

SPECIFICATIONS  
FOR  
CONSTRUCTION OF TECHNOLOGY TRAINING CENTER  
FOR  
THE CITY OF NEWPORT  
NEWPORT, ARKANSAS

September 2021

EDA Project # 08-79-05458

MILLER-NEWELL ENGINEERS, INC.  
P.O. Box 705  
510 Third Street  
Newport, AR 72112

WILLIAM M. WAGE, ARCHITECT  
5341 S. Irvin Drive  
Memphis, TN 38119

M-N 20-038

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ADVERTISEMENT FOR BIDS

Separate sealed bids for Construction of a New Technology Training Center, will be received by Newport City Hall, 615 Third Street, Newport, AR 72112, until 11 o'clock A.M., on October 15, 2021, and then at said location publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, Forms of Bid Bond, Performance and Payment Bond, and other Contract Documents may be examined at the following locations:

Miller-Newell Engineers, Inc., 510 Third Street, Newport, AR  
Newport City Hall, 615 Third Street, Newport, AR  
Dodge Plans Room, ([www.dodgeplans.construction.com](http://www.dodgeplans.construction.com))  
Construction Market Data ([www.cmdgroup.com](http://www.cmdgroup.com))  
Southern Reprographics, 901 West Seventh, Little Rock, AR

Copies of the Contract Documents may be obtained at the office of MILLER-NEWELL ENGINEERS, INC., 510 Third Street, Newport, Arkansas 72112, upon the payment of \$150 for each set. Successful bidders will be refunded \$75 upon return of the Contract Documents in usable condition within 14 days after receipt of bids.

The Owner reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit with his bid security in the amount, form and subject to the conditions provided in the Information for Bidders.

In accordance with Act 150 of 1965, as amended, all bidders shall conform to the requirements of the Arkansas State Licensing Law for Contractors.

No bidder may withdraw his bid within 60 days after the actual date of the opening thereof.

David Stewart/Mayor  
Date: September 26, 2021

## INFORMATION FOR BIDDERS

Bids will be received by City of Newport (herein called the "OWNER"), at Newport City Hall, 615 Third Street, Newport, AR 72112, until 11 o'clock A.M., on October 15, 2021 and then at said office publicly opened and read aloud. Each bid must be submitted in a sealed envelope, addressed to City of Newport. Each sealed envelope containing a bid must be plainly marked on the outside as CONSTRUCTION OF NEW TECHNOLOGY TRAINING CENTER, and the envelope should bear on the outside the name of the bidder, his address, his license number, if applicable, 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 to the Owner, 615 Third Street, Newport, AR 72112.

Bids must be made on the required bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required.

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 60 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.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the drawings and specifications, including all addenda. After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

The Owner shall provide to bidders, prior to bidding, all information which is pertinent to and delineates and describes the land owned and rights-of-way acquired or to be acquired.

The Contract Documents contain the provisions required for the construction of the project. Information obtained from an officer, agent or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the contract.

Each bid must be accompanied by a Bid Bond payable to the Owner for five percent of the total amount of the bid. As soon as the bid prices have been compared, the Owner will return the bonds of all except the three lowest responsible bidders. When the Agreement is executed, the bonds of the two remaining unsuccessful bidders will be returned. The Bid Bond

of the successful bidder will be retained until the Payment Bond and Performance Bond have been executed and approved, after which it will be returned. A certified check **WILL NOT BE ACCEPTED** in lieu of a Bid Bond.

A Performance Bond and Payment Bond, each in the amount of 100 percent of the contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign Bid Bonds or Payment Bonds or Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond within ten (10) calendar days from the date when the Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary Agreement and bond forms. In case of failure of the bidder to execute the Agreement, the Owner may at his option consider the bidder in default, in which case the Bid Bond accompanying the proposal shall become the property of the Owner.

The Owner, within ten (10) days of receipt of acceptable Performance Bond, Payment Bond and Agreement signed by the party to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within ten (10) 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 between the Owner and Contractor. If the Notice to Proceed has not been issued within the ten (10) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

The Owner shall 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 data for this purpose as the Owner may request. The Owner reserves the right to reject any bid on 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 Agreement and to complete the work contemplated therein. A conditional or qualified bid will not be accepted. Award will be made to the lowest responsible bidder.

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.

Each bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any bidder to do any of the foregoing shall in no way relieve any bidder from any obligation in respect to his bid.

The low bidder shall supply the names and addresses of major material suppliers and subcontractors when requested to do so by the Owner.

The Engineer is MILLER-NEWELL ENGINEERS, INC., 510 THIRD STREET, NEWPORT, ARKANSAS 72112. Architect is WILLIAM M. WAGE, ARCHITECT, 5341 S. IRVIN DRIVE, MEMPHIS, TENNESSEE 38119.

*\* This project will be partially funded with Federal funds from the United States Department of Commerce, Economic Development Administration and therefore is subject to the Federal laws and regulations associated with that program.*

## NOTICE TO BIDDERS

The following is made a part of these Contract Documents:

### 1. SAFETY STANDARDS AND ACCIDENT PREVENTION

With respect to all work performed under this Contract, in accordance with Act 291 of the Arkansas 79th General Assembly, the Contractor shall:

- A. 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 Trenches Safety Systems, 29 CFR Part 1926, Subpart P, which is made a part hereof by reference.
- B. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- C. Maintain at his office or other well-known 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 doctor's care of persons (including employees) who may be injured on the job site.

### 2. BID FORM - SEPARATE PAY ITEM

- A. A separate lump sum bid item has been 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 79<sup>th</sup> General Assembly.
- B. 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 non-responsive bid.
- C. NOTE: Payment for the lump sum bid item for "Excavation/Trench Safety Systems" will be paid at the completion of the Contract. No partial payments will be allowed thereunder.

### 3. STORM WATER PERMIT REQUIREMENTS

The bidders attention is specifically called to the Storm Water Permit Requirements as follow:

The Contractor is advised that if this construction activity involves clearing, grading or excavation activities that result in the disturbance of one or more acres of total land area, this activity is subject to Storm Water Permit requirements of the Arkansas Department of Environmental Quality. The Contractor must obtain a site specific Storm Water Discharge Permit or apply for inclusion under the General Permit Number ARR10A000 or ARR150000 covering construction activities. The permit, if required, must be filed for in the Owner's name.

To be included under the General Permit, the Contractor must submit the Notice of Intent (NOI) at least two (2) weeks before the construction activity is to begin. A financial disclosure statement must accompany the NOI.

The General Permit requires that the Contractor control the entrance of pollutants into the surface and ground waters of the State. Temporary and permanent sediment and erosion control measures must be included in the work during the course of construction. These measures may include temporary and permanent seeding, construction of catch basins, the use of mulch, hay bales and silt fences to control sediments, the use of rip-rap at erosion prone areas, and other measures.

The General Permit also requires the Contractor to maintain "good housekeeping practices" that include items such as proper waste disposal, proper storage for hazardous materials and designating safe places for equipment maintenance and washdown.

The Contractor is required to maintain on site a Pollution Prevention Plan describing the storm water pollution prevention measures that will be taken at the construction site. The Plan must include a site description, a description of the nature of the activity, the intended sequence of the work, estimates of the total area involved in the activity, an estimate of the possible volume of run-off from the area, site maps showing drainage patterns, pollution prevention measures that will be taken and other items.

Additional information and application materials may be obtained by calling or writing:

Arkansas Department of Environmental Quality  
Storm Water Permits Section  
5301 Northshore Drive  
North Little Rock, AR 72118

Telephone Number: (501) 562-7444  
Fax Number: (501) 562-4632

or e-mail:

Storm Water Runoff Permits  
Jamal Solaimanian, P.E., Ph.D.  
General Permits Section Supervisor  
501-682-0620  
e-mail: [jamal@adeq.state.ar.us](mailto:jamal@adeq.state.ar.us)

**Permitting and compliance cost shall be considered as subsidiary to the overall project and all costs shall be included in the cost of the work.**



PROPOSAL FORM

DATE: \_\_\_\_\_, 2021

Proposal of \_\_\_\_\_  
(hereinafter called "Bidder"), a corporation, organized and existing  
under the laws of the State of \_\_\_\_\_; a partnership; an  
individual doing business as \_\_\_\_\_  
\_\_\_\_\_.\* (\*STRIKE INAPPLICABLE PHRASE)

TO: City of Newport (Hereinafter called "Owner")

GENTLEMEN:

The Bidder, in compliance with your invitation for bids for the furnishing of materials and/or labor for **CONSTRUCTION OF A NEW TECHNOLOGY TRAINING CENTER** having examined the plans and specifications with the related 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, hereby proposes to furnish all materials and supplies in accordance with the Contract Documents, within the time set forth therein, and at the price stated below. These prices are to cover all expenses incurred in furnishing the equipment/materials required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the contract within **three hundred thirty (330)** consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of \$500 for each calendar day thereafter as hereinafter provided in Section 34 of the General Conditions.

Bidder acknowledges receipt of the following addendum:

\_\_\_\_\_  
\_\_\_\_\_

Bidder agrees to perform all the work required and to furnish all material required to be furnished to cover the finished work as described in the Specifications and as shown on the Plans for the following prices or lump sum:

*(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)*

BID SCHEDULE

BASE BID:

<u>Item</u> <u>No.</u>	<u>Description</u>	<u>Unit</u>	<u>Total Price</u>
1.	Site Work (Including Site Draining, Grading, Etc.)	LS	\$ _____
2.	Site Utilities	LS	\$ _____
3.	Landscaping	LS	\$ _____
4.	Foundation and Concrete	LS	\$ _____
5.	Building	LS	\$ _____
6.	Interior Framing & Finishes	LS	\$ _____
7.	Plumbing	LS	\$ _____
8.	Electrical	LS	\$ _____
9.	HVAC	LS	\$ _____
10.	OSHA Excavation Trench Safety System	LS	\$ _____
11.	Miscellaneous	LS	\$ _____
TOTAL BASE BID			\$ _____

Written in Words \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**DEDUCTIVE ALTERNATIVE NO. 1:**

Delete brick pavers and install concrete at paver locations.

DELETE: \_\_\_\_\_  
\_\_\_\_\_ Dollars Delete (\$ \_\_\_\_\_)

**DEDUCTIVE ALTERNATIVE NO. 2:**

Delete landscaping and landscape lights on west side between alley and building and install topsoil and turf grass.

DELETE:

\_\_\_\_\_  
\_\_\_\_\_ Dollars Delete (\$ \_\_\_\_\_)

**DEDUCTIVE ALTERNATIVE NO. 3:**

Delete landscaping and landscape lights on east side between Hazel Street and building and install top soil and turf grass.

DELETE:

\_\_\_\_\_  
\_\_\_\_\_ Dollars Delete (\$ \_\_\_\_\_)

**DEDUCTIVE ALTERNATIVE NO. 4:**

Delete modular walls and raised bed in triangle area. Install beds at 2' above grade.

DELETE:

\_\_\_\_\_  
\_\_\_\_\_ Dollars Delete (\$ \_\_\_\_\_)

**DEDUCTIVE ALTERNATIVE NO. 5:**

Delete Sternberg light at location shown on Sheet 101.

DELETE:

\_\_\_\_\_  
\_\_\_\_\_ Dollars Delete (\$ \_\_\_\_\_)

**DEDUCTIVE ALTERNATIVE NO. 6:**

Delete removal and replacement of alley.

DELETE:

\_\_\_\_\_  
\_\_\_\_\_ Dollars Delete (\$ \_\_\_\_\_)

(Note: Bids shall include sales tax and all applicable taxes and fees.)

In submitting this bid, it is understood that the right is reserved by the

Owner to reject any or all bids. No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of the Owner.

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 \_\_\_\_\_ Dollars (\$\_\_\_\_\_) 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.

The Bidder further agrees to designate the names of proposed separate subcontractors, if necessary, for masonry work, electrical work, plumbing, heating, ventilation and air conditioning, roofing, etc. as specified below. I (or we) submit the names of the subcontractors I (or we) propose to use and their Arkansas Contractor's State License Number as follows:

	Name	License Number
Masonry	_____	_____
Plumbing	_____	_____
HVAC	_____	_____
Electrical	_____	_____
Roofing	_____	_____
Other	_____	_____

RESPECTFULLY SUBMITTED,

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

(SEAL if bid is by  
corporation)

BUSINESS ADDRESS:

\_\_\_\_\_  
\_\_\_\_\_

CONTRACTOR'S ARKANSAS LICENSE No.

## 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 \_\_\_\_\_, 2021.

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

### CONSTRUCTION OF A NEW TECHNOLOGY TRAINING CENTER

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.*

## AGREEMENT

THIS AGREEMENT, made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2021, by and between **City of Newport** hereinafter called "Owner," and \_\_\_\_\_, hereinafter called "Contractor."

WITNESSETH: That for an in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Owner, the Contractor hereby agrees with the Owner to commence and complete the construction described as follows: **CONSTRUCTION OF A TECHNOLOGY TRAINING CENTER** for City of Newport, Arkansas, hereinafter called the project, for the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his (its or their) own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of the Contract, the plans, which includes all maps, plats, blueprints, and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefore as prepared by MILLER-NEWELL ENGINEERS, INC., NEWPORT, ARKANSAS, herein entitled the Engineer, all of which are made a part hereof and collectively evidence and constitute the contract.

The Contractor hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within **three hundred thirty (330)** consecutive calendar days thereafter. The Contractor further agrees to pay, as liquidated damages, the sum of \$ 500 for each day thereafter as hereinafter provided in the General Conditions.

The Owner agrees to pay the Contractor in current funds for the performance of the contract, subject to additions and/or deductions, as provided in the General Conditions, and to make payments on account thereof as provided in Paragraph 33, "Payments to Contractor," of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in six (6) counterparts, each of which shall be deemed an original, on the day and year first above mentioned.

CITY OF NEWPORT

Owner

(SEAL)  
ATTEST:

By: \_\_\_\_\_

\_\_\_\_\_  
Clerk

\_\_\_\_\_  
Title

\_\_\_\_\_  
Contractor

(SEAL)  
ATTEST:

By: \_\_\_\_\_

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Business Address

NOTE: Secretary of the Owner should attest. If Contractor is a corporation, Secretary should attest.



## 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

### **CONSTRUCTION OF A NEW TECHNOLOGY TRAINING CENTER**

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 \_\_\_\_\_, 2021

\_\_\_\_\_  
*Principal*

\_\_\_\_\_  
*Surety Agent*

\_\_\_\_\_  
*Attorney-in-Fact*

## CERTIFICATION REGARDING LOBBYING LOWER TIER COVERED TRANSACTIONS

Applicants should review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, "New Restrictions on Lobbying."

### LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over \$100,000 or a loan or loan guarantee over \$150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that 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 in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(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, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," 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 subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) 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 occurring on or before October 23, 1996, and of not less than \$11,000 and not more than \$110,000 for each such failure occurring after October 23, 1996.

### Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

In any 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 commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

Submission of this statement 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 statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure occurring on or before October 23, 1996, and of not less than \$11,000 and not more than \$110,000 for each such failure occurring after October 23, 1996.

**As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.**

NAME OF APPLICANT

AWARD NUMBER AND/OR PROJECT NAME

PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE

SIGNATURE

DATE

**NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION  
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY  
(EXECUTIVE ORDER 11246 AND 41 CFR PART 60-4)**

The following Notice shall be included in, and shall be a part of all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000.

The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

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

Timetables	Goals for minority participation for each trade	Goals for female participation for each trade
	16.4 %	6.9 %

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is:

State of	<u>Arkansas</u>
County of	<u>Jackson</u>
City of	<u>Newport</u>

**U. S. DEPARTMENT OF COMMERCE  
ECONOMIC DEVELOPMENT ADMINISTRATION**



**EDA CONTRACTING PROVISIONS  
FOR CONSTRUCTION PROJECTS**

These EDA Contracting Provisions for Construction Projects (EDA Contracting Provisions) are intended for use by recipients receiving federal assistance from the U. S. Department of Commerce - Economic Development Administration (EDA). They contain provisions specific to EDA and other federal provisions not normally found in non-federal contract documents. The requirements contained herein must be incorporated into all construction contracts and subcontracts funded wholly or in part with federal assistance from EDA.

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1. **DEFINITIONS**

*Agreement* – The written instrument that is evidence of the agreement between the Owner and the Contractor overseeing the Work.

*Architect/Engineer* - The person or other entity engaged by the Recipient to perform architectural, engineering, design, and other services related to the work as provided for in the contract.

*Contract* – The entire and integrated written agreement between the Owner and the Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

*Contract Documents* – Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents.

*Contractor* – The individual or entity with whom the Owner has entered into the Agreement.

*Drawings or Plans* – That part of the Contract Documents prepared or approved by the Architect/Engineer that graphically shows the scope, extent, and character of the Work to be performed by the Contractor.

*EDA* - The United States of America acting through the Economic Development Administration of the U.S. Department of Commerce or any other person designated to act on its behalf. EDA has agreed to provide financial assistance to the Owner, which includes assistance in financing the Work to be performed under this Contract. Notwithstanding EDA's role, nothing in this Contract shall be construed to create any contractual relationship between the Contractor and EDA.

*Owner* – The individual or entity with whom the Contractor has entered into the Agreement and for whom the Work is to be performed.

*Project* – The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

*Recipient* – A non-Federal entity receiving a Federal financial assistance award directly from EDA to carry out an activity under an EDA program, including any EDA-approved successor to the entity.

*Specifications* – That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

*Subcontractor* – An individual or entity having direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

*Work* – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

## 2. **APPLICABILITY**

The Project to which the construction work covered by this Contract pertains is being assisted by the United States of America through federal assistance provided by the U.S. Department of Commerce - Economic Development Administration (EDA). Neither EDA, nor any of its departments, entities, or employees is a party to this Contract. The following EDA Contracting Provisions are included in this Contract and all subcontracts or related instruments pursuant to the provisions applicable to such federal assistance from EDA.

## 3. **FEDERALLY REQUIRED CONTRACT PROVISIONS**

- (a) All contracts in excess of the simplified acquisition threshold - currently fixed at \$150,000 (*see* 41 U.S.C. §§ 134 and 1908) must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate.
- (b) All contracts in excess of \$10,000 must address termination for cause and for convenience by the Recipient including the manner by which it will be effected and the basis for settlement.
- (c) All construction contracts awarded in excess of \$10,000 by recipients of federal assistance and their contractors or subcontractors shall contain a provision requiring compliance with Executive Order 11246 of September 24, 1965, *Equal Employment Opportunity*, as amended by Executive Order 11375 of October 13, 1967, and Department of Labor implementing regulations at 41 C.F.R. part 60.
- (d) All prime construction contracts in excess of \$2,000 awarded by Recipients must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. §§ 3141-3148) as supplemented by Department of Labor regulations at 29 C.F.R. part 5. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. § 874 and 40 U.S.C. § 3145) as supplemented by Department of Labor regulations at 29 C.F.R. part 3.
- (e) All contracts awarded by the Recipient in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704 (the Contract Work Hours and Safety Standards Act) as supplemented by Department of Labor regulations at 29 C.F.R. part 5.
- (f) All contracts must include EDA requirements and regulations that involve a requirement on the contractor or sub-contractor to report information to EDA, the Recipient or any other federal agency.



(g) All contracts must include EDA requirements and regulations pertaining to patent rights with respect to any discovery or invention which arises or is developed in the course of or under such contract.

(h) All contracts must include EDA requirements and regulations pertaining to copyrights and rights in data.

(i) All contracts and subgrants in excess of \$150,000 must contain a provision that requires compliance with all applicable standards, orders, or requirements issued under the Clean Air Act (42 U.S.C. § 7401 *et seq.*) and the Federal Water Pollution Control Act (Clean Water Act) (33 U.S.C. § 1251 *et seq.*), and Executive Order 11738, *Providing for Administration of the Clean Air Act and the Federal Water Pollution Control Act With Respect to Federal Contracts, Grants, or Loans.*

(j) Contracts must contain mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. § 6201).

(k) Contracts must contain a provision ensuring that contracts are not to be made to parties on the government wide Excluded Parties List System in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 C.F.R. part 180.

(l) Contracts must contain a provision ensure compliance with the Byrd Anti-Lobbying Amendment (31 U.S.C. § 1352) under which contractors that apply or bid for an award of \$100,000 or more must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. § 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(m) If the Recipient is a state agency or agency of a political subdivision of a state, any contract awarded must contain a provision ensuring compliance with section 6002 of the Solid Waste Disposal Act (42 U.S.C. § 6962), as amended by the Resource Conservation and Recovery Act related to the procurement of recovered materials.

#### 4. **REQUIRED PROVISIONS DEEMED INSERTED**

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion of correction.

5. **INSPECTION BY EDA REPRESENTATIVES**

The authorized representatives and agents of EDA shall be permitted to inspect all work, materials, payrolls, personnel records, invoices of materials, and other relevant data and records.

6. **EXAMINATION AND RETENTION OF CONTRACTOR'S RECORDS**

(a) The Owner, EDA, or the Comptroller General of the United States, or any of their duly authorized representatives shall, generally until three years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

(b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders that do not exceed \$10,000.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the Owner, EDA, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

7. **CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES**

Immediately after execution and delivery of the contract, and before the first partial payment is made, 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 to the Contractor in accordance with the progress schedule. The Contractor also shall furnish the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of 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.

8. **CONTRACTOR'S TITLE TO MATERIAL**

No materials, supplies, or equipment for the work shall be purchased by the Contractor or by any subcontractor that is subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants and guarantees that he/she has good title to all work, materials, and equipment used by him/her in the Work, free and clear of all liens, claims, or encumbrances.

9. **INSPECTION AND TESTING OF MATERIALS**

All materials and equipment used in the completion of the Work shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. Materials of construction, particularly those upon which the strength and durability of any structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for intended uses.

10. **"OR EQUAL" CLAUSE**

Whenever a material, article, or piece of equipment is identified in the Contract Documents by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard. Any material, article, or equipment of other manufacturers and vendors that will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed is, in the opinion of the Architect/Engineer, of equal substance and function. However, such substitution material, article, or equipment shall not be purchased or installed by the Contractor without the Architect/Engineer's written approval.

11. **PATENT FEES AND ROYALTIES**

(a) Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device that is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Architect/Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the Owner in the Contract Documents.

(b) To the fullest extent permitted by Laws and Regulations, the Contractor shall indemnify and hold harmless the Owner and the Architect/Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

12. **CLAIMS FOR EXTRA COSTS**

No claims for extra work or cost shall be allowed unless the same was done in pursuance of a written order from the Architect/Engineer approved by the Owner.

### 13. CONTRACTORS AND SUBCONTRACTORS INSURANCE

(a) The Contractor shall not commence work under this Contract until the Contractor has obtained all insurance reasonably required by the Owner, nor shall the Contractor allow any subcontractor to commence work on his/her subcontract until the insurance required of the subcontractor has been so obtained and approved.

(b) Types of insurance normally required are:

- (1) Workmen's Compensation
- (2) Contractor's Public Liability and Property Damage
- (3) Contractor's Vehicle Liability
- (4) Subcontractors' Public Liability, Property Damage and Vehicle Liability
- (5) Builder's Risk (Fire and Extended Coverage)

(c) **Scope of Insurance and Special Hazards:** The insurance obtained, which is described above, shall provide adequate protection for the Contractor and his/her subcontractors, respectively, against damage claims that may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him/her and also against any of the special hazards that may be encountered in the performance of this Contract.

(d) **Proof of Carriage of Insurance:** The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates, and dates of expiration of applicable insurance policies.

### 14. CONTRACT SECURITY BONDS

(a) If the amount of this Contract exceeds \$150,000, the Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and also a payment bond in an amount equal to one hundred percent (100%) of the Contract price or in a penal sum not less than that prescribed by State, Territorial, or local law, as security for the payment of all persons performing labor on the Work under this Contract and furnishing materials in connection with this Contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law. Before final acceptance, each bond must be approved by EDA. If the amount of this Contract does not exceed \$150,000, the Owner shall specify the amount of the payment and performance bonds.

(b) All bonds shall be in the form prescribed by the Contract Documents except as otherwise provided in applicable laws or regulations, and shall be executed by such sureties as are named in the current list of *Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies* as published in Treasury Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's

authority to act. Surety companies executing the bonds must also be authorized to transact business in the state where the Work is located.

15. **LABOR STANDARDS - DAVIS-BACON AND RELATED ACTS**  
**(as required by section 602 of PWEDA)**

(a) **Minimum Wages**

(1) All laborers and mechanics employed or working upon the site of the Work in the construction or development of the Project 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 at 29 C.F.R. part 3, the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at the 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 that 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 C.F.R. § 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 C.F.R. § 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 determined under 29 C.F.R. § 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.

(2) (i) Any class of laborers or mechanics to be employed under the Contract, but not listed in the wage determination, shall be classified in conformance with the wage determination. EDA shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (A) The work to be performed by the classification requested is not performed by a classification in the wage determination;
- (B) The classification is utilized in the area by the construction industry; and
- (C) The proposed wage rate, including any bona fide fringe benefits, bears a

reasonable relationship to the wage rates contained in the wage determination.

(ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and EDA 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 EDA or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210.

(iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and EDA or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), EDA or its designee shall refer the questions, including the views of all interested parties and the recommendation of EDA or its designee, to the Administrator for determination.

(iv) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(2)(ii) or (iii) of this section, 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.

(3) 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.

(4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part 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.

**(b) Withholding**

EDA 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 in the construction or development of the Project, all or part of the wages required by the Contract, EDA 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. EDA 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.

(c) **Payrolls and basic records**

- (1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the Work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the Work in the construction or development of the Project. 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 C.F.R. § 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, the plan or program is financially responsible, and the plan or program has been communicated in writing to the laborers or mechanics affected, and provide records that 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.
- (2) (i) For each week in which Contract work is performed, the Contractor shall submit a copy of all payrolls to the Owner for transmission to EDA or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 C.F.R. part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose. It may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, D.C. 20402; or downloaded from the U.S. Department of Labor's website at <https://www.dol.gov/whd/forms/wh347.pdf>. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors
- (ii) 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:
  - (A) That the payroll for the payroll period contains the information required to be maintained under 29 C.F.R. § 5.5(a)(3)(i) and that such information is correct and complete;

(B) 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 C.F.R. part 3; and

(C) 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.

(iii) 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 paragraph 15(c)(2)(ii) of this section.

(iv) 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 3729 of Title 31 of the U.S. Code.

(3) The Contractor or subcontractor shall make the records required under paragraph 15(c)(1) of this section available for inspection, copying, or transcription by authorized representatives of EDA 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, EDA or its designee may, after written notice to the Contractor 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 C.F.R. § 5.12.

**(d) Apprentices and Trainees.**

(1) **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, Bureau of Apprenticeship and Training (Bureau), or with a State Apprenticeship Agency recognized by the Bureau, 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 Bureau of Apprenticeship and Training 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 Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, 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.

(2) **Trainees.** Except as provided in 29 C.F.R. § 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 that 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's 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 by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of 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.

(3) **Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity

requirements of Executive Order 11246, *Equal Employment Opportunity*, as amended, and 29 C.F.R. part 30.

(e) **Compliance with Copeland Anti-Kickback Act Requirements.** The Contractor shall comply with the Copeland Anti-Kickback Act (18 U.S.C. § 874 and 40 U.S.C. § 3145) as supplemented by Department of Labor regulations (29 C.F.R. part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that the Contractor and any subcontractors shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which they are otherwise entitled. The Owner shall report all suspected or reported violations to EDA.

(f) **Subcontracts.** The Contractor and any subcontractors will insert in any subcontracts the clauses contained in 29 C.F.R. §§ 5.5(a)(1) through (10) and such other clauses as EDA or its designee may require, 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 29 C.F.R. § 5.5.

(g) **Contract termination; debarment.** The breach of the contract clauses in 29 C.F.R. § 5.5 may be grounds for termination of the contract, and for debarment as a Contractor and a subcontractor as provided in 29 C.F.R. § 5.12.

(h) **Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 C.F.R. parts 1, 3, and 5 are herein incorporated by reference in this contract.

(i) **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 C.F.R. parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and EDA or its designee, the U.S. Department of Labor, or the employees or their representatives.

(j) **Certification of Eligibility.**

(1) By entering into this Contract, the Contractor certifies that neither it nor any person or firm that 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 C.F.R. § 5.12(a)(1).

(2) 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 C.F.R. § 5.12(a)(1).

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

16. **LABOR STANDARDS - CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(a) **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 that person is employed on such work to work in excess of forty 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 forty hours in such workweek.

(b) **Violation; liability for unpaid wages, liquidated damages.** In the event of any violation of the clause set forth in paragraph (a) of this section, the Contractor and any subcontractor responsible therefore 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 paragraph (a) of this section, 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 forty hours without payment of the overtime wages required by the clause set forth in paragraph (a) of this section.

(c) **Withholding for unpaid wages and liquidated damages.** EDA 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 monies payable on account of work performed by the Contractor or subcontractor under any such Contract or any other federal contract with the same prime Contractor, 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 paragraph (b) of this section.

(d) **Subcontracts.** The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (a) through (c) of this section 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 paragraphs (a) through (c) of this section.

17. **EQUAL EMPLOYMENT OPPORTUNITY**

(a) The Recipient hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 C.F.R. chapter 60, which is paid for in whole or in part with funds obtained from EDA, the following equal opportunity clause:

During the performance of this contract, the Contractor agrees as follows:

Economic Development Administration  
Contracting Provisions for Construction Projects

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, 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 setting forth the provisions of this nondiscrimination clause.

(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 race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers representatives of the Contractor's commitments hereunder, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965 and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by EDA and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the Contractor's noncompliance with the nondiscrimination clauses of

this Contract or with any of the said 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 in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

(8) The Contractor will include the portion of the sentence immediately preceding paragraph 17(a)(1) and the provisions of paragraphs 17(a)(1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, 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 EDA or the Secretary of Labor 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 EDA or the Secretary of Labor, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

(9) The Recipient further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally-assisted construction work. Provided, however, that if the Recipient so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality, or subdivision of such government that does not participate in work on or under the Contract.

(10) The Recipient agrees that it will assist and cooperate actively with EDA and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish EDA and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist EDA in the discharge of the EDA's primary responsibility for securing compliance.

(11) The Recipient further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by EDA or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the Recipient agrees that if it fails or refuses to comply with these undertakings, EDA may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this EDA financial assistance; refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case

to the Department of Justice for appropriate legal proceedings.

