.01 AIR TURNING DEVICES/EXTRACTORS

- A. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.

2.02 BACKDRAFT DAMPERS

- A. Manufacturers:
 - 1. Nailor Industries, Inc: www.nailor.com.
 - 2. Ruskin Company, a brand of Johnson Controls: www.ruskin.com.
 - 3. Greenheck Fan Corporation; www.greenheck.com
 - 4. Substitutions: See Section 23 0200 HVAC General Requirements.
- B. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: Galvanized steel, with center pivoted blades of maximum 6 inch (150 mm) width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.03 DUCT ACCESS DOORS

- A. Manufacturers:
 - 1. Nailor Industries, Inc: www.nailor.com.
 - 2. Ruskin Company, a brand of Johnson Controls: www.ruskin.com.

3. Greenheck Fan Corporation; www.greenheck.com
 4. Substitutions: See Section 23 0200 HVAC General Requirements.
- B. Fabrication: Rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ducts, install minimum 1 inch (25 mm) thick insulation with sheet metal cover.
1. Less Than 12 inches (300 mm) Square: Secure with sash locks.
 2. Up to 18 inches (450 mm) Square: Provide two hinges and two sash locks.

2.04 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA (DCS) and as indicated.
- B. Flexible Duct Connections: Fabric crimped into metal edging strip.
1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd (1.0 kg/sq m).
 - a. Net Fabric Width: Approximately 2 inches (50 mm) wide.

2.05 VOLUME CONTROL DAMPERS

- A. Manufacturers:
1. Rossi Industrial Design Firm; www.rossihardware.com
 2. Nailor Industries, Inc: www.nailor.com.
 3. Ruskin Company, a brand of Johnson Controls: www.ruskin.com.
 4. Greenheck Fan Corporation; www.greenheck.com
 5. Substitutions: See Section 23 0200 HVAC General Requirements.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Splitter Dampers:
1. Material: Same gage as duct to 24 inches (600 mm) size in either direction, and two gages heavier for sizes over 24 inches (600 mm).
 2. Blade: Fabricate of single thickness sheet metal to streamline shape, secured with continuous hinge or rod.
 3. Operator: Minimum 1/4 inch (6 mm) diameter rod in self aligning, universal joint action, flanged bushing with set screw .
- D. Single Blade Dampers:
1. Fabricate for duct sizes up to 12 by 12 inch (305 by 305 mm).
 2. Blade: 24 gage, 0.0239 inch (0.61 mm), minimum.
 3. Damper operator shall include a spring-loaded, self-locking handle and thumb trigger to provide positive damper setpoint locking without the use of tools. Damper operator shall be equal to Rossi Everlock model damper operator.
- E. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch (200 by 1825 mm). Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
1. Blade: 14 gage, 14 inch (355 mm), minimum.
 2. Damper operator shall include a spring-loaded, self-locking handle and thumb trigger to provide positive damper setpoint locking without the use of tools. Damper operator shall be equal to Rossi Everlock model damper operator.
- F. End Bearings: Except in round ducts 12 inches (300 mm) and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.

PART 3 EXECUTION

3.01 PREPARATION

- A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.
- B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide for cleaning kitchen exhaust ducts in accordance with NFPA 96. Provide minimum 8 x 8 inch (200 x 200 mm) size for hand access, 18 x 18 inch (450 x 450 mm) size for shoulder access, and as indicated. Provide 4 x 4 inch (100 x 100 mm) for balancing dampers only. Review locations prior to fabrication.
- D. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.
- E. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.
- F. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- G. Use splitter dampers only where indicated.
- H. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 23 3423
HVAC POWER VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ceiling exhaust fans.

1.02 RELATED REQUIREMENTS

- A. Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
- B. Section 23 0548 - Vibration and Seismic Controls for HVAC Ductwork Piping and Equipment.

1.03 REFERENCE STANDARDS

- A. AMCA (DIR) - [Directory of] Products Licensed Under AMCA International Certified Ratings Program; <http://www.amca.org/certified/search/company.aspx>.
- B. AMCA 99 - Standards Handbook; 2010.
- C. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2005.
- D. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2007.
- E. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; 2014.
- F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2014.

1.04 SUBMITTALS

- A. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.

1.05 FIELD CONDITIONS

- A. Permanent ventilators may not be used for ventilation during construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Greenheck Fan Corporation: www.greenheck.com.
- B. Loren Cook Company: www.lorencook.com.
- C. Substitutions: See Section 23 0200 HVAC General Requirements.

2.02 POWER VENTILATORS - GENERAL

- A. Static and Dynamically Balanced: AMCA 204 - Balance Quality and Vibration Levels for Fans.
- B. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
- C. Sound Ratings: AMCA 301, tested to AMCA 300 and bearing AMCA Certified Sound Rating Seal.
- D. Fabrication: Comply with AMCA 99.
- E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- F. Bearings: Fan products with shaft diameters larger than 3/4 inch and motors larger than one horsepower shall be be air handling quality, heavy duty grease lubricated, ball or roller type. Bearings shall be selected for a Basic Rating Life, (L10) of 80,000 hours at maximum operating speed and horsepower for each construction level.

2.03 CEILING EXHAUST FANS

- A. Manufacturers:

1. Greenheck Fan Corporation: www.greenheck.com.
 2. Panasonic Corporation of North America; WhisperGreen Select: www.panasonic.com.
 3. Loren Cook Company: www.lorencook.com.
- B. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge, and fan speed controller mounted in unit housing or remotely mounted.
- C. Disconnect Switch: Cord and plug in housing for thermal overload protected motor.
- D. Grille: Molded white plastic.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Hung Cabinet Fans:
1. Install fans with resilient mountings and flexible electrical leads. Refer to Section 22 0548.
- C. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

END OF SECTION

SECTION 23 3700
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Diffusers.
- B. Registers/grilles.
- C. Louvers.

1.02 RELATED REQUIREMENTS

- A. Section 09 9123 - Interior Painting: Painting of ducts visible behind outlets and inlets.

1.03 REFERENCE STANDARDS

- A. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets; 2006 (R2011).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hart & Cooley, Inc: www.hartandcooley.com.
- B. Price Industries: www.price-hvac.com.
- C. Titus, a brand of Air Distribution Technologies: www.titus-hvac.com.
- D. MetalAire: www.metalaire.com
- E. Substitutions: See Section 23 0200 HVAC General Requirements.

2.02 RECTANGULAR CEILING DIFFUSERS

- A. Connections: Rectangular.
- B. Frame: Provide surface mount and inverted T-bar type. In plaster ceilings, provide plaster frame and ceiling frame.
- C. Fabrication: Steel with baked enamel finish.
- D. Type: Square, stamped, multi-core, aluminum diffuser to discharge air in 360 degree pattern with sectorizing baffles where indicated.
- E. Color: As indicated.
- F. Accessories: Provide radial opposed blade volume control damper; removable core with damper adjustable from diffuser face.

2.03 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Fixed grilles of 1/2 x 1/2 x 1/2 inch (13 x 13 x 13) louvers.
- B. Fabrication: Aluminum with factory finish as indicated on the drawings.
- C. Frame: Channel lay-in frame for suspended grid ceilings.
- D. Damper: Where required, Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.04 WALL SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing with spring or other device to set blades, vertical face, double deflection.
- B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting and gasket.
- C. Fabrication: Steel with 20 gage, 0.0359 inch (0.91 mm) minimum frames and 22 gage, 0.0299 inch (0.76 mm) minimum blades, steel and aluminum with 20 gage, 0.0359 inch (0.91 mm) minimum frame, or aluminum extrusions, with factory baked enamel finish.
- D. Color: As indicated.
- E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.

2.05 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with spring or other device to set blades, vertical face.
- B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting.
- C. Fabrication: Steel frames and blades, with factory baked enamel finish.
- D. Color: As indicated on the drawings.
- E. Damper: Where required, Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.06 LOUVERS

- A. Type: 2 deep with blades on 45 degree slope with center baffle and return bend, heavy channel frame, 1/2 inch (13 mm) square mesh screen over exhaust and 1/2 inch (13 mm) square mesh screen over intake.
- B. Fabrication: 16 gage, 0.0598 inch (1.52 mm) thick galvanized steel welded assembly, with factory prime coat finish.
- C. Color: To be selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 9123.

END OF SECTION

**SECTION 23 4000
HVAC AIR CLEANING DEVICES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Disposable, extended area panel filters.
- B. Disposable panel filters.
- C. Filter frames and housings.

1.02 REFERENCE STANDARDS

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2012, with 2015 amendments.
- B. UL 900 - Standard for Air Filter Units; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on filter media, filter performance data, filter assembly and filter frames, dimensions, motor locations and electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate filter assembly and filter frames, dimensions, motor locations, and electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 FILTER MANUFACTURERS

- A. AAF International/American Air Filter: www.aafintl.com.
- B. The Camfil Group: www.camfilfarr.com.
- C. Substitutions: See Section 23 0200 HVAC General Requirements.

2.02 DISPOSABLE, EXTENDED AREA PANEL FILTERS

- A. Media: UL 900 Class 1, pleated, lofted, non-woven, reinforced cotton fabric; supported and bonded to welded wire grid by corrugated aluminum separators.
 - 1. Nominal thickness: 1 inch (25 mm).
- B. Minimum Efficiency Reporting Value (MERV): 8, when tested in accordance with ASHRAE Std 52.2.

2.03 FILTER FRAMES AND HOUSINGS

- A. General: Fabricate filter frames and supporting structures of 16 gage, 0.0598 inch (1.52 mm) galvanized steel or extruded aluminum T-section construction with necessary gasketing between frames and walls.
- B. Side Servicing Housings: Flanged for insertion into ductwork, of reinforced 16 gage, 0.0598 inch (1.52 mm) galvanized steel; access doors with continuous gasketing and positive locking devices on both sides; extruded aluminum tracks or channels for primary secondary filters with positive sealing gaskets.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install air cleaning devices in accordance with manufacturer's instructions.
- B. Prevent passage of unfiltered air around filters with felt, rubber, or neoprene gaskets.
- C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with clean set.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 23 7413

PACKAGED OUTDOOR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Packaged Outdoor unit.
- B. Unit controls.
- C. Remote panel.
- D. Roof mounting curb and base.

1.02 RELATED REQUIREMENTS

- A. Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
- B. Section 23 0548 - Vibration and Seismic Controls for HVAC Ductwork Piping and Equipment.
- C. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2008.
- B. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- D. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from physical damage by storing off site until roof mounting curbs are in place, ready for immediate installation of units.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Carrier Corporation: www.carrier.com.
- B. Trane Inc: www.trane.com.
- C. York by Johnson Controls Inc: www.johnsoncontrols.com.

- D. Lennox International Inc.: www.lennoxcommercial.com
- E. Aaon, Inc.: www.aaon.com
- F. Substitutions: See Section 23 0200 - HVAC General Requirements.
 - 1. The system has been designed based on specific capacities and characteristics of equipment specified in this section and other sections.
 - 2. When substitution of a different manufacturer or model number is desired, submit sufficient information to demonstrate to the Engineer that the substitute will have the same or better performance as that specified AND that the related equipment in the system will perform acceptably with the substitute.
 - 3. If the related equipment must be modified to perform acceptably with the substitute, the entity proposing the substitution is responsible for all additional costs due to re-design and provision of different related equipment.

2.02 MANUFACTURED UNITS

- A. General: Roof mounted units having gas burner and electric refrigeration.
- B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, heat exchanger and burner, modulating hot gas reheat, controls, air filters, refrigerant cooling coil, and compressor, condenser coil and condenser fan.
- C. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Section 26 2717.

2.03 FABRICATION

- A. Cabinet: Steel with baked enamel finish, including access panels with screwdriver operated flush cam type fasteners. Structural members shall be minimum 18 gage, 0.0478 inch (1.21 mm), with access doors or panels of minimum 20 gage, 0.0359 inch (0.91 mm).
- B. Insulation: R-13 Foam Insulation with edges protected from erosion.
- C. Heat Exchangers: Stainless steel, of welded construction.
- D. Supply Fan: Backward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch motor pulley, and rubber isolated hinge mounted high efficiency motor or direct drive as indicated. Isolate complete fan assembly. Refer to Section 23 0548.
- E. Air Filters: 2 inch (50 mm) thick pleated filter, disposable. Refer to Section 23 4000.

2.04 BURNER

- A. Gas Burner: Forced draft type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame sensing device, and automatic 100 percent shut-off pilot.
- B. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after air flow proven and slight delay, allow gas valve to open.
- C. High Limit Control: Temperature sensor with fixed stop at maximum permissible setting, de-energize burner on excessive bonnet temperature and energize burner when temperature drops to lower safe value.
- D. Supply Fan Control: Temperature sensor sensing bonnet temperatures and independent of burner controls, with provisions for continuous fan operation.

2.05 EVAPORATOR COIL

- A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.
- B. Provide thermostatic expansion valves for units of 6 tons (21 kw) capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons (26 kw) cooling capacity and larger.

2.06 COMPRESSOR

- A. Provide hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and filter drier.
- B. Five minute timed off circuit to delay compressor start.
- C. Provide step capacity control by cycling multi-speed compressors.

2.07 AIR-COOLED CONDENSER

- A. Condenser fans shall be vertical discharge, axial flow, direct drive fans.
- B. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings.
- C. Coils shall be leak tested.
- D. Options:
 - 1. Condenser fans shall be high efficiency electrically commutated motor driven with factory installed head pressure control module. Condenser airflow shall continuously modulate based on head pressure and cooling operation shall be allowed down to 35°F with adjustable compressor lockout.

2.08 MIXED AIR CASING

- A. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Outside air damper to fail to closed position. Relief dampers may be gravity balanced.
- B. Gaskets: Provide tight fitting dampers with edge gaskets.
- C. Damper Operator: 24 volt with gear train sealed in oil.

2.09 OPERATING CONTROLS

- A. Factory Installed and Factory Provided Controller
 - 1. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be installed in the unit controls compartment and factory tested.
 - 2. Unit shall include a touchscreen control interface mounted in a remote cabinet enclosure.
 - 3. Controller shall be capable of standalone operation with unit configuration, set point adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
 - 4. Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.
 - 5. Controller shall include non-volatile memory to retain all programmed values, without the use of an external battery, in the event of a power failure.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that proper power supply is available.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 90A.
- C. Locate remote panels where indicated on drawings.

3.03 SYSTEM STARTUP

- A. Prepare and start equipment. Adjust for proper operation.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

23 HEATING, VENTILATING,
AND AIR-CONDITIONING
(HVAC)

23 7413 - 4

PACKAGED OUTDOOR
CENTRAL-STATION
AIR-HANDLING UNITS

SECTION 23 8126.13
SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Forced air furnaces.
- B. Air cooled condensing units.
- C. Controls.

1.02 RELATED REQUIREMENTS

- A. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections and installation and wiring of thermostats and other controls components.

1.03 REFERENCE STANDARDS

- A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2008.
- B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.
- C. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2013.
- D. ASHRAE Std 23.1 - Methods of Testing for Rating Positive Displacement Refrigerant Compressors and Condensing Units; 2010.
- E. NEMA MG 1 - Motors and Generators; 2014.
- F. NFPA 54 - National Fuel Gas Code; 2015.
- G. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.
- H. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2015.
- I. NFPA 211 - Guide for Smoke and Heat Venting; 2013, Including All Amendments.
- J. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- B. Shop Drawings: Indicate assembly, required clearances, and location and size of field connections.
- C. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions.
- D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- E. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide three year manufacturers warranty for solid state ignition modules.
- C. Provide five year manufacturers warranty for heat exchangers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Ruud / Rheem Manufacturing Company: www.rheem.com
- B. Carrier Corporation: www.carrier.com.
- C. Trane Inc: www.trane.com.
- D. York International Corporation / Johnson Controls: www.york.com.
- E. Substitutions: See Section 23 0200 - HVAC General Requirements.
 - 1. The system has been designed based on specific capacities and characteristics of equipment specified in this section and other sections.
 - 2. When substitution of a different manufacturer or model number is desired, submit sufficient information to demonstrate to the Engineer that the substitute will have the same or better performance as that specified AND that the related equipment in the system will perform acceptably with the substitute.
 - 3. If the related equipment must be modified to perform acceptably with the substitute, the entity proposing the substitution is responsible for all additional costs due to re-design and provision of different related equipment.

2.02 SYSTEM DESIGN

- A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
 - 1. Heating: Natural gas fired.
 - 2. Cooling: Outdoor electric condensing unit with evaporator coil in central ducted indoor unit.
 - 3. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.
- B. Performance Requirements: See Drawings for additional requirements.
- C. Electrical Characteristics:
 - 1. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Section 26 0583.

2.03 INDOOR UNITS FOR DUCTED SYSTEMS

- A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating and cooling element(s), controls, and accessories; wired for single power connection with control transformer.
 - 1. Air Flow Configuration: upflow or horizontal as shown.
 - 2. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
- B. Supply Fan: Centrifugal type rubber mounted with direct or belt drive with adjustable variable pitch motor pulley.
 - 1. Motor: NEMA MG 1; 1750 rpm single speed, permanently lubricated, hinge mounted.
- C. Air Filters: 1 inch (25 mm) thick glass fiber, disposable type arranged for easy replacement.
- D. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve. Horizontal units shall have a secondary drain pan.
 - 1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
 - 2. Manufacturers: System manufacturer.

2.04 OUTDOOR UNITS

- A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.

1. Comply with AHRI 210/240.
 2. Refrigerant: R-410A.
 3. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23.1 and UL 207.
- B. Compressor: ARI 520; hermetic, 3600 rpm, resiliently mounted integral with condenser, with positive lubrication, crankcase heater, high pressure control, motor overload protection, service valves and drier. Provide time delay control to prevent short cycling .
- C. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.
1. Condenser Fans: Direct-drive propeller type.
- D. Coil: Air-cooled, aluminum fins bonded to copper tubes.
- E. Accessories: Filter drier, high pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
1. Provide thermostatic expansion valves.
- F. Operating Controls:
1. Control by room thermostat to maintain room temperature setting.
 2. Low Ambient Kit: Provide refrigerant pressure switch to cycle condenser fan on when condenser refrigerant pressure is above 285 psig (1965 kPa) and off when pressure drops below 140 psig (965 kPa) for operation to 0 degrees F (-18 degrees C).
- G. Mounting Pad: Concrete, minimum 4 inches (100 mm) beyond unit dimensions.

2.05 GAS FURNACE COMPONENTS

- A. Heat Exchanger: Aluminized and stainless steel tubular type.
- B. Insulation: Foil-faced.
- C. Burner: Atmospheric type with adjustable combustion air supply,
1. Gas valve, two stage provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
 2. Electronic pilot ignition, with electric spark igniter.
 3. Combustion air damper with synchronous spring return damper motor.
 4. Non-corrosive combustion air blower with permanently lubricated motor.
- D. Burner Safety Controls:
1. Thermocouple Sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
 2. Flame Rollout Switch: Installed on burner box and prevents operation.
 3. Vent Safety Shutoff Sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
 4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic resets.
- E. Operating Controls:
1. Cycle burner by room thermostat to maintain room temperature setting.
 2. Supply fan energized from bonnet temperature independent of burner controls, with adjustable timed off delay and fixed timed on delay, with manual switch for continuous fan operation.

2.06 ACCESSORY EQUIPMENT

- A. Room Thermostat: Wall-mounted, electric solid state microcomputer based room thermostat with humidity sensor and dehumidification logic to maintain temperature and humidity settings; low-voltage; with following features:
1. System selector switch (heat-off-cool) and fan control switch (auto-on).
 2. Automatic switching from heating to cooling.
 3. Preferential rate control to minimize overshoot and deviation from setpoint.

4. Set-up for four separate temperatures per day.
5. Instant override of setpoint for continuous or timed period from one hour to 31 days.
6. Short cycle protection.
7. Programming based on weekdays, Saturday and Sunday.
8. Battery replacement without program loss.
9. Thermostat Display:
 - a. Time of day.
 - b. Actual room temperature.
 - c. Programmed temperature.
 - d. Duration of timed override.
 - e. System Mode Indication: Heating, Cooling, Fan Auto, Off, and On, Auto or On, Off.
10. Manufacturers:
 - a. Honeywell: www.honeywell.com
 - b. Aprilaire: www.aprilaire.com

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.
- B. Verify that proper power supply is available and in correct location.
- C. Verify that proper fuel supply is available for connection.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.
- B. Install in accordance with NFPA 90A and NFPA 90B.
- C. Install gas fired furnaces in accordance with NFPA 54.
- D. Provide vent connections in accordance with NFPA 211.
- E. Install refrigeration systems in accordance with ASHRAE Std 15.
- F. Pipe drain from cooling coils to nearest floor drain equipped with funnel receiver.

END OF SECTION

SECTION 26 0200
ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 SCOPE

- A. The electrical work commences with the point of electrical service where shown on the drawings and includes furnishing all material and labor for a complete electrical installation.
- B. The requirements of Division 1 apply to all work hereunder. The General and Special Conditions are a part of this Division of the Specifications and all provisions contained therein which affect this work are as binding as though incorporated herein.
- C. The Contractor shall be responsible for construction coordination of all work described in this section with the work specified in other sections of the specifications and shown on the drawings. In advance of construction, coordinate and work out any minor problems with other trades to avoid conflicts therewith. However, if other than minor problems are encountered, bring these problems to the attention of the Architect, who will make the final decisions as to correction.
 - 1. All references and notations pertaining to coordination by the Contractor shall apply to construction coordination. The Architect and Engineers have, to the best of their ability, coordinated the drawing and specifications to avoid conflicts between specified equipment and space required for such, and between architectural and engineering disciplines.

1.02 DEFINITIONS

- A. Provide: Furnish, install, and connect.
- B. Product Data: Catalog cuts and descriptive literature.
- C. Shop Drawings: Factory prepared specific to the installation.
- D. Signal Circuit: Voltage: 0-120 Volts.
- E. Low Voltage: 120-600 Volts.
- F. High Voltage: Above 600 Volts.
- G. Indicated: Shown on the Contract Drawings.
- H. Noted: Indicated or specified elsewhere.

1.03 DIVISION OF WORK

- A. Unless otherwise noted the following are provided by Division 23 0000.
 - 1. Motors.
 - 2. Electric heating and air conditioning equipment.
 - 3. Building energy management systems.
 - 4. Electrical heat tracing.
 - 5. Pilot and control devices for the above equipment, except conduit rough-in is work of this section.
- B. Unless otherwise noted the following are provided and connected by this division and installed by Division 23 0000.
 - 1. Duct Smoke Detectors.
- C. Power wiring and equipment connections for items above are specified in this Division. Control wiring for Division 23 0000 is installed by Division per the requirements of this Division. Control wiring for other divisions is installed by this division except as noted below.
- D. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system.

1.04 LOCAL CONDITIONS

- A. Power will be supplied by the utility company overhead electrical distribution system. Verify and comply with all power company requirements for metering, pull sections, transformer pads. Make necessary arrangements with the power company for temporary service requirements.
- B. Verify and comply with all requirements of the local telephone company concerning the complete telephone system.
- C. Existing Utilities: Locate and protect existing utilities and other underground work in manner which will ensure that no damage or service interruption will result from excavating and backfilling.
- D. Protect property from damage which might result from excavating and backfilling.
- E. Protect persons from injury at excavations by barricades, warnings, and illumination.

1.05 QUALITY ASSURANCE

- A. Provide the complete electrical installation in accordance with the 2017 National Electrical Code (NFPA 70) and other applicable NFPA codes, Fire Prevention Code, Rules and Regulations for Energy Efficiency Standards for New Construction, Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities, and in accordance with applicable local does. Obtain all necessary permits and have all work inspected by appropriate authorities.
- B. All products shall be designed, manufactured, and tested in accordance with industry standards. Where applicable, products shall be labeled or listed by third party certification agencies. Standards organizations, and their abbreviations as used hereafter, include the following:
 - 1. American National Standards Institute, Inc. (ANSI).
 - 2. American Society for Testing and Materials (ASTM).
 - 3. Insulated Cable Engineers Association (ICEA).
 - 4. National Electrical Manufacturers Association (NEMA).
 - 5. National Fire Protection Association (NFPA).
 - 6. Underwriters Laboratories (UL).

1.06 SUBMITTALS

- A. Make all submittals in accordance with the requirements of Division 1. Approval drawings consists of shop drawings, product data, and other information as noted in the individual equipment sections. Except as noted, submittal information is for approval and equipment may not be installed until submittals have been returned with stamped approval.
- B. Provide six copies of each type of equipment material or information for installation.
- C. Product data shall include, for each item, the manufacturer, manufacturer's catalog number, type of class, the rating, capacity, size, etc. Submittals shall include:
 - 1. Fixture Cuts.
 - 2. Disconnect Switches.
 - 3. Panelboards.
 - 4. Wire and Cable.
 - 5. Conduit and Fittings.
 - 6. Boxes and Covers.
 - 7. Fire Alarm System Equipment.
 - 8. Switchgear.
 - 9. Telephone/Intercom System.
 - 10. Lighting Control System.
- D. Fixture Cuts: Contractor shall submit a brochure containing catalog cuts or drawings and data for all the lighting fixtures he proposes to furnish. For fixtures which the contractor proposes to substitute for those specified, he shall submit complete photometric data prepared by a recognized, approved testing laboratory, manufacturer's data sheets or drawings showing dimensions, construction, materials and finished, and when required, sample fixtures.

- E. Shop Drawings: Submit for approval, detailed construction drawings for each item of fabricated equipment required for the electrical installation. All drawings shall be to scale, fully dimensioned, and provide sufficient detail to clearly indicate the arrangement of the equipment and its component parts. Construction of the equipment shown shall be revised to comply with the drawings and specifications as drawings, and the drawings submitted when requested by the Architect. Shop drawings shall be submitted for the following:
 - 1. Switchgear.
 - 2. Panelboards.
- F. Except as noted, installation instructions are not required to be submitted. However, it is the Contractor's responsibility to obtain installation information from the manufacturer for all equipment prior to installing the equipment.
- G. Substitutions and/or systems designed and manufactured by other manufacturers will be considered under the terms described for substitutions with the following exceptions:
 - 1. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Substitution requests will be considered only if received at least 10 days prior to the bid date.
 - 3. Substitution requests will be considered only if required submittal data is complete; see article SUBMITTALS above.
 - 4. Contractor (not equipment supplier) shall certify that the use of the substitute system and equipment will not require changes to other work or re-design.
 - 5. Contractor shall certify that the substitute system will achieve the performance specified.

1.07 DRAWINGS

- A. The electrical drawings, which constitute an integral part of this contract, shall serve as the working drawings. They indicate diagrammatically the general layout of the complete electrical system, including the arrangement of feeders, circuits, outlets, switches, controls, panelboards, service equipment, fixtures, special systems, and other work. Field verifications of scale dimensions taken from the drawings are directed since actual field locations, distances and elevations will be governed by actual field conditions. Review architectural, structural, mechanical and plumbing drawings and adjust work to conform to all conditions indicated thereon. Discrepancies shown on different plans or between plans and actual field conditions, or between plans and specifications, shall promptly be brought to the attention of the Architect for a decision prior to installation of equipment in question. If discrepancies are not brought to the attention of the Architect prior to installation of said equipment the Contract, if so directed, will move, remove or modify said equipment at no additional cost.

1.08 RECORD DRAWINGS

- A. Furnish record drawings in accordance with the requirements of Division 1. Record drawings consist of submittal data as listed above, operation and maintenance data, and as built drawings. Record drawings are to reflect the final installation including any changes during approval, manufacturing tests, and installation.
- B. In addition to other required sets, furnish one set of operation and maintenance data for all apparatus requiring service. This set is to be bound in hardback, three-ring binder(s) located in a hinged metal cabinet in the main electrical room and shall include:
 - 1. Title page with project name; installing contractor's name, address, and telephone number; date of installation and warranty period.
 - 2. Index sheet.
 - 3. Complete manufacturers operation and maintenance data with tabs (corresponding to the index) separating each item or system. Include the name, address, and phone number of the nearest sales and service organization for each item.
- C. As-Built Drawings: Furnish one set of prints maintained at the job site at all times with all changes during construction marked thereon. Include on the as-built drawings sufficient dimensions to permit location of underground conduits.

- D. Submit the results of any test required in the individual equipment sections.