(b) Exemptions to Above Equal Opportunity Clause (41 C.F.R. chapter 60):

(1) Contracts and subcontracts not exceeding \$10,000 (other than Government bills of lading, and other than contracts and subcontracts with depositories of Federal funds in any amount and with financial institutions which are issuing and paying agents for U.S. savings bonds and savings notes) are exempt. The amount of the Contract, rather than the amount of the federal financial assistance, shall govern in determining the applicability of this exemption.

(2) Except in the case of subcontractors for the performance of construction work at the site of construction, the clause shall not be required to be inserted in subcontracts below the second tier.

(3) Contracts and subcontracts not exceeding \$10,000 for standard commercial supplies or raw materials are exempt.

18. **CONTRACTING WITH SMALL, MINORITY AND WOMEN'S BUSINESSES**

(a) If the Contractor intends to let any subcontracts for a portion of the work, the Contractor shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services.

(b) Affirmative steps shall consist of:

(1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(2) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;

(3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;

(4) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises;

(5) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies;

(6) Requiring each party to a subcontract to take the affirmative steps of this section; and

(7) The Contractor is encouraged to procure goods and services from labor surplus area firms.

19. **HEALTH, SAFETY, AND ACCIDENT PREVENTION**

(a) In performing this contract, the Contractor shall:

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

(2) Protect the lives, health, and safety of other persons;

(3) Prevent damage to property, materials, supplies, and equipment; and

(4) Avoid work interruptions.

(b) For these purposes, the Contractor shall:

(1) Comply with regulations and standards issued by the Secretary of Labor at 29 C.F.R. part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 3701 – 3708); and

(2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.

(c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this Contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 C.F.R. part 1904.

(d) The Owner shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the Work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Owner may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.

(e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as EDA, or the Secretary of Labor shall direct as a means of enforcing such provisions.

20. **CONFLICT OF INTEREST AND OTHER PROHIBITED INTERESTS**

(a) 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 architectural, engineering, inspection, construction or material supply contract 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.

(b) No officer, employee, architect, attorney, engineer, 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 contract pertaining to the Project.

(c) The Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the Contract Documents has a corporate or financial affiliation with the supplier or manufacturer.

(d) The Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, may be involved. Such a conflict may arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in the Contractor. The Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors, or anything of monetary value from the Contractor or subcontractors.

(e) If the Owner finds after a notice and hearing that the Contractor, or any of the Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of the Owner or EDA in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, the Owner may, by written notice to the Contractor, terminate this Contract. The Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which the Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.

(f) In the event this Contract is terminated as provided in paragraph (e) of this section, the Owner may pursue the same remedies against the Contractor as it could pursue in the event of a breach of this Contract by the Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, the Owner may pursue exemplary damages in an amount (as determined by the Owner) which shall not be less than three nor more than ten times the costs the Contractor incurs in providing any such gratuities to any such officer or employee.



## 21. RESTRICTIONS ON LOBBYING

(a) This Contract, or subcontract is subject to 31 U.S.C. § 1352, regarding lobbying restrictions. The section is explained in the common rule, 15 C.F.R. part 28 (55 FR 6736-6748, February 26, 1990). Each bidder under this Contract or subcontract is generally prohibited from using federal funds for lobbying the Executive or Legislative Branches of the Federal Government in connection with this EDA Award.

(b) **Contract Clause Threshold:** This Contract Clause regarding lobbying must be included in each bid for a contract or subcontract exceeding \$100,000 of federal funds at any tier under the EDA Award.

(c) **Certification and Disclosure:** Each bidder of a contract or subcontract exceeding \$100,000 of federal funds at any tier under the federal Award must file Form CD-512, *Certification Regarding Lobbying – Lower Tier Covered Transactions*, and, if applicable, Standard Form-LLL, *Disclosure of Lobbying Activities*, regarding the use of any nonfederal funds for lobbying. Certifications shall be retained by the Contractor or subcontractor at the next higher tier. All disclosure forms, however, shall be forwarded from tier to tier until received by the Recipient of the EDA Award, who shall forward all disclosure forms to EDA.

(d) **Continuing Disclosure Requirement:** Each Contractor or subcontractor that is subject to the Certification and Disclosure provision of this Contract Clause is required to file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by such person. Disclosure forms shall be forwarded from tier to tier until received by the Recipient of the EDA Award, who shall forward all disclosure forms to EDA.

(e) **Indian Tribes, Tribal Organizations, or Other Indian Organizations:** Indian tribes, tribal organizations, or any other Indian organizations, including Alaskan Native organizations, are excluded from the above lobbying restrictions and reporting requirements, but only with respect to expenditures that are by such tribes or organizations for lobbying activities permitted by other federal law. An Indian tribe or organization that is seeking an exclusion from Certification and Disclosure requirements must provide EDA with the citation of the provision or provisions of federal law upon which it relies to conduct lobbying activities that would otherwise be subject to the prohibitions in and to the Certification and Disclosure requirements of 31 U.S.C. § 1352, preferably through an attorney's opinion. Note, also, that a non-Indian subrecipient, contractor, or subcontractor under an award to an Indian tribe, for example, is subject to the restrictions and reporting requirements.

## 22. HISTORICAL AND ARCHAEOLOGICAL DATA PRESERVATION

The Contractor agrees to facilitate the preservation and enhancement of structures and objects of historical, architectural or archaeological significance and when such items are found and/or unearthed during the course of project construction. Any excavation by the Contractor that uncovers an historical or archaeological artifact shall be immediately reported to the Owner and a representative of EDA. Construction shall be temporarily halted pending the notification process and further directions issued by EDA after consultation with the State Historic

Preservation Officer (SHPO) for recovery of the items. *See the National Historic Preservation Act of 1966 (54 U.S.C. § 300101 et seq., formerly at 16 U.S.C. § 470 et seq.) and Executive Order No. 11593 of May 31, 1971.*

23. **CLEAN AIR AND WATER**

Applicable to Contracts in Excess of \$150,000

(a) **Definition.** "Facility" means any building, plant, installation, structure, mine, vessel, or other floating craft, location, or site of operations, owned, leased, or supervised by the Contractor or any subcontractor, used in the performance of the Contract or any subcontract. When a location or site of operations includes more than one building, plant, installation, or structure, the entire location or site shall be deemed a facility except when the Administrator, or a designee, of the United States Environmental Protection Agency (EPA) determines that independent facilities are collocated in one geographical area.

(b) In compliance with regulations issued by the EPA, 2 C.F.R. part 1532, pursuant to the Clean Air Act, as amended (42 U.S.C. § 7401 *et seq.*); the Federal Water Pollution Control Act, as amended (33 U.S.C. § 1251 *et seq.*); and Executive Order 11738, the Contractor agrees to:

(1) Not utilize any facility in the performance of this contract or any subcontract which is listed on the Excluded Parties List System, part of the System for Award Management (SAM), pursuant to 2 C.F.R. part 1532 for the duration of time that the facility remains on the list;

(2) Promptly notify the Owner if a facility the Contractor intends to use in the performance of this contract is on the Excluded Parties List System or the Contractor knows that it has been recommended to be placed on the List;

(3) Comply with all requirements of the Clean Air Act and the Federal Water Pollution Control Act, including the requirements of section 114 of the Clean Air Act and section 308 of the Federal Water Pollution Control Act, and all applicable clean air and clean water standards; and

(4) Include or cause to be included the provisions of this clause in every subcontract and take such action as EDA may direct as a means of enforcing such provisions.

24. **USE OF LEAD-BASED PAINTS ON RESIDENTIAL STRUCTURES**

(a) If the work under this Contract involves construction or rehabilitation of residential structures over \$5,000, the Contractor shall comply with the Lead-based Paint Poisoning Prevention Act (42 U.S.C. § 4831). The Contractor shall assure that paint or other surface coatings used in a residential property does not contain lead equal to or in excess of 1.0 milligram per square centimeter or 0.5 percent by weight or 5,000 parts per million (ppm) by weight. For purposes of this section, "residential property" means a dwelling unit, common areas, building exterior surfaces, and any surrounding land, including outbuildings, fences and play equipment affixed to the land, belonging to an owner and available for use by residents, but not

including land used for agricultural, commercial, industrial or other non-residential purposes, and not including paint on the pavement of parking lots, garages, or roadways.

- (b) As a condition to receiving assistance under PWEDA, recipients shall assure that the restriction against the use of lead-based paint is included in all contracts and subcontracts involving the use of federal funds.

25. **ENERGY EFFICIENCY**

The Contractor shall comply with all standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. § 6201) for the State in which the Work under the Contract is performed.

26. **ENVIRONMENTAL REQUIREMENTS**

When constructing a Project involving trenching and/or other related earth excavations, the Contractor shall comply with the following environmental constraints:

- (1) **Wetlands.** When disposing of excess, spoil, or other construction materials on public or private property, the Contractor shall not fill in or otherwise convert wetlands.
- (2) **Floodplains.** When disposing of excess, spoil, or other construction materials on public or private property, the Contractor shall not fill in or otherwise convert 100 year floodplain areas delineated on the latest Federal Emergency Management Agency (FEMA) Floodplain Maps, or other appropriate maps, i.e., alluvial soils on Natural Resource Conservation Service (NRCS) Soil Survey Maps.
- (3) **Endangered Species.** The Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of the Contractor, the Contractor will immediately report this evidence to the Owner and a representative of EDA. Construction shall be temporarily halted pending the notification process and further directions issued by EDA after consultation with the U.S. Fish and Wildlife Service.

27. **DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSIONS**

As required by Executive Orders 12549 and 12689, *Debarment and Suspension*, 2 C.F.R. Part 180 and implemented by the Department of Commerce at 2 C.F.R. part 1326, for prospective participants in lower tier covered transactions (except subcontracts for goods or services under the \$25,000 small purchase threshold unless the subrecipient will have a critical influence on or substantive control over the award), the Contractor agrees that:

- (1) By entering into this Contract, the Contractor and subcontractors certify, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared Economic Development Administration Contracting Provisions for Construction Projects

ineligible, or voluntarily excluded from participation in this Contract by any federal department or agency.

(2) Where the Contractor or subcontractors are unable to certify to any of the statements in this certification, the Contractor or subcontractors shall attach an explanation to this bid.

*See also 2 C.F.R. part 180 and 2 C.F.R. § 200.342.*

28. **EDA PROJECT SIGN**

The Contractor shall supply, erect, and maintain in good condition a Project sign according to the specifications provided by EDA. To the extent practical, the sign should be a free standing sign. Project signs shall not be located on public highway rights-of-way. Location and height of signs will be coordinated with the local agency responsible for highway or street safety in the Project area, if any possibility exists for obstructing vehicular traffic line of sight. Whenever the EDA site sign specifications conflict with State law or local ordinances, the EDA Regional Director will permit such conflicting specifications to be modified so as to comply with State law or local ordinance.

29. **BUY AMERICA**

To the greatest extent practicable, contractors are encouraged to purchase American-made equipment and products with funding provided under EDA financial assistance awards.

## GENERAL CONDITIONS

### 1. DEFINITIONS

- A. The "Contract Documents" consist of the Advertisement for Bids, the Information for Bidders, the Proposal Form, the General Conditions, the Agreement of Contract, the Contract Bond, the Specifications and the Approved Plans, including all modifications to any of the above documents incorporated therein before their execution. All of these form the Contract.
- B. The "Owner" is understood to mean the individual for whom the work is being done.
- C. The "Engineer" is understood to mean the Registered Professional Engineer, registered in Arkansas, employed by the Owner to carry out the conditions of this contract. The Engineer is the duly authorized representative of the Owner. Where the term "Architect/Engineer" is used it is intended to mean "Engineer" and does not mean to imply the Engineer is an Architect.
- D. The "Work Order" or "Notice to Proceed" is the Contractor's authority to begin the work. It shall designate the day on which working time shall commence. The work order shall be deemed to have been delivered when mail to the Contractor at the address given in the Proposal. When a Contractor begins work before a work order is issued, his time begins on the day he commences.
- E. The term "Subcontractor," as employed herein, includes only those having direct contact with the Contractor and it includes one who furnished material worked to a special design according to the plans or specifications, but does not include one who merely furnishes material so worked.
- F. The term "Work," includes labor or material or both, equipment, or other facilities necessary to complete the work.

### 2. CONTRACTOR'S UNDERSTANDING OF CONDITIONS OF WORK

It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract. No verbal agreement or conversation with any officer, agent or employee of the Owner, either before or after the

execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

### 3. MATERIALS, APPLIANCES, EMPLOYEES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power and transportation and other facilities necessary for the execution and completion of the work.

Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence, such as test reports, as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

### 4. ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible when a particular process or product of a particular manufacturer is specified, but if the Contractor has information that the process or article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer in writing.

### 5. SURVEYS, PERMITS AND REGULATIONS

The Engineer will provide the Contractor with the bench mark and alignment as may be necessary for the Contractor to layout the work correctly. The finished work must conform to the bench marks furnished by the Engineer.

The Owner shall furnish all right-of-way, easements and sites for the construction.

The Contractor shall furnish all permits and licenses required by law.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the plans and specifications are at variance therewith, he shall

promptly notify the Engineer in writing and proper changes or adjustments shall be made in accordance with the contract provisions for changes in the work.

#### 6. PROTECTION OF WORK AND PROPERTY

The Contractor shall continuously maintain adequate protection of all his work from damages and shall protect the Owner's property from injury or loss arising in connection with the work. He shall make good any such damage, injury or loss, except such as may be due directly to errors in the Contract Documents or caused by agents or employees of the Owner. He shall protect all private property adjacent to the work. He shall provide and maintain all passage ways, guard fences, lights and other facilities for protection required by law or local conditions.

The Contractor is hereby authorized to act in an emergency affecting loss of life or property without special authorization from the Engineer. Any compensation claimed by the Contractor on account of emergency work shall be determined by agreement or arbitration.

#### 7. INSPECTION OF WORK AND TESTING OF MATERIALS

Inspection shall be provided by a representative of Miller-Newell Engineers, Ltd. The Engineer, and his representatives, shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access and inspection.

The Contractor shall furnish to the Engineer certified laboratory testing on all material to be used on the project.

No work or preparation for work shall be covered up without consent of the Engineer. If such work is covered up, without consent of the Engineer, the Contractor, if required by the Engineer, shall uncover such work for examination and replace it at his own expense.

Re-examination of approved work may be ordered by the Engineer and if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of the reexamination and replacement. If such work is found not to be in accordance with the Contract Documents, the Contractor shall pay such cost, unless he shall show that the defect in the work was caused by another Contractor and, in that event, the Owner shall pay such cost.

## 8. SUPERINTENDENCE AND SUPERVISION

The Contractor shall keep on his work during its progress a competent superintendent and any necessary assistants, all satisfactory to the Engineer. The Superintendent shall not be changed without the consent of the Engineer, unless he proves to be unsatisfactory to the Contractor and ceases to be in his employ. The Superintendent shall represent the Contractor in his absence and instructions and directions given to him shall be binding on the Contractor. Important decisions shall be confirmed to the Contractor in writing.

If the Contractor, in the course of the work, finds any discrepancy between the plans and the physical conditions of the locality, or any errors of omissions in the drawings or in the layout as given by prints and instructions, it shall be his duty to immediately inform the Engineer, in writing, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk.

## 9. CHANGES IN THE WORK

The Owner, without invalidating the Contract, may order extra work or make changes by altering, adding or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract, except that any claim for extension in time caused thereby shall be adjusted at the time of ordering such change.

In giving instructions, the Engineer shall have the authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purpose of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Engineer, and no claim for an addition to the Contract sum shall be valid unless so ordered.

The value of any such extra work or changes shall be determined in one or more of the following ways:

- A. By estimate and acceptance in a lump sum;
- B. By unit prices named in the Contract or subsequently agreed upon;
- C. By cost and percentage or by cost and a fixed fee.

If none of the above methods is agreed upon, the Contractor, pro-



vided he receives an order as above, shall proceed with the work. He shall keep an accurate account of the cost of labor and materials, pending final determination of the value of the work.

10. CLAIMS FOR EXTRA COST

If the Contractor claims that any instructions in the plans or otherwise involves any extra cost under this contract, he shall give the Engineer written notice thereof within a reasonable time after the receipt of such instructions and, in any event, before proceeding to execute the work, except in an emergency endangering life or property. No such claims shall be valid unless so made.

11. DEDUCTIONS FOR UNCORRECTED WORK

If the Engineer deems it inexpedient to correct work injured or not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore.

12. DELAYS AND EXTENSION OF TIME

If the Contractor be delayed at any time in the progress of the work by an act or neglect of the Owner or of his employees or by any other contractor employed by the Owner or by changes ordered in the work or by strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties or any causes by the Engineer pending arbitration, or by any cause which the Engineer shall decide justifies the delay, then the time of completion shall be extended for such reasonable time as the Engineer may decide.

No such extension shall be made for delay occurring more than seven days before claim therefor is made in writing to the Engineer. In the case of the continuing cause of delay, only one claim is necessary.

This article does not exclude recovery of damages for delay by either party under provisions of the Contract Documents.

13. CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor shall promptly remove from the premises all materials condemned by the Engineer as failing to conform to the Contract, whether incorporated in the work, or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Owner and shall bear all the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work and materials within a reasonable time, fixed by written notice, the Owner may remove them and may store the materials at the expense of the Contractor.

14. SUSPENSION OF WORK

The Owner may at any time suspend work, or any part thereof, by giving five days written notice to the Contractor. The work shall be resumed by the Contractor within ten days after the date fixed by the written notice from the Owner to the Contractor to do so. The Owner shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this contract as a result of such suspension.

But, if the work or any part thereof shall be stopped by the notice in writing aforesaid, and if the Owner does not give in writing notice to the Contractor to resume the work at a date within thirty days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work so suspended and he will be entitled to the estimates and payment for all work done on the portions so abandoned.

15. THE OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work or fail to perform any of the provisions of this Contract, the Owner, after three days written notice to the Contractor, may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

16. THE OWNER RIGHT TO TERMINATE THE CONTRACT

If the Contractor should be adjudged a bankrupt, or he should make a general assigned for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or fail to make prompt payment to his subcontractors or for material or labor, or if he should persistently or repeatedly refuse or should fail, except in cases for which time is provided, to supply enough skilled workmen or proper materials, or if he should persistently disregard laws, ordinances or the instructions of the Engineer, or otherwise be guilty of a substantial violation of any provision of the contract, then the Owner, upon the certification of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy and after giving the Contractor seven (7) days notice in writing, terminate the employment of the Contractor and take possession of the premises

and all materials, tools and appliances thereon and finish the work by whatever method he may deem expedient. In such cases, the Contractor will not be entitled to any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Engineer.

17. THE CONTRACTOR'S RIGHT TO TERMINATE THE CONTRACT

If the work should be stopped under the order of any court, or other public authority, for a period of three months, through no act or fault of the Contractor or of anyone employed by him, or if the Engineer should fail to issue any estimate for payment seven days after it is due, or if the Owner should fail to pay the Contractor within seven (7) days of its maturity and presentation, any sum certified by the Engineer or awarded by arbitrators, then the Contractor may, upon seven (7) days written notice to the Owner and the Engineer, stop the work or terminate this contract and recover from the Owner payments for all work executed and any loss sustained upon any plant or materials and reasonable profit and damages.

18. PAYMENTS WITHHELD

The Owner may withhold or, on account of subsequently discovered evidence, nullify whole or a part of any certificate to such extent as may be necessary to protect himself from loss on account of:

- A. Defective work not remedied;
- B. Claims or reasonable evidence that claims will be filed;
- C. Failure of the Contractor to pay all bills properly;
- D. A reasonable doubt that the Contractor can finish work on time; or
- E. Damage to another contractor.

When the above grounds are removed, payment shall be made for the amounts withheld because of them.

19. CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall maintain such insurance as will protect him for claims under the Worker's Compensation Act and from other claims for damages for personal injury, including death, which may arise from operations under this Contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them. Certificates of insurance for liability and property damage shall be filed with the Engineer before the work is started and shall be subject to his approval for adequacy of protection.

As required above, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$500,000.00 for injuries, including accidental death, to any one person, and subject to the same limit for each person, and in an amount not less than \$500,000.00 on account of one accident, and Contractor's property damage insurance in an amount not less than \$500,000.00.

The insurance certificate must contain the following verbiage: **"The insurance covered by this certificate will not be canceled or materially altered except after ten (10) days prior written notice has been received by the Owner."**

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 of the type and in the same amounts as specified in the preceding paragraphs, or (2) insure the activities of his subcontractors in his own policy.

20. INDEMNITY

The Contractor shall indemnify and save harmless the Owner from and against all losses and all claims, demands, suits, actions, recoveries and judgments of every nature and description brought or recovered against him by reason of any act or omission of the said Contractor, his agents or employees, in the execution of the work or in the guarding of it.

The Contractor shall, and is hereby authorized to, maintain and pay for such insurance, issued in the name of the Owner, as will protect the Owner from his contingent liability under this Contract, and the Owner's right to enforce against the Contractor any provisions of this article shall be contingent upon the full compliance by the Owner with terms of such insurance or policies, a copy of which shall be deposited with the Owner.

21. FIRE INSURANCE AND BUILDERS RISK INSURANCE

The Contractor shall secure in the name of the Owner, policies for fire insurance and builders risk insurance in the amount, form and

from companies satisfactory to the Engineer, upon such structures and materials as shall be specified by the latter, payable to the Owner for the benefit of the Contractor or the Owner as the Engineer shall find their interest to appear.

22. GUARANTY BONDS

The Contractor shall furnish the Owner, where stipulated in the advertisement for bids, with a performance bond covering the faithful performance on the contract and payment of all obligations arising thereunder, in such form as the Owner may prescribe and with surety company or companies as the Owner may approve.

23. DAMAGES

Any claims for damages arising under this Contract shall be made in writing to the party liable within a reasonable time of the first observance of such damage and not later than the time of final payment, except as expressly stipulated by agreement or arbitration.

24. LIENS

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he had knowledge or information, the releases and receipts include all the labor and material for which the lien could be filed; but the Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Engineer, to indemnify the Owner against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs and a reasonable attorney's fee.

25. ASSIGNMENT

Neither party to the contract shall assign the contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him hereunder without the previous written consent of the Engineer.

26. SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

27. SUBCONTRACTS

The Contractor shall, as soon as practicable after the signature of the contract, notify the Engineer in writing the names of the subcontractors proposed for the work and shall not employ any of the subcontractors that the Engineer may object to as incompetent or unfit.

The Contractor agrees that he is fully responsible to the Owner for all work or omissions of his subcontractors, either directly or indirectly employed by him. Nothing in this contract shall create any contractual relations between the subcontractor or the Owner.

28. POINTS AND INSTRUCTIONS

The Contractor shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

29. ENGINEER'S STATUS

The Engineer shall observe the execution of the work. He has the authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract. He shall also have the authority to reject all work and materials which do not conform to the contract, to direct application of the forces to any part of the work, as in his judgment is required, and to order the force increased or diminished, and to decide questions which arise in the execution of the work.

30. ENGINEER'S DECISIONS

The Engineer shall, within a reasonable time after their presentation to him, make decisions in writing on all claims of the Owner or Contractor and on other matters relating to the execution and progress of the work or the interpretation of the Contract Documents.

All such decisions of the Engineer shall be final except in cases where time and/or financial considerations are involved, which, if no agreement in regard thereto is reached, shall be subject to arbitration.

31. LANDS FOR WORK

The Owner shall provide the lands upon which the work under this Contract is to be done, except that the Contractor shall provide land required for the erection of temporary construction facilities and storage of his materials, together with right of access to same.

32. CLEANING UP

The Contractor, as directed by the Engineer, shall remove from the Owner's property and from all public and private property, at his own expense, all temporary structures and construction facilities, rubbish and waste materials resulting from his operations.

33. PAYMENTS TO CONTRACTOR

At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the work performed during the period covered by the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the Owner's title to the material and equipment and protect his interest therein, including applicable insurance. The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Owner shall retain five (5) percent of the amount of each payment until final completion and acceptance of all work covered by the Contract Documents. When the work is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, less authorized deductions.

The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

34. TIME OF COMPLETION - LIQUIDATED DAMAGES

The work shall be commenced at the time stipulated in the Notice to Proceed to the Contractor. The project shall be completed within three hundred thirty (330) consecutive calendar days thereafter.

As actual damages for any delay in completion are impossible to determine, the Contractor and his sureties shall be liable for and shall pay to the Owner the sum of \$ 500 per day as fixed and agreed liquidated damages for each calendar day of delay until the work is completed and accepted.

35. SAFETY STANDARDS AND ACCIDENT PREVENTION

With respect to all work performed under this Contract, the Contractor shall:

- A. 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 Trenches Safety Systems, 29 CFR Part 1926, Subpart P.
- B. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- C. Maintain at his office or other well-known 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 doctor's care of persons (including employees) who may be injured on the job site.



## SUPPLEMENTAL GENERAL CONDITIONS

REFERENCE DOCUMENT: These Supplemental General Conditions are included as a part of the Contract Documents for this project to supplement and/or amend the standard provisions of the General Conditions.

### 36. EXECUTION, CORRELATION, INTENT AND INTERPRETATIONS

Section 2 of the General Conditions is hereby supplemented as follows: The Drawings and Specifications are intended to agree and to be mutually explanatory. Should any discrepancy exist and not be clarified by addendum prior to bid opening, it will be presumed that the Contractor has based his proposal on the more expensive of the conflicting requirements. Before proceeding with any part of the work, Contractor shall report any such discrepancy to the Engineer, who shall rule on which of the conflicting requirements is to be followed. If the least expensive is directed, the Contractor shall refund to the Owner the difference in net cost.

Explanatory notes on Drawings shall be preferred to conflicting drawn out indications, if any. Large scale details will be preferred to small scale drawings, and figured dimensions to scale measurements. Where figures are lacking, scale measurements may be followed, but in all cases the measurements are to be checked from work in place, and should variations be found, such must be referred to the Engineer for instructions. Where on any of the Drawings a portion of work is drawn out and remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the work. Where the word "similar" occurs on Drawings, it shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relationship to their location and their connection with other parts of the work.

### 37. PROTECTION AGAINST THEFT

Contractor shall take such precautions as he deems necessary to protect himself and the Owner from loss by theft. Contractor shall be responsible for the recovery or replacement of all materials or equipment lost by reason of theft during the entire course of the work, even though payment for same may have been received.

### 38. TOILET FACILITIES

General Contractor shall furnish, install and maintain ample sanitary facilities for workmen, including those of other contractors. Toilets shall be placed where indicated on the site as soon as work begins. They shall be housed in temporary enclosures and shall be maintained in a sanitary condition. They shall be

removed from the premises upon completion of the work. They shall comply with all regulations of governmental agencies having jurisdiction.

39. GUARANTY

The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of substantial completion. The Contractor warrants and guarantees for a period of one (1) year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects, including the repairs of any damage to other parts of the system resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

"General Decision Number: AR20210021 01/01/2021

Superseded General Decision Number: AR20200021

State: Arkansas

Construction Type: Building

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Counties: Clay, Cross, Fulton and Jackson Counties in Arkansas.

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/01/2021

ENGI0624-006 01/01/2017

Rates

Fringes

POWER EQUIPMENT OPERATOR

Crane.....	\$ 26.20	12.30
Forklift.....	\$ 26.20	12.30

\* IRON0321-010 08/01/2020

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 22.00	19.26

PAIN0424-008 07/01/2019

	Rates	Fringes
PAINTER (Spray).....	\$ 16.10	6.97

SHEE0036-035 06/01/2015

	Rates	Fringes
SHEET METAL WORKER (HVAC Duct Installation Only).....	\$ 22.64	13.35

SUAR2015-018 01/09/2017

	Rates	Fringes
BRICKLAYER.....	\$ 19.15	0.00
CARPENTER, Includes Drywall Hanging.....	\$ 17.20	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 21.08	0.00
ELECTRICIAN.....	\$ 21.95	6.36
LABORER: Common or General.....	\$ 11.12	0.00
LABORER: Mason Tender - Brick...	\$ 12.32	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 23.08	0.00
OPERATOR: Bulldozer.....	\$ 18.14	0.00
PAINTER (Brush and Roller).....	\$ 15.68	0.00
PLUMBER.....	\$ 19.72	3.49
SPRINKLER FITTER (Fire Sprinklers).....	\$ 21.77	2.46

TRUCK DRIVER: Dump Truck.....\$ 15.00 0.00

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were

prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is

based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

"



### **Certificate of Owner's Attorney**

I, the undersigned, \_\_\_\_\_, the duly authorized and acting legal representative of City of Newport, Arkansas, 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.

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*Attorney Signature*

---

*Date*

## EDA PROJECT SIGN

The Contractor shall supply, erect, and maintain in good condition a project sign according to the specifications set forth below:

### EDA SITE SIGN SPECIFICATIONS

Size: 4' x 8' x 3/4"

Materials: Exterior grade/MDO plywood (APA rating A-B)

Supports: 4" x 4" x 12' posts with 2" x 4" cross branching

Erection: Posts shall be set a minimum of three feet deep in concrete footings that are at least 12" in diameter.

Paint: Outdoor enamel

Colors: Jet Black, Blue (PMS300), and Gold (PMS7406). Specifically, on white background the following will be placed:

The U. S. Department of Commerce seal in blue, black, and gold;

"EDA" in blue;

"U. S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT

ADMINISTRATION" in black;

"In partnership with" in blue;

(Actual name of the) "EDA Grant Recipient" in black;

Lettering: Specific fonts are named below; positioning will be as shown on the attached illustration.