1.09 SERIES CONNECTED RATINGS

- A. Combinations for series connected interrupted ratings shall be recognized by Underwriters Laboratories and shall appear in the Recognized Component Directory under the "Circuit Breakers-Series Connected" product category DKS2. Current limiting circuit breakers shall allow the use of branch circuit breakers with lower interrupting capacities on systems capable of delivering fault currents which are higher than these capacities.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Ship products to the job site in their original packaging. Receive and store products in a suitable manner to prevent damage or deterioration. Keep equipment upright at all times.
- B. Investigate the spaces through which equipment must pass to reach its final destination. Coordinate with the manufacturer to arrange delivery at the proper stage of construction and to provide shipping splits where necessary.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide only new products of the manufacturer's latest design.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The complete installation is to be accomplished by skilled electrical tradesmen with certified or suitably qualified individuals performing all special systems installation and testing. All workmanship shall be of the highest quality; sub-standard work will be rejected.
- B. Schedule the work and cooperate with all trades to avoid delays, interferences, and unnecessary work. If any conflicts occur necessitating departures from the Contract Drawings and specifications, detail of departures and reasons therefore shall be submitted immediately for the Architect's consideration.
- C. Do not allow installations to be concealed or enclosed before they have been inspected and tested. Should work be concealed before it has been inspected and tested, uncover at no additional cost, repairing as necessary after inspection.
- D. Electrical License Requirements
 - 1. No Electrical Contractor shall perform electrical work on the contract without possessing a State of Arkansas Electrical Contractor License.
 - 2. All electricians shall have a copy of their license with them and shall be required to show it to an appropriate inspector upon request.

3.02 CERTIFICATION AND TESTS

- A. Prior to request for final review test all systems and repair or replace all defective work. Submit, with request for final review, written certification that all electrical systems are complete and operational.
- B. At the time of final review of electrical work, demonstrate the operation of electrical systems. Furnish labor, apparatus and equipment for systems' demonstration.
- C. After final review and acceptance, turn over to the Owner all keys for electrical equipment locks. Present to the Owner or his designated representative demonstrations and oral instructions for proper operation and maintenance of the electrical equipment and systems.

3.03 PROJECT MODIFICATIONS

- A. During the progress of construction, if such conditions arise that require revisions, modifications, or relocations to any electrical equipment or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review by the Architect prior to actual revision work in the field.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single conductor building wire.
- B. Nonmetallic-sheathed cable.
- C. Metal-clad cable.
- D. Wire and cable for 600 volts and less.
- E. Wiring connectors.
- F. Electrical tape.
- G. Heat shrink tubing.
- H. Wire pulling lubricant.
- I. Cable ties.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- C. Section 26 0536 - Cable Trays for Electrical Systems: Additional installation requirements for cables installed in cable tray systems.
- D. Section 26 0200 - Electrical General Requirements
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013.
- B. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).
- C. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).
- D. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- F. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); 2012.
- G. NEMA WC 70 - Nonshielded Power Cable 2000 V or Less for the Distribution of Electrical Energy; 2009.
- H. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- K. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- L. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- M. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- N. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

- O. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
- P. UL 719 - Nonmetallic-Sheathed Cables; Current Edition, Including All Revisions.
- Q. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide for each cable assembly type.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F (-10 degrees C), unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Concealed Dry Interior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- D. Exposed Dry Interior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- E. Above Accessible Ceilings: Use only building wire with Type THHN/THWN insulation in raceway.
- F. Wet or Damp Interior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- G. Exterior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- H. Underground Installations: Use only building wire with Type XHHW insulation in raceway.

- I. Use solid or stranded conductor for feeders and branch circuits 10 AWG and smaller.
- J. Use stranded conductor for feeders and branch circuits 8 AWG and larger.
- K. Use conductor not smaller than 12 AWG for power and lighting circuits.
- L. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 100 feet (33 m).
- M. Conductor sizes are based on copper. Aluminum wire will not be accepted.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductors for Grounding and Bonding: Also comply with Section 26 0526.
- H. Conductors and Cables Installed in Cable Tray: Listed and labeled as suitable for cable tray use.
- I. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
- J. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- K. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- L. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.
 - 3. Color Code:
 - a. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - b. Equipment Ground, All Systems: Green.

2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
 - 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Solid or Stranded.
 - b. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.

- D. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
 - a. Installed Underground: Type XHHW-2.

2.04 NONMETALLIC-SHEATHED CABLE

- A. Description: NFPA 70, Type NM multiple-conductor cable listed and labeled as complying with UL 719, Type NM-B.
- B. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Solid.
 - 2. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Uses Allowed: Nonmetallic-Sheathed Cable shall not be used on any portion of this project.

2.05 METAL-CLAD CABLE

- A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
- B. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Solid.
 - 2. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- E. Grounding: Full-size integral equipment grounding conductor.
- F. Armor: Steel, interlocked tape.
- G. Uses Allowed: Metal Clad Cable shall only be allowed for final connections to equipment and grid mounted light fixtures where the cable is exposed or easily accessible.

2.06 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 0526.

2.07 WIRING ACCESSORIES

- A. Electrical Tape:
 - 1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
 - 2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
 - 3. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil (2.3 mm).
- B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
- C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
- D. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that raceway installation is complete and supported.
- E. Verify that field measurements are as indicated.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Circuiting Requirements:
 - 1. When circuit destination is indicated without specific routing, determine exact routing required.
 - 2. Arrange circuiting to minimize splices.
 - 3. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
 - 4. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install metal-clad cable (Type MC) in accordance with NECA 120.
- E. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- F. Exposed Cable Installation (only where specifically permitted):
 - 1. Route cables parallel or perpendicular to building structural members and surfaces.
 - 2. Protect cables from physical damage.
- G. Installation in Cable Tray: Also comply with Section 26 0536.
- H. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- I. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
 - 1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
 - 2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.

- J. Terminate cables using suitable fittings.
 - 1. Metal-Clad Cable (Type MC):
 - a. Use listed fittings.
 - b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- K. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.
- L. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet (1.5 m) of slack.
- M. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- N. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- O. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminants. Do not use wire brush on plated connector surfaces.
 - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- P. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
 - 1. Dry Locations: Use insulating covers specifically designed for the connectors.
 - 2. Damp Locations: Use insulating covers specifically designed for the connectors.
 - a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
 - 3. Wet Locations: Use heat shrink tubing.
- Q. Insulate ends of spare conductors using vinyl insulating electrical tape.
- R. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
- S. Identify conductors and cables in accordance with Section 26 0553.
- T. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- U. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.
- V. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- W. Clean conductor surfaces before installing lugs and connectors.
- X. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- Y. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

- Z. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
- D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.
- D. Ground rod electrodes.
- E. Ground access wells.

1.02 RELATED REQUIREMENTS

- A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- C. Section 26 0200 - Electrical General Requirements
- D. Section 26 5600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

1.03 REFERENCE STANDARDS

- A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2007.
- D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. NFPA 99 - Health Care Facilities Code; 2015.
- G. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify exact locations of underground metal water service pipe entrances to building.
 - 2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
 - 3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.
- C. Field quality control test reports.
- D. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- D. Grounding System Resistance:
 - 1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
 - 2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.
 - 3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using "point-to-point" methods.
- E. Grounding Electrode System:
 - 1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
 - a. Provide continuous grounding electrode conductors without splice or joint.
 - b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
 - 2. Metal Underground Water Pipe(s):
 - a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.
 - b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
 - c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
 - 3. Metal In-Ground Support Structure:
 - a. Provide connection to metal in-ground support structure that is in direct contact with earth in accordance with NFPA 70.
 - 4. Concrete-Encased Electrode:
 - a. Provide connection to concrete-encased electrode consisting of not less than 20 feet (6.0 m) of bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.

5. Ground Rod Electrode(s):
 - a. Provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.
 - b. Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.
 - c. Where location is not indicated, locate electrode(s) at least 5 feet (1.5 m) outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
 - d. Provide ground access well for first connected electrode.
 6. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.
- F. Service-Supplied System Grounding:
1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
 2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.
- G. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
 6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
 7. Provide bonding for metal building frame.
 8. Provide bonding and equipment grounding for pools and fountains and associated equipment in accordance with NFPA 70.
 9. Provide redundant grounding and bonding for patient care areas of health care facilities in accordance with NFPA 70 and NFPA 99.
- H. Pole-Mounted Luminaires: Also comply with Section 26 5600.

2.02 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.

- 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 2. Unless otherwise indicated, use exothermic welded connections or compression connectors for underground, concealed and other inaccessible connections.
 3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
- D. Ground Bars:
1. Description: Copper rectangular ground bars with mounting brackets and insulators.
 2. Holes for Connections: As indicated or as required for connections to be made.
- E. Ground Rod Electrodes:
1. Comply with NEMA GR 1.
 2. Material: Copper-bonded (copper-clad) steel.
 3. Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.
 4. Where rod lengths of greater than 10 feet (3.0 m) are indicated or otherwise required, sectionalized ground rods may be used.
- F. Ground Access Wells:
1. Description: Open bottom round or rectangular well with access cover for testing and inspection; suitable for the expected load at the installed location.
 2. Size: As required to provide adequate access for testing and inspection, but not less than minimum size requirements specified.
 - a. Round Wells: Not less than 8 inches (200 mm) in diameter.
 - b. Rectangular Wells: Not less than 12 by 12 inches (300 by 300 mm).
 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 10 inches (250 mm).
 4. Cover: Factory-identified by permanent means with word "GROUND".

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.
 1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches (150 mm) below finished grade.
 2. Indoor Installations: Unless otherwise indicated, install with 4 inches (100 mm) of top of rod exposed.
- D. Make grounding and bonding connections using specified connectors.
 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.

2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- E. Identify grounding and bonding system components in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.13.
- D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS

- A. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- B. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
- C. Section 26 0548 - Vibration and Seismic Controls for Electrical Systems.
- D. Section 26 5100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.
- E. Section 26 5600 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2013.
- D. MFMA-4 - Metal Framing Standards Publication; 2004.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
 - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
 - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.

1.06 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
 - 6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
 - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Components for Vibration Isolation and/or Seismic Controls: Comply with Section 26 0548.
- C. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
- D. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
- E. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
 - 1. Comply with MFMA-4.
- F. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
- G. Non-Penetrating Rooftop Supports for Low-Slope Roofs: Steel pedestals with thermoplastic or rubber bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified.
 - 1. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.

2. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
 3. Mounting Height: Provide minimum clearance of 6 inches (150 mm) under supported component to top of roofing.
- H. Anchors and Fasteners:
1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
 2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
 3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
 4. Hollow Masonry: Use toggle bolts.
 5. Hollow Stud Walls: Use toggle bolts.
 6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
 7. Sheet Metal: Use sheet metal screws.
 8. Wood: Use wood screws.
 9. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - a. Comply with MFMA-4.
 - b. Channel Material: Use galvanized steel.
 - c. Manufacturer: Same as manufacturer of metal channel (strut) framing system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Provide required vibration isolation and/or seismic controls in accordance with Section 26 0548.
- H. Equipment Support and Attachment:
 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 4. Unless otherwise indicated, mount floor-mounted equipment on properly sized 3 inch (80 mm) high concrete pad constructed in accordance with Section 03 3000.
 5. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Conduit Support and Attachment: Also comply with Section 26 0533.13.

- J. Box Support and Attachment: Also comply with Section 26 0533.16.
- K. Interior Luminaire Support and Attachment: Also comply with Section 26 5100.
- L. Exterior Luminaire Support and Attachment: Also comply with Section 26 5600.
- M. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.
- N. Secure fasteners according to manufacturer's recommended torque settings.
- O. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. Aluminum rigid metal conduit (RMC).
- C. Intermediate metal conduit (IMC).
- D. PVC-coated galvanized steel rigid metal conduit (RMC).
- E. Flexible metal conduit (FMC).
- F. Liquidtight flexible metal conduit (LFMC).
- G. Electrical metallic tubing (EMT).
- H. Rigid polyvinyl chloride (PVC) conduit.
- I. Reinforced thermosetting resin conduit (RTRC).
- J. Conduit fittings.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete encasement of conduits.
- B. Section 26 0200 - Electrical General Requirements
- C. Section 07 8456 - Fire Safing.
- D. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- E. Section 26 0529 - Hangers and Supports for Electrical Systems.
- F. Section 26 0533.16 - Boxes for Electrical Systems.
- G. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- H. Section 26 2100 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.
- I. Section 27 1000 - Structured Cabling: Additional requirements for communications systems conduits.
- J. Section 31 2316 - Excavation.
- K. Section 31 2323 - Fill: Bedding and backfilling.

1.03 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2005.
- B. ANSI C80.3 - American National Standard for Steel Electrical Metallic Tubing (EMT); 2005.
- C. ANSI C80.5 - American National Standard for Electrical Rigid Aluminum Conduit (ERAC); 2005.
- D. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC); 2005.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- F. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.
- G. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit; 2004.
- H. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2003.
- I. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2012.

- J. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; 2005.
- K. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2013.
- L. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2015.
- M. NEMA TC 14 (SERIES) - Reinforced Thermosetting Resin Conduit and Fittings Series; 2015.
- N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- O. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
- P. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
- Q. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.
- R. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.
- S. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
- T. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
- U. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.
- V. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
 - 4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
 - 5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Underground:
 - 1. Under Slab on Grade: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
 - 2. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
 - 3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
 - 4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
 - 5. Where rigid polyvinyl (PVC) conduit larger than 2 inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit elbows for bends.
- D. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- E. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- F. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- G. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.
- H. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- I. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
- J. Exposed, Exterior: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or PVC-coated galvanized steel rigid metal conduit.
- K. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
- L. Corrosive Locations Above Ground: Use PVC-coated galvanized steel rigid metal conduit, aluminum rigid metal conduit, or reinforced thermosetting resin conduit (RTRC).
- M. Hazardous (Classified) Locations: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), aluminum rigid metal conduit, or PVC-coated galvanized steel rigid metal conduit.

- N. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
 - 1. Maximum Length: 6 feet (1.8 m).
- O. Connections to Vibrating Equipment:
 - 1. Dry Locations: Use flexible metal conduit.
 - 2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
 - 3. Maximum Length: 6 feet (1.8 m) unless otherwise indicated.

2.02 CONDUIT REQUIREMENTS

- A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Minimum Conduit Size, Unless Otherwise Indicated:
 - 1. Branch Circuits: 3/4 inch (21 mm) trade size.
 - 2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
 - 3. Control Circuits: 1/2 inch (16 mm) trade size.
 - 4. Flexible Connections to Luminaires: 1/2 inch (16 mm) trade size.
 - 5. Underground, Interior: 3/4 inch (21 mm) trade size.
 - 6. Underground, Exterior: 3/4 inch (21 mm) trade size.
- D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- B. Fittings:
 - 1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Material: Use steel or malleable iron.
 - 3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 ALUMINUM RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC aluminum rigid metal conduit complying with ANSI C80.5 and listed and labeled as complying with UL 6A.
- B. Fittings:
 - 1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
 - 3. Material: Use aluminum.
 - 4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 INTERMEDIATE METAL CONDUIT (IMC)

- A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.
- B. Fittings:
 - 1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
 - 3. Material: Use steel or malleable iron.

4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.06 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.
- B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil (1.02 mm).
- C. PVC-Coated Fittings:
 1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
 2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
 3. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
 4. Material: Use steel or malleable iron.
 5. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil (1.02 mm).
- D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil (0.38 mm).

2.07 FLEXIBLE METAL CONDUIT (FMC)

- A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
- B. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.

2.08 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- B. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.

2.09 ELECTRICAL METALLIC TUBING (EMT)

- A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- B. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.
 3. Connectors and Couplings: Use compression (gland) or set-screw type.
 - a. Do not use indenter type connectors and couplings.

2.10 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

- A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- B. Fittings:
 1. Manufacturer: Same as manufacturer of conduit to be connected.
 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.11 REINFORCED THERMOSETTING RESIN CONDUIT (RTRC)

- A. Description: NFPA 70, Type RTRC reinforced thermosetting resin conduit complying with NEMA TC 14 (SERIES).
- B. Supports: Per manufacturer's recommendations.
- C. Fittings: Same type and manufacturer as conduit to be connected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify routing and termination locations of conduit prior to rough-in.
- E. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Install aluminum rigid metal conduit (RMC) in accordance with NECA 102.
- E. Install intermediate metal conduit (IMC) in accordance with NECA 101.
- F. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.
- G. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.
- H. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal all conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
 - c. Within joists in areas with no ceiling.
 - 5. Unless otherwise approved, do not route conduits exposed:
 - a. Across floors.
 - b. Across top of parapet walls.
 - c. Across building exterior surfaces.
 - 6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
 - 7. Arrange conduit to maintain adequate headroom, clearances, and access.
 - 8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
 - 9. Route conduits above water and drain piping where possible.
 - 10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.

11. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.
 12. Maintain minimum clearance of 12 inches (300 mm) between conduits and hot surfaces. This includes, but is not limited to:
 - a. Heaters.
 - b. Hot water piping.
 - c. Flues.
 13. Group parallel conduits in the same area together on a common rack.
- I. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
 4. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
 5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
 6. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
 7. Use non-penetrating rooftop supports to support conduits routed across rooftops (only where approved).
 8. Use of wire for support of conduits is not permitted.
- J. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 3. Use suitable adapters where required to transition from one type of conduit to another.
 4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
 5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
 7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
- K. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
 6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are

- necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- L. Underground Installation:
1. Provide trenching and backfilling in accordance with Sections 31 2316 and 31 2323.
 2. Minimum Cover, Unless Otherwise Indicated or Required:
 - a. Underground, Exterior: 24 inches (610 mm).
 - b. Under Slab on Grade: 12 inches (300 mm) to bottom of slab.
 3. Provide underground warning tape in accordance with Section 26 0553 along entire conduit length for service entrance where not concrete-encased.
- M. Embedment Within Structural Concrete Slabs (only where approved by Structural Engineer):
1. Maximum Conduit Size: 1 inch (27 mm) unless otherwise approved.
 2. Install conduits within middle one third of slab thickness.
 3. Secure conduits to prevent floating or movement during pouring of concrete.
- N. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide concrete in accordance with Section 03 3000 with minimum concrete cover of 3 inches (76 mm) on all sides unless otherwise indicated.
- O. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where calculated in accordance with NFPA 70 for reinforced thermosetting resin conduit (RTRC) conduit installed above ground to compensate for thermal expansion and contraction.
 4. Where conduits are subject to earth movement by settlement or frost.
- P. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
 2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- Q. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches (300 mm) at each end.
- R. Provide grounding and bonding in accordance with Section 26 0526.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.
- D. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

3.06 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- B. Route conduit through roof openings for piping and ductwork wherever possible. Where separate roofing penetration is required, coordinate location and installation method with roofing contractor.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).
- C. Floor boxes.
- D. Underground boxes/enclosures.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete.
- B. Section 26 0200 - Electrical General Requirements
- C. Section 07 8456 - Fire Safing.
- D. Section 08 3100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- E. Section 26 0529 - Hangers and Supports for Electrical Systems.
- F. Section 26 0533.13 - Conduit for Electrical Systems:
 - 1. Conduit bodies and other fittings.
 - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- G. Section 26 0548 - Vibration and Seismic Controls for Electrical Systems.
- H. Section 26 2726 - Wiring Devices:
 - 1. Wall plates.
 - 2. Floor box service fittings.
 - 3. Additional requirements for locating boxes for wiring devices.
- I. Section 27 1000 - Structured Cabling: Additional requirements for communications systems outlet boxes.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2012.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. SCTE 77 - Specification for Underground Enclosure Integrity; 2013.
- H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- J. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
- K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
 5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
 6. Coordinate the work with other trades to preserve insulation integrity.
 7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
 8. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 6000 - Product Requirements, for additional provisions.
 2. Keys for Lockable Enclosures: Two of each different key.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 BOXES

- A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
 3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 3. Use suitable concrete type boxes where flush-mounted in concrete.

4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 6. Use shallow boxes where required by the type of wall construction.
 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Wall Plates: Comply with Section 26 2726.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 - a. Indoor Clean, Dry Locations: Type 1, painted steel.
 - b. Outdoor Locations: Type 3R, painted steel.
 3. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
 4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
 - a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
 - b. Back Panels: Painted steel, removable.
 5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
- D. Floor Boxes:
1. Description: Floor boxes compatible with floor box service fittings provided in accordance with Section 26 2726; with partitions to separate multiple services; furnished with all components, adapters, and trims required for complete installation.
 2. Metallic Floor Boxes: Fully adjustable (with integral means for leveling adjustment prior to and after concrete pour).
 3. Manufacturer: Same as manufacturer of floor box service fittings.
- E. Underground Boxes/Enclosures:
1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
 2. Size: As indicated on drawings.
 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches (300 mm).
 4. Applications:
 - a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77, Tier 8 load rating.
 - b. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77, Tier 15 load rating.
 - c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
 5. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
 - a. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide separate boxes for emergency power and normal power systems.
- E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- H. Box Locations:
 - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 3100 as required where approved by the Architect.
 - 2. Unless dimensioned, box locations indicated are approximate.
 - 3. Locate boxes as required for devices installed under other sections or by others.
 - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.
 - b. Communications Systems Outlets: Comply with Section 27 1000.
 - 4. Locate boxes so that wall plates do not span different building finishes.
 - 5. Locate boxes so that wall plates do not cross masonry joints.
 - 6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
 - 7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches (150 mm) horizontal separation unless otherwise indicated.
 - 8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) horizontal separation.
 - 9. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
 - a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
 - b. Do not install flush-mounted boxes with area larger than 16 square inches (0.0103 sq m) or such that the total aggregate area of openings exceeds 100 square inches (0.0645 sq m) for any 100 square feet (9.29 sq m) of wall area.
 - 10. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
 - 11. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
 - a. Concealed above accessible suspended ceilings.
 - b. Within joists in areas with no ceiling.

- c. Electrical rooms.
- d. Mechanical equipment rooms.
- I. Box Supports:
 - 1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide required seismic controls in accordance with Section 26 0548.
 - 3. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
 - 4. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
- J. Install boxes plumb and level.
- K. Flush-Mounted Boxes:
 - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface.
 - 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
 - 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch (3 mm) at the edge of the box.
- L. Floor-Mounted Cabinets: Mount on properly sized 3 inch (80 mm) high concrete pad constructed in accordance with Section 03 3000.
- M. Install boxes as required to preserve insulation integrity.
- N. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.
- O. Underground Boxes/Enclosures:
 - 1. Install enclosure on gravel base, minimum 6 inches (150 mm) deep.
 - 2. Flush-mount enclosures located in concrete or paved areas.
 - 3. Mount enclosures located in landscaped areas with top at 1 inch (25 mm) above finished grade.
 - 4. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.
- P. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- R. Close unused box openings.
- S. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- T. Provide grounding and bonding in accordance with Section 26 0526.

3.03 CLEANING

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0548

VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The requirements for seismic protection measures to be applied to electrical equipment and systems specified herein are in addition to any other items called for in other sections of these specifications. Electrical equipment shall include the following items to the extent required on plans or in other sections of these specifications:
 - 1. Light fixtures.
 - 2. Switchboards (floor mounted).
 - 3. Switch gear.
 - 4. Conduits.
 - 5. Cable Tray Systems.

1.02 INSTALLATIONS NOT REQUIRING SPECIAL SEISMIC RESTRAINTS

- A. Seismic restraints may be omitted from the following installations.
 - 1. All electrical conduit less than 2-1/2" inside diameter.
 - 2. All conduit suspended by individual hangers 12" or less in length from the top of support rod to the bottom of the support for the hanger.

1.03 SHOP DRAWINGS

- A. Shop drawings along with catalog cuts, templates, and erection and installation details, as appropriate, for the items listed below shall be submitted. Submittals shall be complete in detail; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction.

PART 2 PRODUCTS

2.01 BOLTS AND NUTS

- A. SQUAREHEAD BOLTS AND HEAVY HEXAGON NUTS: ANSI B1 8.2.1 and B1 8.2.2, and ASTM A307 or A576.
- B. BOLTS, UNDERGROUND: ASTM A325.

2.02 SWAY BRACE

- A. Materials used for seismic members shall be structural steel conforming with ASTM A36.
- B. Any other sway bracing system products and materials shall be listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown

PART 3 EXECUTION

3.01 SWAY BRACE

- A. Sway brace shall be installed on conduit and cable tray not otherwise rigidly anchored to preclude damage during seismic activity. Bracing shall conform to approved arrangements. Hanger rods shall be increased in cross sectional area proportionate to the increased weight per linear foot of conduit, cable tray and contents supported at each trapeze hanger. No trapeze-type hanger shall be secured with less than two 1/2" bolts.
- B. TRANSVERSE SWAY BRACING: Transverse sway bracing shall be provided at intervals not to exceed 30'-0".
- C. LONGITUDINAL SWAY BRACING: Longitudinal sway bracing shall be provided at 40'-0" intervals.
- D. VERTICAL RUNS: Vertical runs of conduit and cable tray shall be braced at not more than 10'-0" vertical intervals.

- E. ANCHOR RODS, ANGLES, AND BARS: Anchor rods, angles, and bars shall be bolted to conduit clamps at one end and cast-in-place concrete or masonry insert or clip angles bolted to the steel structure on the other end. Rods shall be solid metal or pipe as specified hereinafter.
- F. BOLTS: Bolts used for attachment of anchors to pipe and structure shall be not less than ½" diameter.

3.02 SPREADERS

- A. Spreaders shall be provided between racked or adjacent conduit runs to prevent contact during seismic activity whenever surfaces are less than 4" apart or four times the maximum displacement due to seismic force. Spreaders to be applied at same interval as sway braces.

3.03 ANCHOR BOLTS

- A. All floor or pad mounted equipment will have a minimum of four anchor bolts securely fastened through base. Two nuts shall be provided on each bolt. Anchor bolts shall have an embedded straight length equal to at least 10 times the nominal diameter of the bolt and shall be sized in accordance with ASTM A325 and A576.
- B. When height-to-width ratio of the equipment exceeds 8.9, overturning must be investigated.

3.04 EQUIPMENT SWAY BRACING

- A. Equipment sway bracing shall be provided for all items supported from overhead floor or roof structures. Braces shall consist of angles, rods, bars, or pipes run at a 45° angle from the equipment frame to the building structure secured at both ends with not less than ½" bolts. Bracing shall be provided in two planes of directions, 90° apart, for each item of equipment. Sufficient braces shall be provided for equipment to resist a horizontal force equal to 113% of the weight of equipment without exceeding safe working stress of bracing components. Details of all equipment bracing shall be submitted for approval. In lieu of bracing with vertical supports, these items may be supported with hangers inclined at 45°, provided that supporting members are properly sized to support operating weight of equipment when inclined at a 45° angle.

3.05 LIGHTING FIXTURES IN BUILDINGS

- A. In addition to the requirements of the preceding paragraphs, lighting fixtures and supports will conform to the following:
- B. MATERIALS AND CONSTRUCTION:
 - 1. Fixture supports shall be malleable iron.
 - 2. Loop and hook or swivel hanger assemblies for pendant fixtures shall be fitted with a restraining device to hold the stem in the support position during earthquake motions. Pendant supported fluorescent fixtures shall also be provided with a flexible hanger device at the attachment to the fixture channel to preclude breaking of the support. The motion of swivels or hinged joints shall not cause sharp bends in conductors or damage to insulation.
 - 3. Recessed fluorescent fixtures shall be supported by a seismic resistant suspended ceiling support system and shall be attached thereto at each corner of the fixture with earthquake clips; AND shall be provided with fixture support wires attached to the building structural members using one wire at each end of fixture.
 - 4. A supporting assembly that is intended to be mounted on an outlet box shall be designed to accommodate mounting features on 4" boxes, 3" plaster rings, and fixture studs.
 - 5. Surface mounted fluorescent individual or continuous row fixtures shall be attached to a seismic resistant ceiling support system. Fixture support devices for attaching to suspended ceilings shall be a locking-type scissor clamp or a full loop band that will securely attach to the ceiling support. Fixtures attached to underside of a structural slab shall be properly anchored to the slab at each corner of the fixture.

6. Each wall mounted emergency light unit shall be secured in a manner to hold the unit in place during a seismic disturbance.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Voltage markers.
- D. Underground warning tape.
- E. Warning signs and labels.

1.02 RELATED REQUIREMENTS

- A. Section 26 0200 - Electrical General Requirements
- B. Section 26 2726 - Wiring Devices - Lutron: Device and wallplate finishes; factory pre-marked wallplates.

1.03 REFERENCE STANDARDS

- A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011.
- B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2015.
- E. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 - 2. Do not install identification products until final surface finishes and painting are complete.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

1.06 FIELD CONDITIONS

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

- A. Identification for Equipment:
 - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - a. Panelboards:
 - 1) Identify ampere rating.
 - 2) Identify voltage and phase.
 - 3) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.