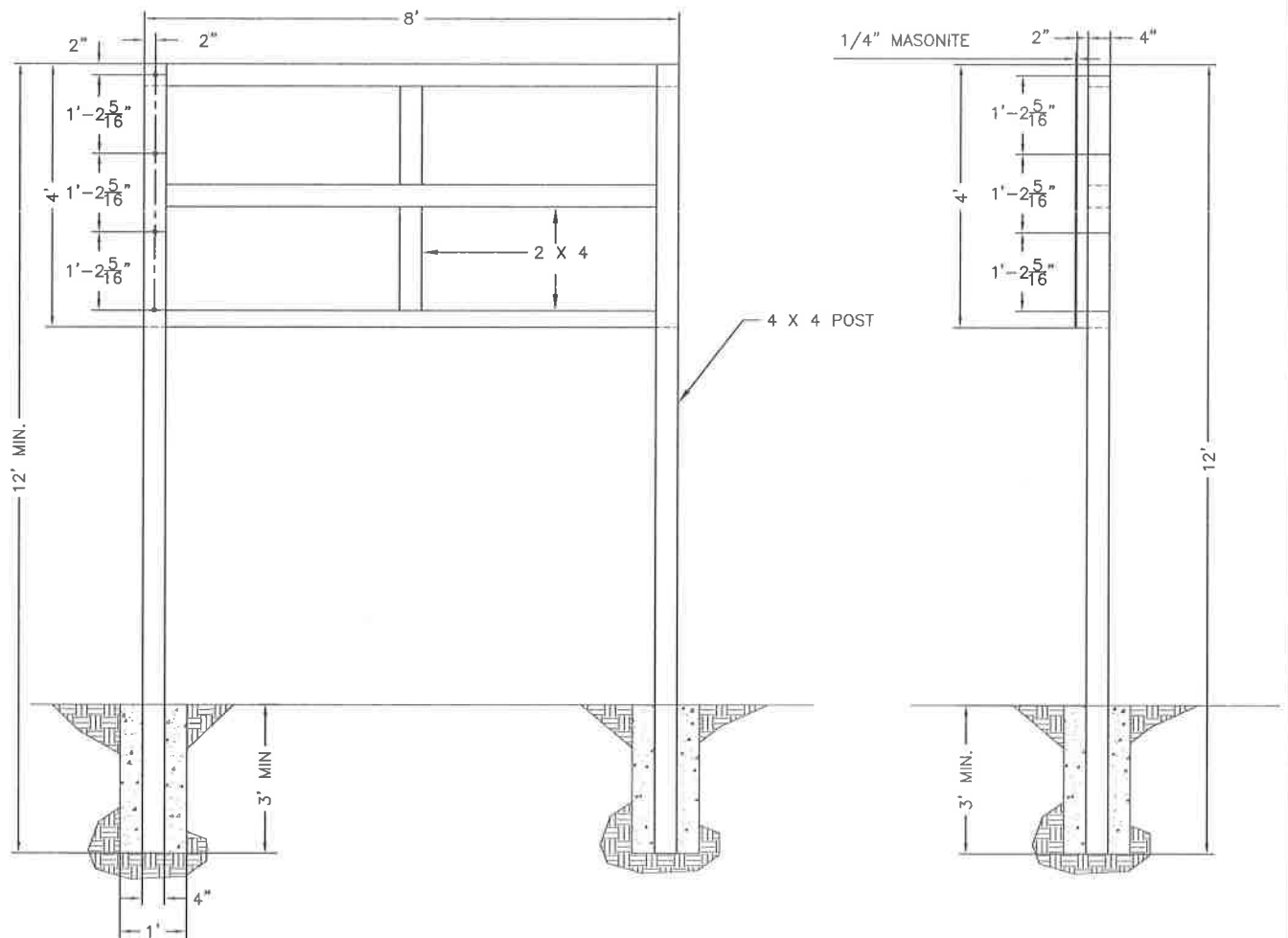
"U. S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT  
ADMINISTRATION" use Bank Gothic Medium - **BANK GOTHIC MED**

"In partnership with" use Univers™ 55 Oblique - *Univers 55*

(Name of) "EDA Grant Recipient" use Univers™ Extra Black 85 **Univers 85**

Project signs will not be erected on public highway rights-of-way. If any possibility exists for obstruction to traffic line of sight, the location and height of the sign will be coordinated with the agency responsible for highway or street safety in the area.

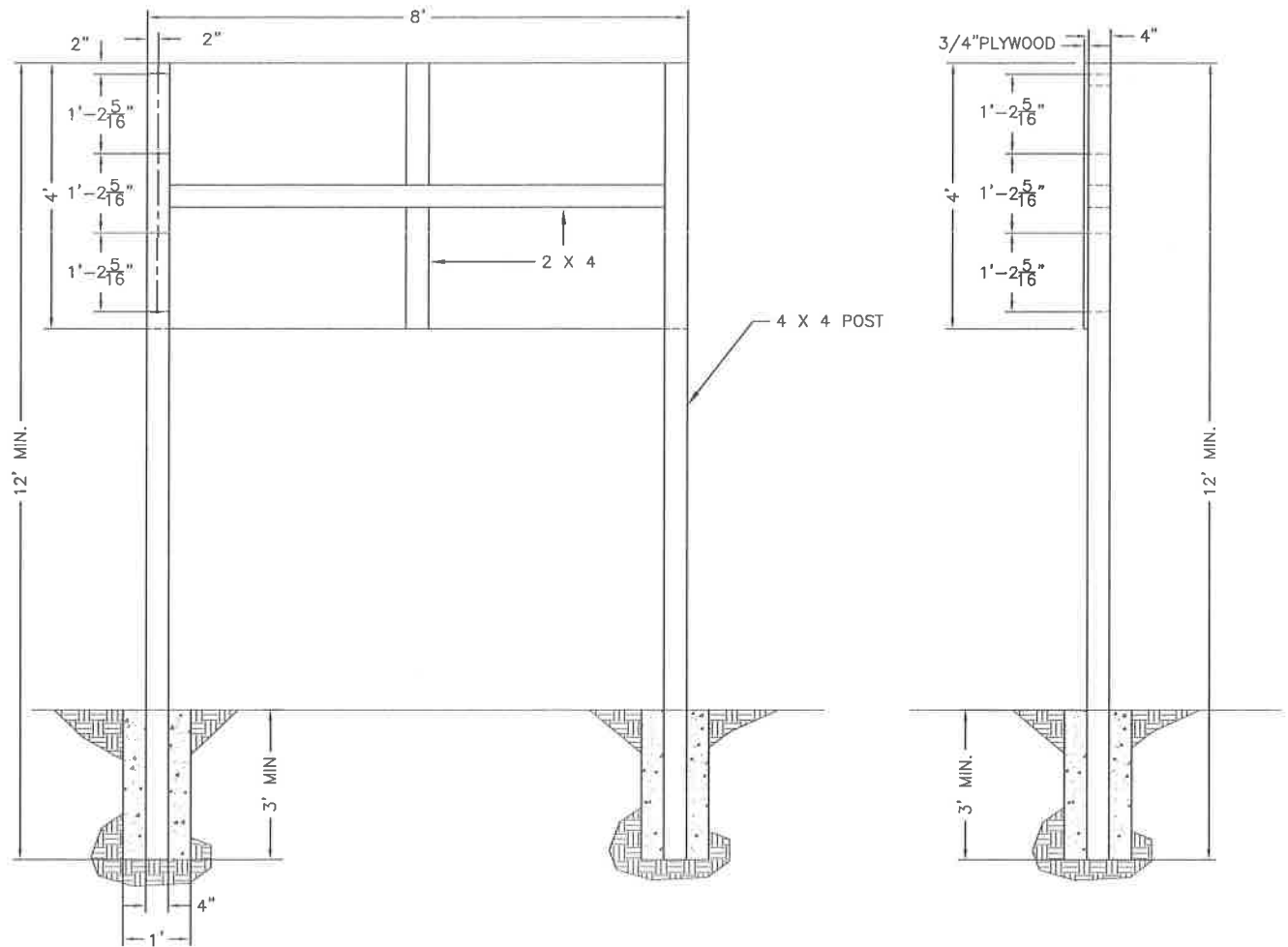
The EDA Regional Director may permit modifications to these specifications if they conflict with state law or local ordinances.



SIGN A  
MASONITE SIGN  
SCALE:  $\frac{3}{8}" = 1'$

PROJECT – SIGN A

ECONOMIC DEVELOPMENT ADMINISTRATION



SIGN B  
PLYWOOD SIGN  
SCALE:  $\frac{3}{8}" = 1'$

PROJECT – SIGN B

ECONOMIC DEVELOPMENT ADMINISTRATION

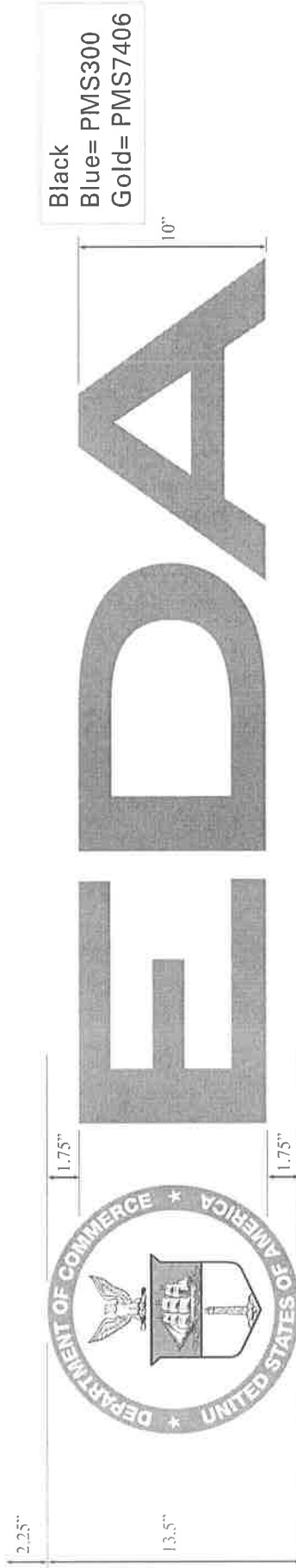


# EDA

U.S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT ADMINISTRATION

*In partnership with*

**<EDA Grant Recipient Name>**



Black  
Blue= PMS300  
Gold= PMS7406

U.S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT ADMINISTRATION

*In partnership with*

**<EDA Grant Recipient Name>**

2.0"

1.5"

4.0"

6

3.0"

3.0"

3.75"

15.0"

## SECTION 01 10 00 SCOPE OF WORK

### PART 1 - WORK INCLUDED

- 1.1 It is intended that the contract shall include all materials, labor, equipment, services, etc. required for:

Construction of a Technology Training Center to include the building, mechanical, electrical, plumbing, sitework, grading, parking areas, drives, etc..

together with any site work and attendant facilities thereto, as shown in the Drawings and described in the Specifications prepared by Bill Wage, Architect and Miller-Newell Engineers, Inc., 510 Third Street, Newport, AR.

The Contractor will not be required to perform work that is not within the general character and scope of the Drawings and Specifications or not reasonably inferrable therefrom; however, he must recognize and accept the fact that these documents are not intended to illustrate or describe each and every possible detail of construction or finish that will be encountered in the execution of the work, nor can they show the exact location of each mechanical line, wiring device, fixture, etc. Where conditions are encountered that have not been specifically shown or detailed, they shall be worked out and finished similar to other details of like nature, or in accordance with supplementary Drawings furnished by the Engineer.

It shall be the responsibility of the General Contractor to coordinate all of the various phases of the construction and finish materials, including mechanical and electrical lines and equipment, so that all of the many components will fit together and function properly without interference one to the other to the end that the entire job when completed will present a neat and finished appearance with all movable parts and mechanical and electrical equipment operating properly, ready for the Owner's occupancy and use.

### PART 2 - SCOPE OF SUBCONTRACTORS WORK

- 2.1 This shall be established by agreement between the General Contractor and his subcontractors. For convenience of reference, the Specifications are separated into titled sections; however, such separation shall not operate to make the Engineer an arbiter to establish limits of the contracts between the General Contractor and subcontractors.

### PART 3 - GRADES, LINES, LEVELS AND SURVEYS

- 3.1 All grades, lines, levels and bench marks shall be established and maintained by the General Contractor who shall be responsible for same.

Contractor shall verify all grades, lines, levels and dimensions as shown on the Drawings, and he shall report any errors or inconsistencies in the above to the Engineer before commencing work.

Contractor shall provide and maintain well built batterboards at all corners, he shall establish bench marks in not less than two widely separated places. As the work progresses he shall establish bench marks at each floor, giving exact levels of the various floors, and shall layout on the forms (or rough flooring) the locations of all partitions, etc., as a guide to all trades and subcontractors.

### PART 4 - DATA FOR "AS-BUILT" DRAWINGS

- 4.1 Contractor shall make a clearly legible record on one set of drawings of all conditions where the actual construction differs from the Contract Drawings. This includes the exact location of all mechanical lines and principal electrical conduits, referenced to convenient points with dimensions. Upon completion of the job, this set of drawings shall be delivered to the Engineer for his use.

### PART 5 - PROTECTION OF EXISTING UTILITIES

- 5.1 Contractor shall exercise extreme caution during excavation and/or earthwork of all kinds to prevent damage to existing mechanical lines and/or cables which may be located in the vicinity of work under this Contract. Approximate locations of such lines, insofar as the Engineer has been able to determine, are indicated on the plot plan; however, the Engineer does not certify to the correctness of such information and does not assume any responsibility for same. In the event that such lines or cables should be disturbed by operations under this Contract, the Contractor shall immediately and at his own expense, make repairs necessary to restore them to their present condition.

### PART 6 - OWNER AND LOCATION

- 6.1 The work is to be done for the City of Newport, Arkansas or its duly authorized representative, referred to throughout the Contract Documents as the "Owner."

The project is located at Newport, Arkansas, at the point indicated on the plans.



All items to be done shall be inspected by the Engineer's Resident Project Representative and/or the Owner's Inspector before being covered up by other trades of work.

END OF SECTION

**SECTION 01 32 23  
CONSTRUCTION LAYOUT**

**PART 1-GENERAL**

**1.1 SUMMARY:**

A. Laying out the entire project, all walks, structures, walls, fences, bridges, displays, streams and other features etc. with stakes, twine, flagging tape, and marking paint for field review and adjustment by Owner's Representative. .

**1.2 SUBMITTALS:**

A. "As-built" Drawings: Prepare and submit marked drawings with all the adjustments shown to scale. Submit one reproducible and three non-reproducible copies.

**1.3 FIELD ENGINEERING:**

A. Employ a Land Surveyor registered in the State of Arkansas and acceptable to Owner's Representative and Owner. Contractor shall locate and protect survey control and reference points. Promptly notify Owner's Representative and Owner of any discrepancies discovered. Control datum for survey is that shown on Drawings. Verify set-backs and easements; confirm drawing dimensions and elevations. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices. Submit a copy of site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents. Maintain a complete and accurate log of control and survey work as it progresses.

Protect survey control points prior to starting site work; preserve permanent reference points during construction. Promptly report to Owner's Representative. the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Owner's Representative and Owner. Calculate and measure required dimensions as shown (within indicated or recognized tolerances), **DO NOT** scale the drawings to determine dimensions. Record deviations (if any) from Contract Document information on existing conditions, and review with Owner's Representative at time of discovery.

**1.4 QUALITY ASSURANCE:**

A. Surveyor Qualifications: Land Surveyor or company registered in the State of Arkansas experienced in construction layout with minimum three years experience and acceptable to Owner's Representative and Owner.

**1.5 DELIVERY, STORAGE AND HANDLING:**

A. Protection: Protect layout stakes, tapes, strings, paint marks from displacement until Owner and Owner's Representative. adjustments are complete.

**1.6 SCHEDULING:**

A. Notify Owner's Representative. 14 days in advance of marking the layout for inspection and adjustment.

**PART 2-PRODUCTS**

**2.1 MATERIALS:**

A. Stakes: Wood or other suitable material; sufficiently long for visibility over vegetation and structures to remain; capable of being driven into the soil; capable of maintaining position until adjustments are made; and capable of being repositioned and maintaining position into construction phase.

Tape: Surveyor's flagging tape; high visibility; and strength to withstand inclement weather without displacement or deterioration.

Twine: Natural fiber; biodegradable; sufficient strength to withstand inclement weather without displacement through construction.

Surveyor's marking paint: High visibility; non-toxic paint.

**PART 3-EXECUTION**

**3.1 EXAMINATION:**

A. Verify and mark location of all utilities and conditions which may affect layout and adjustment.

**3.2 PREPARATION:**

A. Insure demolition is complete and entire area can be viewed for verification of layout and adjustment by the Owner and Owner's Representative. .

### **3.3 LAYOUT:**

A. Layout and stake entire project in accordance with drawings and specifications. Clearly label stakes, tapes, and areas. Ensure layout is visible and all parts recognizable by Owner's Representative. . Layout all walks, structures, walls, fences, streams and other features with both corner and centerline stakes and continuous painted alignment for centerline and edges. Color code painted layout lines with various color marking paints to allow easy differentiation between walks, structures, walls, fences, streams and other features.

### **3.4 FIELD QUALITY CONTROL:**

A. Site Tests, Inspection: Owner's Representatives, Contractor, and Owner's Representative. will meet at the site to inspect the layout and make any adjustments to the layout deemed necessary.

### **3.5 ADJUSTING:**

A. Make all adjustments to layout required by Owner's Representative. . Mark adjusted staking, flagging, tapes, and painted layout to prevent any error of mistaking unadjusted layout for the final layout.

### **3.6 CLEANING:**

A. Clean the site; sweep paved areas; and rake clean all landscaped surfaces. Remove waste and surplus materials, rubbish, and construction facilities from the site.

### **3.7 PROTECTION:**

A. Provide temporary and removable protection for installed layout markings. Control activity in immediate work area to prevent damage. Protect existing finished paving, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials. Prohibit traffic from landscaped areas.

**End of Section**

## SECTION 03 30 00 CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specified cast-in-place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.
- B. Concrete paving and walks are specified in Division 2.
- C. Precast concrete is specified in Division 3 Sections.
- D. Mechanical finishes and concrete floor toppings are specified in other Division 3 Sections.

#### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by the Architect/Engineer.
- C. Shop drawings for reinforcement, prepared for fabrication, bending and placement of concrete reinforcement, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

#### 1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
  - 1. ACI 318, "Building Code Requirements for Reinforced Concrete."

2. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
- B. Concrete Testing Service: Engage a testing laboratory acceptable to Architect/Engineer to perform material evaluation tests and do design concrete mixes.
- C. Materials and installed work may require testing and retesting at any time during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.
- D. Pre-Construction Conference: Conduct conference at project site to comply with requirements of Division 1 Section "Project Meetings" and to be attended by the following:
  1. Contractor's superintendent.
  2. Laboratory responsible for field quality control.
  3. Ready-mix concrete producer.
  4. Concrete subcontractor.
  5. Architect, Engineer, or Owner's representative.

## PART 2 – PRODUCTS

### 2.1 FORM MATERIALS

- A. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- B. Form Ties: Factory-fabricated, adjustable length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.

### 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.
  1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

## 2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
  - 1. Use one brand of cement throughout project unless otherwise acceptable to Architect/Engineer.
- B. Normal Weight Aggregates: ASTM C 33 and as herein specified. Provide aggregates from a single source for exposed concrete.
  - 1. Local aggregates not complying with ASTM C 33 but that special tests or actual service have shown to produce concrete of adequate strength and durability may be used when acceptable to Architect/Engineer.
- C. Water: Drinkable.
- D. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

## 2.4 RELATED MATERIALS

- A. Vapor Retarder: Provide vapor retarder cover over prepared base material where indicated below slabs on grade. Use only materials that are resistant to deterioration when tested in accordance with ASTM E 154, as follows:
  - 1. Polyethylene sheet not less than 8 mils thick.
- B. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
    - "Aquafilm," Conspec Marketing and Mfg. Co.
    - "Eucobar," Euclid Chemical Co.
    - "E-Con," L & M Construction Chemicals, Inc.
    - "Confilm," Master Builders, Inc.
- C. Expansion joints in concrete slabs shall be 1 x 4 or 2 x 4 Redwood lumber.
- D. Expansion joints using 1 x 4 Redwood shall be constructed with a 1 / 2" x 3 / 4" reservoir for sealant. The joints shall be sealed with Throseal Caulking, as manufactured by Sonneborne.

## 2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Submit written reports to Architect/Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Architect/Engineer.
- B. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules.
  - 1. 3000 psi, 28 day compressive strength; W/C ratio 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained); with a minimum cement of 470# per cu.yd.
  - 2. 4000 psi, 28 day compressive strength; with a minimum cement of 560# per cu.yd.
- C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect/Engineer. Laboratory test data for revised mix design and strength results must be submitted to an accepted by Architect/Engineer before using in work.

## 2.6 ADMIXTURES

- A. Use water-reducing admixture or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability.
- B. Use non-chloride accelerating admixture in concrete slabs at ambient temperatures below 50 deg. F (10 deg C).
- C. Use high-range water-reducing admixture (HRWR) in pumped concrete, concrete for industrial slabs, architectural concrete, parking structures slabs, concrete required to be watertight, and concrete with water/cement ratios below 0.50.
- D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within following limits:
  - 1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure: 6.0 percent (sever exposure) 3/4-inch max. aggregate.
  - 2. Other concrete (not exposed to freezing, thawing, or hydraulic pressure) or to

receive a surface hardener: 2 percent to 4 percent air.

E. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

1. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:

Subjected to freezing and thawing: W/C 0.45.

Subjected to deicers/watertight: W/C 0.40.

Subjected to brackish water, salt spray or deicers: W/C 0.40.

F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing HRWR admixture (Superplasticizer): Not more than 8 inches after addition of HRWR to site-verified 2-inch to 3-inch slump concrete.
4. Other Concrete: Not more than 4 inches.

G. Fly ash is not acceptable as a substitute for cement.

## 2.7 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as specified.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 GENERAL

A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

### 3.2 FORMS

A. General: Design, erect, support, brace, and maintain form work to support vertical



and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct form work so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain form work construction tolerances complying with ACI 347.

- B. Construct forms to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, recesses, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
- D. Provisions for Other Trades: Provide openings in concrete form work to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- E. Cleaning & Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.

### 3.3 VAPOR RETARDER/BARRIER INSTALLATION

- A. General: Following leveling and tamping of granular base for slabs on grade, place vapor retarder/ barrier sheeting with longest dimension parallel with direction of pour.
- B. Lap joints 6 inches and seal vapor barrier joints with manufacturer's recommended mastic and pressure-sensitive tape.
- C. After placement of vapor retarder/barrier, cover with sand cushion and compact to depth as shown on drawings.

### 3.4 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.

1. Avoid cutting or puncturing vapor retarder during reinforcement placement and concreting operations.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect/ Engineer.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### 3.5 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect/Engineer.
- B. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as otherwise indicated. Do not continue reinforcement through sides of strip placements.
- C. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

### 3.6 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

### 3.7 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.
- B. General: Comply with ACI 304, "Recommended Practice of Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
  - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
  - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
  - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
  - 3. Maintain reinforcing in proper position during concrete placement.

- F. Cold-Weather Placing: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- G. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
  - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 2. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- H. Hot-Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
  - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Mixing water may be chilled, or chapped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
  - 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
  - 3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
  - 4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Architect/Engineer.

### 3.8 MONOLITHIC SLAB FINISHES

- A. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other film finish coating system.
  - 1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation,

free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of Ff20 - F1 17. Grind smooth surface defects that would telegraph through applied floor covering system.

- B. Trowel and Fine Broom Finish: Sidewalks shall receive trowel and fine broom finish.

### 3.9 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
- D. Provide moisture curing by following methods.
  - 1. Keep concrete surface continuously wet by covering with water.
  - 2. Use continuous water-fog spray.
  - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
- E. Provide moisture-cover curing as follows:
  - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- F. Provide curing and sealing compound to exposed interior slabs and to exterior slabs walks, and curbs as follows:
  - 1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water

sheen has disappeared). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

### 3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled.

### 3.11 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect/Engineer.
  1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried.
- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repairs to satisfaction of Architect/Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections of surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.
  1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and

replace concrete.

- C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.
  - 1. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.
  - 2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
  - 3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect/Engineer.
  - 4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

### 3.12 QUALITY CONTROL TESTING DURING CONSTRUCTION.

- A. General: Employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect/Engineer.
- C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM D 94.
  - 1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method of normal weight concrete; one for each day's pour of each type of air-entrained concrete.
  3. Concrete Temperature: Test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27deg C) and above, and each time a set of compression test specimens is made.
  4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.
  5. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. more than the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
  6. When frequency of testing will provide fewer than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
- D. Test results will be reported in writing to Architect, Structural Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect/Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

END OF SECTION



**SECTION 03 35 43**  
**GRIND AND SEAL CONCRETE**

**PART 1 - GENERAL**

- 1.1 SUMMARY: DEEP GRIND COLORED CONCRETE WORK, COMPLETE. WORK INCLUDES MATERIALS, EQUIPMENT AND SERVICES NECESSARY FOR GRINDING & SEALING OF FLOORS.**
- 1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS:**
- A. Cast-In-Place Concrete; Section 03 30 00.
- 1.3 SUBMITTALS: COMPLY WITH THE REQUIREMENTS OF DIVISION ONE.**
- A. Product Data: Submit product information, specifications, and maintenance information. Submit product information on equipment to be used.
  - B. Samples: Submit manufacturer's full color palette for concrete coloring material for color selections by Architect.
  - C. Letter of Certification from all Machinery and Chemical Manufacturers.
- 1.4 PROJECT MOCK-UP:**
- A. Prior to installation of grind and sealed concrete finish system, provide minimum 100 square foot mock-up at project. Architect shall approve workmanship of mock-up. Retain mock-up as standard for judging completed work. Mock-up shall not be a part of finished work. Mock up is to be completed upon initial deployment, and before any work is completed.
- 1.5 QUALITY ASSURANCE:**
- A. Provide a current letter of certification by densifier and sealer manufacturer that states contractor is a current qualified installer.
- 1.6 DELIVERY AND STORAGE:**
- A. Deliver materials in approved containers clearly marked and identified with manufacturer's name and description of contents.
  - B. Store materials inside and under cover; keep dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, damage from construction traffic and other causes.
- 1.7 ENVIRONMENTAL REQUIREMENTS: STORE MATERIALS INDOORS, PROTECTED FROM DAMAGE, MOISTURE, DIRECT SUNLIGHT, AND TEMPERATURE BELOW 50 DEGREES F OR ABOVE 80 DEGREES F.**
- 1.8 WARRANTY: 10-YEAR WARRANTY SIGNED BY CHEMICAL MANUFACTURER AND POLISHED CONCRETE CONTRACTOR FOR FAILURE AND REPLACEMENT OF MATERIALS AND WORKMANSHIP.**
- 1.9 COORDINATION: COORDINATE WORK WITH TRADES PROVIDING CONCRETE FINISH WORK. COORDINATE PRE-CONSTRUCTION MEETING WITH GENERAL CONTRACTOR, CONCRETE FINISHING CONTRACTOR AND POLISHED CONTRACTOR PRIOR TO THE FIRST POUR.**

**PART 2 - PRODUCTS**

**2.1 PRODUCT SUPPLIERS:**

- A. Integral Concrete Colorant: ASTM C 979, factory-measured powdered mix in self-dissolving packaging, consisting of non-fading finely-ground synthetic mineral-oxide coloring pigments and water reducing wetting agent.
  - 1. Butterfield Color®, 625 West Illinois Avenue, Aurora, Illinois 60506, Telephone: 1-800-282-3388, Fax: 630-906-1982, [www.butterfieldcolor.com](http://www.butterfieldcolor.com)
  - 2. Product Uni-Max Integral Colorant
  - 3. Color as selected by owner.
- B. Densifier, Hardener, Sealer: Retroplate 99 or approved equivalent.
- C. Joint filler: see Section 033000.
- D. Oil Repellent Sealer: RetroPel or approved equivalent.

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- E. Stain protector: RetroGuard or Curecrete shield.
- F. Cleaning solution: CreteClean Plus
- G. Sealant: Silane/Siloxane Sealer: Siloxa-Tek 8500.
- H. Substitutions permitted under the requirements of Division One.

**2.2 MACHINERY REQUIREMENTS:** HTC SYSTEMS 800HD OR EQUIVALENT SIZE MACHINERY MADE FOR GRINDING CONCRETE.

**2.3 CONCRETE SLABS:** SPECIFIED IN SECTION 03 30 00. ROUGHEN SLAB SURFACE WITH 100 GRIT DIAMOND PROFILE ABRASIVE.

**2.4 ADMIXTURES:** COMPLY WITH SECTION 033000. DO NOT USE CALCIUM CHLORIDE ADMIXTURES ON ANY INTEGRALLY COLORED CONCRETE.

**2.5 RELATED: SEE 03 30 00 FOR EXPANSION JOINT MATERIAL ETC.**

- A. Bonding agent: ASTM C 1059, Type II.

**2.6 CONCRETE SEALANT:**

- A. Clear, solvent based Membrane forming Curing and Sealing Compound, ASTM C 309, non-yellowing, VOC-compliant, high gloss, clear liquid. Butterfield Color Clear Guard Cure and Seal.
- B. Mixes for Integral Concrete: Minimum Cement Content: Five sacks of cement per yard. Maximum slump 4" inches. Add integral concrete colorant according to manufacturer's instructions. Maintain mix characteristics for all concrete required to have matching finish.

### **PART 3 - EXECUTION**

**3.2 EXAMINATION:**

- A. After concrete curing period (minimum 14 days) has elapsed, surface must be clean and dry, physical sound and free of contamination.
- B. Do not proceed with work until unsatisfactory conditions have been corrected.

**3.3 PREPARATION:** AS REQUIRED BY MANUFACTURER FOR INSTALLATION METHOD.

**3.4 INSTALLATION: COMPLY WITH ALL FLOOR SYSTEM MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS REGARDING PREPARATION AND MIXING OF MATERIALS AND APPLICATION OF EACH COMPONENT OF FLOORING SYSTEM.**

- A. Main Grind is to be started not less than 14 days after the pour.
  - 1. Use 100 grit diamond segments bonded in metallic matrix. The diamonds are to be chosen to achieve a "deep grind" affect where exposed rock size is average of a nickel or larger.
  - 2. Use minimum 100 or 200, grit diamond dust embed in plastic or resin matrix to polished finish to match level approved by Architect.
  - 3. Apply hardener and densifier according to manufacturer's instructions.
  - 4. Apply sealant after the hardener/densifier cure time.

**3.5 CURING AND SEALING:**

- A. Apply Silane/Siloxane Sealer according to sealant manufacturer's instructions.
- B. Protect concrete from prematurely drying and excessive cold or hot temperatures.
- C. Cure Concrete according to manufacturer's instructions.
- D. Apply curing and sealing compound by sprayer or short nap roller according to manufacturer's instructions. After initial application is dry and tack free, apply a second coat.

**3.6 CLEAN-UP:** CLEAN ADJACENT MATERIALS AND SURFACES, AND WORK AREA OF FOREIGN MATERIALS RESULTING FROM WORK OF THIS SECTION. REMOVE UNUSED MATERIALS AND DISPOSE OF OFFSITE.