- 4) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
 - 5) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
 - b. Enclosed switches, circuit breakers, and motor controllers:
 - 1) Identify voltage and phase.
 - 2) Identify load(s) served. Include location when not within sight of equipment.
 - c. Time Switches:
 - 1) Identify load(s) served and associated circuits controlled. Include location.
 - d. Enclosed Contactors:
 - 1) Identify load(s) and associated circuits controlled. Include location.
 2. Service Equipment:
 - a. Use identification nameplate to identify each service disconnecting means.
 - b. For buildings or structures supplied by more than one service, or any combination of branch circuits, feeders, and services, use identification nameplate or means of identification acceptable to authority having jurisdiction at each service disconnecting means to identify all other services, feeders, and branch circuits supplying that building or structure. Verify format and descriptions with authority having jurisdiction.
 3. Emergency System Equipment:
 - a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.
 4. Use identification nameplate to identify switchboards and panelboards utilizing a high leg delta system in accordance with NFPA 70.
 5. Use identification label or handwritten text using indelible marker on inside of door at each fused switch to identify required NEMA fuse class and size.
 6. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".
 7. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
 - a. Service equipment.
 - b. Industrial control panels.
 - c. Motor control centers.
 - d. Elevator control panels.
 - e. Industrial machinery.
 8. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment indicated.
 - a. Minimum Size: 3.5 by 5 inches (89 mm by 127 mm).
 - b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
 - c. Service Equipment: Include the following information in accordance with NFPA 70.
 - 1) Nominal system voltage.
 - 2) Available fault current.
 - 3) Date label applied.
 9. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.
- B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.

2. Identification for Communications Conductors and Cables: Comply with Section 27 1000.
 3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
 4. Use underground warning tape to identify direct buried cables.
- C. Identification for Raceways:
1. Use underground warning tape to identify underground raceways.
- D. Identification for Boxes:
1. Use voltage markers to identify highest voltage present.
 2. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".
- E. Identification for Devices:
1. Wiring Device and Wallplate Finishes: Comply with Section 26 2726.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Nameplates:
1. Materials:
 - a. Indoor Clean, Dry Locations: Use plastic nameplates.
 - b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
 2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch (1.6 mm); engraved text.
 - a. Exception: Provide minimum thickness of 1/8 inch (3 mm) when any dimension is greater than 4 inches (100 mm).
 3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
 4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
 5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch (25 mm) high; Four, located at corners for larger sizes.
- B. Identification Labels:
1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
 - a. Use only for indoor locations.
 2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- C. Format for Equipment Identification:
1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).
 2. Legend:
 - a. System designation where applicable:
 - 1) Emergency Power System: Identify with text "EMERGENCY".
 - b. Equipment designation or other approved description.
 - c. Other information as indicated.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height:
 - a. System Designation: 1/2 inch (13 mm).
 - b. Equipment Designation: 1/4 inch (6 mm).
 - c. Other Information: 1/8 inch (3 mm).
 5. Color:

- a. Normal Power System: White text on black background.
 - b. Emergency Power System: White text on red background.
- D. Format for Caution and Warning Messages:
- 1. Minimum Size: 2 inches (51 mm) by 4 inches (100 mm).
 - 2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
 - 3. Text: All capitalized unless otherwise indicated.
 - 4. Minimum Text Height: 1/2 inch (13 mm).
 - 5. Color: Black text on yellow background unless otherwise indicated.

2.03 VOLTAGE MARKERS

- A. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.
- B. Minimum Size:
- 1. Markers for Equipment: 1 1/8 by 4 1/2 inches (29 by 110 mm).
 - 2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches (29 by 110 mm).
 - 3. Markers for Junction Boxes: 1/2 by 2 1/4 inches (13 by 57 mm).
- C. Legend:
- 1. Markers for Voltage Identification: Highest voltage present.
 - 2. Markers for System Identification:
 - a. Emergency Power System: Text "EMERGENCY".
- D. Color: Black text on orange background unless otherwise indicated.

2.04 UNDERGROUND WARNING TAPE

- A. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
- 1. Exception: Use foil-backed detectable type tape where required by serving utility or where directed by Owner.
- B. Non-detectable Type Tape: 6 inches (152 mm) wide, with minimum thickness of 4 mil (0.1 mm).
- C. Foil-backed Detectable Type Tape: 3 inches (76 mm) wide, with minimum thickness of 5 mil (0.1 mm), unless otherwise required for proper detection.
- D. Legend: Type of service, continuously repeated over full length of tape.
- E. Color:
- 1. Tape for Buried Power Lines: Black text on red background.
 - 2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

2.05 WARNING SIGNS AND LABELS

- A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- B. Warning Signs:
- 1. Materials:
 - a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
 - b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
 - 2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
 - 3. Minimum Size: 7 by 10 inches (178 by 254 mm) unless otherwise indicated.
- C. Warning Labels:
- 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.

2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches (51 mm by 102 mm) unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 1. Surface-Mounted Equipment: Enclosure front.
 2. Flush-Mounted Equipment: Inside of equipment door.
 3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
 4. Elevated Equipment: Legible from the floor or working platform.
 5. Branch Devices: Adjacent to device.
 6. Interior Components: Legible from the point of access.
 7. Conduits: Legible from the floor.
 8. Boxes: Outside face of cover.
 9. Conductors and Cables: Legible from the point of access.
 10. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
 1. Do not use adhesives on exterior surfaces except where substrate cannot be penetrated.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Install underground warning tape above buried lines with one tape per trench at 3 inches (75 mm) below finished grade.
- G. Secure rigid signs using stainless steel screws.
- H. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 0583
WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical connections to equipment.

1.02 RELATED REQUIREMENTS

- A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.
- B. Section 26 0200 - Electrical General Requirements.
- C. Section 26 0533.13 - Conduit for Electrical Systems.
- D. Section 26 0533.16 - Boxes for Electrical Systems.
- E. Section 26 2726 - Wiring Devices.
- F. Section 26 2816.16 - Enclosed Switches.

1.03 REFERENCE STANDARDS

- A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (R 2010).
- B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2012.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
 - 2. Determine connection locations and requirements.
- B. Sequencing:
 - 1. Install rough-in of electrical connections before installation of equipment is required.
 - 2. Make electrical connections before required start-up of equipment.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide wiring device manufacturer's catalog information showing dimensions, configurations, and construction.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Disconnect Switches: As specified in Section 26 2816.16 and in individual equipment sections.
- B. Wiring Devices: As specified in Section 26 2726.
- C. Flexible Conduit: As specified in Section 26 0533.13.
- D. Wire and Cable: As specified in Section 26 0519.
- E. Boxes: As specified in Section 26 0533.16.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Provide receptacle outlet to accommodate connection with attachment plug.
- E. Provide cord and cap where field-supplied attachment plug is required.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.
- J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

END OF SECTION

SECTION 26 0923
LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Occupancy sensors.
- B. Time switches.
- C. Outdoor photo controls.
- D. Lighting contactors.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0533.16 - Boxes for Electrical Systems.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 2726 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, and fan speed controllers.
- F. Section 26 5100 - Interior Lighting.
- G. Section 26 5600 - Exterior Lighting.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- D. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; 2011.
- E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000 (R2005), with errata, 2008.
- F. NEMA ICS 6 - Industrial Control and Systems: Enclosures; 1993 (R2011).
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.
- I. UL 916 - Energy Management Equipment; Current Edition, Including All Revisions.
- J. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.
- K. UL 60947-1 - Low-Voltage Switchgear and Controlgear - Part 1: General Rules; Current Edition, Including All Revisions.
- L. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.

2. Coordinate the placement of wall switch occupancy sensors with actual installed door swings.
 3. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
 4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.
- B. Sequencing:
1. Do not install lighting control devices until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
 1. Occupancy Sensors: Include detailed motion detection coverage range diagrams.
- C. Project Record Documents: Record actual installed locations and settings for lighting control devices.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.08 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for all occupancy sensors.

PART 2 PRODUCTS

2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.
- C. Products for Switching of Electronic Ballasts/Drivers: Tested and rated to be suitable for peak inrush currents specified in NEMA 410.

2.02 OCCUPANCY SENSORS

- A. All Occupancy Sensors:
 1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small

desktop level movements, according to published coverage areas, for automatic control of load indicated.

2. Sensor Technology:
 - a. Passive Infrared (PIR) Occupancy Sensors: Designed to detect occupancy by sensing movement of thermal energy between zones.
 - b. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.
 3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
 4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
 5. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
 6. Passive Infrared Lens Field of View: Field customizable by addition of factory masking material, adjustment of integral blinders, or similar means to block motion detection in selected areas.
 7. Turn-Off Delay: Field adjustable, up to a maximum time delay setting of not less than 5 minutes and not more than 30 minutes.
 8. Sensitivity: Field adjustable.
 9. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.
- B. Wall Switch Occupancy Sensors:
1. All Wall Switch Occupancy Sensors:
 - a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.
 - b. Unless otherwise indicated or required to control the load indicated on drawings, provide line voltage units with self-contained relay.
 - c. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.
 - d. Finish: Match finishes specified for wiring devices in Section 26 2726, unless otherwise indicated.
 2. Passive Infrared (PIR) Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 square feet (83.6 sq m).
 3. Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 square feet (83.6 sq m).
- C. Ceiling Mounted Occupancy Sensors:
1. All Ceiling Mounted Occupancy Sensors:
 - a. Description: Low profile occupancy sensors designed for ceiling installation.
 - b. Unless otherwise indicated or required to control the load indicated on drawings, provide low voltage units, for use with separate compatible accessory power packs.
 - c. Finish: White unless otherwise indicated.
 2. Passive Infrared (PIR) Ceiling Mounted Occupancy Sensors:
 - a. Standard Range Sensors: Capable of detecting motion within an area of 450 square feet (41.8 square meters) at a mounting height of 9 feet (2.7 m), with a field of view of 360 degrees.

- b. Extended Range Sensors: Capable of detecting motion within an area of 1,200 square feet (111.5 sq m) at a mounting height of 9 feet (2.7 m), with a field of view of 360 degrees.
 3. Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:
 - a. Standard Range Sensors: Capable of detecting motion within an area of 450 square feet (41.8 sq m) at a mounting height of 9 feet (2.7 m), with a field of view of 360 degrees.
 - b. Extended Range Sensors: Capable of detecting motion within an area of 1,200 square feet (111.5 sq m) at a mounting height of 9 feet (2.7 m), with a field of view of 360 degrees.
 - D. Power Packs for Low Voltage Occupancy Sensors:
 1. Description: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensors for switching of line voltage loads.
 2. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on drawings.
 3. Input Supply Voltage: Dual rated for 120/277 V ac.
 4. Load Rating:
 - a. Incandescent Load: Not less than 15 A.
 - b. Fluorescent Load: Not less than 20 A.
 - c. Motor Load: Not less than 1 HP.

2.03 TIME SWITCHES

- A. Digital Electronic Time Switches:
 1. Description: Factory-assembled solid state programmable controller with LCD display, listed and labeled as complying with UL 916 or UL 917.
 2. Program Capability:
 - a. 7-Day Time Switches: Single channel, capable of different schedule for each day of the week with additional holiday schedule available to override normal schedule for selected days.
 3. Schedule Capacity: Not less than 16 programmable on/off operations.
 4. Provide automatic daylight savings time and leap year compensation.
 5. Provide power outage backup to retain programming and maintain clock.
 6. Manual override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
 7. Provide remote photocell input.
 8. Input Supply Voltage: As indicated on the drawings.
 9. Output Switch Configuration: As required to control the load indicated on drawings.
 10. Output Switch Contact Ratings: As required to control the load indicated on drawings.
 11. Provide lockable enclosure; environmental type per NEMA 250 as specified for the following installation locations:
 - a. Indoor clean, dry locations: Type 1.
 - b. Outdoor locations: Type 3R.
 12. Provide flush-mounted unit where indicated, where mounted in public areas, or where mounted adjacent to flush-mounted equipment.
- B. Electromechanical Time Switches:
 1. Description: Factory-assembled controller with motor-operated timing dial mechanism and adjustable trippers for setting on/off operations, listed and labeled as complying with UL 917.
 2. Program Capability:
 - a. 7-Day Time Switches: Capable of different schedule for each day of the week.
 3. Schedule Capacity:

- a. 7-Day Time Switches: Accommodating not less than two pairs of selected on/off operations per day.
4. Provide spring reserve backup to maintain clock during power outage.
5. Manual override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
6. Input Supply Voltage: As indicated on the drawings.
7. Output Switch Configuration: As required to control the load indicated on drawings.
8. Output Switch Contact Ratings: As required to control the load indicated on drawings.
9. Provide lockable enclosure; environmental type per NEMA 250 as specified for the following installation locations:
 - a. Indoor clean, dry locations: Type 1.
 - b. Outdoor locations: Type 3R.
10. Provide flush-mounted unit where indicated, where mounted in public areas, or where mounted adjacent to flush-mounted equipment.

2.04 OUTDOOR PHOTO CONTROLS

- A. Stem-Mounted Outdoor Photo Controls:
 1. Description: Direct-wired photo control unit with threaded conduit mounting stem and field-adjustable swivel base, listed and labeled as complying with UL 773A.
 2. Housing: Weatherproof, impact resistant polycarbonate.
 3. Photo Sensor: Cadmium sulfide.
 4. Provide external sliding shield for field adjustment of light level activation.
 5. Light Level Activation: 1 to 5 footcandles (10.8 to 53.8 lux) turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
 6. Voltage: As required to control the load indicated on the drawings.
 7. Failure Mode: Fails to the on position.
 8. Load Rating: As required to control the load indicated on the drawings.
 9. Provide accessory wall-mounting bracket where indicated or as required to complete installation.

2.05 LIGHTING CONTACTORS

- A. Description: Magnetic lighting contactors complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; noncombination type unless otherwise indicated; ratings, configurations and features as indicated on the drawings.
- B. Short Circuit Current Rating:
 1. Provide contactors with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
- C. Enclosures:
 1. Comply with NEMA ICS 6.
 2. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1 or Type 12.
 - b. Outdoor Locations: Type 3R or Type 4.
 3. Finish: Manufacturer's standard unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.

- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
- F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.
- G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of lighting control devices provided under this section.
 - 1. Mounting Heights: Unless otherwise indicated, as follows:
 - a. Wall Switch Occupancy Sensors: 48 inches (1.2 m) above finished floor.
- C. Install lighting control devices in accordance with manufacturer's instructions.
- D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- E. Install lighting control devices plumb and level, and held securely in place.
- F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 2726.
- G. Provide required supports in accordance with Section 26 0529.
- H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- I. Identify lighting control devices in accordance with Section 26 0553.
- J. Occupancy Sensor Locations:
 - 1. Location Adjustments: Within the design intent, reasonably minor adjustments to locations may be made in order to optimize coverage and avoid conflicts or problems affecting coverage.
 - 2. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet (1.2 m) from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.
- K. Outdoor Photo Control Locations:
 - 1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.
 - 2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by the photo control itself.
- L. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into the photo control.
- M. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.

- N. Where indicated, install separate compatible wall switches for manual control interface with lighting control devices or associated power packs.
- O. Unless otherwise indicated, install switches on load side of power packs so that switch does not turn off power pack.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect each lighting control device for damage and defects.
- C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area.
- D. Test time switches to verify proper operation.
- E. Test outdoor photo controls to verify proper operation, including time delays where applicable.
- F. Correct wiring deficiencies and replace damaged or defective lighting control devices.

3.05 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.
- B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.
- C. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.
- D. Adjust time switch settings to achieve desired operation schedule as indicated or as directed by Architect. Record settings in written report to be included with submittals.
- E. Adjust external sliding shields on outdoor photo controls under optimum lighting conditions to achieve desired turn-on and turn-off activation as indicated or as directed by Architect.

3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of lighting control devices to Architect, and correct deficiencies or make adjustments as directed.
- B. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Instructor: Qualified contractor familiar with the project and with sufficient knowledge of the installed lighting control devices.
 - 3. Location: At project site.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 2100
LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical service requirements.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Materials and installation requirements for cast-in-place concrete equipment pads.
- B. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0529 - Hangers and Supports for Electrical Systems.
- E. Section 26 0533.13 - Conduit for Electrical Systems.
- F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- G. Section 26 2416 - Panelboards: Service entrance equipment.
- H. Section 26 2816.16 - Enclosed Switches: Service entrance equipment.
- I. Section 31 2316 - Excavation.
- J. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.
- K. Section 31 2323 - Fill: Bedding and backfilling.

1.03 DEFINITIONS

- A. Service Point: The point of connection between the facilities of the serving utility and the premises wiring as defined in NFPA 70, and as designated by the Utility Company.

1.04 REFERENCE STANDARDS

- A. IEEE C2 - National Electrical Safety Code; 2012.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. No later than two weeks following date of the Agreement, notify Utility Company of anticipated date of service.
- B. Coordination:
 - 1. Verify the following with Utility Company representative:
 - a. Utility Company requirements, including division of responsibility.
 - b. Exact location and details of utility point of connection.
 - c. Utility easement requirements.
 - d. Utility Company charges associated with providing service.
 - 2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for electrical service and associated equipment.
 - 3. Coordinate arrangement of service entrance equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- C. Arrange for Utility Company to provide permanent electrical service. Prepare and submit documentation required by Utility Company.

- D. Utility Company charges associated with providing permanent service to be paid by Contractor..
- E. Preinstallation Meeting: Convene one week prior to commencing work of this section to review service requirements and details with Utility Company representative.
- F. Scheduling:
 - 1. Where work of this section involves interruption of existing electrical service, arrange service interruption with Owner.
 - 2. Arrange for inspections necessary to obtain Utility Company approval of installation.

1.06 QUALITY ASSURANCE

- A. Comply with the following:
 - 1. IEEE C2 (National Electrical Safety Code).
 - 2. NFPA 70 (National Electrical Code).
 - 3. The requirements of the Utility Company.
 - 4. The requirements of the local authorities having jurisdiction.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- B. Store products indoors in a clean, dry space having a uniform temperature to prevent condensation (including outdoor rated products which are not weatherproof until completely and properly installed). Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle products carefully to avoid damage to internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 ELECTRICAL SERVICE REQUIREMENTS

- A. Provide new electrical service consisting of all required conduits, conductors, equipment, metering provisions, supports, accessories, etc. as necessary for connection between Utility Company point of supply and service entrance equipment.
- B. Electrical Service Characteristics: As indicated on drawings.
- C. Utility Company: To be determined by Contractor.
- D. Division of Responsibility:
 - 1. Pole-Mounted Utility Transformers:
 - a. Utility Poles: Furnished and installed by Utility Company.
 - b. Transformers: Furnished and installed by Utility Company.
 - c. Transformer Grounding Provisions: Furnished and installed by Utility Company.
 - d. Primary: Furnished and installed by Utility Company.
 - e. Secondary - Underground Service:
 - 1) Conduits: Furnished and installed by Contractor.
 - 2) Conductors: Furnished and installed by Contractor (Service Point at utility pole).
 - 2. Terminations at Service Point: Provided by Utility Company.
 - 3. Metering Provisions:
 - a. Meter Bases: Furnished and installed by Contractor per Utility Company requirements.
- E. Products Furnished by Contractor: Comply with Utility Company requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.

- B. Verify that ratings and configurations of service entrance equipment are consistent with the indicated requirements.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Verify and mark locations of existing underground utilities.

3.03 INSTALLATION

- A. Install products in accordance with manufacturer's instructions and Utility Company requirements.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances and required maintenance access.
- D. Provide required trenching and backfilling in accordance with Section 31 2316 and Section 31 2323.
- E. Construct cast-in-place concrete pads for utility equipment in accordance with Utility Company requirements and Section 03 3000.
- F. Provide required protective bollards in accordance with Utility Company requirements.
- G. Provide required support and attachment components in accordance with Section 26 0529.
- H. Provide grounding and bonding for service entrance equipment in accordance with Section 26 0526.
- I. Identify service entrance equipment, including main service disconnect(s) in accordance with Section 26 0553.

3.04 PROTECTION

- A. Protect installed equipment from subsequent construction operations.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 2416
PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Power distribution panelboards.
- B. Lighting and appliance panelboards.
- C. Overcurrent protective devices for panelboards.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 26 0200 - Electrical General Requirements.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0529 - Hangers and Supports for Electrical Systems.
- E. Section 26 0548 - Vibration and Seismic Controls for Electrical Systems.
- F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; Federal Specification; Revision E, 2013.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2009.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- E. NEMA PB 1 - Panelboards; 2011.
- F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; 2013.
- G. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- K. UL 67 - Panelboards; Current Edition, Including All Revisions.
- L. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.
- M. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.
- N. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.
- O. UL 1699 - Arc-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.

2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted panelboards where indicated.
4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.
- C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
 1. Clearly indicate whether proposed short circuit current ratings are fully rated or, where acceptable, series rated systems.
- D. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperature within the following limits during and after installation of panelboards:
 1. Panelboards Containing Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. ABB/GE: www.geindustrial.com/#sle.
- B. Eaton Corporation: www.eaton.com.
- C. Schneider Electric; Square D Products: www.schneider-electric.us.
- D. Siemens Industry, Inc: www.usa.siemens.com.
- E. Engineer Approved Equal.

- F. Source Limitations: Furnish panelboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 PANELBOARDS - GENERAL REQUIREMENTS

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet (2,000 m).
 - 2. Ambient Temperature:
 - a. Panelboards Containing Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).
- C. Short Circuit Current Rating:
 - 1. Provide panelboards with listed short circuit current rating as indicated on the drawings.
 - 2. Listed series ratings are acceptable, except where not permitted by motor contribution according to NFPA 70.
 - 3. Label equipment utilizing series ratings as required by NFPA 70.
- D. Panelboards Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
- E. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
- F. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
- G. Bussing: Sized in accordance with UL 67 temperature rise requirements.
 - 1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
 - 2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
 - 3. Provide separate isolated/insulated ground bus where indicated or where isolated grounding conductors are provided.
- H. Conductor Terminations: Suitable for use with the conductors to be installed.
- I. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1.
 - b. Outdoor Locations: Type 3R.
 - 2. Boxes: Galvanized steel unless otherwise indicated.
 - a. Provide wiring gutters sized to accommodate the conductors to be installed.
 - b. Increase gutter space as required where sub-feed lugs, feed-through lugs, gutter taps, or oversized lugs are provided.
 - c. Provide painted steel boxes for surface-mounted panelboards where indicated, finish to match fronts.
 - 3. Fronts:
 - a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
 - b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
 - c. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
 - 4. Lockable Doors: All locks keyed alike unless otherwise indicated.
- J. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

- K. Multi-Section Panelboards: Provide enclosures of the same height, with feed-through lugs or sub-feed lugs and feeders as indicated or as required to interconnect sections.
- L. Provide the following features and accessories where indicated or where required to complete installation:
 - 1. Feed-through lugs.
 - 2. Sub-feed lugs.

2.03 POWER DISTRIBUTION PANELBOARDS

- A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.
- B. Conductor Terminations:
 - 1. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
 - 2. Main and Neutral Lug Type: Mechanical.
- C. Bussing:
 - 1. Phase and Neutral Bus Material: Copper.
 - 2. Ground Bus Material: Copper.
- D. Circuit Breakers:
 - 1. Provide bolt-on type.
 - 2. Provide thermal magnetic circuit breakers.
- E. Enclosures:
 - 1. Provide surface-mounted enclosures unless otherwise indicated.
 - 2. Fronts: Provide trims to cover access to load terminals, wiring gutters, and other live parts, with exposed access to overcurrent protective device handles.
- F. Minimum integrated short circuit rating:
 - 1. 240 Volt Panelboards: 22,000 amperes rms symmetrical.
 - 2. 480 Volt Panelboards: 30,000 amperes rms symmetrical.

2.04 LIGHTING AND APPLIANCE PANELBOARDS

- A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.
- B. Conductor Terminations:
 - 1. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
 - 2. Main and Neutral Lug Type: Mechanical.
- C. Bussing:
 - 1. Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.
 - 2. Phase and Neutral Bus Material: Copper.
 - 3. Ground Bus Material: Copper.
- D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.
- E. Enclosures:
 - 1. Provide surface-mounted or flush-mounted enclosures as indicated.
 - 2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
 - 3. Provide clear plastic circuit directory holder mounted on inside of door.
- F. Minimum Integrated Short Circuit Rating:
 - 1. 240 Volt Panelboards: 10,000 amperes rms symmetrical.

2. 480 Volt Panelboards: 14,000 amperes rms symmetrical.

2.05 OVERCURRENT PROTECTIVE DEVICES

- A. Molded Case Circuit Breakers:
 1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
 2. Interrupting Capacity:
 - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated.
 - b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
 - c. Series Rated Systems: Provide circuit breakers listed in combination with upstream devices to provide interrupting rating not less than the short circuit current rating indicated.
 3. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
 4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
 - a. Provide interchangeable trip units where indicated.
 5. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
 6. Provide the following circuit breaker types where indicated:
 - a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
 - b. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Combination type listed as complying with UL 1699.
 7. Do not use tandem circuit breakers.
 8. Do not use handle ties in lieu of multi-pole circuit breakers.
 9. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.
 10. Provide the following features and accessories where indicated or where required to complete installation:
 - a. Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.
 - b. Handle Pad-Lock Provision: For locking circuit breaker handle in OFF position.

2.06 SOURCE QUALITY CONTROL

- A. Factory test panelboards according to NEMA PB 1.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive panelboards.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.

- D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- E. Provide required support and attachment in accordance with Section 26 0529.
- F. Install panelboards plumb.
- G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.
- H. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches (2000 mm) above the floor or working platform.
- I. Mount floor-mounted power distribution panelboards on properly sized 3 inch (80 mm) high concrete pad constructed in accordance with Section 03 3000.
- J. Provide minimum of six spare 1 inch (27 mm) trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling and below floor.
- K. Provide grounding and bonding in accordance with Section 26 0526.
 - 1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.
 - 2. Terminate branch circuit isolated grounding conductors on isolated/insulated ground bus only. Do not terminate on solidly bonded equipment ground bus.
- L. Install all field-installed branch devices, components, and accessories.
- M. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
- N. Multi-Wire Branch Circuits: Group grounded and ungrounded conductors together in the panelboard as required by NFPA 70.
- O. Provide filler plates to cover unused spaces in panelboards.
- P. Provide circuit breaker lock-on devices to prevent unauthorized personnel from de-energizing essential loads where indicated. Also provide for the following:
 - 1. Emergency and night lighting circuits.
 - 2. Fire detection and alarm circuits.
- Q. Identify panelboards in accordance with Section 26 0553.
- R. Provide computer-generated circuit directory for each lighting and appliance panelboard and each power distribution panelboard provided with a door, clearly and specifically indicating the loads served. Identify spares and spaces.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Fusible Switches: Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
- D. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for all main circuit breakers and circuit breakers larger than _____ amperes. Tests listed as optional are not required.
- E. Test GFCI circuit breakers to verify proper operation.
- F. Test AFCI circuit breakers to verify proper operation.
- G. Test shunt trips to verify proper operation.
- H. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.04 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

- B. Adjust alignment of panelboard fronts.

3.05 CLEANING

- A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 2726
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall switches.
- B. Wall dimmers.
- C. Receptacles.
- D. Wall plates.
- E. Floor box service fittings.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0533.16 - Boxes for Electrical Systems.
- C. Section 26 0200 - Electrical General Requirements.
- D. Section 26 0923 - Lighting Control Devices: Devices for automatic control of lighting, including occupancy sensors.

1.03 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.
- B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Federal Specification; Revision F, 1999.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
- E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (R 2010).
- F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2012.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.
- I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.
- J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.
- K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.
- B. Sequencing:
 - 1. Do not install wiring devices until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
 - 1. Wall Dimmers: Include derating information for ganged multiple devices.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS

2.01 WIRING DEVICE APPLICATIONS

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
- D. Provide GFCI protection for receptacles installed within 6 feet (1.8 m) of sinks.
- E. Provide GFCI protection for receptacles installed in kitchens.
- F. Provide GFCI protection for receptacles serving electric drinking fountains.
- G. Unless noted otherwise, do not use combination switch/receptacle devices.
- H. For flush floor service fittings, use tile rings for installations in tile floors.
- I. For flush floor service fittings, use carpet flanges for installations in carpeted floors.

2.02 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.
- C. Wiring Devices Installed in Finished Spaces: White with white nylon wall plate.
- D. Wiring Devices Installed in Unfinished Spaces: Gray with galvanized steel wall plate.
- E. Wiring Devices Installed in Wet or Damp Locations: Gray with specified weatherproof cover.
- F. Wiring Devices Connected to Emergency Power: Red with red nylon wall plate.