### **END OF SECTION**

**SECTION 03 51 13**  
**CEMENTITIOUS ROOF DECK**  
**(CEMENTITIOUS WOOD FIBER PLANK)**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

1. Cementitious wood fiber plank roof deck.

**1.2 RELATED SECTIONS**

1. SECTION 07 54 23: TPO Single Ply Roof System

**1.3 REFERENCES**

- A. ASTM C177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- B. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by means of the Heat Flow Meter Apparatus.
- C. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- D. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- E. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
- F. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
- G. UL 580 Standard for Safety of Tests for Uplift Resistance of Roof Assemblies. UL Class 90 Design.

**1.4 SYSTEM DESCRIPTION**

- A. Three-in-One Composite Roof Deck Panels that provide acoustics, insulation and nailable deck surface.

**1.5 SUBMITTALS**

- A. Submit under provisions of Section 01 33 00 - Administrative Requirements.
- B. Product Data: Submit manufacturer's product data and installation instructions.

- C, Shop Drawings: Submit drawings indicating locations and spacing of planks and purlins.
- D. Samples: Submit set of 6 -inch square sample of assembly showing full range of texture to be expected in completed work.
- E. Submit labeled set of all accessories required for a complete installation.
- F. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.
- G. Closeout Documents: Submit warranty documents specified herein.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having demonstrated experience installing specified system on projects of similar size and complexity.
- B. Comply with applicable requirements of the ARKANSAS FIRE PREVENTION CODE (AFPC) and local codes and ordinances.
- C. Pre-installation meeting will be scheduled by the General Contractor.

## 1.7 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
  - 1. Provide labels indicating brand name, deck style, plank size and plank thickness.
- B. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
  - 1. Prevent soiling, physical damage or wetting.
  - 2. Store cartons open at each end to stabilize moisture content and temperature.

## 1.8 WARRANTY

- A. Submit Manufacturer's Standard Warranty Document executed by authorized company official.
  - 1. Warranty Period: 15 years beginning with date of substantial completion.

# PART 2 PRODUCTS

## 2.1 ROOF DECK SYSTEM

- A. Three-in-One Composite Roof Deck Panels - providing acoustics, insulation and nailable deck surface.

B. Manufacturer: Tectum Inc. - Armstrong World Industries.  
Proprietary Product. Cementitious deck form board products including the following:

1. Tectum III Roof Deck Panels:

- a. Material: Aspen wood fibers bonded with inorganic hydraulic cement, bonded to styrofoam and foam insulation, bonded to top surface of 7/16 inch oriented strand board (OSB).
- b. Nominal Panel Thickness: 6 inches.
- c. Insulation Water Vapor Permeability (ASTM E96): 0.6 perm.
- d. Insulation Compressive Strength (ASTM D1621): 40 PSI
- e. Insulation Water Absorption (ASTM D2842): 1% by volume.
- f. Insulation linear Coefficient of Thermal Expansion:  $3.5 \times 10^{-5}$  in/in/deg F.
- g. Insulation Thermal Resistance: R-value R5 per inch.
- h. EPS Core Compliance (ASTM C578): Exceeds Type IV.
- i. OSB meets Voluntary Product Standard PS2-2 Performance Standard for Wood-Based Structural-Use Panels.

## 2.2 ACCESSORIES

- A. Provide all accessories required for a complete installation of the TECTUM II System as shown on drawings and specified.

## PART 3 EXECUTION

### 3.1. MANUFACTURERS INSTRUCTIONS.

- A. Comply with the instructions and recommendations of the roof deck panel manufacturer.

### 3.2. EXAMINATION

- A. Verify that site conditions are acceptable for installation of roof deck panel system.
- B. Do not proceed with installation of roof deck panel system until unacceptable conditions are corrected.

### 3.3 INSTALLATION

- A. Place planks on joists with the square cut ends butted tightly together.
- 1. Stagger end joints
  - 2. Tectum panels must be supported by bent plates (steel or other support) at all transitions of the roof. Panels must have a minimum of 1

inch bearing and should be glued and screwed at these transitions.

3. Panel ends must fall over structural supports and have a minimum of 1 inch bearing.

B. Secure planks to joists with screws and spacing recommended by plan manufacturer

C. Do not allow foot traffic on planks until after screws are installed.

D. Apply adhesive recommended by manufacturer to ensure diaphragm performance as designed.

### 3.4 CLEANING

A. Clean exposed surfaces of all deck surfaces.

B. Remove and replace work that cannot be successfully repaired to eliminate evidence of structural damage.

### 3.5 PROTECTION

A. Protect installed work from damage due to weather related moisture.

B. Protect installed work from damage due to subsequent construction activity on the site so that the work will be without damage and deterioration at the time of acceptance by the Owner.

END OF SECTION

SECTION 04 21 00  
ARCHITECTURAL FACE BRICK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Brick units.
- B. Reinforcement, anchors, and accessories.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.

1.3 ALLOWANCES

- A. Allow \$500 per thousand for face brick to include taxes, freight and delivery to Project site. Selection to be made by the Owner.

1.4 REFERENCES

- A. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- B. ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
- C. ASTM D 1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Administrative Requirements.
- B. Selection Samples: For each product specified, two complete samples of brick to reflect the full range of color, shades and surface texture of brick specified.
- C. Verification Samples: For each product specified, two samples of four brick each, representing actual product, color, and texture.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.6 MOCKUP

- A. As soon as the brick samples have been approved, deliver enough brick to the job site to construct a four foot by four foot mockup wall panel.

- B. Construct the mockup panel using the brick, mortar, reinforcing, weep holes, tooling, and cleaning as specified, with appropriate backup walls as shown on the Drawing.
- C. The approved sample panel shall be a standard of workmanship for the Work.
- D. As construction proceeds, the first full panel of brickwork, between expansion joints shall become the standard of workmanship for issues, such as head joint alignment, that are not apparent on the smaller mockup panel.
- E. Mockup panel shall not be removed until masonry work required by this Section has been completed and accepted.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials to prevent inclusion of foreign materials and damage by water or weather. Store packaged materials in their original packages. Remove damaged or deteriorated materials from the premises

#### 1.8 PROJECT CONDITIONS

- A. Follow hot weather and cold weather requirements in the masonry code and specifications, TMS 402 and TMS 602.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Acme Brick Company, which is located at: 3024 Acme Brick Plaza; Fort Worth, TX 76109; Toll Free Tel: 800-792-1234; Tel: 817-332-4101; Fax: 817-390-2404; Email: Contact@Brick.com; Web: www.brick.com
- B. Substitutions: Submit proposed substitutions prior to bidding.

#### 2.2 BRICK UNITS

- A. Face Brick: Brick shall be Type FBS or HBS as follows:
  - 1. Modular in size, 2-1/4 by 3-5/8 by 7-5/8 inches, and conform to the requirements of ASTM C 216, Grade SW. \_\_\_\_\_
- B. Furnish special uncured face brick in locations where cores would be exposed in finish work.

#### 2.3 ANCHORS AND TIES

- A. Acceptable Manufacturers:
  - 1. Products of Hohmann and Barnard and Heckmann Building Products, conforming to specification requirements are acceptable.



- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
- C. Anchors:
  - 1. Slotted anchors of type DW10 shall be used with steel stud backup walls unless noted otherwise.

## 2.4 ACCESSORIES

- A. Weep Holes: Install at every third brick at lintels and maximum spacing of 24" at base flashing.
- B. Mortar Net: Provide continuous Mortar Net along base of air space to catch mortar drippings. High-density polyethylene, 90 percent open mesh, dovetail shape. Provide and install Mortar Net Weep Vents in accordance with system recommendations.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until backup substrates have been properly prepared.
- B. Verify field conditions are acceptable and are ready to receive work.
- C. Verify built-in items are in proper location, and ready for roughing into masonry work.
- D. If backup substrate and other preparation work is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

### 3.3 INSTALLATION

- A. Pre-wet all brick having initial rate of absorption greater than 30 before laying.
- B. Heat water and sand in cold weather. Do not lay brick in temperature below freezing unless such heating of materials and protection of work is properly provided for.
- C. Lay brickwork true to dimensions, plumb, square, and in bond. All courses shall be level with joints of uniform width and height.
- D. Vertical joints in facing bond work shall be spaced so as to line up plumb and true, and all joints shall be as uniform as the type of brick will allow.

- E. Lay facing brick in full mortar bed with shoved head joints. Completely fill joints with mortar. Do not deep furrow bed joints.
- F. Allow space for caulking of joints at frames.
- G. Bond for facing brick shall be running bond unless otherwise indicated on the Drawings. Match existing bond patterns unless noted otherwise.
- H. Anchor facing brick to metal studs or masonry backup at 16 inches o.c. vertically and 16 inches o.c. horizontally with adjustable anchors and ties.
- I. Joint thickness shall be such as to provide coursing pattern to match existing brickwork. When the joints have become thumbprint hard, all exposed joints shall be tooled with a sled-jointing tool. The jointer shall be larger than the width of the joints so that a complete contact is made along the edges of the units, compressing and sealing the surface of the joint. Joints shall be pointed as the tool proceeds.
- J. Form weep holes in head joints at face brick over shelf angles and lintels and where shown on the Drawings. Rake out bed joint mortar to clean flashing surface. Weep holes shall be filled with preformed mesh type vent at bottom of head joints not more than 24 inches o.c.
- K. Keep air space clean of mortar at all times. Where brick extends below grade, fill brick cavity solid to level of flashing and slope mortar slightly to outside under flashing.
- L. When flashing is to be laid on or against masonry, the surface of the masonry shall be smooth and free from projections that might puncture the flashing material.
- M. Where fresh masonry joins masonry that is partially set or totally set, the exposed surface of the set masonry shall be cleaned and lightly wetted so as to obtain the best possible bond with the new work. All loose brick and mortar shall be removed.
- N. Expansion Joints:
  - 1. Vertical: Locate where indicated on Drawings. Lay units to form a vertical joint free of mortar and of same width as normal head joint.
  - 2. Horizontal: Locate under shelf angles and other dissimilar materials abutted by brick. Maintain a clear space at least 1/4-inch thick free of mortar. Inspect with trowel before installing backer rod and sealant.
  - 3. Sealant. Shall be in accordance with Section 07 90 00 - Joint Protection.

### 3.4 FLASHING

- A. Build in, as the work progresses all flashings which enter the masonry as specified in Sections 07600 Sheet Metal Flashing and 07670 Thru-Wall Flashing.
- B. Extend all flexible flashing 1 inch past face of wall and trim after tooling

joints.

- C. Where metal flashing or drip edge is shown, align drip with face of brick. Edge of flashing or drip edge shall be a simple hem rolled edge and not turned down.

### 3.5 OPENINGS AND HOLES

- A. Provide all chases and recesses in masonry work of all types as indicated on the Drawings and as required for pipes, ducts, and other work of Mechanical and Electrical trades. Such work shall be accurately located by the trades requiring the work, but masonry work shall not be constructed without giving other trades due notices and opportunity to lay out or install such items as may be required for their work.
- B. Where required for installation of work of other trades, leave openings as indicated on the Drawing or as required to receive a later installation.
- C. After work of other trades is in place, openings shall be neatly filled with masonry of the same type as in the adjoining surfaces.

### 3.6 SETTING AND BUILDING-IN

- A. Build-in materials occurring in any type of masonry construction that are furnished by other trades. All built-in work shall be accurately placed, secured, held in position, and located by the trade requiring the work.
- B. Set and built -in items of related miscellaneous iron such as loose lintels and anchors required to complete all parts not connected to building framing.
- C. Set all anchor bolts required for the attachment of work to masonry or steel backup.
- D. Build-in recesses, flashings, receivers, slots, anchors, sleeves and other work shown on Drawings.

### 3.7 CLEANING

- A. After tooling and pointing is done, clean face brick surface with dry brush.
- B. After 3 days clean with water and mild detergent or cleaners recommended by brick manufacturer. Do not use muriatic acid.
  - 1. Wet brick surfaces thoroughly before applying cleaning solution.
  - 2. Apply cleaning solution with bucket and brush or LOW PRESSURE spray.
  - 3. Remove all stains and mortar streaks using stiff fiber bristle brush.
  - 4. Rinse THOROUGHLY with water.
  - 5. Protect windows, landscaping, and surrounding masonry surfaces from cleaning solution and rinse water.

END OF SECTION

SECTION 06 10 00  
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wood blocking, cants and nailers
- D. Plywood backing panels

1.2 SUBMITTALS

- A. Material Certificates as applicable:
  - 1. Preservative treated wood.
  - 2. Metal framing anchors.

PART 2 PRODUCTS

2.1 MISCELLANEOUS LUMBER

- A. Provide No. 2 Southern Yellow Pine or approved substitution for the following:
  - 3. Blocking
  - 4. Nailers
  - 5. Equipment bases and support curbs
  - 6. Cants
  - 7. Furring
  - 8. Grounds

2.5 PLYWOOD BACKING PANELS

- A. Exterior, AC in thickness indicated, if not indicated, not less than ½ inch.

2.5 METAL FRAMING ANCHORS

- A. Manufacturers:
  - 1. Simpson Strong-Tie Co., Inc. or approved equal.
- B. For interior locations unless otherwise indicated use Hot-Dipped, zinc-coated Galvanized-Steel Sheet
- C. For wood-preservative-treated lumber use Hot-Dipped, Heavy-galvanized Steel Sheet.

## PART 3 EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line and fitted.
- B. Install Engineered Wood Products in compliance with manufacturer's written instructions and recommendations.
- C. Install metal framing anchors and connectors in compliance with manufacturer's written instructions.
- D. Apply field treatment to cut surfaces of preservative-treated materials.

### 3.2 PROTECTION

- A. Protect all treated and untreated lumber from weather.
- B. Protect installed material and systems from damage during following construction procedures.

END OF SECTION

## SECTION 06 40 23

### ARCHITECTURAL CASEWORK

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Plastic-laminate cabinets.
  - 2. Plastic-laminate countertops.
- B. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips unless concealed within other construction before woodwork installation.

##### 1.2 SUBMITTALS

- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- B. Samples:
  - 1. Plastic-laminates, for each type, color, pattern, and surface finish.

##### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of woodwork.
- B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards."

##### 1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

#### PART 2 - PRODUCTS

## 2.1 MATERIALS

### A. Wood Products:

1. Hardboard: AHA A135.4.
2. Medium-Density Fiberboard: ANSI A208.2, Grade MD[, made with binder containing no urea formaldehyde.
3. Particleboard: ANSI A208.1, Grade M-2.
4. Softwood Plywood: DOC PS 1, Medium Density Overlay.

### B. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.

### C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

## 2.2 CABINET HARDWARE AND ACCESSORIES

### A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork that meets the requirement for Non-Ferrous installation in the Magnet Room.

### B. Door Hinges: Adjustable, and as follows:

1. Semi-concealed Hinges for Overlay Doors: BHMA A156.9, B01521.

### C. Wire Pulls: Back mounted, solid Aluminum, 4 inches long, 5/16 inches in diameter.

### D. Catches: Magnetic catches, BHMA A156.9, B03141.

### E. Drawer Slides: BHMA A156.9, B05091.

1. Standard Duty: Side mounted and extending under bottom edge of drawer; full-extension type with polymer rollers.
2. Pencil Drawer Slides: for drawers not more than 3 inches high and 24 inches wide.

### F. Door Locks: BHMA A156.11, E07121.

### G. Drawer Locks: BHMA A156.11, E07041.

### H. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Brushed Aluminum..

## 2.3 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

## 2.4 FABRICATION

- A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
  - 1. Interior Woodwork Grade: Premium.
  - 2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.
- B. Plastic-Laminate Cabinets:
  - 1. AWI Type of Cabinet Construction: Reveal overlay.
  - 2. Reveal Dimension: ½ inch.
  - 3. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate as selected by Architect from manufacturer's standard selections..
  - 4. Materials for Semiexposed Surfaces Other Than Drawer Bodies: Thermoset decorative panels.
  - 5. Drawer Sides and Backs: Thermoset decorative panels.
  - 6. Drawer Bottoms: Hardwood plywood.
  - 7. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of standard solid colors and patterns, matte finish.
- C. Plastic-Laminate Countertops:
  - 1. High-Pressure Decorative Laminate Grade: HGS.
  - 2. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid colors, wood grains, patterns, matte finish.
  - 3. Edge Treatment: Same as laminate cladding on horizontal surfaces.

## PART 3 - EXECUTION

### 3.1 INSTALLATION



- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.
- B. Install woodwork level, plumb, true, and straight to a tolerance of 1/2 inch in 96 inches. Shim as required with concealed shims.
- C. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation.
- E. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
  - 1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing, blocking, or hanging strips.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

END OF SECTION

## SECTION 07 21 00

### BELOW GRADE-PERIMETER INSULATION

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Extruded polystyrene insulation board (XPS) Type IV.

##### 1.2 REFERENCES

- A. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E 2178 - Standard Test Method for Air Permeance of Building Materials.
- D. CAN/ULC-S701 - Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

##### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Administrative Requirements.
- B. Product Data: Submit insulation manufacturer's product data, building code compliance reports or test reports and the insulation manufacturer's printed installation guidelines.
  - 1. Submit product literature or a letter from the insulation manufacturer indicating approval of products not manufactured by the specified insulation manufacturer.
  - 2. If a letter is submitted, it shall include a statement that materials are compatible with adjacent materials proposed for use.

##### 1.4 QUALITY ASSURANCE

- A. Insulation Manufacturer: Obtain insulation board from a single manufacturer regularly engaged in manufacturing the extruded polystyrene insulation board (XPS) type specified. Obtain secondary materials from a source acceptable to the primary insulation manufacturer.
- B. Accredited Laboratory Testing for XPS insulation board: Laboratory accredited by International Accreditation Service Inc. (IAS), American Association for Laboratory Accreditation (A2LA), or the Standards Council of Canada (SCC).
- C. Installer qualifications:
  - 1. Installer shall have experience with installation of insulation board; and installation shall be in accordance with insulation manufacturer's

- installation guidelines.
- 2. Minimum 2 year experience installing similar products.

#### 1.5 PRE-INSTALLATION MEETINGS

- A. Preconstruction Meeting: To be arranged.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver insulation board to the project site in original packaging, labeled with manufacturer's information, product name, and date of manufacture, and instructions for storage.
- B. Store insulation board in its original undamaged packaging or in a clean, dry, protected location and within temperature range required by insulation manufacturer. Protect stored materials from direct sunlight.
- C. Handling: Handle materials to avoid damage.

#### 1.7 PROJECT CONDITIONS

- A. Temperature: Install insulation board within range of ambient and substrate temperatures recommended by the insulation manufacturer. Do not apply insulation board to a damp or wet substrate.
- B. Field Conditions: Do not install insulation board in snow, rain, fog, or mist. Do not install insulation board or auxiliary materials when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the insulation and auxiliary material manufacturers.

#### 1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

#### 1.9 WARRANTY

- A. Material Warranty: Provide insulation manufacturer's warranty.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable ManufacturerS: Dow Building Solutions, Kingspan Insulation LLC.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Material Performance, Thermal Insulation: Provide extruded polystyrene insulation board (XPS) that meets the requirements of ICC-ES AC12, "Acceptance Criteria for Foam Plastic Insulation", ASTM C 578, Type IV, Type VI and Type VII, and CAN/ULC-S701, Type 4.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which the insulation board will be applied, with installer present, for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Review requirements for sequencing of installation of all wall assembly components as demonstrated in the mock-up wall assembly.

### 3.2 INSTALLATION - BELOW-GRADE, PERIMETER FOUNDATION INSULATION

- A. Install insulation board to the exterior side of masonry walls after the waterproofing membrane has cured according to the manufacturer's installation instructions. If the surface of the cured waterproofing membrane is not sufficiently tacky to hold the insulation board in place until backfilling takes place, then an adhesive shall be used to secure the insulation board to the wall. Apply adhesive to the insulation board as recommended by the adhesive manufacturer using the amount and pattern required for the application.
- B. Place backfill directly in contact with the insulation board. Remove all large rocks and other debris that may damage insulation board during backfilling.
- C. Do not leave insulation boards exposed above grade. If insulation board is exposed above the grade line, then it shall be covered with an exterior cladding material or foundation covering.

### 3.3 FIELD QUALITY CONTROL

- A. Owner's Inspection and Testing: Cooperate with Owner's testing agency. Allow access to work areas and staging. Notify Owner's testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection. Daily inspection and testing may be required. Do not cover Work of this section until testing and inspection is accepted.

### 3.4 PROTECTING AND CLEANING

- A. Protect insulation board from damage during installation and remainder of construction period, according to manufacturer's written instructions.
  - 1. Coordinate with installation of insulation board to ensure exposure periods do not exceed the manufacturer's recommendations.

END OF SECTION

## SECTION 07 21 16

### BATT INSULATION

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Fiberglass batt thermal insulation for exterior envelope assemblies.

##### 1.2 REFERENCES

Materials shall meet the property requirements of one or more of the following specifications as applicable to the specific product or end use.

- A. ASTM C 423 - Test Methods for Sound Absorption Coefficient by the Reverberation Room Method.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM C 518 - Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter..
- D. ASTM E119 - Test Methods for Fire Tests of Building Construction Materials.

##### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Administrative Requirements.
- B. Product Data: Submit insulation manufacturer's product data, building code compliance reports or test reports and the insulation manufacturer's printed installation guidelines.
  - 1. Submit product literature or a letter from the insulation manufacturer indicating approval of products not manufactured by the specified insulation manufacturer.
  - 2. If a letter is submitted, it shall include a statement that materials are compatible with adjacent materials proposed for use.

##### 1.4 QUALITY ASSURANCE

- A. Insulation Manufacturer: Obtain insulation product from a single manufacturer regularly engaged in manufacturing the insulation type specified. Obtain secondary materials from a source acceptable to the primary insulation manufacturer.
- B. Installer qualifications:
  - 1. Installer shall have experience with installation of batt insulation; and installation shall be in accordance with insulation manufacturer's installation guidelines.

2. Minimum 2 year experience installing similar products.

#### 1.5 PRE-INSTALLATION MEETINGS

- A. Preconstruction Meeting: To be arranged.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original packaging.
- B. Store and protect products in accordance with manufacturer's instructions. Store in a dry indoors location. Protect insulation materials from moisture and soiling. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and maintained in acceptable condition.
- C. Handling: Handle materials to avoid damage.
- D. Do not install insulation that has been damaged or wet. Remove it from jobsite.

#### 1.7 PROJECT CONDITIONS

- A. Temperature: Install insulation within range of ambient and substrate temperatures recommended by the insulation manufacturer. Do not apply insulation to a damp or wet substrate.

#### 1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

#### 1.9 WARRANTY

- A. Material Warranty: Provide insulation manufacturer's warranty.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURER AND MATERIAL

- A. Thermal Insulation: EcoTouch® PINK® FIBERGLAS™ Insulation with PureFiber® Technology by Owens-Corning, Toledo, OH 43659.
- B. EcoTouch® Kraft Faced Batt Insulation: ASTM C665, Type II, Class C Preformed formaldehyde free glass fiber batt type, Kraft paper faced one side.
  1. Perm Rating: 1 perm maximum per ASTM E96
- C. Accessories: Provide accessories per insulation system manufacturer's recommendations, including the following:
  1. Tape: Polyethylene self-adhering type for Kraft faced insulation.
  2. Insulation fasteners: Type recommended by insulation manufacturer for particular use intended.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Metal Frame Construction, R-Value for Batt Insulation: Per ASTM C518  
1. R-19, 6 1/4 inch, 16" width, 96 inch length.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which the insulation will be installed, with installer present, for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Friction-fit blanked insulation in place, until the interior finish is applied. Install batts to fill entire stud cavity, with no gaps, voids or areas of compressions. If stud cavity is less than 8 feet in height, cut lengths to friction fit against floor and ceiling tracks. Walls with penetrations require that insulation be carefully cut to fit around outlet, junction boxes and other irregularities.
- B. Within exterior wall framing, install insulation between pipes and backside of sheathing. Cut or split insulation material as required to fit around wiring and plumbing.
- C. Fluff insulation to full thickness for specified R-value before installation. Do not compress insulation in the cavity during installation, creating gaps or voids that could diminish thermal value.
- D. For batt insulation with factory-applied facing, install with vapor retarder membrane facing warm in the winter side of building spaces. Lap ends and side flanges of membrane over or between framing members. Tape to seal tears, cuts or misalignments in membrane.
- E. Secure insulation in place using one of the following methods: friction fit; tape in place, retian in place with fasteners or wire mesh as approved by the insulation manufacturer.

### 3.3 PROTECTION

- A. Protect installed insulation from damage due to weather and physical abuse during the remainder of the construction period until protected by permanent construction.
  - 1. Coordinate with installation of insulation to ensure exposure periods do not exceed the manufacturer's recommendations.

END OF SECTION

## SECTION 07 27 00

### WEATHER-RESISTANT BARRIER (WRB)

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Work of this section includes weather-resistant barrier (WRB and all accessory materials required for sealing sheathing joints, penetrations, rough openings, and material transitions, for use behind exterior wall claddings.

##### 1.2 RELATED SECTIONS

- A. Section 04 21 00 - Architectural Face Brick - Cavity Drainage System, flashing and masonry ties.

##### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E84-Standard Test Method for Surface Burning Characteristics of Building Materials
  - 2. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials
  - 3. ASTM E331-Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
  - 4. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- B. International Code Council (ICC):
  - 1. ICC IBC - International Building Code
  - 2. ARKANSAS FIRE PREVENTION CODE

##### 1.4 DEFINITIONS

- A. Weather-Resistant Barrier (WRB): Water-shedding barrier made of material that is moisture-resistant, installed to shed water, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.
- B. Rough Openings: Openings in the wall to accommodate windows and doors.

##### 1.5 SUBMITTALS

- A. Required submittals are to be submitted through the General Contractor/Construction Manager to the Architect. Do not submit directly to the Architect.
- B. Product Data and Installation Instructions: Submit manufacturer's product



data, installation instructions and substrate preparation recommendations.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

#### 1.7 PRE-INSTALLATION CONFERENCE

- A. Meeting schedule and agenda to be arranged.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

#### 1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- B. Ensure substrate surface is free from moisture, dirt, and other debris before the application of tape.
- C. Do not install tape in temperatures less than 20 degrees F or if panel surface has frost or ice.

#### 1.10 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

#### 1.11 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard limited warranty.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Du Pont.
- B. Requests for substitutions must be submitted to the Architect through the General Contractor/Construction Manager. Submittal must include data showing that the product complies with the project requirements and warranties.

### 2.2 WEATHER BARRIER MEMBRANE

- A. Tyvek® Commercial Wrap.
- B. System Description: Air and water-resistive barrier system installed at exterior stud walls under exterior cladding, consisting of the following components as herein specified:
  - 1. Weather Barrier Membrane with all required material to seal penetrations in membrane and at overlapping edges.

### 2.3 WEATHER-RESISTANT BARRIER (WRB)

- A. Install a single layer weather barrier.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly constructed and prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Examine framing spacing and alignment to determine if work is ready to receive sheathing. Proceed with sheathing work once conditions meet requirements.
- B. Remove projections, protruding fasteners, loose or damaged sheathing material at edges of panel that might interfere with proper installation to seal joints, corners, penetrations, openings, or material transitions.
- C. Wipe down the sheathing surface to receive sealing materials with a clean cloth.
- D. Ensure manufacturer's recommended field conditions are met.

### 3.3 INSTALLATION OF WEATHER RESISTANT BARRIER (WRB)

- A. Install Weather Resistant Membrane in accordance with manufacturer's written instructions, requirements of applicable Product Report, and requirements of authorities having jurisdiction.
- B. Coordinate membrane installation with flashing and joint sealant sequencing and installation and with adjacent building components to provide complete, continuous air- and moisture- barrier.

### 3.4 FIELD QUALITY CONTROL

- A. Do not cover installed Weather-Resistive membrane until required inspections have been completed and installation has been accepted.
- B. Where applicable, allow for owner's inspection and air barrier testing and reporting.

### 3.5 PROTECTION

- A. Protect WRB from damage during installation and during the construction period.

END OF SECTION

SECTION 07 42 00  
METAL WALL PANELS  
and SOFFIT PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pre-finished, pre-fabricated metal wall panels and soffit panels.
- B. Flashing and trim integral to panels.
- C. Clips, anchoring devices, fasteners, and accessories for installation of panel system.

1.2 REFERENCES

- A. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- B. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000.
- C. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
- D. AAMA 501.1-05 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.

1.3 DESIGN / PERFORMANCE REQUIREMENTS

- A. Design Requirements for Wall Systems:
  - 1. System Design: Metal wall system as designed by the manufacturer shall be a complete system. All components of the system shall be supplied by the same manufacturer.
  - 2. Wall Panels: Wall panels shall be designed in accordance with the local building code using the Manufacturer's published Load Tables from tests in accordance with ASTM E 1592.
  - 3. Design Loads: Design load application shall be in accordance with local building code.
  - 4. Wind Loads: Design wind loads shall be based on the wind criteria in accordance with local building code.
  - 5. Deflection: Deflection requirements shall be in accordance with the applicable building code, or as a minimum, L/180 for wind load (but not less than 10 psf (49 kg/sq m).
  - 6. Accessories and Fasteners: Accessories and fasteners shall be capable of resisting the specified design wind suction forces in accordance with local building code.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Material type, metal thickness and finish.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Shop Drawings:
  - 1. Show elevations, and plans of wall panels, including sections and details, anticipated loads, flashings, roof curbs, vents, sealants, interfaces with all materials not supplied and proposed identification of component parts and their finishes.
  - 2. Submit complete shop drawings and erection details to Architect for review. Do not proceed with manufacture prior to review and approval of shop drawings. Do not use drawings prepared by Architect for shop or erection drawings.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: Submit 1 foot (305 mm) high by full width sample panel for each profile specified indicating the metal, texture, color and finish.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment and periodic cleaning and maintenance of all components.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing metal panels with a minimum documented experience of ten years.
- B. Installer Qualifications: Company specializing in installation of the products specified for projects of similar size and scope with minimum five years documented experience.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.
  - 4. Accepted mock-ups shall be comparison standard for remaining Work

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver panels to job site properly packaged to provide protection against transportation damage.
- B. Exercise extreme care in unloading, storing, and erecting panels to prevent bending, warping, twisting, end and surface damage.
- C. Store products above ground on well skidded platforms in manufacturer's unopened packaging until ready for installation.
- D. Store inside or under breathable waterproof covering. Provide proper ventilation to panels to prevent condensation buildup between each panel. Elevate one end of bundles while being stored.