2.03 WALL SWITCHES

- A. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.04 WALL DIMMERS

- A. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA

WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

- B. Control: Slide control type with separate on/off switch.
- C. Power Rating, Unless Otherwise Indicated or Required to Control the Load Indicated on the Drawings:
 - 1. Incandescent: 600 W.
 - 2. Electronic Low-Voltage: 400 VA.
 - 3. Fluorescent: 600 VA.

2.05 RECEPTACLES

- A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
 - 2. NEMA configurations specified are according to NEMA WD 6.
- B. Convenience Receptacles:
 - 1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
 - 2. Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.
 - 3. Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.
- C. GFCI Receptacles:
 - 1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
 - a. Provide test and reset buttons of same color as device.
 - 2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
 - 3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.
 - 4. Tamper Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.

2.06 WALL PLATES

- A. Wall Plates: Comply with UL 514D.
 - 1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 - 2. Size: Standard.
 - 3. Screws: Metal with slotted heads finished to match wall plate finish.
- B. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.
- C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.
- D. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.

- E. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

2.07 FLOOR BOX SERVICE FITTINGS

- A. Description: Service fittings compatible with floor boxes provided under Section 26 0533.16 with components, adapters, and trims required for complete installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that floor boxes are adjusted properly.
- F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
 - 1. Mounting Heights: Unless otherwise indicated, as follows:
 - a. Wall Switches: 48 inches (1200 mm) above finished floor.
 - b. Wall Dimmers: 48 inches (1200 mm) above finished floor.
 - c. Receptacles: 18 inches (450 mm) above finished floor or 6 inches (150 mm) above counter.
 - d. All mounting heights specified in the project documents are to the bottom of the device box, unless otherwise noted..
 - 2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
 - 3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
 - 4. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches (150 mm) long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
- L. Do not share neutral conductor on branch circuits utilizing wall dimmers.
- M. Install vertically mounted receptacles with grounding pole on bottom and horizontally mounted receptacles with grounding pole on right.
- N. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- O. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect each wiring device for damage and defects.
- C. Operate each wall switch and fan speed controller with circuit energized to verify proper operation.
- D. Test each receptacle to verify operation and proper polarity.
- E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- F. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.
- B. Adjust presets for wall dimmers according to manufacturer's instructions as directed by Architect.

3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 2816.16
ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Enclosed safety switches.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0548 - Vibration and Seismic Controls for Electrical Systems.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 0200 - Electrical General Requirements.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- C. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013.
- D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- H. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.
- I. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
 - 4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
- C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperature between -22 degrees F (-30 degrees C) and 104 degrees F (40 degrees C) during and after installation of enclosed switches.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. ABB/GE: www.geindustrial.com/#sle.
- B. Eaton Corporation: www.eaton.com.
- C. Schneider Electric; Square D Products: www.schneider-electric.us.
- D. Siemens Industry, Inc: www.usa.siemens.com.
- E. Engineer Approved Equal.

2.02 ENCLOSED SAFETY SWITCHES

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet (2,000 m).
 - 2. Ambient Temperature: Between -22 degrees F (-30 degrees C) and 104 degrees F (40 degrees C).
- D. Horsepower Rating: Suitable for connected load.
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:
 - 1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location.
 - 2. Minimum Ratings:
 - a. General Duty Single Throw Switches Protected by Class R, Class J, or Class T Fuses: 100,000 rms symmetrical amperes.
 - b. Heavy Duty Single Throw Switches Protected by Class R, Class J, Class L, or Class T Fuses: 200,000 rms symmetrical amperes.
- G. Enclosed Safety Switches Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
- H. Provide with switch blade contact position that is visible when the cover is open.
- I. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
 - 1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.
- J. Conductor Terminations: Suitable for use with the conductors to be installed.

- K. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
- L. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- M. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1.
 - b. Outdoor Locations: Type 3R.
 - c. Interior Damp Locations: Type 4X.
 - 2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.
- N. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- O. Heavy Duty Switches:
 - 1. Comply with NEMA KS 1.
 - 2. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
 - 3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.
 - a. Provide means for locking handle in the ON position where indicated.
- P. Provide the following features and accessories where indicated or where required to complete installation:
 - 1. Hubs: As required for environment type; sized to accept conduits to be installed.
 - 2. Auxiliary Switch: SPDT switch suitable for connection to system indicated, with auxiliary contact operation before switch blades open and after switch blades close.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed safety switches.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Provide required seismic controls in accordance with Section 26 0548.
- F. Install enclosed switches plumb.
- G. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches (2000 mm) above the floor or working platform.
- H. Provide grounding and bonding in accordance with Section 26 0526.

- I. Provide fuses complying with Section 26 2813 for fusible switches as indicated or as required by equipment manufacturer's recommendations.
- J. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
- K. Identify enclosed switches in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
- D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.04 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

- A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 2913
ENCLOSED CONTROLLERS

PART 2 PRODUCTS

1.01 ENCLOSED CONTROLLERS

- A. Provide enclosed controller assemblies consisting of all required components, control power transformers, instrumentation and control wiring, accessories, etc. as necessary for a complete operating system.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Description: Enclosed controllers complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; ratings, configurations and features as indicated on the drawings.
- D. Service Conditions:
 - 1. Provide controllers and associated components suitable for operation under the following service conditions without derating:
 - a. Altitude:
 - 1) Class 1 Km Equipment (devices utilizing power semiconductors, e.g. variable frequency controllers): Less than 3,300 feet (1,000 m).
 - 2) Class 2 Km Equipment (electromagnetic and manual devices): Less than 6,600 feet (2,000 m).
 - b. Ambient Temperature: Between 32 degrees F (0 degrees C) and 104 degrees F (40 degrees C).
 - 2. Provide controllers and associated components suitable for operation at indicated ratings under the service conditions at the installed location.
- E. Short Circuit Current Rating:
- F. Conductor Terminations: Suitable for use with the conductors to be installed.
- G. Enclosures:
 - 1. Comply with NEMA ICS 6.
 - 2. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - 3. Finish: Manufacturer's standard unless otherwise indicated.
- H. Instrument Transformers:
 - 1. Comply with IEEE C57.13.
 - 2. Select suitable ratio, burden, and accuracy as required for connected devices.
 - 3. Current Transformers: Connect secondaries to shorting terminal blocks.
 - 4. Potential Transformers: Include primary and secondary fuses with disconnecting means.

1.02 OVERCURRENT PROTECTIVE DEVICES

- A. Overload Relays:
 - 1. Provide overload relays and, where applicable, associated current elements/heaters, selected according to actual installed motor nameplate data, in accordance with manufacturer's recommendations and NFPA 70; include consideration for motor service factor and ambient temperature correction, where applicable.
 - 2. Inverse-Time Trip Class Rating: Class 20 unless otherwise indicated or required.
 - 3. Trip-free operation.
 - 4. Visible trip indication.
 - 5. Resettable.
 - a. Employ manual reset unless otherwise indicated.
 - b. Do not employ automatic reset with two-wire control.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 26 5100
INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Interior luminaires.
- B. Emergency lighting units.
- C. Exit signs.
- D. Ballasts and drivers.
- E. Lamps.
- F. Luminaire accessories.

1.02 RELATED REQUIREMENTS

- A. Section 26 0200 - Electrical General Requirements.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0533.16 - Boxes for Electrical Systems.
- D. Section 26 0548 - Vibration and Seismic Controls for Electrical Systems.
- E. Section 26 0919 - Enclosed Contactors: Lighting contactors.
- F. Section 26 0923 - Lighting Control Devices: Automatic controls for lighting including occupancy sensors, time switches, and outdoor photo controls.
- G. Section 26 2726 - Wiring Devices: Manual wall switches and wall dimmers.
- H. Section 26 5600 - Exterior Lighting.

1.03 REFERENCE STANDARDS

- A. ANSI C82.4 - American National Standard for Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type); 2002.
- B. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.
- C. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; Illuminating Engineering Society; 2015.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- E. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2006.
- F. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.
- G. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. NFPA 101 - Life Safety Code; 2015.
- J. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.
- K. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- L. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc.

- required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
 3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
 4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
 1. LED Luminaires:
 - a. Include estimated useful life, calculated based on IES LM-80 test data.
 - b. Include IES LM-79 test report upon request.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70 and NFPA 101.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting) and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.08 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for all LED luminaires, including drivers.
- C. Provide five year pro-rata warranty for batteries for emergency lighting units.
- D. Provide ten year pro-rata warranty for batteries for self-powered exit signs.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

- A. Furnish products as indicated in Lighting Fixture Schedule included on the drawings.

2.02 LUMINAIRES

- A. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- B. Provide products that comply with requirements of NFPA 70 and NFPA 101.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- G. Recessed Luminaires:
 - 1. Ceiling Compatibility: Comply with NEMA LE 4.
 - 2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
 - 3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.
- H. LED Luminaires:
 - 1. Components: UL 8750 recognized or listed as applicable.
 - 2. Tested in accordance with IES LM-79 and IES LM-80.
 - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 EMERGENCY LIGHTING UNITS

- A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
- B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- C. Battery:
 - 1. Sealed maintenance-free lead calcium unless otherwise indicated.
 - 2. Size battery to supply all connected lamps, including emergency remote heads where indicated.
- D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- E. Provide low-voltage disconnect to prevent battery damage from deep discharge.
- F. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status.
- G. Accessories:
 - 1. Provide compatible accessory mounting brackets where indicated or required to complete installation.
 - 2. Provide compatible accessory wire guards where indicated.
 - 3. Where indicated, provide emergency remote heads that are compatible with the emergency lighting unit they are connected to and suitable for the installed location.

2.04 EXIT SIGNS

- A. Description: Exit signs and similar signs for special purpose applications such as area of refuge/rescue assistance.
- B. Description: Internally illuminated exit signs with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
 - 1. Number of Faces: Single or double as indicated or as required for the installed location.
 - 2. Directional Arrows: As indicated or as required for the installed location.
- C. Self-Powered Exit Signs:
 - 1. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
 - 2. Battery: Sealed maintenance-free nickel cadmium unless otherwise indicated.
 - 3. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
 - 4. Provide low-voltage disconnect to prevent battery damage from deep discharge.
 - 5. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status.

2.05 BALLASTS AND DRIVERS

- A. Ballasts/Drivers - General Requirements:
 - 1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
 - 2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
- B. Dimmable LED Drivers:
 - 1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
 - 2. Control Compatibility: Fully compatible with the dimming controls to be installed.

2.06 LAMPS

- A. Manufacturers:
 - 1. Osram Sylvania: www.sylvania.com/#sle.
 - 2. GE Lighting: www.gelighting.com.
 - 3. Philips Lighting Co of NA: www.lighting.philips.com.
 - 4. Engineer Approved Equal.
- B. Lamps - General Requirements:
 - 1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
 - 2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
 - 3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
 - 4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.
- C. Lamp Types: As specified for each fixture.

2.07 ACCESSORIES

- A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.

- B. Provide accessory plaster frames for luminaires recessed in plaster ceilings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.
- B. Install products in accordance with manufacturer's instructions.
- C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Suspended Ceiling Mounted Luminaires:
 - 1. Do not use ceiling tiles to bear weight of luminaires.
 - 2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
 - 3. Secure surface-mounted and recessed luminaires to ceiling support channels or framing members or to building structure.
 - 4. Secure pendant-mounted luminaires to building structure.
 - 5. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
 - 6. In addition to ceiling support wires, provide two galvanized steel safety wire(s), minimum 12 gage, connected from opposing corners of each recessed luminaire to building structure.
 - 7. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
- G. Recessed Luminaires:
 - 1. Install trims tight to mounting surface with no visible light leakage.
 - 2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
 - 3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.
- H. Suspended Luminaires:
 - 1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
 - 2. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
 - 3. Install canopies tight to mounting surface.
 - 4. Unless otherwise indicated, support pendants from swivel hangers.

- I. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
- J. Install accessories furnished with each luminaire.
- K. Bond products and metal accessories to branch circuit equipment grounding conductor.
- L. Emergency Lighting Units:
 - 1. Install lock-on device on branch circuit breaker serving units.
- M. Exit Signs:
 - 1. Install lock-on device on branch circuit breaker serving units.
- N. Remote Ballasts: Install in accessible location as indicated or as required to complete installation, using conductors per manufacturer's recommendations not exceeding manufacturer's recommended maximum conductor length to luminaire.
- O. Install lamps in each luminaire.
- P. Lamp Burn-In: Operate lamps at full output for prescribed period per manufacturer's recommendations prior to use with any dimming controls. Replace lamps that fail prematurely due to improper lamp burn-in.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect each product for damage and defects.
- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Test emergency lighting units to verify proper operation upon loss of normal power supply.
- E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.05 ADJUSTING

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
- B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect or authority having jurisdiction.
- C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

3.06 CLEANING

- A. Clean surfaces according to NECA 500 (commercial lighting) and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.
- B. Just prior to Substantial Completion, replace all lamps that have failed.

3.08 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

3.09 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 26 5600
EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior luminaires.
- B. Ballasts.
- C. Lamps.
- D. Poles and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 26 0200 - Electrical General Requirements.
- B. Section 03 3000 - Cast-in-Place Concrete: Materials and installation requirements for concrete bases for poles.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0529 - Hangers and Supports for Electrical Systems.
- E. Section 26 0533.16 - Boxes for Electrical Systems.
- F. Section 26 0919 - Enclosed Contactors: Lighting contactors.
- G. Section 26 0923 - Lighting Control Devices: Automatic controls for lighting including time switches and outdoor photo controls.
- H. Section 26 5100 - Interior Lighting.

1.03 REFERENCE STANDARDS

- A. AASHTO LTS - Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals; American Association of State Highway and Transportation Officials; 6th Edition, with 2015 Interim Revisions.
- B. ANSI C82.4 - American National Standard for Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type); 2002.
- C. IEEE C2 - National Electrical Safety Code; 2012.
- D. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.
- E. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; Illuminating Engineering Society; 2015.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- G. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2006.
- H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- K. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate placement of poles and associated foundations with utilities, curbs, sidewalks, trees, walls, fences, striping, etc. installed under other sections or by others. Coordinate elevation to obtain specified foundation height.

2. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
 2. Provide structural calculations for each pole proposed for substitution.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
 1. LED Luminaires:
 - a. Include estimated useful life, calculated based on IES LM-80 test data.
 2. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for all LED luminaires, including drivers.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

- A. Furnish products as indicated in Lighting Fixture Schedule included on the Drawings.