#### 1.7 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

#### 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### 1.9 WARRANTY

- A. Provide with manufacturer's PAC-Clad 30 Limited Warranty applied to aluminum, G-90 hot-dipped galvanized steel or AZ50 zinc-aluminum alloy steel sheet.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Petersen Aluminum Corp., which is located at: 1005 Tonne Rd.; Elk Grove Village, IL 60007; Toll Free Tel: 800-722-2523; Tel: 847-228-7150; Fax: 847-956-7968; Email: request info (rheselbarth@petersenmail.com); Web: <https://www.pac-clad.com>
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

#### 2.2 FLUSH WALL PANELS AND VENTED SOFFIT PANELS

- A. Flush & Reveal Wall Panels: Pre-finished, pre-fabricated concealed fastener metal wall system designed for horizontal and vertical applications.
  - 1. Materials:
    - a. .032 aluminum
  - 2. Panel Type:

- a. Flush profile
  - 3. Panel Width:
    - a. 12 inch O.C. flush profile
  - 4. Panel Height:
    - a. 1 inch High
  - 5. Texture:
    - a. Smooth
  - 6. Panel Edge:
    - a. Clip
  - 7. Substrate:
    - a. OSB or
    - b. Plywood
  - 8. Finish:
    - a. 36 stocked PAC-Clad colors (.032 aluminum) (Kynar Coating)
  - 9. Tests:
    - a. ASTM E 330 (12 inch only)
- B. Flush Soffit Panels: Pre-finished, pre-fabricated concealed fastener metal Soffit system to match wall panels.
- 1. Materials:
    - a. .032 aluminum
  - 2. Panel Width:
    - a. 12 inch, Wide Vent profile.
  - 3. Panel Height:
    - a. 1 inch high.
  - 4. Texture:
    - a. Smooth wide vent.
  - 5. Finish:
    - a. 36 stocked PAC-Clad colors (.032 aluminum) (Kynar Coating)

## 2.3 ACCESSORIES

- A. Metal Components:
  - 1. Provide accessories and other items essential to a complete roof or wall panel installation including panel clips, trim, closures, fascia, soffits, caps and similar metal components.
  - 2. Metal components fabricated from same gauge and finish as metal panels, unless otherwise noted.
  - 3. Flashing: Provide the same gauge and finish as the exterior panel, unless otherwise noted.
- B. Fasteners:
  - 1. Exposed fasteners shall be hex head self-drilling screws with bonded washers and color to match panels. Screws may be either plated steel or stainless steel as noted on the Drawings.
- C. Closure Strips: EPDM rubber to match configuration of the covering.
- D. Sealants:
  - 1. Exposed Sealants: One component silicone based as recommended by panel manufacturer: field applied.
  - 2. Concealed Sealants: Non-curing, non-skinning butyl, polyisobutylene or polybutane tape as recommended by panel manufacturer; field applied.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that substrates are acceptable for installation in accordance with manufacturer's instructions.
- B. Examine alignment of structural steel and related supports, primary and secondary framing, solid sheathing, prior to installation
- C. Verify wall openings, windows, doors, or louvers through walls are properly located.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations including approved shop drawings.
- B. Form panel shape as indicated on Drawings, accurate in size, square, and free from distortion or defects.
- C. Install flashing and trim true and in proper alignment.
- D. Separate dissimilar metals to prevent galvanic action.
- E. Use fasteners recommended by panel manufacturer; conceal fasteners wherever possible; cover and seal exposed fasteners.
- F. Provide uniform, neat seams; provide sealant-type joint where indicated and form joints to conceal sealant.
- G. Install sealants where indicated to clean dry surfaces only without skips or voids, to ensure weather tightness and integrity of the vapor barrier.

### 3.4 CLEANING

- A. Replace damaged panels and other components of work, which cannot be repaired by finish touch-up or similar minor repair.
- B. Wipe finished surfaces clean of any filings caused by drilling or cutting to prevent rust staining.

### 3.5 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 54 23**

### **TPO SINGLE PLY ROOFING SYSTEM**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Furnish and install elastomeric sheet roofing system, including:
  - 1. Roofing manufacturer's requirements for the specified warranty.
  - 2. Preparation of roofing substrates.
  - 3. Wood nailers for roofing attachment as required.
  - 4. Tapered Insulation.
  - 5. Cover boards.
  - 6. Self Adhering elastomeric membrane roofing.
  - 7. Metal roof edge, scuppers/leader heads & flashings.
  - 8. Walkway pads.
  - 9. Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete weatherproof roofing system.
- B. Disposal of debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at <http://manual.fsbp.com>.
- D. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

##### **1.02 RELATED SECTIONS/DRAWINGS**

- E. Section 03 51 13 - Cementitious wood fiber roof deck
- F. Section 06 10 00 - Rough Carpentry: Wood nailers associated with roofing and roof insulation as required.
- G. Roof Accessories: See architectural, structural and MEP drawings/specification information for Roof hatches, vents, plumbing piping, roof drains and manufactured curbs.

### **1.03 REFERENCES**

- H. Referenced Standards: These standards form part of this specification only to the extent they are referenced as specification requirements.
1. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.
  2. ASTM C 1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer; 2009.
  3. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics; 2010.
  4. ASTM D 1004 - Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting; 2009.
  5. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2000.
  6. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2011a.
  7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
  8. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
  9. FM 1-28 - Design Wind Loads; Factory Mutual System; 2007.
  10. FM 1-29 - Roof Deck Securement and Above Deck Roof Components; Factory Mutual System; 2006.
  11. PS 1 - Construction and Industrial Plywood; 2009.
  12. PS 20 - American Softwood Lumber Standard; 2010.
  13. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; 2007. (ANSI/SPRI ES-1).

### **1.04 SUBMITTALS**

- I. Product Data:
1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
  2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable; include data itemizing the components of the classified or approved system.
  3. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where

instructions allow installation options, clearly indicate which option will be used.

J. Shop Drawings: Provide:

1. The roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.
2. For tapered insulation, provide project-specific layout and dimensions for each board.
3. For roof coping, provide manufacturer's color selected to match the existing adjacent coping.

K. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.

L. Executed Warranty.

**1.05 QUALITY ASSURANCE**

M. Applicator Qualifications: Roofing installer shall have the following:

1. Current Firestone Master Contractor status or similar qualifications from alternate manufacturer.
2. At least five years experience in installing specified system.
3. Capability to provide payment and performance bond to building owner.

N. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.

1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
2. Notify Architect well in advance of meeting.

**1.06 DELIVERY, STORAGE AND HANDLING**

O. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.

P. Store materials clear of ground and moisture with weather protective covering.

Q. Keep combustible materials away from ignition sources.

**1.07 WARRANTY**

R. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

S. Warranty: Firestone 10 year Red Shield Limited Warranty covering membrane, roof insulation, and membrane accessories.

**Warranty  
Duration**

**Membrane Thickness,  
required minimums**

20 year maximum

.060 UltraPly TPO SA

1. Limit of Liability: No dollar limitation.
2. Scope of Coverage: Repair leaks in the roofing system caused by:
  - a. Ordinary wear and tear of the elements.
  - b. Manufacturing defect in Firestone brand materials.
  - c. Defective workmanship used to install these materials.
  - d. Damage due to winds up to 55 mph.
3. Not Covered:
  - a. Materials made entities other than Firestone Building Products
  - b. Damage due to winds in excess of 55 mph.
  - c. Damage due to hurricanes or tornadoes.
  - d. Hail.
  - e. Intentional damage.
  - f. Unintentional damage due to normal rooftop inspections, maintenance, or service.

## **PART 2 PRODUCTS**

### **1.1 MANUFACTURERS**

- A. Acceptable Manufacturer - Roofing System: Firestone Building Products Co., Carmel, IN.
- B. Roofing systems manufactured by others may be acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the manufacturer meets the following qualifications:
  1. Specializing in manufacturing the roofing system to be provided.
  2. Minimum ten years of experience manufacturing the roofing system to be provided.
  3. Able to provide a no dollar limit, single source roof system warranty that is backed by corporate assets in excess of one billion dollars.
  4. ISO 9002 certified.
  5. Able to provide polyisocyanurate insulation that is produced in own facilities.
- C. Manufacturer of Insulation and Cover Board: Same manufacturer as roof membrane.
- D. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.
  1. Metal roof edging products by other manufacturers are not acceptable.
  2. Field- or shop-fabricated metal roof edgings are not acceptable.

### **2.02 ROOFING SYSTEM DESCRIPTION**

IT TRAINING CENTER for the  
ECONOMIC DEVELOPMENT ADMINISTRATION  
NEWPORT, ARKANSAS

E. Roofing System:

1. Membrane: Self Adhering Thermoplastic Polyolefin (TPO).
2. Thickness: As specified elsewhere.
3. Membrane Attachment: Fully adhered.
4. Slope: Deck is not sloped. Provide additional slope to achieve 1/4 inch per foot (1:48 ) by means of tapered insulation.
5. Comply with applicable local building code requirements.
6. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
7. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28 and 1-29, and meeting minimum requirements of FM 1-[60, 90, 120, 160] wind uplift rating.

F. Insulation:

1. Total System R Value: 20, minimum.
2. Maximum Board Thickness: 2 inches (50 mm); use as many layers as necessary; stagger joints in adjacent layers. Minimum thickness of 1 inch.
3. Base Layer: Polyisocyanurate foam board, non-composite.
  - a. Attachment: Mechanical fastening.
4. Top Layer: Polyisocyanurate foam board, non-composite.
  - a. Attachment: Mechanical fastening.

C. Cover Board: High Density Polyisocyanurate Cover Board:

1. Thickness: 0.5 inch (12.7mm).
2. R-Value: 2.5 based on ASTM tests C158 and C177.
  - a. Attachment: Mechanical fastening.

## 2.03 TPO MEMBRANE MATERIALS

- A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D 6878, with polyester weft inserted reinforcement and the following additional characteristics:
1. Thickness: 0.060 inch (1.15 mm) plus/minus 10 percent, with coating thickness over reinforcement of 0.021 inch (0.54 mm) plus/minus 10 percent.
  2. Puncture Resistance: 300 lbf (1,334 N), minimum, when tested in accordance FTM 101C Method 2031.
  3. Solar Reflectance: 0.74, minimum, when tested in accordance with ASTM C 1549.
  4. Color: White
  5. Acceptable Product: UltraPly TPO SA with Secure Bond technology by Firestone.
- B. Membrane Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.
- C. Curb and Parapet Flashing: Same material as membrane, with encapsulated

edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches (457 mm) wide.

- D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
  - 1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent.
  - 2. Tensile Strength: 1550 psi (10.7 MPa), minimum, when tested in accordance with ASTM D 638 after heat aging.
  - 3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D 638 after heat aging.
  - 4. Tearing Strength: 12 lbf (53 N), minimum, when tested in accordance with ASTM D 1004 after heat aging.
  - 5. Color: Same as field membrane.
  - 6. Acceptable Product: UltraPly TPO Flashing by Firestone.
- E. Tape Flashing: 5-1/2 inch (140 mm) nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch (1.6 mm) nominal; TPO Quickseam Flashing by Firestone.
- F. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Firestone.
- G. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
- H. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches (33 mm) wide by 0.10 inch (2.5 mm) thick; Firestone Termination Bar by Firestone.
- I. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; UltraPly TPO Cut Edge Sealant by Firestone.
- J. General Purpose Sealant: EPDM-based, one part, white general purpose sealant; UltraPly TPO General Purpose Sealant by Firestone.
- K. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; UltraPly TPO Small and Large Pipe Flashing by Firestone.
- L. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch (3 mm) by 30 inches (760 mm) by 40 feet (12.19 m) long with patterned traffic bearing surface; UltraPly TPO Walkway Pads by Firestone.
- M. Yellow Safety Strip: To designate areas of caution on the roof or around rooftop objects. 5.5 inches wide (140 mm) by 100 feet long (30 m) strip and nominal 30 mil (0.76 mm) thick yellow TPO membrane laminated to a white, cured, seam tape. Compatible with TPO and EPDM; QuickSeam Yellow Safety Strip by Firestone.

## **2.04 ROOF INSULATION AND COVER BOARDS**

- N. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C 1289 Type II Class 1, with the following additional characteristics:
  - 1. Thickness: As indicated elsewhere.
  - 2. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.

3. Exception: Insulation to be attached using adhesive or asphalt may be no larger than 48 inches (1220 mm) by 48 inches (1220 mm), nominal.
  4. R-Value (LTTR): 1.0 inch (25 mm) Thickness: 5.7 R, minimum.
  5. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C 1289.
  6. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
  7. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
  8. Acceptable Product: ISO 95+ polyiso board insulation by Firestone
- A. High Density Polyisocyanurate Cover Board: Non-combustible, water resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D 1623, and with the following additional characteristics:
1. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.
    - a. Exception: Board to be attached using adhesive or asphalt may be no larger than 48 inches (1220 mm) by 48 inches (1220 mm), nominal.
  2. Thickness: 0.5 inch (12.7mm).
  3. R-Value: 2.5 R based on ASTM tests C158 and C177.
  4. Surface Water Absorption: <3%, maximum, when tested in accordance with ASTM C 209.
  5. Compressive Strength: 120psi, when tested in accordance with ASTM 1621.
  6. Density: 5pcf, when tested in accordance with ASTM 1622.
  7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
  8. Mold Growth Resistance: Passed, when tested in accordance with ASTM D 3273.
  9. Acceptable Product: ISOGARD HD Cover Board by Firestone.
- B. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

## **2.05 METAL ACCESSORIES**

- A. Metal Roof Edging and Fascia: Continuous metal edge membrane serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mount to roof edge nailer.
1. Wind Performance:
    - a. At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.
    - b. Fascia Pull-Off Resistance: At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.
    - c. Provide product listed in current Factory Mutual Research



Corporation Approval Guide with at least FM 1-90 rating.

1. Description: two piece: 45 degree sloped galvanized steel sheet edge membrane securing top and bottom edges of formed metal fascia; Firestone EdgeGard.
2. Fascia Face Height: Match existing adjacent fascia.
3. Dimensions:
  - a. Wall Width: As indicated on the drawings.
  - b. Piece Length: Minimum 144 inches (3650 mm).
1. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick galvanized steel cleat with pre-punched holes.
2. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.
3. Fasteners: Factory-furnished; corrosion resistant, electrolytically compatible; minimum pull out resistance of 240 pounds (109 kg) for actual substrate used; no exposed fasteners.

## **2.06 ACCESSORY MATERIALS**

- A. Wood Nailers: PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine; pressure preservative treated.
  1. Width: 3-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
  2. Thickness: Same as thickness of roof insulation.

## **PART 3 INSTALLATION**

### **3.01 GENERAL**

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install self-adhering roofing membrane only when surfaces are clean, dry,

smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (16 to 27 degrees C).

- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
  - 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
  - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
  - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- I. Consult membrane manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

### **3.02 EXAMINATION**

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptance of project conditions and requirements.

### **3.03 PREPARATION**

- A. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.
- B. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.

### **3.04 INSULATION AND COVER BOARD INSTALLATION**

- A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.
- B. Install only as much insulation as can be covered with the completed roofing

system before the end of the day's work or before the onset of inclement weather.

- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch (6 mm). Fill gaps greater than 1/4 inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).
- E. Mechanical Fastening: Using specified fasteners and insulation plates, engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.

### **3.05 SELF ADHERING SINGLE-PLY MEMBRANE INSTALLATION**

- A. Substrates must be clean, dry and free of foreign material which could inhibit adhesion.
  - 1. Install Firestone UltraPly TPO SA membrane with Secure Bond technology only when ambient and substrate temperatures are 20 °F (-7 °C) minimum and rising. Do not install Firestone UltraPly TPO SA below this minimum temperature.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
  - 1. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
  - 2. Fold back one side (1/2 of the membrane) to expose the release liner without disturbing the original position.
  - 3. Starting at one end, remove the release liner at a 45° angle in one continuous motion.
  - 4. Immediately broom the installed membrane. Roll the installed membrane with a weighted roller to ensure full contact with the substrate.
- C. Fold back the remaining half of membrane and repeat the preceding steps.
- D. Follow all current manufacturer technical specifications for heat welding TPO membrane.
  - 1. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches (1:6 ) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.

- a. Exception: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
  - b. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.
2. Side Laps: All seams (side laps) must be heat-welded. Overlap adjoining sheets and heat weld the uncoated area to create a minimum 1½" welded monolithic seam.
  3. End Laps: Adjoining rolls must be butted together (not lapped). Strip in all butted end laps according to manufacturer's instructions. Apply cut edge sealant to all exposed scrim areas of the membrane strip.

### **3.06 FLASHING AND ACCESSORIES INSTALLATION**

- E. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- F. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
  1. Follow roofing manufacturer's instructions.
  2. Remove protective plastic surface film immediately before installation.
  3. Install water block sealant under the membrane anchorage leg.
  4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
  5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
  6. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
  7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- G. Roofing Expansion Joints: Install as shown on drawings and as recommended by roofing manufacturer.
- H. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface.
  1. Use the longest practical flashing pieces.
  2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
  3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.

4. Provide termination directly to the vertical substrate as shown on roof drawings.

I. Roof Drains:

1. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed manufacturer's recommendations.
2. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.
3. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
4. Apply sealant on top of drain bowl where clamping ring seats below the membrane
5. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.

J. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.

1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches (50 mm) deep, with at least 1 inch (25 mm) clearance from penetration, sloped to shed water.
3. Structural Steel Tubing: If corner radii are greater than 1/4 inch (6 mm) and longest side of tube does not exceed 12 inches (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.
4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

### **3.07 FINISHING AND WALKWAY INSTALLATION**

- K. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
- L. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch (25 mm) and maximum of 3.0 inches (75 mm) from each other to allow for drainage.
1. If installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches (150 mm) on either side.
  2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

### **3.08 FIELD QUALITY CONTROL**

M. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).

N. Perform all corrections necessary for issuance of warranty.

### **3.09 CLEANING**

O. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.

P. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.

Q. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

### **3.10 PROTECTION**

R. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

**END OF SECTION**

SECTION 07 92 00  
JOINT SEALANTS

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 sealants for the following applications:
  - 1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:
    - a. Joints between different materials.
    - b. Perimeter joints at frames of doors and windows.
    - c. Other joints as indicated.
  - 2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
    - a. Perimeter joints between interior wall surfaces and frames of interior doors, windows, running trim and built-in cabinets..
    - b. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - c. Other joints as indicated

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
  - 2. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## PART 2 - PRODUCTS

### 2.1 PRODUCTS AND MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified in the sealant schedules at the end of Part 3.

### 2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.



- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

## 2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

## 2.4 LATEX JOINT SEALANTS

- A. Latex Sealant Standard: Comply with ASTM C 834 for each product of this description indicated in the Latex Joint-Sealant Schedule at the end of Part 3.

## 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
    - a. Masonry.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
    - a. Metal.
    - b. Glass.
    - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses provided for each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealants from surfaces adjacent to joint.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

### 3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants

immediately so installations with repaired areas are indistinguishable from the original work.

### 3.6 ELASTOMERIC JOINT-SEALANT SCHEDULE

- A. Mildew-Resistant Silicone Sealant: Where joint sealants of this type are indicated, provide products formulated with fungicide that are intended for sealing interior joints that are subject to in-service exposures of high humidity and temperature extremes, and that comply with the following:
1. Products: Available products include the following:
    - a. 786 Mildew Resistant; Dow Corning.
    - b. Sanitary 1700; GE Silicones.
    - c. NuFlex 302; NUCO Industries, Inc.
    - d. 898 Silicone Sanitary Sealant; Pecora Corporation.
    - e. PSI-611; Polymeric Systems, Inc.
    - f. Tremsil 600 White; Tremco.
  2. Type and Grade: S (single component) and NS (nonsag).
  3. Class: 25.
  4. Use Related to Exposure: NT (nontraffic).
  5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
  6. Applications: Around countertop backsplash and around toilet fixtures and pipe penetrations.
- B. Single-Component Nonsag Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:
1. Products: Available products include the following:
    - a. Chem-Calk 900; Bostik Findley.
    - b. Chem-Calk 915; Bostik Findley.
    - c. Vulkem 916; Tremco.
    - d. Dynatrol I-XL; Pecora Corporation.
    - e. Flexiprene 1000; Polymeric Systems, Inc.
    - f. PSI-901; Polymeric Systems, Inc.
    - g. SM7100 Permathane; Schnee-Morehead, Inc.
    - h. DyMonic; Tremco.
  2. Type and Grade: S (single component) and NS (nonsag).
  3. Class: 25.
  4. Use Related to Exposure: NT (nontraffic).
  5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

6. Applications: Exterior vertical and horizontal joints.

### 3.7 LATEX JOINT-SEALANT SCHEDULE

- A. Latex Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

1. Products: Available products include the following:
  - a. Chem-Calk 600; Bostik Findley
  - b. NuFlex 330; NUCO Industries, Inc.
  - c. SM 8200; Schnee-Moorhead, Inc..
  - d. AC-20; Pecora Corporation.
  - e. PSI-701; Polymeric Systems, Inc.
  - f. Sonolac; Sonneborn Building Products Div., ChemRex, Inc.
  - g. Tremflex 834; Tremco.
2. Applications: Interior calking and sealing; perimeter sealing around door and window frames and general calking applications.

END OF SECTION 07 92 00

## SECTION 07 92 13 JOINT SEALERS

### PART 1 - GENERAL

- 1.1 SUMMARY:
  - A. Section Includes: Preparing substrate surfaces and Sealant and joint backing.
- 1.2 SYSTEM DESCRIPTION: System performance to achieve moisture tight joint seals.
- 1.3 SUBMITTALS:
  - A. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and colors available.
  - B. QUALITY ASSURANCE: Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- 1.4 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS: Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

### PART 2 - PRODUCTS

- 2.1 MANUFACTURERS:
  - A. Chemrex, Sonneborn, 889 Valley Park Drive, Shakopee, Minnesota 55379, (800) 433-9517 Style Sonolastic NP-1.
  - B. Substitutions: Under provisions of Section 01600.
- 2.2 SEALANTS
  - A. Polyurethane Sealant : ASTM C920, Grade NS, Class 25; single component, chemical curing, non-staining, non-bleeding self-leveling type; color as selected.
    - 1. Elongation Capability: 25 percent
    - 2. Service Temperature Range: -40 to 180 degrees F (-40 to 82 degrees C)
    - 3. Shore A Hardness Range: 20 to 35.
- 2.3 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: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.
  - D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

### PART 3 - EXECUTION

- 3.1 EXAMINATION AND PREPARATION: Verify that joint openings are ready to receive work. Verify that joint backing and release tapes are compatible with sealant.
- 3.2 PREPARATION: Clean joints in accordance with manufacturer's instructions. Remove loose materials and foreign matter which might impair adhesion of sealant. Perform preparation in accordance with ASTM C804 for solvent release or ASTM C790 for latex base sealants.
- 3.3 INSTALLATION: Measure joint dimensions and size materials to achieve required width/depth ratios. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width. Install bond breaker where joint backing is not used. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges. Tool joints square.
- 3.4 CLEANING: Remove all trash and debris from the site. Keep areas clean of excess materials and rubbish during and after application. Remove all spatters, spillage and soiling with appropriate cleaning agents and procedures from adjacent and surrounding equipment, surfaces and substrates and leave area in neat and clean condition.

End of Section

SECTION 08 11 13  
STEEL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Steel doors and steel frames.

1.2 RELATED SECTIONS

- A. Section 08 14 00 - Wood Doors.
- B. Section 09 90 00 - Interior and Exterior Painting.

1.3 REFERENCES

- A. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 1998.
- B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames.
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998.
- D. ANSI A250.11, Recommended Erection Instructions for Steel Frames.
- E. ASTM A 366/A 366M - Standard Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled; 1997.
- F. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-coated (Galvannealed) by the Hot-Dip Process; 1998.
- G. ASTM E-90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- H. DHI A115.1G - Installation Guide for Doors and Hardware; 1994.
- I. NFPA 80 - Standard for Fire Doors and Windows; 1999.
- J. NFPA 252 - Standard Methods of Fire Tests for Door Assemblies; 1995.
- K. UL 10B - Standard for Fire Tests of Door Assemblies; 1997.
- L. UL 10C - Positive Pressure Fire Tests of Door Assemblies.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.

- 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.
- C. Shop Drawings: Include schedule identifying each unit, with door marks or numbers referencing drawings. Show layout, profiles, product components and anchorages.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum five years documented experience manufacturing products specified this Section.
- B. Installer Qualifications: Minimum five years documented experience installing products specified this Section.
- C. All products shall conform to the requirements of ANSI A250.8, "SDI 100 Recommended Specifications for Standard Steel Doors and Frames".
- D. Insulated Doors shall have:
  - 1. A "U Factor" of 0.10 for a Polyurethane core.
- E. Fire Rated Doors:
  - 1. Doors shall be tested in accordance with UL 10B, "Fire Tests of Door Assemblies", NFPA 252, "Fire Tests of Door Assemblies", and UL 10C, "Positive Pressure Fire Tests of Door Assemblies".
  - 2. Doors must have an approved marking or physical label, applied by an authorized facility, in accordance with the procedure set forth by an independent certification agency.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Handle, store and protect products in accordance with the manufacturers printed instructions and ANSI/SDI A250.10 and NAAMM/HMMA 840.
- B. Store frames in an upright position with heads uppermost under cover. Place on 4 inch (102 mm) high wood sills to prevent rust and damage. Store assembled frames five units maximum in a stack with 2 inch (51 mm) space between frames to promote air circulation.
- C. Do not store under non-vented plastic or canvas shelters.
- D. Remove wrappers immediately if they become wet.

#### 1.7 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent



interruption of construction progress.

- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Republic Doors and Frames an Allegion Brand.
- B. Substitutions: Not permitted without approval of Owner's Representative.
- C. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00 - Product Requirements.

### 2.2 MATERIALS

- A. Uncoated Steel Sheet: Cold rolled commercial steel sheet complying with ASTM A 366/A 366M.

### 2.3 DOORS AND FRAMES

- A. Doors: Full flush (No Vertical Face Seams), complying with ANSI A250.8; face panels laminated to core and complete unit closed with steel perimeter channels projection welded to face sheets.
  - 1. Thickness: 1-3/4 inches (44 mm).
    - a. ANSI Level 3, Model 1; 16 gage (1.3 mm) faces, visible edge seams.
  - 2. Faces:
    - a. Full flush.
  - 3. Face Material:
    - a. Cold Roll steel sheet.
  - 4. Core: Manufacturer's standard core
  - 5. Steel Stiffened Doors: Steel reinforced with minimum 20 gage (0.794 mm) hat shaped stiffeners welded to the inside of each face sheet at maximum of 6 inches (150 mm) on center, with mineral wool filling spaces between stiffeners. Stiffeners shall be manufacturer's standard.
  - 6. Beveled Doors: Bevel lock edge of door 1/8 inch in 2 inches (3 mm in 50 mm).
  - 7. Finish: Factory prime finish.
- B. Door Reinforcements:
  - 1. Top and Bottom Channels: 16 gage steel, projection welded to both face sheets at a maximum of 2-1/2 inches (64 mm) on center.
    - a. For exterior Doors fill top channel with epoxy and grind smooth.
  - 2. Hinge Reinforcement: Manufacturer's standard.
  - 3. Lock Reinforcing Channel: Lock reinforcing channel shall be projection welded to both face sheets.
    - a. DL Series: Non beveled and reinforced with a continuous 16 gage channel. 16 gage reinforcements for mortised or cylindrical locks are of an integral type in accordance with ANSI A115 standards.
  - 4. Closer Reinforcement: 12 gage box type reinforcement, 18 inches (457

mm) long.

## 2.4 FRAMES CONSTRUCTION

- A. Frames: Formed steel sheet, with 2 inch (50 mm) wide face jambs and heads unless otherwise indicated; complying with ANSI A250.8.
  - 1. Frame Depth: Fixed, as indicated on drawings.
  - 2. ANSI Level 3 Doors: 16 gage (1.5 mm) frames.
  - 3. Material: Cold Roll steel sheet.
  - 4. Corners: Mitered; face welded and ground smooth.
  - 5. Provide 3 silencers for single doors, 2 silencers on head of frame for pairs of doors.
  - 6. Finish: Factory prime finish.
- B. Reinforcements for 1-3/4 Inch (44 mm) Frames:
  - 1. Hinge Reinforcements: 9 gage (3.8 mm).
  - 2. Strike Reinforcement: 10 gage (3.4 mm) equivalent.
  - 3. Closer Reinforcements: 12 gage (2.6 mm).
- C. Frame Anchors: Minimum of six wall anchors and two base anchors. Provide with an additional anchor for every 30 inches (760 mm) over 90 inches (2286 mm).

## 2.5 FACTORY FINISH

- A. All doors, frames, and stick components shall be cleaned and finished in accordance with ANSI A250.10, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames".
- B. Preparation: Clean and phosphatize surfaces of steel doors and frames".
- C. Primer: Apply one coat of a gray, alkyd acrylic enamel primer, forced cured.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that substrate conditions are acceptable for installation of doors and frames in accordance with manufacturer's installation instructions and technical bulletins.
- C. Verify door frame openings are installed plumb, true, and level.
- D. Select fasteners of adequate type, number, and quality to perform intended functions.
- E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install frames plumb, level, rigid and in true alignment in accordance with ANSI A250.11, "Recommended Erection Instructions for Steel Frames" and ANSI A115.IG, "Installation Guide for Doors and Hardware".
- C. All frames other than slip-on types shall be fastened to the adjacent structure to retain their position and stability.
- D. Install fire-rated doors and frames in accordance with NFPA 80 and local code authority requirements.
- E. Install doors to maintain alignment with frames to achieve maximum operational effectiveness and appearance. Adjust to maintain perimeter clearances as required. Shim as needed to assure the proper clearances are achieved.
- F. Install hardware in accordance with the hardware manufacturer's recommendations and templates. ANSI A115.IG, "Installation Guide for Doors and Hardware" shall be consulted for other pertinent information.

### 3.4 CLEARANCES

- A. Clearance between the door and frame head and jambs for both single swing and pairs of doors shall be 1/8 inch (3.2 mm).
- B. Clearance between the meeting edges of pairs of doors shall be 3/16 inch plus or minus 1/16 inch (5 mm plus or minus 1.6 mm). For fire rated applications, the clearance between the meeting edges of pairs of doors shall be 1/8 inch plus or minus 1/16 inch (3.2 mm plus or minus 1.6 mm).
- C. Bottom clearance shall be 3/4 inch (19 mm). (Standard)
- D. The clearance between the face of the door and door stop shall be 1/16 inch to 1/8 inch (1.6 mm plus or minus 3.2 mm).
- E. All clearances shall be, unless otherwise specified, subject to a tolerance of plus or minus 1/32 inch (.4 mm).

### 3.5 ADJUSTING AND CLEANING

- A. Adjust doors for free swing without binding.
- B. Adjust hinge sets, locksets, and other hardware. Lubricate using a suitable lubricant compatible with door and frame coatings.
- C. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in

accordance with manufacturer's instructions before owner's acceptance.

- D. Remove from project site and legally dispose of construction debris associated with this work.

### 3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08 14 16  
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.

1.2 SUBMITTALS

A. Product Data: For each type of door.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.

1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A ARCHITECTURAL WOOD FLUSH DOORS."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ampco, Inc.
2. Graham.
3. VT Industries Inc.

## 2.2 DOOR CONSTRUCTION, GENERAL

### A. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-1, made with binder containing no urea-formaldehyde resin.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

## 2.3 VENEERED-FACED DOORS - FACTORY FINISH

### A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species: Red Oak.
3. Cut: Plain sliced.
4. Assembly of Veneer Leaves on Door Faces: Balance match.
5. Core: Particleboard.
6. Construction: Five plies.bonded, hot-pressed, then entire unit abrasive planed before veneering.
7. Factory finish: Manufacturer's standard system.

## 2.4 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Openings: Cut and trim openings through doors in factory.
  1. Light Openings: Trim openings with moldings of material and profile indicated.
  2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.

END OF SECTION

## SECTION 08 41 13

### ALUMINUM STOREFRONTS & ENTRANCES

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Aluminum storefronts and Entrance Doors..

##### 1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 2. ASTM E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
  - 3. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 4. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

##### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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.
- C. Shop Drawings: Configuration and details for installation, maintenance and operation.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

##### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.



## 1.5 PRE-INSTALLATION MEETINGS

- A. Pre-installation meeting to be scheduled..

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

## 1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

## 1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with project requirements, available manufacturers offering products that may be incorporated into the work, include, but are not limited to the following:
  - 1. Kawneer
  - 2. Tubelite
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 ALUMINUM STOREFRONT

- A. Product: Thermal Barrier Design - Aluminum Storefront and Entrance Doors.
- B. Design:
  - 1. Framing sections shall be extruded from 6063-T5 aluminum alloy.
  - 2. Glazing beads shall be NS (non-stretch, high-shore) vinyl used on both sides of the glass. Vinyl shall incorporate a fiberglass cord bonded with the vinyl.
  - 3. Sections shall conform to details and shall present clean, straight, sharply defined lines, and shall be free from defects impairing strength or durability.
  - 4. Screws, nuts, bolts and fastening devices and internal components shall be of aluminum, stainless steel or other non-corrosive material.
  - 5. Factory preparation from detail drawings shall be so fabricated that field assembly will be able to produce accurate, tightly fitted joints.

- C. 2 X 4-1/2 inch, Center Glaze For 1" Glazing:
- D. Finish: To be selected from manufacturer's standard offerings.

## 2.3 DOORS

- A. Medium Stile:
  - 1. 3-1/2 inches stile with 3-1/4 inches rail.
  - 2. Medium stile single acting
  - 3. ADA compliant high bottom rail
  - 4. Finish: To be selected from manufacturer's standard offerings.
- B. Accessories:
  - 1. ADA Bottom Rail: 10-1/2 inches (267 mm) high.
  - 2. Threshold: 4 inches (102 mm) extruded aluminum
    - a. Finish: Mill.
  - 3. Hardware: See Door Schedule in drawings for exit device and key cylinder information.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

### 3.4 FIELD QUALITY CONTROL

- A. All joints between metal and masonry shall be fully caulked and field tested to resist water leakage with provisions taken to drain infiltrated water.

### 3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

**SECTION 08 51 13  
ALUMINUM WINDOWS**

**PART 1      GENERAL**

**1.01   SUMMARY**

A. Section Includes:

1. Fixed Aluminum Window Units
2. Glass and Glazing for Aluminum Windows.
3. Wood Blocking, Shims, Anchors, Clips, and all accessories necessary for a complete installation furnished and installed.
4. All aluminum trim and closure pieces
5. Installation labor, tools, equipment, and services necessary for installation of Aluminum Windows.

B. Related Sections:

1. Section 07 92 00 (07920) - Joint Sealants

**1.02   REFERENCES**

A. Aluminum Association (AA)

DAF-45 – “Designation System for Aluminum Finishes”

B. American Architectural Manufacturers Association (AAMA):

1. 101 – “Voluntary Performance Specification for Windows, Skylights and Glass Doors”
2. 502 – “Voluntary Specification for Field Testing of Newly Installed Fenestration Products”
3. 611 – “Voluntary Specification for Anodized Architectural Aluminum”

4. 1503 – “Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections”
5. 2605 – “Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels”
6. CW-10 – “Care and Handling of Architectural Aluminum from Shop to Site”

C. American National Standards Institute (ANSI) Publications

1. Z97.1 – “Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings”

D. ASTM International (ASTM) Publications:

1. C518 – “Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus”
2. C1036 – “Standard Specifications for Flat Glass”
3. C1048 – “Standard Specifications for Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass”
4. D3985 – “Standard Test Method for Oxygen Gas Transmission Rate Through Plastic Film and Sheeting Using a Coulometric Sensor”
5. E90 – “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements”
6. E283 – “Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen”
7. E330 – “Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference”
8. E331 – “Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference”
9. E413 – “Classification for Rating Sound Insulation”
10. E547 – “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential”

- 11.E774 – “Standard Specification for Sealed Insulating Glass Units”
- 12.E1886 – “Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials”
- 13.E1996 - “Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes”
- 14.F588 - “Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact”
- 15.F1249 – “Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor”

E. Glass Association of North America (GANA):

1. “GANA Glazing Manual”

F. Insulating Glass Certification Council (IGCC)

G. Insulating Glass Manufacturers Alliance (IGMA) Publications:

1. Glazing Guidelines

H. National Fenestration Ratings Council (NFRC)

I. U.S. Consumer Product Safety Commission (CPSC) Publications:

1. 16 CFR Part 1201 “Safety Standard For Architectural Glazing Materials”

J. Window and Door Manufacturers Association (WDMA) Publications:

1. ANSI/AAMA/WDMA 101/I.S.2/NAFS-02 “Voluntary Performance Specification for Windows, Skylights and Glass Doors”
2. AAMA/AAMA/WDMA/CSA 101/I.S.2/A440 “Standard/Specification for Windows, Doors and Unit Skylights”

### 1.03 SUBMITTALS

- A. Submit “Letter of Conformance” in accordance with Section 01 33 00 – with the following supporting data:

1. Product data for each type of aluminum window specified, including standard construction details, dimensions of individual components, profiles, finishes, and accessories.
2. Shop drawings for each type of window specified, including 1/4-inch scale wall elevations, typical unit elevations at 3/4-inch scale details, full size details of typical composite members and the following:
  - a. Panning Details
  - b. Flashing and drainage details.
  - c. Mullion details, including reinforcement and stiffeners.
  - d. Joinery details.
3. Samples: Provide full-size or partial-size sample of window illustrating glazing system, quality of construction and finish.
4. Product certificates signed by the window manufacturer certifying that window units comply with specified performance requirements.
5. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.05 PERFORMANCE REQUIREMENTS as requested by Architect.

#### **1.04 DEFINITIONS**

- A. Performance grade number, included as part of the AAMA/WDMA/CSA 101/I.S.2/A440 product designation code, is actual design pressure in pounds force per square foot used to determine structural test pressure and water test pressure.

#### **1.05 PERFORMANCE REQUIREMENTS**

- A. Certify that windows have been tested in accordance with American Architectural Manufacturers Association (AAMA/WDMA) Specification for Performance Class specified complying with the following performance standards:

1. AAMA/WDMA/CSA 101/I.S.2/A440 Performance Requirements: Provide aluminum windows of the performance class and grade indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440.
  - a. Performance Class: F-HC
  - b. Performance Grade: 50
2. Uniform Structural Properties (ASTM E330): Pressure acting inward and outward. No permanent damage to glass or fasteners shall occur with permanent deformation at a maximum of 1/175 of its span, when tested at a static air pressure difference of the following:
  - a. Class F-HC-50: 75.0 PSF
2. Water Resistance (ASTM E331 and ASTM E547): No water penetration at test pressure indicated.
  - a. Class F-HC-50: 10.00 PSF
2. Air Leakage (ASTM E283):
  - a. Maximum 0.3 CFM per sq./ft. of total exterior surface area, when tested at a static air pressure differential of 6.2 PSF minimum.

**B. Project Wind Loads:**

1. The system shall be designed to withstand the following loads with respect to the plane of the wall as required by applicable codes.

## **1.06 QUALITY ASSURANCE**

**A. All window units shall be manufactured by a single source.**

1. All windows in any one project must be by the same manufacturer and with comparable frame depth, profile, glazing bite, and installation requirements. Manufacturer must provide a window system that can incorporate all window configurations used on the project.
2. Standards: Requirements for aluminum windows, terminology and standard of performance, and fabrication workmanship are those specified

and recommended in AAMA/WDMA/CSA 101/I.S.2/A440 and The Aluminum Association (AA).

- a. All window units shall be labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440. The label shall state the name of the manufacturer, the approved labeling agency and the product designation as specified in AAMA/WDMA/CSA 101/I.S.2/A440.
- b. All testing shall be conducted using AAMA/WDMA/CSA 101/I.S.2/A440 Gateway Performance minimum specified test sizes.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Transportation and Handling: Transport products by methods to avoid product damage, deliver in undamaged condition in manufacturer's unopened containers or packaging. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- B. Storage and Protection: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain with temperature and humidity ranges required by manufacturer's instruction.

#### **1.08 WARRANTIES**

##### **A. Aluminum Window Warranty**

1. Products: Submit a written warranty, executed by the window manufacturer, for the following:
  - a. Framing components: A period of (1) year from the date of manufacture, against defective materials and workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which results in premature failure of the windows or parts, outside of normal wear.
  - b. Insulated glass units: A period of (10) years from the date of manufacture, against insulated glass seal failure unrelated to glass breakage.
  - c. In the event windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.



- d. Where applicable, materials which are applied to the face of insulated glass for the purpose of simulating division in glass openings (SDL's) are warranted against detaching from the glass surface for a period of (5) years.
  - e. Finish: Refer to Part 2, Section 2.06 "FINISHES" for warranty requirements.
  - f. Warranty for all components must be direct from the manufacturer (non- pass through) and non- prorated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.
2. Installation: Submit a written warranty, executed by the window installer, for a period of (1) year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
- a. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

## **PART 2        PRODUCTS**

### **2.01    MANUFACTURERS**

#### **A. Approved Manufacturers:**

- 1. Quaker Window Products Company, Inc. (800) 347-0438
  - a. Fixed Window: "K300 DS Series"
- 2. Substitutions: Only pre-approved products specified by the Architect will be acceptable. Submit the following information with proper documentation as required for pre-bid substitution requests, and at least (10) working days prior to bid date.
  - a. Independent test reports certifying that proposed product is in accordance with, and meets all criteria specified in Section 1.05 "PERFORMANCE REQUIREMENTS".
  - b. Drawing details of elevations and sections, and samples in accordance with, and as specified in Section 1.03 "SUBMITTALS".

- c. Copy of manufacturer's warranty specified in accordance with, and as specified in Section 1.08 "WARRANTIES".
- d. Any additional information requested by the Architect.

## **2.02 MATERIALS**

### **A. Aluminum Members:**

- 1. Extruded aluminum prime billet 6063-T6 alloy for primary components, 6063-T6, or 6061-T6 for structural components, all in accordance with (ASTM B221).

### **B. Structural Thermal Break Construction:**

- 1. Frame and sash members shall include a structural thermal barrier, applied in the manufacturer's facility, using concealed low-conductance poured-in-place polyurethane in a pre-treated cavity.
- 2. After proper curing, the aluminum bridge section must be removed to provide a 1/4" minimum separation between interior and exterior metal surfaces.
- 3. The thermal barrier cavity shall have a manufactured mechanical lock applied consisting of abrading or lancing of the extrusion cavity prior to application of poured-in-place polyurethane.
- 4. Thermal Break Performance Requirements:
  - a. Shear strength: minimum 2,500 Lbf in accordance with (AAMA TIR-A8).
  - b. Flexural strength: minimum 19,000 psi in accordance with (AAMA\_D 790).
  - c. Thermal conductivity of barrier material: maximum 0.84 BTU-in/(hr-ft<sup>2</sup>-°F) in accordance with (ASTM C 518).
  - d. Systems employing non-structural thermal barriers, or barrier systems absent of a mechanical lock application are not acceptable.

## **2.03 MANUFACTURED UNITS**

- A. Principal window frame members shall have a minimum 0.062" wall thickness, which includes all mounting webs and sectional flanges.

B. Window frame depth shall be 3 1/4" minimum.

C. Glazing: Refer to Section 2.05 "GLASS MATERIALS".

## **2.04 COMPONENTS**

A. All fasteners, tools, equipment, and other materials necessary for a complete installation shall be furnished by the Contractor.

1. Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be noncorrosive and compatible with all window members, cladding, trim, anchors, and other components.

B. Thermoplastic or thermo-set plastic caps, housings, and other components to be injection-molded nylon, extruded PVC, or other suitable compound.

C. Accessories:

2. Sills: Manufacturer's standard exterior sills, as shown on Drawings.

3. Trim: Manufacturer's standard interior snap trims, type as shown on Drawings.

4. Mullions: Provide mullions and cover plates as shown, matching window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

5. Muntins:

a. Internal Muntins:

1) Roll formed aluminum of specified width, located between glass panes within the sealed insulated glass unit. Interior applied extruded aluminum Muntin of specified width, continuously adhered to surface of glass with a high performance acrylic adhesive system.

2) Finish of Exterior and Interior applied muntin components shall comply with Section 2.06 "FINISHES".

3) Finish color of internal muntins shall match Window Frame.

## 2.05 GLASS MATERIALS:

A. Tempered Glass: Fully tempered. See Window Schedule on drawing sheet A600. Clear and tinted.

1. All tempered glass shall conform to ASTM C1048, ANSI Z97.1, and CPSC 16 CFR Part 1201. Tempered glass shall bear permanent monogram indicating tempered quality. Fabrication marks on tempered glass shall be located to be concealed in completed installation.

C. Windows shall be glazed as follows:

2. Sound Transmission Class (STC) (ASTM E413): Provide glazing required for conforming to over all STC ratings as specified for aluminum windows.

- a. Sound Transmission Class (STC): 27 minimum

D. Insulating Glass: Manufacturer's standard units that comply with specified quality standards and coatings.

- a. Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E774 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, space material, and desiccants.

- 1) Total Thickness: 1"
- 2) Thickness of Each Pane: 1/8"
- 3) Air Space Thickness: 3/4"

b. Exterior Pane of Glass:

- 1) Provide tempered glass where shown on Drawings and as required by local codes and ordinances.

b. Insulated Unit Sealing System:

- 1) Thermal conductivity of insulated glass spacer shall perform in accordance to the following:
  - a) Silicone: 0.202 BTU/hr-ft-F (0.350 W/m-K)
  - b) PIB 0.089 BTU/hr-ft-F (0.155 W/m-K)
  - c) Desiccant (loose fill): 0.017 BTU/hr-ft-F (0.030 W/m-K)
  - d) Spacer: 8.197 BTU/hr-ft-F (14.187 W/m-K)
- 2) Insulated glass unit spacer system must include a secondary dual seal. This also applied to solid foam warm edge seal glass spacer systems.

## **2.06 FINISHES**

- A. Finish of Aluminum Components.  
Superior Performance Organic Powder Coating conforming to AAMA 2605.
  - a. Finish Warranty Period: 15 years from date of manufacture
  - b. Color Selection: To be selected from manufacturer's standard selection chart.

## **2.07 FABRICATION**

- A. Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.
- B. Rigidly fit joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant.
- C. Develop drainage holes with moisture pattern to exterior.
- D. Prepare components to receive anchor devices. Fabricate anchorage items

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Site Verification of Conditions:

1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
2. Do not install windows until unsatisfactory conditions are corrected.

### **3.02 INSTALLATION**

#### **A. Erection of Aluminum Windows**

1. Install windows with skilled tradesmen in exact accordance with approved Shop Drawings, Installation Instructions, Specifications, and in accordance with (AAMA\_101/I.S.2./ A440).
2. Windows must be installed plumb, square, and level for proper weathering and operation. Jambs must not be "sprung", bowed, or warped during installation.
3. Any uncoated aluminum components of Aluminum Window shall be insulated from direct contact with steel, masonry, concrete, or other dissimilar metals by bituminous paint, zinc chromate primer, nonconductive shims, or other suitable insulating materials.

#### **B. Field Tests**

1. Field testing procedure of installed windows shall be in accordance with AAMA 502.
2. The test pressure used during the field test procedure shall be 2/3 of the rated test pressure of the test specimen in accordance with AAMA 502. There shall be no optional variances over 2/3 used during testing.
3. Initial field testing must be performed prior to no more than 5% of windows have been installed. All field testing expenses shall be at the burden of the contractor.

### **3.02 ADJUSTING AND CLEANING**

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, or other debris. Protection from this point shall be the responsibility of the General Contractor.

#### **END OF SECTION**

## SECTION 09 29 00

### GYPSUM BOARD

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Standard Gypsum Board.
- B. Interior Ceiling Gypsum Board.

##### 1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B.

##### 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C 473 - Standard Test Methods for Physical Testing of Gypsum Panel Products.
  - 2. ASTM C 475 - Standard Specification for Joint Compound and Joint Tape for Finishing.
  - 3. ASTM C 514 - Standard Specifications for Nails for the Application of Gypsum Board.
  - 4. ASTM C 639 - Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants.
  - 5. ASTM C 681 - Standard Test Method for Volatility of Oil- and Resin-Based, Knife-Grade, Channel Glazing Compounds.
  - 6. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board.
  - 7. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
  - 8. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - 9. ASTM C 1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - 10. ASTM C 1396 - Standard Specification for Gypsum Board.
  - 11. ASTM D 2202 - Standard Test Method for Slump of Sealants.
  - 12. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
  - 13. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 14. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  - 15. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
  - 16. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

17. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 176; C.
18. ASTM E 695-03 - Standard Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
19. ASTM E 2126-02a - Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Walls for Buildings.
20. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

B. Gypsum Association (GA):

1. GA-214 - Recommended Levels of Gypsum Board Finish.
2. GA-216 - Application and Finishing of Gypsum Panel Products.
3. GA-231 - Assessing Water Damage to Gypsum Board.
4. GA-238 - Guidelines for the Prevention of Mold Growth on Gypsum Board.
5. GA-253 - Application of Gypsum Sheathing.
6. GA-801 - Handling and Storage of Gypsum Panel Products: A Guide For Distributors, Retailers, and Contractors.

#### 1.4 SUBMITTALS

- A. Refer to Section 01 33 00 - Administrative Requirements Submittal Procedures
- B. Product Data: Submit manufacturer current technical literature for each component.
- C. Quality Assurance Submittals:
  1. Provide products manufactured in North America only.
  2. Manufacturer Instructions: Provide manufacturer's written installation instructions

#### 1.5 QUALITY ASSURANCE

- A. Installer shall have experience with installation of gypsum board under similar conditions.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic and other causes in accordance with GA-238 and manufacturer recommendations. Stack product flat to prevent sagging. In addition, follow guidelines found in GA-801.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 or GA-216 requirements, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and



those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## 1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Acceptable Manufacturers: American Gypsum, Certainteed Corporation, Georgian-Pacific, PABCO Gypsum, USG Corporation.

### 2.2 STANDARD GYPSUM BOARD

- A. Basis of Design: Regular Gypsum Board.
  1. Panel Physical Characteristics:
    - a. Core: Regular Gypsum Core.
    - b. Surface Paper: 100 percent recycled content paper on front, back and long edges.
    - c. Long Edges: Tapered.
    - d. Overall Thickness/ Weight: 5/8 inch.
    - e. Panel complies with requirements of ASTM C 1396.

### 2.3 INTERIOR CEILING GYPSUM BOARD

- A. Basis of Design: Regular Gypsum Board.
  1. Panel Physical Characteristics:
    - a. Core: Regular Gypsum Core.
    - b. Surface Paper: 100 percent recycled content paper on front, back and long edges.
    - c. Long Edges: Tapered.
    - d. Overall Thickness: 5/8 inch.
    - e. Panel complies with requirements of ASTM C 1396.
    - f. Humidified Deflection:  $\leq 5/16$  inch (8mm) when tested in accordance with ASTM C 473.

### 2.4 EXTERIOR SHEATHING (Entry Porch Ceilings)

- A. Basis of Design: PABCO GLASS Regular Sheathing.
  1. Panel Physical Characteristics:
    - a. Core: Regular Gypsum Core with additives to enhance moisture/water and mold/mildew-resistance and reinforced with glass fibers to increase resilience.
    - b. Facing: moisture/water-resistant coated fiberglass mat on front, back and long edges.
    - c. Long Edges: Square.
    - d. Overall Thickness: 1/2 inch (12.7mm).
    - e. Weight: 2.0 lbs/ft<sup>2</sup>.

- f. Panel complies with requirements of ASTM C 1396 and ASTM C 1177.
- g. Flexural Strength - Parallel: 80lbf when tested in accordance with ASTM C 473.
- h. Flexural Strength - Perpendicular: 100lbf when tested in accordance with ASTM C 473.
- i. Mold/Mildew Resistance: 10 when tested in accordance with ASTM D 3273.
- j. Humidified Deflection: 2/8 inch (6mm) when tested in accordance with ASTM C 473.
- k. Water Absorption: <10% by weight when tested in accordance with ASTM C 473.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840, GA-216 or GA-214.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panel not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4 to 3/8 inch (6 to 9 mm) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4 to 1/2 inch (6 to 12 mm) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
1. Regular Type: Vertical or horizontal surfaces, unless otherwise indicated.
  2. Ceiling Type: Ceiling surfaces.
  3. Moisture and Mold-Resistant Type: As indicated on Drawings.
- B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
  2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
  3. On furring members, apply gypsum panels vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members..

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints at locations indicated on Drawings and if not shown, according to ASTM C 840 or GA-216 and in specific locations approved by Owner's Representative for visual effect.
- C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners, unless otherwise indicated.
  2. LC-Bead: Use at exposed panel edges.
- D. Exterior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners.
  2. LC-Bead: Use at exposed panel edges.
- E. Aluminum Trim: Install in locations indicated on Drawings.

### 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840, GA-216 or GA-214:
  - 1. Level 4 finish (all joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints): All flat and eggshell paints, light textures, or wall coverings.

### 3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

## SECTION 09 30 00

### TILE

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Tile and Accessories:
  - 1. Stone Tile.
  - 2. Tile Setting Materials.

##### 1.2 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI A108/A118/A136.1 - Specifications for the Installation of Ceramic Tile.
  - 2. ANSI A137.1 - Specifications for Ceramic Tile.
- B. Tile Council of North America (TCNA): TCA Handbook for Ceramic Tile Installation.

##### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Administrative Requirements.
- 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.
- C. Selection Samples: For each product specified, two complete sets of color charts representing manufacturer's full range of available colors and patterns.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements. When applicable, submit a Master Grade Certificate signed by the manufacturer and the installer certifying that products meet or exceed the specified requirements of ANSI A137.1.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and maintenance coatings.

##### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum two years experience.
- B. Single Source Responsibility: Obtain each type and color of tile from a single

source. Obtain each type and color of mortar, adhesive and grout from the same source.

- C. General: Provide tile that complies with ANSI A137.1 where applicable for types, compositions and other characteristics indicated. Provide tile in the locations indicated on the Drawings.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging until ready for installation.
- B. Protect setting materials from freezing or overheating in accordance with manufacturer's instructions.
- C. Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.

#### 1.6 PROJECT CONDITIONS

- A. Do not install adhesives in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during tiling and for a minimum of 7 days after completion.

#### 1.7 EXTRA MATERIALS

- A. Deliver extra sets of hardware items for Owner's use in maintenance.
  - 1. Provide for Owner's use a minimum of 2 percent of the primary sizes and colors of tile specified, boxed and clearly labeled.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers include but are not limited to: American Olean Tile Co., Daltile.
- B. Substitutions: Not permitted without prior approval.

#### 2.2 TILE

- A. Unglazed Wall Tile:
  - 1. Size: To be selected from manufacturer's standard selection.
  - 2. Tile color and pattern: To be selected from manufacturer's standard selection.
  - 3. Grout color to be selected by owner.

#### 2.3 TILE SETTING MATERIALS

- A. Tile Setting Materials: Comply with ANSI A108/A118/A136.1 as applicable to the installation methods referenced in Part 3 of this Section.

- B. Silicone Sealant: Silicone sealant, moisture and mildew resistant type, white; use for shower floors and shower walls.
- C. Patching and Leveling Compound: As recommended by tile manufacturer and compatible with both substrate and setting materials.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Acceptability of Surfaces: Inspect surfaces to be tiled to ensure proper bonding can be achieved, and to verify that surfaces are free of curing membranes, oil, grease, wax and dust.
- B. Substrate Tolerances: Before tiling, inspect surfaces to be tiled to verify that the following tolerances are not exceeded. If tolerances are exceeded, provide specified leveling coat to achieve specified tolerances.
  - 1. Walls: 1/8 inch in 8 feet (3 mm in 2.4 m) for dry-set mortar, epoxy and organic adhesives.
  - 2. Floors: 1/8 inch in 10 feet (3 mm in 3 m) for dry-set mortar and epoxy; 1/16 inch in 3 feet (1.5 mm in 1 m) for organic adhesive.

### 3.2 PREPARATION

- A. Layout: Determine locations of control and expansion joints before starting tile work. Layout tile work to minimize cuts less than one-half tile in size.

### 3.3 INSTALLATION

- A. General: Comply with ANSI A108/A118/A136.1 and manufacturer's recommendations. Comply with applicable TCA Handbook for Tile Installation requirements as listed below.
- B. Walls, Interior, Metal Studs, Gypsum Board Substrate:
  - 1. TCNA W243-17, Gypsum board thin-set.

### 3.4 CLEANING AND PROTECTION

- A. Cleaning: Clean tile within time period recommended by manufacturer, using materials recommended by manufacturer.
- B. Protection: Prohibit foot and wheeled traffic from floors for a minimum of 3 days. Where traffic is unavoidable, provide large flat boards in walkways and wheelways for a minimum of 7 days after installation. Protect from construction dirt and debris with heavy-duty, non-staining construction paper, masked in place.

END OF SECTION

SECTION 09 90 00  
INTERIOR AND EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior paint including surface preparation.
- B. Exterior paint including surface preparation.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Administrative Requirements.
- B. Product Data: For each paint system indicated, including.
  - 1. Product characteristics.
  - 2. Surface preparation instructions and recommendations.
  - 3. Primer requirements and finish specification.
  - 4. Storage and handling requirements and recommendations.
  - 5. Application methods.
  - 6. Cautions for storage, handling and installation.
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.
- D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Paint exposed surfaces. If a color of finish, or a surface is not specifically mentioned the Owner's representative will select from standard products, colors and sheens available.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels unless indicated.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish surfaces for verification of products, colors and sheens.
  - 2. Finish area designated by Owner's representative.
  - 3. Provide samples that designate primer and finish coats.
  - 4. Do not proceed with remaining work until the Owner's representative approves the mock-up.



#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.
  - 1. Product name, and type (description).
  - 2. Application and use instructions.
  - 3. Surface preparation.
  - 4. VOC content.
  - 5. Environmental handling.
  - 6. Batch date.
  - 7. Color number.
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
- D. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

#### 1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

#### 1.6 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
- B. Furnish Owner with an additional one percent of each material and color, but not less than 1 gal (3.8 l) or 1 case, as appropriate.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Benjamin Moore, Sherwin-Williams, Farrell-Calhoun.
- B. Substitutions: Submit for approval prior to bidding.

#### 2.2 APPLICATIONS/SCOPE

- A. Interior Paints and Coatings

1. Metal: Exposed structural Steel, factory primed hollow metal doors and frames.
  2. Wood: doors, trim and similar items.
  3. Drywall: Drywall board, Gypsum board.
- B. Exterior Paints and Coatings:
1. Wood: Trim and miscellaneous hardboard.

## 2.3 PAINT MATERIALS - GENERAL

- A. Paints and Coatings:
1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
  2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufacturer's product instructions for optimal color conformance.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.
- D. Color: To be selected from manufacturer's standard selections.

## 2.4 INTERIOR PAINT SYSTEMS

- A. METAL - (Factory Primed).
1. Latex Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Touch-up factory primer as required with acceptable primer product.
      - 2) 2nd Coat: Latex Semigloss.
      - 3) Topcoat: Latex Semigloss to cover.
- B. WOOD - (Trim):
1. Latex Systems:
    - a. Semi - Gloss Finish:
      - 1) 1st Coat: Acrylic Latex Wood Primer.
      - 2) 2nd Coat: Acrylic Latex Semigloss to match topcoat.
      - 3) 3rd Coat: Acrylic Latex Semiglass to cover.
- C. DRYWALL - (Walls, Ceilings, Gypsum Board).
1. Latex Systems:
    - a. Eg-Shel/Satin Finish:
      - 1) 1st Coat: Latex Primer.
      - 2) 2nd Coat: Latex to match topcoat.
      - 3) Topcoat: Acrylic eggshell to cover.

## 2.5 EXTERIOR PAINT SYSTEMS

- A. CONCRETE (Cement-fiber porch ceiling).
  - 1. Latex Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Concrete & Masonry Primer Sealer.
      - 2) 2nd Coat: Acrylic Semi-Gloss, match topcoat.
      - 3) Topcoat: Acrylic Semi-Gloss to cover.
- B. METAL - (Factory Primed).
  - 1. Latex Systems:
    - a. Semi-Gloss Finish:
      - 1) 1st Coat: Touch-up factory primer as required with acceptable primer product.
      - 2) 2nd Coat: Exterior Latex Gloss.
      - 3) Topcoat: Latex Gloss to cover.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared; notify Owner's representative of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Owner's representative of unsatisfactory preparation before proceeding.
- B. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

### 3.2 SURFACE PREPARATION

- A. General: Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
  - 1. Prior to attempting to remove mildew, it is recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions are advised.
  - 2. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
  - 3. Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
  - 4. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is

below 50 degrees F (10 degrees C), unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50 degrees F (10 degrees F) or higher to use low temperature products.