2.02 LUMINAIRES

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.
- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

- G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.
- H. Recessed Luminaires:
 - 1. Ceiling Compatibility: Comply with NEMA LE 4.
 - 2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
 - 3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.
- I. LED Luminaires:
 - 1. Components: UL 8750 recognized or listed as applicable.
 - 2. Tested in accordance with IES LM-79 and IES LM-80.
 - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
- J. Exposed Hardware: Stainless steel.

2.03 BALLASTS AND DRIVERS

- A. Ballasts/Drivers - General Requirements:
 - 1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
 - 2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
- B. Dimmable LED Drivers:
 - 1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
 - 2. Control Compatibility: Fully compatible with the dimming controls to be installed.

2.04 LAMPS

- A. Manufacturers:
 - 1. General Electric Company/GE Lighting: www.gelighting.com.
 - 2. Osram Sylvania: www.sylvania.com/#sle.
 - 3. Philips Lighting North America Corporation; www.usa.lighting.philips.com/#sle.
 - 4. Engineer Approved Equal.
- B. Lamps - General Requirements:
 - 1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
 - 2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
 - 3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
 - 4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.
- C. Lamp Types: As specified for each fixture.

2.05 POLES

- A. All Poles:
 - 1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
 - 2. Structural Design Criteria:
 - a. Comply with AASHTO LTS.
 - b. Wind Load: Include effective projected area (EPA) of luminaire(s) and associated supports and accessories to be installed.
 - 3. Material: Steel, unless otherwise indicated.
 - 4. Shape: Square straight, unless otherwise indicated.
 - 5. Finish: Match luminaire finish, unless otherwise indicated.

6. Mounting: Install on concrete foundation, height as indicated on the drawings, unless otherwise indicated.
 7. Unless otherwise indicated, provide with the following features/accessories:
 - a. Top cap.
 - b. Handhole.
 - c. Anchor bolts with leveling nuts or leveling shims.
 - d. Anchor base cover.
- B. Metal Poles: Provide ground lug, accessible from handhole.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.
- B. Install products in accordance with manufacturer's instructions.
- C. Install luminaires in accordance with NECA/IESNA 501.
- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Recessed Luminaires:
 1. Install trims tight to mounting surface with no visible light leakage.
 2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
- G. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
- H. Pole-Mounted Luminaires:
 1. Maintain the following minimum clearances:
 - a. Comply with IEEE C2.
 - b. Comply with utility company requirements.
 2. Foundation-Mounted Poles:
 - a. Provide cast-in-place concrete foundations for poles as indicated, in accordance with Section 03 3000.
 - 1) Install anchor bolts plumb per template furnished by pole manufacturer.
 - 2) Position conduits to enter pole shaft.
 - b. Install foundations plumb.
 - c. Install poles plumb, using leveling nuts or shims as required to adjust to plumb.
 - d. Tighten anchor bolt nuts to manufacturer's recommended torque.

- e. Install non-shrink grout between pole anchor base and concrete foundation, leaving small channel for condensation drainage.
- f. Install anchor base covers as indicated.
- 3. Embedded Poles: Install poles plumb as indicated.
- 4. Grounding:
 - a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
- 5. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.
- I. Install accessories furnished with each luminaire.
- J. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect each product for damage and defects.
- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.
- E. Measure illumination levels at night with calibrated meters to verify conformance with performance requirements. Record test results in written report to be included with submittals.

3.05 ADJUSTING

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
- B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.

3.06 CLEANING

- A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.
- B. Just prior to Substantial Completion, replace all lamps that have failed.

3.08 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

3.09 SCHEDULE - SEE DRAWINGS

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

SECTION 28 4600
FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire alarm system design and installation, including all components, wiring, and conduit.
- B. Transmitters for communication with supervising station.
- C. Maintenance of fire alarm system under contract for specified warranty period.

1.02 RELATED REQUIREMENTS

- A. Section 07 8456 - Fire Safing: Materials and methods for work to be performed by this installer.
- B. Section 08 7100 - Door Hardware: Electrically operated locks and door holder devices to be monitored and released by fire alarm system.
- C. Section 21 1300 - Fire-Suppression Sprinkler Systems: Supervisory, alarm, and actuating devices installed in sprinkler system.

1.03 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Cor 1, 2012).
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. NFPA 72 - National Fire Alarm and Signaling Code; 2016.
- F. NFPA 101 - Life Safety Code; 2015.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Proposal Documents: Submit the following with cost/time proposal:
 - 1. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 - 2. Manufacturer's detailed data sheet for each control unit, initiating device, and notification appliance.
 - 3. Certification by Contractor that the system design will comply with the contract documents.
 - 4. Proposed maintenance contract.
- C. Evidence of designer qualifications.
- D. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
 - 1. Copy (if any) of list of data required by authority having jurisdiction.
 - 2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 - 3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
 - 4. System zone boundaries and interfaces to fire safety systems.
 - 5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
 - 6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
 - 7. List of all devices on each signaling line circuit, with spare capacity indicated.

8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
 9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
 10. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
 11. Certification by the manufacturer of the control unit that the system design complies with the contract documents.
 12. Certification by Contractor that the system design complies with the contract documents.
- E. Evidence of installer qualifications.
- F. Evidence of maintenance contractor qualifications, if different from installer.
- G. Inspection and Test Reports:
1. Submit inspection and test plan prior to closeout demonstration.
 2. Submit documentation of satisfactory inspections and tests.
 3. Submit NFPA 72 "Inspection and Test Form," filled out.
- H. Operating and Maintenance Data: See Section 01 7800 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:
1. Complete set of specified design documents, as approved by authority having jurisdiction.
 2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
 3. Contact information for firm that will be providing contract maintenance and trouble call-back service.
 4. List of recommended spare parts, tools, and instruments for testing.
 5. Replacement parts list with current prices, and source of supply.
 6. Detailed troubleshooting guide and large scale input/output matrix.
 7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
 8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.
- I. Project Record Documents: See Section 01 7800 for additional requirements; have one set available during closeout demonstration:
1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
 2. "As installed" wiring and schematic diagrams, with final terminal identifications.
 3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.
- J. Closeout Documents:
1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
 2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.
 3. Certificate of Occupancy.
 4. Maintenance contract.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer .

- B. Installer Qualifications: Firm with minimum 3 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
 - 1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
 - 2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
 - 3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
 - 4. Contract maintenance office located within 50 miles (80 km) of project site.
 - 5. Certified in the State in which the Project is located as fire alarm installer.
- C. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.
- D. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.
- E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 WARRANTY

- A. Provide control panel manufacturer's warranty that system components other than wire and conduit are free from defects and will remain so for 1 year after date of Substantial Completion.
- B. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Alarm Control Units and Accessories - Basis of Design: Notifier Fire Warden #NFW-100X w/ First Command ECS #NFC-100.
- B. Fire Alarm Control Units and Accessories - Other Acceptable Manufacturers:
 - 1. Honeywell Security & Fire Solutions/Gamewell-FCI: www.gamewell-fci.com/#sle.
 - 2. Honeywell Security & Fire Solutions/Fire-Lite: www.firelite.com/#sle.
 - 3. Honeywell Security & Fire Solutions/Silent Knight: www.silentknight.com/#sle.
 - 4. Siemens Building Technologies, Inc/Faraday: www.us.sbt.siemens.com/faraday.
 - 5. Simplex, a Tyco Business: www.simplex-fire.com/#sle.
 - 6. Engineer Approved Equal.
 - 7. Provide control units made by the same manufacturer.
- C. Initiating Devices and Notification Appliances:
 - 1. Provide initiating devices and notification appliances made by the same manufacturer, where possible.
- D. Substitutions: See Section 01 6000 - Product Requirements.
 - 1. For other acceptable manufacturers of control units specified, submit product data showing equivalent features and compliance with contract documents.
 - 2. For substitution of products by manufacturers not listed, submit product data showing features and certification by Contractor that the design will comply with contract documents.

2.02 FIRE ALARM SYSTEM

- A. Fire Alarm System: Provide a new automatic fire detection and alarm system:
 - 1. Provide all components necessary, regardless of whether shown in the contract documents or not.

2. Protected Premises: Entire building shown on drawings.
 3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
 - a. ADA Standards.
 - b. The requirements of the State Fire Marshal.
 - c. The requirements of the local authority having jurisdiction .
 - d. Applicable local codes.
 - e. The contract documents (drawings and specifications).
 - f. NFPA 101.
 - g. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
 4. Evacuation Alarm: Single smoke zone; general evacuation of entire premises.
 5. Voice Notification: Provide emergency voice/alarm communications with multichannel capability; digital.
 6. Program notification zones and voice messages as directed by Owner.
 7. Hearing Impaired Occupants: Provide visible notification devices in all public areas.
 8. Master Control Unit (Panel): New, at location indicated on drawings.
 9. Combined Systems: Do not combine fire alarm system with other non-fire systems.
- B. Supervising Stations and Fire Department Connections:
1. Public Fire Department Notification: By remote supervising station.
 2. Remote Supervising Station: UL-listed central station under contract to facility.
 3. Means of Transmission to Remote Supervising Station: Digital alarm communicator transmitter (DACT), 2 telephone lines.
- C. Circuits:
1. Initiating Device Circuits (IDC): Class B, Style B.
 2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
 3. Notification Appliance Circuits (NAC): Class B, Style Y.
- D. Spare Capacity:
1. Initiating Device Circuits: Minimum 25 percent spare capacity.
 2. Notification Appliance Circuits: Minimum 25 percent spare capacity.
 3. Fire Alarm Control Units: Capable of handling all circuits utilized to capacity without requiring additional components other than plug-in control modules.
- E. Power Sources:
1. Primary: Dedicated branch circuits of the facility power distribution system.
 2. Secondary: Storage batteries.
 3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.

2.03 FIRE SAFETY SYSTEMS INTERFACES

- A. Alarm: Provide alarm initiation in accordance with NFPA 72 for the following:
1. Duct smoke detectors.
- B. HVAC:
1. Duct Smoke Detectors: Shut down air handlers indicated.

2.04 COMPONENTS

- A. General:
1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted units are acceptable.
 2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

- B. Fire Alarm Control Units: Analog, addressable type; listed, classified, and labeled as suitable for the purpose intended.
- C. Master Control Unit: As specified for Basis of Design above, or equivalent.
- D. Remote Annunciators: Notifier #FDU-80.
- E. Initiating Devices:
 - 1. Addressable Systems:
 - a. Addressable Devices: Individually identifiable by addressable fire alarm control unit.
 - b. Provide suitable addressable interface modules as indicated or as required for connection to conventional (non-addressable) devices and other components that provide a dry closure output.
 - 2. Dual-Action Manual Pull Stations: Notifier #NOT-BG12LX w/ Protective Cover equal to Safety Technology International #STI-1200..
 - 3. Smoke Detectors: Notifier #NP-200.
 - 4. Duct Smoke Detectors: Notifier #NP-100 Detector w/ #DNRW Housing
 - 5. Heat Detectors: Notifier #NH-200.
 - 6. Addressable Monitor Modules: Notifier #NMM-100.
 - 7. Addressable Control Modules: Notifier #NC-100.
 - 8. Addressable Relay Modules: Notifier #NC-100R.
- F. Notification Appliances:
 - 1. Speaker/Strobes: Notifier SpectrAlert Series #SPSCWL.
 - 2. Strobes: Notifier SpectrAlert Series #SCWL.
 - 3. Outdoor Speaker/Strobes: Notifier #SPSRK.
- G. Circuit Conductors: Copper; provide 200 feet (60 m) extra; color code and label.
- H. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.
- I. Locks and Keys: Deliver keys to Owner.
 - 1. Provide the same standard lock and key for each key operated switch and lockable panel and cabinet; provide 5 keys of each type
- J. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
 - 1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
 - 2. Provide one for each control unit where operations are to be performed.
 - 3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
 - 4. Provide extra copy with operation and maintenance data submittal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and the contract documents.
- B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
- C. Install instruction cards and labels.

3.02 INSPECTION AND TESTING FOR COMPLETION

- A. Notify Owner 3 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.

- D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.
- H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
 - 1. Record all system operations and malfunctions.
 - 2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
 - 3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
 - 4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.03 OWNER PERSONNEL INSTRUCTION

- A. Provide the following instruction to designated Owner personnel:
 - 1. Hands-On Instruction: On-site, using operational system.
 - 2. Classroom Instruction: Owner furnished classroom, on-site or at other local facility.
- B. Administrative: One-hour session(s) covering issues necessary for non-technical administrative staff; classroom:
 - 1. Initial Training: 1 session pre-closeout.
- C. Basic Operation: One-hour sessions for attendant personnel, security officers, and engineering staff; combination of classroom and hands-on:
 - 1. Initial Training: 1 session pre-closeout.
- D. Furnish the services of instructors and teaching aids; have copies of operation and maintenance data available during instruction.

3.04 CLOSEOUT

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
 - 1. Be prepared to conduct any of the required tests.
 - 2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
 - 3. Have authorized technical representative of control unit manufacturer present during demonstration.
 - 4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
 - 5. Repeat demonstration until successful.
- B. Substantial Completion of the project cannot be achieved until inspection and testing is successful and:
 - 1. Specified diagnostic period without malfunction has been completed.
 - 2. Approved operating and maintenance data has been delivered.
 - 3. All aspects of operation have been demonstrated to Owner.
 - 4. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.
 - 5. Occupancy permit has been granted.
 - 6. Specified pre-closeout instruction is complete.

3.05 MAINTENANCE

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Provide to Owner, at no extra cost, a written maintenance contract for entire manufacturer's warranty period, to include the work described below.
- C. Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:
 - 1. Maintenance of fire safety interface and supervisory devices connected to fire alarm system.
 - 2. Repairs required, unless due to improper use, accidents, or negligence beyond the control of the maintenance contractor.
 - 3. Record keeping required by NFPA 72 and authorities having jurisdiction.
- D. Provide trouble call-back service upon notification by Owner:
 - 1. Provide on-site response within 2 hours of notification.
 - 2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
 - 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- E. Provide a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
- F. Maintain a log at each fire alarm control unit, listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.
- G. Comply with Owner's requirements for access to facility and security.

END OF SECTION

Early Head Start Facility
City of Pocahontas
Pocahontas, Arkansas

Commission No. 14617
(SE #18-118)