- B. Cement Composition Siding/Panels: Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Pressure clean, if needed, with a minimum of 2100 psi pressure to remove all dirt, dust, grease, oil, loose particles, laitance, foreign material, and peeling or defective coatings. Allow the surface to dry thoroughly. The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments.
- C. Wood: Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

### 3.3 INSTALLATION

- A. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendations.
- B. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content. Wait until wood is fully dry after rain or morning fog or dew.
- C. Apply coatings using methods recommended by manufacturer.
- D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.
- F. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
- G. Inspection: The coated surface must be inspected and approved by the Owner's representative just prior to the application of each coat.

### 3.4 PROTECTION

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION

**Section 09 91 13**  
**Painting**

**PART 1 - GENERAL**

**1.1 SUMMARY:**

- A. Section Includes: Surface preparation and field application of paints and coatings.
- B. Related Sections: Section 05520 Metal Handrails - Painting metal handrails.

**1.2 REFERENCES:** The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

- A. GENERAL SERVICES ADMINISTRATION, Federal Supply Service Bureau, 470 L'Enfant Plaza, S.W. Washington, DC 20407
  - 1. COMMERCIAL ITEM DESCRIPTIONS (CID)
    - a. CID A-A-2904 (Basic) Thinner, Paint, Mineral Spirits, Regular and Odorless
    - b. CID A-A-2962 (Basic) Rev A Enamel, Alkyd (Metric)
    - c. CID A-A-3067 (Basic) Paint: Alkyd, Exterior, Low VOC
  - 2. FEDERAL SPECIFICATIONS (FS)
    - a. FS TT-E-489 (Rev J) Enamel, Alkyd, Gloss, Low Voc Content
    - b. FS TT-E-2784 (Rev A) Basic Enamel (Acrylic-Emulsion, Exterior Gloss and Semigloss) (Metric)
    - c. FS TT-P-645 (Rev B) Primer, Paint, Zinc-Molybdate, Alkyd Type
- B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), Francis Perkins Department of Labor Building, 200 Constitution Ave., N.W., Washington, DC 20210
  - 1. OSHA 29 CFR 0001 et seq. Occupational Safety and Health Regulations
- C. SOCIETY FOR PROTECTIVE COATINGS (SSPC), 40 24th Street, 6th Floor, Pittsburgh, PA 15222-4656
  - 1. SSPC PA 1 Shop, Field, and Maintenance Painting
  - 2. SSPC PA Guide 3 Safety in Paint Application
  - 3. SSPC PA Guide 5 Guide to Maintenance Painting Programs
  - 4. SSPC Paint 5 Zinc Dust, Zinc Oxide and Phenolic Varnish Paint
  - 5. SSPC Paint 20 Zinc-Rich Primers (Type I - "Inorganic" and Type II - "Organic")
  - 6. SSPC Paint 21 White or Colored Silicone Alkyd Paint
  - 7. SSPC Paint 22 Epoxy-Polyamide Paints (Primer, Intermediate, and Topcoat)
  - 8. SSPC Paint 23 Latex Primer for Steel Surfaces
  - 9. SSPC Paint 25 Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead and Chromate Pigments)
  - 10. SSPC Paint 27 Basic Zinc Chromate-Vinyl Butyral Wash Primer
  - 11. SSPC Paint 104 White or Tinted Alkyd Paint
  - 12. SSPC SP 1 Solvent Cleaning
  - 13. SSPC SP 2 Hand Tool Cleaning
  - 14. SSPC SP 3 Power Tool Cleaning
  - 15. SSPC SP 5/NACE 1 White Metal Blast Cleaning
  - 16. SSPC SP 6/NACE 3 Commercial Blast Cleaning
  - 17. SSPC SP 7/NACE 4 Brush-Off Blast Cleaning
  - 18. SSPC SP 8 Pickling
  - 19. SSPC SP 10/NACE 2 Near-White Blast Cleaning
  - 20. SSPC SP 11 Power Tool Cleaning to Bare Metal
  - 21. SSPC-SP COM Surface Preparation Commentary
  - 22. SSPC VIS 1 Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs)
  - 23. SSPC-01 Good Painting Practice Steel
  - 24. Structures Painting Manual, Volume 1
- D. SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCCI) PUBLIC SAFETY TESTING AND EVALUATION SERVICES, INC., 900 Montclair Road, Suite A, Birmingham, AL 35213-1206
  - 1. Arkansas Fire Prevention Code 1999 (AFPC)

**1.3 SUBMITTALS:**

- A. Product Data: Provide data and Material Safety Data Sheet on all finishing products.
- B. Samples: Submit two samples, 4 x 4 inches (10 x 10 cm) in size illustrating range of colors available for each surface finishing product scheduled for Landscape Architect selection.

**1.4 QUALITY ASSURANCE:**

ITT TRAINING CENTER for the  
ECONOMIC DEVELOPMENT ADMINISTRATION  
NEWPORT, ARKANSAS

- A. Regulatory Requirements: Comply with AFPC and OSHA.
  - B. Reference Standards: Conform to the requirements, methods and reference standards for surface preparation, primers and primer application, finish products and finish products application.
- 1.5 DELIVERY, STORAGE AND HANDLING: Deliver, store, protect, and handle products to site under provisions of Section 01600.
- A. Packing, Shipping, Handling, and Unloading: Handle in a manner to prevent damage and contamination.
  - B. Acceptance at Site: Deliver materials in original containers with seals unbroken and labels intact until time of use, in accordance with manufacturer's instructions.
  - C. Storage and Protection: Store equipment and materials in original containers, suitably sheltered from the elements, but readily accessible for inspection by Landscape Architect until installed. Store all items subject to moisture damage in dry, heated places. Tightly cover equipment and protect against dirt, water, and chemical or mechanical injury and theft. Contractor repair or make good damage or defects developing before acceptance of the work shall be made good at the Contractor's expense.
  - D. Waste Management and Disposal: Remove rejected materials from site immediately.
- 1.6 PROJECT/SITE CONDITIONS:
- A. Project/Site Environmental Requirements: Store and apply materials in environmental conditions required by manufacturer's instructions.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS:**

- A. Benjamin Moore and Company, 51 Chesnut Ridge Road, Montvale, New Jersey 07645, (201) 573-9600
- B. Sherwin Williams Company, Cleveland, Ohio 44101, (800) 321-8194.
- C. Pratt and Lambert Paints, P.O. Box 22, Buffalo, New York 14240, (800) 289-7728.
- D. Pittsburgh Paints, One PPG Place, Pittsburgh, Pennsylvania 15272, (800) 441-9695.
- E. Substitutions: Under provisions of Section 01600.

### **2.2 MATERIALS:**

- A. Coatings: Ready mixed except field catalyzed coatings of good flow and brushing properties, capable of drying or curing free of streaks or sags.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials required to achieve the finishes specified.

### **2.3 FINISHES:** Refer to schedule at end of section for surface finish and color schedule

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION:**

- A. Site verification of Conditions: Verify that substrate conditions are ready to receive work.

### **3.2 PREPARATION:**

- A. Surface Preparation: Correct minor defects and clean surfaces which affect work of this Section. Remove, hardware, trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- B. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- C. Uncoated Ferrous Surfaces: Remove scale by wire brushing, sandblasting, clean by washing with solvent. Apply treatment of phosphoric acid solution. Prime paint with two coats rust inhibiting primer after repairs.
- D. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust, hand or power tool clean, clean surfaces with solvent. Prime paint with two coats rust inhibiting primer bare steel surfaces.

### **3.3 SCHEDULE EXTERIOR SURFACES:**

- A. Pavement Markings: Two coats of solvent borne chlorinated rubber, solventborne chlorinated polyolefin, or solventborne acrylic copolymer paint, white.
- B. SteelShop Primed: Touch-up with alkyd primer. Two coats of alkyd enamel, gloss.
- C. SteelGalvanized: One coat of galvanize primer. Two coats of alkyd enamel, gloss.

**End of Section**

## **SECTION 10 14 23 SIGNAGE**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Interior door signs

#### **1.02 SUBMITTAL**

- A. Manufacturer must submit 3 references showing products for projects completed within the last 5 years.
- B. Submit manufacturer's technical data and recommended installation for each type of sign required.
- C. Submit shop drawings listing sign size, letter form and letter heights.
- D. Submit one full size sample of sign of type, style and color specified, including method of attachment. If approved, the sample may become part of the job.

#### **1.03 SIGN TYPE DESCRIPTION**

- A. Signage shall consist of room number and room function to meet the requirements of the Americans with Disabilities Act.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURER**

- A. Provide products similar to those manufactured by Mohawk Sign Systems, Inc. Submit alternate manufacturers systems for approval.

#### **2.02 GRAPHIC PROCESS**

- A. All signs shall be manufactured using Graphic Process Series 200A - Sand Carved® using format D.
  - 1. Tactile characters shall be raised the required 1/32 inches from the sign face. Glue-on letters or etched backgrounds are not acceptable.
  - 2. All text shall be accompanied by Grade 2 braille. Braille shall be separated 1/2" from the corresponding raised characters or symbols. Grade 2 braille to be provided by sign manufacturer.
  - 3. All letters, numbers and/or symbols shall contrast with their background, either light characters on a dark background or dark characters on a light background. Characters and background shall

have a non-glare finish.

B. Plaque material shall be Special Purpose SP125 decorative thermosetting high pressure laminate. Material to be 1/8" thick laminate with a melamine resin surface and a phenolic resin core which provides resistance to abrasion, stains, alcohol, solvents, boiling water and heat. The material shall be NEMA rated and have flammability and smoke values that meet the standards for flammability of interior materials.

C. Background color as selected from manufacturer's standard color samples.

D. Letterform shall be Gill Sans upper case letters and numbers.

E. Size of letters and numbers shall be as follows:

1. Room numbers shall be 1"
2. Letter for room ID signs shall 5/8"
3. Symbol size shall be 4"
4. Standard Grade 2 braille shall be 1/2" below copy.
5. Corners: 1/2" radius.

F. Copy position: CC (centered/centered)

## 2.03 SIGN DESIGN

A. Room ID signs with room number and function, size 6" x 6", similar to layout shown on drawings sheet A600.

B. Restroom signs design, 6"X 8" or 8" x 8" with a 4" accessibility and gender symbol with the verbal description placed directly below with Grade 2 braille symbol - similar to layout shown on drawings sheet A600.

## PART 3 - EXECUTION/INSTALLATION

### 3.01 INSTALLATION

A. Signs shall be mounted 60 inches from the floor to the center of the sign on the latch side. The distance from the door frame and sign shall be 2 inches. Install signs utilizing materials and procedures in accordance with manufacturer's recommendations.



### 3.02 CLEANING AND PROTECTION

A. After installation, clean soiled signs surface according to manufacturer's instructions. Protect signs from damage until final project completion.

END OF SECTION

## **SECTION 10 22 26 OPERABLE WALL SYSTEM**

### **PART 1 – GENERAL SPECIFICATIONS**

#### **1.01 WORK INCLUDED**

- A. Operable wall system shall be furnished, installed and serviced by wall manufacturer's authorized distributor, in compliance with the architectural drawings and specifications contained herein.

#### **1.02 RELATED WORK**

- A. Structural Support: Structural support system required for suspending the operable wall shall be designed, installed and pre-punched by others, in accordance with ASTM E 557 and manufacturer's shop drawings.
- B. Insulation: Sound insulation and baffles for the plenum area above the track system, under the permanent floor, inside air ducts passing over or around the operable wall, and in permanent walls adjoining the operable wall system shall be by others, in accordance with ASTM E 557.
- C. Opening Preparation: Proper and complete preparation of the operable wall system opening shall be by others in accordance with ASTM E 557, and shall include floor leveling; plumbness of adjoining permanent walls; substrate and/or ceiling tile enclosures for the track system; and the painting and finishing of trim and other materials adjoining the head and jamb areas of the operable wall. Any permanent wall(s) receiving an adjustable or fixed wall jamb will require internal structural blocking in order to secure the jamb to the permanent wall. Refer to a copy of the shop drawings for additional details.

#### **1.03 SYSTEM DESCRIPTION**

- A. The operable wall system shall consist of Individual Panels that are top supported by two (2) multi-directional carriers that are capable of negotiating 90° "X", "L" and "T" intersections.
- B. The operable wall system shall consist of acoustically rated panels tested in accordance with ASTM E 90 and ASTM E 413 test procedures, and shall have achieved a STC rating as specified herein (see "Acoustical Performance" article listed under Part 2 – Products).

#### **1.04 QUALITY ASSURANCE**

- A. The operable wall shall have been tested in an independent acoustical testing laboratory in accordance with ASTM E 90 and ASTM E 413 test procedures.
- B. The operable wall panel construction and finish materials shall consist of Class A rated

materials (except as noted, under "Finishes" Part 2 – Products) in accordance with ASTM E 84.

- C. The operable wall shall be installed by the manufacturer's authorized distributor in accordance with ASTM E 557.

#### **1.05 REFERENCES**

- A. ASTM E 90: Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions.
- B. ASTM E 413: Determination of Sound Transmission Class (STC).
- C. ASTM E 557: Architectural Application and Installation of Operable Partitions.
- D. ASTM E 84: Surface Burning Characteristics of Building Materials.
- E. ASTM A 653: Specification for General Requirements for Steel Sheet, Alloy-Coated (Galvannealed) by the Hot Dip Process.
- F. ASTM C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- G. CCC-W-408A: Federal Specification which applies to Vinyl Coated Wall Coverings.
- H. CFFA-W-101-D: Chemical Fabrics and Film Association Quality Standard for Vinyl Coated Fabric Wall Coverings.

#### **1.06 SUBMITTALS**

- A. Manufacturer shall provide written technical information and related detail drawings, which demonstrate that the products comply with contract documents for each type of operable partition specified.
- B. Manufacturer shall provide detailed engineering drawings featuring track plan, panel elevation, horizontal and vertical details and beam punching template as required.
- C. Manufacturer shall provide written test report of the independent acoustical testing laboratory certifying the attainment of the specified STC rating, upon request.
- D. Manufacturer shall provide written instructions specifying the proper operation and maintenance of the operable wall system.
- E. Manufacturer shall provide a color selector demonstrating the manufacturer's selections of the specified finish material. Samples shall consist of actual swatches of the specified finish

material.

### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Panels shall be individually wrapped in a protective plastic covering to keep panels clean during delivery, storage and handling.
- B. Panels shall be stored on edge and above the floor on cushioned blocking in a dry and ventilated area, protected from humidity and temperature extremes.

### **1.08 SEQUENCING / SCHEDULING**

- A. Beam Punching: Manufacturer shall provide beam punching template drawing detailing the anchor locations for the suspended track system (as required for Drop Rod Mounting), as required for the fabrication and installation of structural overhead support by others.
- B. Track Installation: Scheduling of operable wall track installation shall occur after structural overhead support has been properly and completely fabricated and installed by others.
- C. Panel Installation: Operable wall panel installation shall occur after fixed wall substrate construction is properly and completely installed by others, as required to protect panels from ongoing adjacent construction.

### **1.09 WARRANTY**

Manufacturer shall warrant each operable wall panel and its component parts to be free from defects in material and workmanship for a period of five (5) years from the date of delivery to the original purchaser, when installed by an authorized KWIK-WALL distributor. KWIK-WALL also warrants the fixed top seals, track, carriers, and its component parts to be free from defects in material and workmanship for a period of ten (10) years. (Contact your local KWIK-WALL Distributor or KWIK-WALL Company for complete warranty information.)

## **PART 2 – PRODUCT SPECIFICATIONS**

### **2.01 ACCEPTABLE MANUFACTURER**

- A. Operable walls shall be Series 2000, Model 2020 Individual Panels / Multi-Directional as manufactured by KWIK-WALL Company.

### **2.02 PANEL CONSTRUCTION**

- B. Panel Dimensions: Standard panel dimension shall be a nominal 3" [76] thick.
- C. Panel Frame: Vertical steel frame members shall be minimum 18-gauge galvanized steel, horizontal top cross member shall be minimum 12-gauge galvanized steel, which meets or exceeds ASTM A 653 requirements. Frame shall be all-welded construction with steel corner supports and cross-bracing reinforcements. Panel frame shall be Class A rated fire retardant,

non-combustible and non-corrosive in accordance with ASTM E 84.

- C. Panel Skins: Panel skins shall be Class A rated (except Wood Veneer and High Pressure Laminate) in accordance with ASTM E 84. Panel skin material shall consist of (select):
1. *Standard Acoustical Substrate*: consisting of structural acoustical substrate pressure laminated to both sides of the steel frame to form a rigid, unitized and structural panel.
- D. Panel Hinges (*if required*): Panel hinges shall be architectural grade, full leaf butt hinges. Hinges shall be attached to the steel frame of the panel and reinforced with a steel backer plate.
- E. Panel Weight: Maximum panel weight shall be 6.5 – 12.0 lb./ft.<sup>2</sup> (32 – 59 kg/m<sup>2</sup>) depending on STC rating, size and options selected.

## 2.03 OPERATION

- A. Operation shall be Individual Panels with a Multi-Directional track system that allows the panels to negotiate 90° “X”, “L” and “T” intersections as required for movement of panels from storage location(s) to various installed positions. Panels shall be top supported by two (2) carriers featuring dual horizontal precision bearings with high strength polymer tires riding on a structural aluminum track.

## 2.04 STACK ARRANGEMENTS

- A. Stack Type: Panel storage configuration shall be (select):
1. *Standard Perpendicular Stack*: consisting of panels stacked perpendicular to the wall's installed position.
- B. Stack Quantity: Panels shall be stored at one (1) or both ends in separate stack areas as required for panel storage.

## 2.05 FINISHES

- A. Finish Material Type: Panel finish material shall be Class A (except wood veneer and high pressure laminate) rated in accordance with ASTM E 84, consisting of (select):
1. *Optional Upgrade Carpet*: consisting of acoustically absorbent, non-woven needle punch fibers fused to prevent fraying and unraveling of material weighing 23 oz./lin. yd. (713 g/lin. m). Upgrade Carpet shall achieve a minimum NRC (Noise Reduction Coefficient) rating of .25 (applied over gypsum substrate) in accordance with ASTM C 423.
- A. Finish Material Supplier: Finish material shall be (select):
1. *Standard Factory Supplied*: from manufacturer's standard selection of finish materials, as specified

C. Finish Material Application: Finish material shall be (select):

2. *Standard Factory Applied*: by operable wall manufacturer. Customer supplied finish material samples must be submitted to manufacturer for testing and approval prior to acceptance and application

## 2.06 PERIMETER TRIM AND SEALS

A. Vertical Trim and Seals: Panels shall have vertical astragals containing flexible vinyl seals and incorporate reversible tongue-and-groove-type configurations for positive interlocking with adjacent panels. Vertical astragal type shall be (select):

3. *Standard Trimless Astragal*: consisting of an aluminum extrusion with tongue-and-groove-type vertical astragals. Vertical trim shall not be permitted on the panel faces, resulting in a minimal groove appearance between adjacent panels.

B. Horizontal Top Trim and Seals: Top seals shall consist of flexible vinyl sweep seals installed on both sides of the panel. The seals shall consist of a compressed bulb between two (2) fingers of vinyl. Top seal type shall be (select):

1. *Standard Fixed Top Seals*: consisting of continuous-contact flexible vinyl sealing against the bottom flange of the overhead track.

C. Horizontal Bottom Trim and Seals: Bottom seals shall consist of multiple fingers of flexible vinyl for positive contact and sealing with various floor surfaces. Bottom seal type shall be (select):

4. *Standard Operable Bottom Seals*: consisting of an edge-activated seal using a removable wrench as supplied by manufacturer. Bottom seals shall provide 2" [50.8] of nominal

D. Horizontal and Vertical Panel Trim: All exposed panel trim and hinges shall be of one (1) similar color (select):

1. Dark Bronze.

## 2.07 CLOSURE SYSTEMS

A. Initial Closure System: The lead panel (the first panel exiting the stack) shall form a seal vertically against a rigid wall surface, as accomplished by (select):

1. *Standard Bulb Seal*: consisting of continuous-contact, flexible vinyl bulb seals installed along the vertical edge of the lead panel for positive compression against a rigid wall surface

B. Final Closure System: The final closure panel (the last panel exiting the stack) shall form a seal vertically against a rigid wall surface. The type of final closure panel shall be (select):

1. *Standard Expander Panel Closure*: consisting of an expander mechanism with a nominal 5" [127] of travel, activated from the face of the panel using a removable wrench as supplied by manufacturer. The Expander Panel shall be equipped with an adjustable bottom seal (standard) and a flush pull handle

## **2.08 ACOUSTICAL PERFORMANCE**

- A. Certification: The operable wall shall have been tested in an independent acoustical testing laboratory in accordance with ASTM E 90 and ASTM E 413 test procedures.
- B. STC Rating: The operable wall acoustical performance rating shall be based on (select):
  - 1. *Standard Acoustical Substrate*: with a standard rating of 49 STC, or optional ratings of 42 STC, 45 STC or 50 STC.

## **2.09 TRACK SYSTEMS**

- A. Track Type: The operable wall track system shall be extruded from structural aluminum alloy, which prohibits deterioration caused by rust or corrosion. The aluminum track shall have a durable anodized clear satin finish, which resists color fading and flaking. The track shall utilize grooves and interlocking steel pins for positive alignment of adjacent track sections. The track joints shall be reinforced overhead by a heavy-duty steel bracket made of hot-rolled, 3/8" [10] thick plate steel. Aluminum track shall include an integral nut slot to accept a hardened steel square nut to facilitate attachment of each steel all-rod and splice brackets to the overhead structural support.
- B. Track Size: The track size shall be as appropriate for this installation:
  - 1. *Type 425 Multi-Directional Aluminum Track*: certified to be capable of supporting up to 525 lb. (238 kg) of total live load weight per panel.
  - 2. *Type 850 Multi-Directional Aluminum Track*: certified to be capable of supporting up to 850 lb. (386 kg) of total live load weight per panel.

## **2.11 CARRIER SYSTEMS**

- A. Carrier Type: Each individual panel shall be top supported by two (2) carriers utilizing a 5/8" [16] diameter pendant bolt. Each carrier shall consist of dual horizontal, permanently lubricated, precision ground steel bearings with high strength polymer tires as required for smooth and quiet operation. Multi-Directional carriers shall be capable of negotiating 90° "X", "L" and "T" intersections as required for moving panels from storage location(s) to various installed positions.
- B. Carrier Size: The carrier size shall be as appropriate for this installation:
  - 1. *Type 425 Multi-Directional Carrier*: certified to be capable of supporting up to 525 lb. (238 kg) of total live load weight per panel.
  - 2. *Type 850 Multi-Directional Carrier*: certified to be capable of supporting up to 850 lb. (386 kg) of total live load weight per panel.

## **2.12 SUSPENSION SYSTEMS**

A. Mounting Systems: The track shall be supported by (select):

1. *Standard Drop Rod Mount*: consisting of adjustable rods of grade 2, 3/8" [10] diameter threaded steel all-rod provided with 3/8" [10] serrated steel nuts.

## **PART 3 – EXECUTION**

### **3.01 INSPECTION**

- A. Proper and complete preparation of the operable wall system opening shall be by others in accordance with the architectural drawings, manufacturers shop drawings and ASTM E 557. Any deviation of the actual opening from these specifications shall be called to the attention of the architect prior to the installation of the operable wall.
- B. Deficiencies in the operable wall opening shall be corrected by others prior to installation of the operable wall.

### **3.02 INSTALLATION**

- A. The operable wall system shall be installed by manufacturer's authorized distributor.
- B. The operable wall shall be installed in accordance with manufacturer's written instructions, shop drawings and ASTM E 557 installation guidelines.

### **3.03 ADJUSTING AND CLEANING**

- A. The operable wall panels and track system shall be adjusted and cleaned in accordance with manufacturers written instructions.

### **3.04 PROTECTION**

- A. The operable wall panels shall be stored in the stacked (retracted) position prior to acceptance by the owner's representative.

### **3.05 DEMONSTRATION**

- A. The operable wall manufacturer's authorized distributor shall demonstrate proper operation and explain proper and necessary maintenance requirements of the operable wall system to the owner's representative.

END OF SECTION



SECTION 10 21 00  
TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid plastic partitions.

1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association: NFPA 286 - Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Literature indicating typical panel, pilaster, door, hardware and fastening.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Shop Drawings:
  - 1. Dimensioned plans indicating layout of toilet compartments.
  - 2. Dimensioned elevations indicating heights of doors, pilasters, separation partitions, and other components; indicate locations and sizes of openings in compartment separation partitions for toilet and bath accessories to be installed in partitions; indicate floor and ceiling clearances.
  - 3. Details indicating anchoring components (bolt layouts) and methods for project conditions; indicate components required for installation, but not supplied by toilet compartment manufacturer.
- D. Selection Samples: For each finish product specified, one complete set of color selection guides representing manufacturer's full range of available colors, textures and patterns.
- E. Verification Samples: For each finish product specified, two samples representing actual product, color, texture and pattern.
- F. Manufacturer's Certificates: Certify products meet or exceed specified

requirements.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
- B. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.
- C. Lay cartons flat, with adequate support to ensure flatness and to prevent damage to pre-finished surfaces.
- D. Do not store where ambient temperature exceeds 120 degrees F (49 degrees C).

#### 1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at a minimum of 60 degrees F (15.6 degrees C).

#### 1.6 WARRANTY

- A. Manufacturers Standard Warranty: For Solid Plastic HDPE Material: Against breakage, corrosion, and delamination for 15 years.

#### 1.7 COORDINATION

- A. Coordinate Work with placement of support framing and anchors in walls and ceilings.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: ASI Accurate Partitions; 160 Tower Drive, Burr Ridge, IL 60527; Tel: 708-442-6800; Email: [info@asi-accuratepartitions.com](mailto:info@asi-accuratepartitions.com); Web: <http://www.asi-accuratepartitions.com>.
  - 1. Other Acceptable Manufacturer: ASI Global Partitions; Eastanollee, GA; Tel: 706-827-2700; Web: [www.asi-globalpartitions.com](http://www.asi-globalpartitions.com).
  - 2. No other manufacturer will be accepted without ASTM performance compliance.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

## 2.2 COMPARTMENTS AND SCREENS

- A. Toilet Compartments: Floor anchored/overhead braced solid plastic.
  - 1. Compartment Depth and Width: As scheduled and indicated on Drawings.
  - 2. Door Width: 24 inches (610 mm), minimum; at ADA accessible compartments 36 inches (915 mm) minimum.
  - 3. Height Above Floor: 12 inches (305 mm).
  - 4. Door/Panel Height: 58 inches (1473 mm).
  - 5. Pilaster Height: 82 inches (2083 mm).

## 2.3 SOLID PLASTIC TOILET COMPARTMENTS

- A. Doors, Panels, Screens, and Pilasters: Single sheet solid, homogenous HDPE plastic material formed from waterproof, non-absorbent, high-density polyethylene resins; mark-resistant self-lubricating surface; edges finished smooth.
  - 1. Material: Solid, homogenous HDPE; 1 inch (25 mm) thick.
  - 2. Rating: Class "B" Fire Rated per ASTM E 84.
  - 3. Rating: Meets the standard acceptance criteria per Annex C of NFPA 286.
  - 4. Edges: 1/4 inch (6 mm) radius machined edges.
  - 5. Heat Sink: Aluminum heat sink, to dissipate heat from incendiary devices used by vandals, attached to bottom of doors and panels.
- B. Finish: Pebble-textured homogenous color throughout material.
  - 1. Color: As selected from manufacturer's standard colors.
- C. Door Hardware: 8 inches (203 mm) Aluminum Wrap-around hinge.
  - 1. Hinges: Hinges shall be 8 inches (203 mm) and fabricated from heavy-duty extruded aluminum (6463-T5 alloy) with a brushed anodized finish with wrap-around flanges, surface mounted and through bolted to doors and pilasters. Hinges operate and are field set with adjustable nylon cams. Cams can be set in 30 degree increments.
  - 2. Latch: Anodized extruded aluminum, with housing, slide bolt and button.
  - 3. Strike and Keeper: 6 inch (152 mm) wrap-around flanges fabricated from heavy-duty extruded aluminum (6463-T5 alloy) with a brushed anodized finish.
  - 4. Coat Hook and Bumper: Non-ferrous, chrome-plated, with black rubber tip for doorstep.
  - 5. Fastening Hardware: Manufacturer's standard, Type 304 stainless steel, No. 4 satin finish, theft-resistant barrel nuts and machine screws.
  - 6. Door Pulls: Non-ferrous, chrome-plated. Standard on ADA compartments. Two per ADA door.
- D. Mounting Brackets: Provide optional stainless steel continuous bracket with theft resistant barrel nuts and shoulder screws.
- E. Pilaster Shoes: Type 304 Stainless Steel, No. 4 satin finish. Easy Stall shoe shall be of a one piece design and integral to the mounting system and formed from 304 stainless steel 3 inch (76 mm) high with a No. 4 satin finish. Pilaster shoes are anchored to the pilaster with No. 10 stainless steel,

vandal-resistant screws.

- F. Headrail: Manufacturer's standard anodized aluminum rail with anti-grip profile.
- G. Pilaster Anchors, Floor Anchored/Overhead Braced:
  - 1. Easy Stall shoe system. 1/4 by 2 inch (6 by 51 mm) steel screws attach Easy Stall shoe to floor.
  - 2. Pilaster to be inserted into shoe and secured after height adjusted. Leveling adjustment to be concealed by pilaster shoe.
  - 3. Height/leveling adjustment to be made via machine thread bolts inserted into factory installed threaded insert in bottom of pilaster.

## PART 3 EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Inspect and prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Clean surfaces thoroughly prior to installation.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
  - 1. Verify dimensions of areas to receive compartments.
  - 2. Verify locations of built-in framing, anchorage, bracing, and plumbing fixtures.

### 3.2 INSTALLATION

- A. Install in accordance with approved shop drawings and manufacturer's instructions.
- B. Fasten components to adjacent materials and to other components using purpose-designed fastening devices.
- C. Adjust pilaster anchors for substrate variations; conceal anchors with pilaster shoes.
- D. Equip each compartment door with hinges and door latch.
- E. Install door strike keeper on pilasters in alignment with door latch.
- F. Equip each compartment door with one coat hook and bumper.
- G. Installation Tolerances:
  - 1. Maximum variations from plumb or level: 1/8 inch (3 mm).
  - 2. Clearance between wall surface and panels or pilasters: 1-1/2 inch (38 mm) maximum.

### 3.3 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors.
- B. Adjust adjacent components for consistency of line or plane.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. Remove factory protective coverings and clean finish surfaces in accordance with manufacturer's instructions before substantial completion.

END OF SECTION

## SECTION 22 00 00 MECHANICAL - GENERAL

### PART 1 - GENERAL

#### 1.1 GENERAL CONDITIONS

- A. The General Conditions and other pertinent documents issued by the Engineer are a part of these Specifications and shall be complied with in every respect. In addition, the accompanying Architectural, Structural, Mechanical, Electrical and other Drawings shall be complied with in every respect. It shall be the responsibility of the Mechanical and Electrical Contractors to avail themselves of a complete set of Drawings and Specifications and be familiar with all parts thereof. Failure to do so shall not relieve any responsibility in the fulfillment of the Contract in any respect.

#### 1.2 INTENT

- A. The intent of the Mechanical and Electrical Drawings and Specifications is that the Contractor shall furnish all labor and materials, equipment and transportation necessary for the proper execution of the work. The work required as related to other trades is shown in its majority in the drawings, but thoroughly examine the Drawings and Specifications relating to other trades in order to include all necessary work. No additional compensation shall be considered for failure to properly interpret the responsibilities to other trades. The Contractor shall do all the work shown on the Drawings and described in the Specifications and all incidental work considered necessary to complete the project. The Engineer reserves the right to make any reasonable change in the locations indicated without additional compensation to the Contractor.

#### 1.3 CONFLICT

- A. If there is a conflicting variance between the Drawings and Specifications, the provisions of the most stringent shall control. In case of conflict between the General Provisions of the Contract or any modifications thereof, the Mechanical and Electrical Specifications shall control. The Drawings and Specifications are complementary and any work required by one, but not by the other, shall be performed as though required by both.

#### 1.4 SCOPE

- A. The work contemplated and included under this Section of the Specifications consists of the furnishing of all labor, materials and supervision necessary for the installation of complete mechanical and electrical systems, as specified herein or

shown on the Drawings, together with all necessary auxiliaries and appurtenances for same.

- B. Furnish and install all systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the Drawings or mentioned in these Specifications.

## 1.5 RELATED SECTIONS

- A. Section 221113 - Plumbing
- B. Section 260800 - Heating, Ventilation and Air Conditioning
- C. Section 260000 - Electrical

## 1.6 INSPECTION OF SITE

- A. The Contractor, before submitting his proposal, shall inspect the site of the proposed construction and become fully informed as to the facilities, difficulties and restrictions attending the execution of the work. No additional compensation will be granted for work or items omitted from his proposal due to his failure to inform himself of the conditions affecting the performance of the work included in the Contract, or necessary to carry on and satisfactorily complete the work included herein.
- B. Locations and elevations of the various utilities included within the scope of this work are offered separate from the Contract Documents as a general safety guide only without guarantee as to accuracy.

## 1.7 CODES, STANDARDS AND REGULATIONS

- A. All workmanship and materials herein specified shall meet in every respect the codes, standards and regulations having jurisdiction of the work. In case of difference between the various standards and other regulations, the matter will be brought to the attention of the Engineer and either the most stringent shall govern or the regulation or standard selected by the Engineer shall govern.
- B. Should the Contractor perform any work that does not comply with the requirements of the applicable codes, standards and regulations, he shall bear all costs arising from the deficiencies.
- C. The following codes, standards and regulations in effect on the date of bid invitation shall be considered a part of this Specification:
  - a. State Public Health Department Regulations

- b. State Plumbing Code and HVACR Code
- c. National Fire Protection Association
- d. American Society of Mechanical Engineers
- e. American Society for Testing Materials
- f. Air Conditioning and Refrigeration Institute
- g. National Electrical Code
- h. National Electrical Safety Code
- i. Local, City, State and Federal Codes and Standards
- j. Underwriters' Laboratories
- k. Local Utilities Requirements
- l. National Electrical Manufacturers Association
- m. OSHA - Occupational Safety and Health Standards

#### 1.8 PERMITS AND FEES

- A. Provide all necessary notices, obtain all permits, pay all taxes, file all necessary plans and obtain all necessary approvals in connection with the mechanical and electrical work required for the project.

#### 1.9 CONTRACTOR DEFINITION

- A. Where the word "Contractor" is used in connection with the work included under the Mechanical and Electrical Sections of these Specifications, reference is thereby made to the Contractor who is engaged to execute the work included under that Section of the Specifications only, notwithstanding the fact that this Contractor may be either the prime contractor, general contractor or his subcontractor.

#### 1.10 DRAWINGS

- A. The accompanying Mechanical and Electrical Drawings in general indicate approximately the locations of equipment and devices, except in those cases where specified notes appear. Exact locations of outlets and apparatus shall be determined by reference to the general plans and to detailed shop drawings, by measurements at the building and in cooperation with other contractors and the Engineer.
- B. Exact locations are subject to approval by the Engineer and may differ a reasonable amount from the approximate locations shown on the Drawings without additional compensation to the Contractor.
- C. Major changes resulting in a savings in labor or material shall be made only in accordance with a Change Order. Major deviations shall be made only where necessary to avoid interference and only after drawings showing the proposed deviations have been submitted to and approved by the Engineer.



## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Provide materials and equipment which are new and in perfect condition. Where the Underwriters' Laboratories have established standards and issued labels for a particular group, class or type of equipment, the Underwriters' label shall be required on all equipment in that category. Each component shall have a nameplate giving the name and address of the manufacturer, catalog number and designation.
- B. Where the words "or equal" are used in the Specifications or on the Drawings, it shall be understood that the Engineer will be the sole judge in the matter. In all cases where more than one manufacturer or material is specified, the Contractor shall be permitted to furnish any of those specified, however, power equipment, panels, transformers and safety switches should be of the same manufacturer. It is not the intention to discriminate against any "equal" product of other manufacturers, but rather to definitely set a standard of quality and shall not be construed to limiting competition. Any proposed substitution will be assumed to be acceptable without specific authorization from the Engineer. Should a substitution be accepted and should the substitution prove defective or otherwise unsatisfactory for the intended service within the warranty period, the Contractor shall replace the substitution with the equipment or material originally specified, and on which the Specification required him to base his proposal, at no additional compensation.

### 2.2 TEMPORARY CONSTRUCTION POWER

- A. Furnish and install temporary power, water, heating, gas and lighting as the needs require for construction and safety purposes. It shall be the responsibility of the General or Prime Contractor to obtain and be responsible for all utility charges.

## PART 3 - EXECUTION

### 3.1 WORKMANSHIP - GENERAL

- A. All work shall be installed in a neat, careful, safe and workmanlike manner by craftsmen skilled in the trade.

### 3.2 STANDARDS

- A. Perform all work in such a manner that the many components will function as a complete workable system, including any accessories required to accomplish such installations. Perform all work in accordance with acceptable industry standards except where other standards or procedures are herein specified.

### 3.3 COORDINATION AND COOPERATION

- A. Coordinate all mechanical and electrical work with general, structural and other grades to insure proper execution of the work and general progress for the entire project and to avoid delaying any other Contractor. Cooperate with all other trades so that the entire project will not be handicapped, hindered or delayed. Assist other trades in working out space conditions to permit all work to be installed satisfactorily. No extra compensation will be allowed the Contractor for any remedial work required to eliminate interferences due to lack of coordination and cooperation.

### 3.4 STORAGE OF MATERIALS

- A. Protect all mechanical and electrical materials and apparatus to prevent any damage to them. Unless approved, no material or apparatus shall be stored outside or exposed to the elements. Cover apparatus with tarpaulins or other protective coverings, provide pallets or other methods to raise materials above the floor, and where directed, provide barriers or guard rails to protect the materials. Failure on the part of the Contractor to comply with the above to the complete satisfaction of the Engineer or his representative will be sufficient cause for rejection of the piece of apparatus in question.

### 3.5 DAMAGED AND DEFECTIVE WORK

- A. Remove and replace damaged and defective work or materials as directed by the Engineer with no extra compensation. All repairs to the work shall be made with new materials or a complete new piece of equipment shall be provided as directed by the Engineer.

### 3.6 ACCESSIBILITY

- A. Install all equipment and devices in an accessible location or in a location where they can be made accessible with removable panels. Provide Milcor or approved equal access panels as required for access to concealed equipment which requires servicing and testing. Equipment and devices shall be "readily accessible" where required by the National Electrical Code. In non-removable ceilings, the removal of a lighting fixture or air device is not an approved access panel.

### 3.7 SAFETY

- A. Provide necessary precautions for the safety of life or property. All construction work shall conform to the standards of the Occupational Safety and Health Act. Pro-

vide approved ground fault interrupter devices on all electrical construction devices consuming power and including temporary lighting systems.

### 3.8 CLEAN-UP

- A. The Contractor shall keep his work area clean at all times. Upon completion of work in any area, remove all equipment, excess materials and debris from the area and leave area broom clean. Protect all equipment during operations of painting, plastering, cutting or drilling and any like operation which might damage the equipment. Upon completion of the project, remove all equipment, excess material, scrap and debris from the job site. The job site shall be left clean and finished.

### 3.9 CONTRACTOR FURNISHED DATA

- A. Submit to the Engineer shop drawings for all equipment and materials to be installed on the project. No equipment or materials shall be installed until the shop drawings have been approved, even if the material submitted is identical to that originally specified. Consideration for substitution of materials will not be allowed if shop drawings are not received within 30 days after award of Construction Contract.
- B. Rough-in materials including pipe, wire, conduits, connectors and boxes may be submitted in a list form including the names of manufacturers and catalog type or number. All other equipment and materials shall be submitted with detailed prints or drawings. Prints or drawings shall be permanent reproductions and not Thermofax copies. The total number of shop drawings and lists shall be not less than six.
- C. Should the Contractor propose to submit items other than those specified, he shall include cuts of both the specified item and the proposed "equal item" in the brochures. The "originally specified product" and the "proposed substitution" shall be clearly marked.
- D. Where the Specifications or Drawings call for the work to be installed in accordance with the manufacturer's specifications, recommendations or directions, copies of the same shall be submitted to the Engineer for review and surveillance.
- E. Provide the Engineer four (4) copies of hard bound manuals for the project ten (10) days prior to final acceptance of the completion of the project. The manuals shall include copies of all corrected and approved shop drawings, schedules, catalog data, illustrations, performance curves and rating data, wiring and control diagrams, manufacturer's recommendations, operating and maintenance instructions, including safe operating procedures and requirements, spare parts lists and other pertinent information for the specified equipment and systems. The

manual shall include a typewritten schedule of each motor, giving nameplate data, switch and fuse or breaker sizes and voltage and phase at motor terminals.

### 3.10 TESTS

- A. Test and demonstrate each and every system in the presence of and to the complete satisfaction of a representative of the Engineer. Prior to demonstration, start all equipment and make necessary tests and adjustments to place the system in first class operating conditions.
- B. Furnish all services, instruments, equipment and personnel required for the tests; in addition, submit a typewritten test report, where applicable and recorded data is taken or required for approval prior to final acceptance.
- C. Test all electrical conductors after installation but prior to termination with a 500 volt meggar. Conductors shall test free of grounds and shorts, and their insulation resistance shall be recorded for all feeders and circuits where the conductor size is size 8 and larger.
- D. No piping work, fixtures or equipment shall be concealed or covered until they have been inspected and approved. Engineer's representative shall be notified one week prior to when the work is ready for inspection. All work shall be completely installed, tested as required by the Section and the State Ordinances and State Safety Orders, and shall be leak-tight before inspection if requested. All tests shall be repeated upon request to the complete satisfaction of those making the inspection.
- E. All domestic water piping shall be flushed out, tested and shall be left under pressure of supply main or a minimum of 40 psi for the balance of the construction period.

### 3.11 AS-BUILT DRAWINGS

- A. Before the project will be finally accepted, a set of permanent as-built drawings must be submitted to the Engineer. The Contractor must certify accuracy by endorsement. The as-built drawings must be correct in every detail so that the Owner can properly operate, maintain and repair exposed and concealed work.
- B. All underground work shall be dimensioned. All change orders, field changes, equipment, circuit numbers, motors, feeders, breakers and starters shall be clearly indicated on the drawings. As-built drawings shall be submitted on tracings or other reproducible forms.

### 3.12 GUARANTEE

- A. Furnish to the Engineer a typewritten guarantee, countersigned by the General Contractor, to the effect that all work or equipment installed by him under this Contract shall be free from any or all mechanical and electrical defects for a period of one (1) year from the date of final acceptance. Should any mechanical or electrical defect develop in any of the systems or equipment within the period, due to faulty equipment, poor installation or workmanship, this Contractor shall agree to repair or replace same with new and like material without additional compensation. Lamps in all fixtures shall be guaranteed for 100 percent of manufacturer's published life data.

### 3.13 GENERAL CONSTRUCTION WORK FOR MECHANICAL AND ELECTRICAL FACILITIES - SLEEVES

- A. Provide 22 gauge galvanized sheet iron sleeves where pipes and conduits pass through interior masonry walls. Sleeves shall be trimmed flush with each finished surface. Sleeves shall be sufficient size to allow insertion of pipe or conduit passing through concrete beams and walls, masonry exterior walls and all floors. Sleeves shall be sized at least 1/2 inch greater than the outside diameters of the pipes or conduits. Floor sleeves shall extend 1 inch above floors. After conduits/pipes are installed, seal the space between the conduits/pipes and sleeves with a filler to provide a non-runable watertight joint.

### 3.14 ROOF FLASHING

- A. Provide complete watertight flashing and counter-flashing for all roof penetrations. All flashings shall be made to the complete satisfaction of the Engineer.

### 3.15 PAINTING

- A. All exposed mechanical and electrical equipment in finished areas shall be painted.
- B. Provide a prime coat to all unfinished equipment or material and all ferrous metal subject to rusting and corrosion during construction.
- C. All duct work visible through registers, grilles and diffuser openings shall be given two coats of dull black paint.

### 3.16 FASTENING DEVICES AND METHODS

- A. Provide fastening devices which are permanent, non-corroding, high strength type using threads or tightening. Minimum size bolt shall be 3/16 inch, and medium size screw shall be No. 10. Cement or glue type fasteners shall not be used. Driven studs may be used for fastening only in steel.

- B. In concrete and solid masonry, use threaded inserts secured in drilled holes or cast into the concrete. Conduits 1 inch and larger, junction boxes 12 inches and larger, and all equipment subject to motion, operation or vibration shall be fastened with lead tamped or wedge type expanding shield secured threaded inserts.
- C. In hollow masonry, plaster or plaster board, toggle bolts or expanding lag anchors shall be used with excess hole area covered with washers. Whenever possible, fastening in plaster or plaster board shall be into studs or structural supports.
- D. In wood construction, wood screws and lag bolts may be used. Screws shall not be hammered into wood.
- E. In steel construction, driven threaded studs, welded threaded studs, drilled threaded or through holes, or threaded clamps shall be used.
- F. In light weight applications on sheet metal, self-threading screws or bolts may be used.

### 3.17 PIPING

- A. Cut pipe accurately to measurements established at the site, work into place, without springing or facing and clear all windows, doors and other openings. Ream all piping to remove burrs and install so as to permit free expansion and contraction without causing damage. Make all changes in direction with fittings.
- B. Provide, whether shown or not, sufficient awing joints, expansion loops and devices necessary for a flexible piping system. Provide union shut off valves suitable located to facilitate maintenance and removal of all equipment or apparatus. Install drain valves at all low points of each system to enable complete drainage, and air vents at all high points in the piping system to enable complete air venting.
- C. Pipe all drains from condensate pans, and relief valves, to spill over an open sight drain, floor drain or other acceptable discharge points, and terminate with a plain end (unthreaded pipe) 6 inches above the drain. Rigidly support all drains.
- D. Weld-O-Let type fittings may be used for branch take offs where size of take off does not exceed 3 inch IPS and the take off is at least two standard pipe sizes smaller than the main size. Standard welding steel shall be used in all other locations. Copper piping shall have soldered joints with 95-5 solder. Galvanized piping shall have screwed joints.
- E. Joints in copper tubing shall be made using sweat fittings and tin-antimony solder and non-corrosive flux. For soldered joints, the outside surface at end of pipe and inside surface of fitting shall be thoroughly cleaned with steel wool or emery cloth

and all burrs shall be removed. After cleaning, surfaces to be joined shall be evenly and completely covered with flux. Solder joints shall be well supported during the heating process and shall not be strained during the cooling period. Excess solder shall be removed while in a plastic state, leaving a fillet around the cup of the fitting as it cools.

- F. All pipe and fittings with screwed ends shall have its threads cut clean and true and in conformance with the ASA Specification B2-1 for taper threads. Screwed pipe and fitting of brass shall be made up without marring or damaging pipe and fitting surfaces. All screwed pipe joints, except where specified otherwise, shall be made up with non-soluble, non-toxic, approved thread compound, applied to male threads only.
- G. Connections between pipe fittings, hangers and equipment of dissimilar metals shall be avoided wherever practical. Wherever such connections are unavoidable, they shall be insulated against direct contact, using a high grade dielectric insulating material of Teflon, Milarta, asbestos fiber, neoprene, or equal.
- H. Hangers: Furnish and install suitable hangers and supports for all horizontal lines. Hangers and supports shall be Grinnel, Fee and Mason, or equal. Heavy pipes shall be carried by pipe hangers supported by rods secured to slab or by approved design. No piping shall be hung from other piping. In no case shall hangers be supported by means of vertical expansion bolts.
- I. Horizontal steel piping shall be supported in accordance with the following schedule:

<u>PIPE SIZE</u>	<u>MAX. HANGER SPACING</u>	<u>ROD SIZE</u>
1" & smaller	6 ft. 0 inches	3/8 inch
1 1/2" to 2"	9 ft. 0 inches	3/8 inch
2 1/2" to 4"	10 ft. 0 inches	1/2 inch
Larger than 4"	12 ft. 0 inches	1/2 inch

- J. All lines of copper tubing shall be supported by approved type hangers. Hangers for uncovered lines shall be especially designed for copper tubing. Hangers for covered tubing shall have broad scraps fitting outside of covering with insulation protection. Horizontal copper tubing shall be installed in accordance with the following schedule.

<u>PIPE SIZE</u>	<u>HANGER HORIZONTAL SPACING</u>	<u>ROD SIZE</u>
1/2"	6'	3/8 inch
3/4" & 1"	8'	3/8 inch
1 1/4" & Larger	10'	3/8 inch

### 3.18 ESCUTCHEONS

- A. Escutcheons shall be installed on pipes and conduits wherever they pass through floors, ceilings, walls or partitions in finished areas.
- B. Escutcheons shall be chrome plated brass.

### 3.19 RELOCATION OF GAS LINE

- A. Trenches for gas line shall be excavated to the required depth.
- B. The bottom of the trenches shall be tamped hard and graded to secure all available fill. Bell holes shall be excavated to ensure pipe resting for its entire length on solid ground. If rock is encountered, it shall be excavated to a depth of 6 inches below the bottom of the pipe, and before laying the pipe, the space between the bottom of the pipe and the rock surface shall be filled with gravel and shall be well tamped. No extra compensation will be made for rock excavation.
- C. After the gas line has been tested, inspected and approved by the Engineer and utility company representative, the trenches shall be backfilled with approved fill material, in 12 inch layers, firmly compacted, flooded if necessary, and thoroughly tamped.

### 3.20 NAMEPLATES AND IDENTIFICATION

- A. Provide nameplates and identification on all major mechanical and electrical equipment.
- B. Exposed or surface mounted panel boards, cabinets, starters, contactors, time clocks, fans, motors, air handling units, shall be coded and painted with one inch high stenciled black letters across the front.
- C. The above equipment where flush mounted, shall be coded on the inside of the cover.
- D. Stencils shall be made from heavy waxed cardboard with all letters in capitals and of the same size. At the completion of the project, the stencils shall be turned over



to the Owner.

- E. In lieu of stencils, engraved bakelite nameplates may be used; nameplates shall be minimum one inch high with 1/4 inch high capital letters permanently fastened to equipment.

### 3.21 PIPE VIBRATION AND NOISE ISOLATION

- A. Insert 1 inch strip of hair felt to isolate all piping, conveying fluids, from direct contact with building walls, framing and sleeves. Pipe isolation shall be installed at all ring hangers consisting of 1 inch felt. Separate cold and hot water piping by 6 inches.
- B. All rotating equipment, piping, hangers, supports and tank connections to rotating equipment shall be vibration isolated from beams, columns, floors, ceilings, joists and walls using isolation equipment as specified in other sections of this specification or as shown on the Drawings.

### 3.22 CONTROL WIRING

- A. The Electrical Contractor shall furnish and install all control and interlock wiring for electrical equipment furnished. All wiring shall be in conduit and shall be in conformance with Section 16. Where control voltage is greater than 48 volts, wire shall be minimum 14 gauge AWG and shall have 600 volt insulation. Motors, starters, heaters, thermostats, and other control devices shall be furnished and delivered from the Mechanical Contractor to the Electrical Contractor for installation by the Electrical Contractor. The Mechanical Contractor shall furnish complete wiring diagrams to the Electrical Contractor for each and every piece of equipment to be installed and inter-connected if necessary. The Mechanical Contractor shall notify the Electrical Contractor concerning any changes in the electrical requirements due to substitution of equipment or variations in the equipment. Control raceways and boxes exposed to the elements shall be NEMA 3R or weatherproof.

END OF SECTION

## SECTION 22 11 13 PLUMBING

### PART 1 - GENERAL

#### 1.1 GENERAL CONDITIONS

- A. Furnish all labor, materials, equipment and services to complete the plumbing work as shown on the drawings or as specified. Refer to the General Conditions, Supplemental General Conditions, Mechanical, Electrical, and other sections as they apply.

#### 1.2 RELATED SECTIONS

- A. Section 220000 - Mechanical General

#### 1.3 SCOPE

- A. Furnish and install all plumbing systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each item or accessory is shown on the drawings or mentioned in these specifications.
- B. The work shall consist of, but is not limited to the following general items.
  - 1. Plumbing fixtures and related drainage and water supply systems.
  - 2. Hot water heater system.
  - 3. Floor drains, cleanouts and hose bibbs.
  - 4. Gas piping system.

#### 1.4 SUBMITTALS

- A. Submit shop drawings for:
  - 1. Fixtures.
  - 2. Water heaters.
  - 3. Drains, cleanouts, and hose bibbs.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Fixtures: As scheduled on Drawings and as manufactured by American Standard, Kohler, Crane, Bradley, or equal.
- B. Trim as for fixtures, plus Delta Faucet, or equal.
- C. Seats: Olsonite or Church.
- D. Hot water heater system: Refer to Plumbing Fixture Schedule on Drawings for manufacturer and model number.
- E. Hose bibbs: Josam, Chicago Faucet, Speakman, Zurn, or equal, with vacuum breaker. Material rough brass outside, chrome plated brass inside.
- F. Floor drains and cleanouts: Josam, Zurn or Wade.

### 2.2 PIPE AND FITTINGS

- A. Hot and cold water piping above slab shall be Schedule 40 galvanized steel with galvanized M.I. fittings or Type "L" copper with wrought copper fittings, or equal. Piping below slab shall be Type "K" copper tubing. Exterior piping shall be Schedule 40 galvanized steel, Type "K" or "L" copper, or Class 150 cast iron.
- B. Soil and storm drainage piping shall be Schedule 40 PVC, or Schedule 40 ABS DWV plastic pipe, or service weight cast iron with service weight fittings or no hub. Pipe and fittings to be coated with hot coal tar pitch inside and out.
- C. Vent piping 2 1/2 inch and under may be Schedule 40 galvanized steel pipe with banded cast iron fittings or galvanized victaulic couplings and fittings. Three inch and larger pipe shall be service weight cast iron, no hub. Copper DWV with copper drainage fittings may be used for all size vent piping. Vent pipe may be Schedule 40 PVC or ABS DWV plastic pipe.
- D. Gas piping shall be Schedule 40 black steel assembled with M.I. or welded fittings. Piping below grade coated and wrapped. Straight lengths furnished with factory coating. Fittings and damaged coatings shall be wrapped with tape-coat applied according to manufacturer's instructions.

### 2.3 VALVES AND STRAINERS

- A. Gate and globe valves shall be bronze with a steam working pressure of 125 psi as

- manufactured by Jenkins, Stockham or Wellworth, or equal.
- B. Valves 2" and smaller shall have screwed ends. Valves 2 1/2" and larger shall be iron body bronze mounted 125 psi ASA flanged.
  - C. Strainer shall be "Y" pattern Sarco, or equal, and furnished with stainless steel baskets.
  - D. Ball valves shall be full flow round port with teflon seats and seals.
  - E. Pet cocks shall be brass and rated 125 lb. W.P.
  - F. Check valves shall be all brass, swing check, screwed ends and suitable for 150 lb. W.P.
  - G. Gas cocks 1" and below - Crane No. 272 low pressure, 1 1/4" and above and all medium pressure, Rockwell No. 114 or 116.
  - H. Under water service valves shall be Mueller H-15200 curb stop with cast iron curb box with lid, plug and footpiece for sizes 1 1/2" and smaller, and Mueller A-2380-5, 200 psi, AWWA, iron body, non-rising stem gate valve with H-10360 cast iron valve box for sizes 2" and larger. Four 12" x 12" x 6" thick concrete pads around each box. Furnish key for each valve size.

## 2.4 BACKFLOW PREVENTERS

- A. Connections not permitted between potable water and a non-potable water or waste sources.
- B. Air gaps or approved backflow preventers shall always be used when required by code or as necessary to prevent backflow.
- C. Backflow preventers shall be installed with any supply fixture when the outlet end may at times be submerged, such as hoses, sprays, direct flushing valves, aspirators and under-rim connections to a fixture in which the surface of water in the fixture is exposed at all times to atmospheric pressure.

## PART 3 - EXECUTION

### 3.1 INSULATION

- A. All cold and hot water supply and return piping except exposed connections to plumbing fixtures, flanges and unions shall be insulated with 3/4" wall thickness

Gustin-Bacon "snap-on," Owens-Corning "PF," or standard thick 85% magnesia.

- B. All exposed piping shall have a fire retardant jacket applied.
- C. Fittings and valves shall be insulated with insulating cement. In exposed areas a fire retardant jacket shall be applied.
- D. Cold water piping shall have a vapor barrier jacket applied.
- E. Hot water piping under floors, 1" foamglas covered with glass cloth and mastic.
- F. Pipe insulation shall have a protective shield of 14 gauge galvanized steel placed centrally between the insert section at all hangers. Shield shall cover one-half of the insulation.

### 3.2 ROOF FLASHING

- A. A waterproof flashing shall be provided for each pipe or vent passing through the roof.
- B. Flashing shall be one piece 26 gauge FHA flashing assembly with the joint between flashing and pipe sealed with waterproof compound.
- C. Approved equal 3 pound lead, copper or Semco assembly may be used in lieu of FHA flashing.

### 3.3 STERILIZING WATER SUPPLY PIPES

- A. After the hot and cold water systems are complete, they shall be flushed out completely and filled with water and a solution of sodium hypochlorite added to the system. The solution shall consist of 1 gallon of 5% sodium hypochlorite, Purex or other bleach to 200 gallons of water. Check residual chlorine by orthotolidin test. Allow solution to remain in the system for 24 hours, after which the entire system shall be flushed.
- B. The Engineer shall be notified 24 hours prior to testing so his representative can witness test.

### 3.4 WATER HAMMER ARRESTERS

- A. Water hammer arresters shall be provided on all supply piping, both hot and cold, where indicated on the Drawings.

### 3.5 LAYING SUPPLY LINES

- A. Exterior water supply lines shall be laid with a minimum cover of 36". Installation shall be in accordance with Arkansas Department of Health Regulations and local codes and ordinances.

### 3.6 T & P VALVE

- A. The T & P valve on the water heater shall be run to outside of building.

END OF SECTION

## SECTION 23 08 00 HEATING, VENTILATION & AIR CONDITIONING

### PART 1 - GENERAL

#### 1.1 CONDITIONS

- A. Furnish all labor, materials, equipment and services to complete the work as shown on the Drawings or as specified. Refer to the General Conditions, Supplemental General Conditions, Electrical, and other Sections as they apply.

#### 1.2 RELATED SECTIONS

- A. Section 220000 - Mechanical General

#### 1.3 SCOPE

- A. Furnish all HVAC systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the Drawings or mentioned in these Specifications.
- B. The work shall consist of but is not limited to the following items:
  - 1. Exhaust fans
  - 2. Sheet metal duct work
  - 3. Diffusers and grilles
  - 4. Roof top units
  - 5. Vent hoods

#### 1.3 SUBMITTALS

- A. Submit shop drawings for:
  - 1. Exhaust fans
  - 2. Diffusers and grilles
  - 3. Roof top units
  - 4. Vent hoods
  - 5. Condensing unit

## PART 2 - PRODUCTS

### 2.1 ROOF TOP UNIT

- A. Roof top units shall be equal to units shown in the Mechanical Equipment Schedule.

### 2.2 EXHAUST FANS

- A. Exhaust fans shall bear AMCA or PFMA certified seal and be of minimum sizes and capacities as shown on the drawings. Include disconnects, integral mounted. Furnish with variable pitch drives unless otherwise directed. Fans shall be spun type with automatic backdraft dampers.
- B. Furnish with factory curbs.
- C. Approved equals shall include Greenhack, Penn, Cook or Exit-Air.

### 2.3 PRE-FABRICATED ROOF CURBS

- A. All roof top equipment shall be furnished with pre-fabricated roof curbs.

## PART 3 - EXECUTION

### 3.1 DUCTWORK

- A. Ductwork shall be galvanized fabricated and installed in accordance with the latest publication of SMACNA standards, for low pressure ductwork.
- B. Duct sizes shown on the drawings are actual sizes required and do not include allowance for internal insulation. Rectangular duct for units must be increased in size from that shown on the drawings to allow for insulation.
- C. Air foil turning vanes shall be installed in all abrupt elbows. Connection to diffusers, grille and register faces shall be made absolutely air tight.
- D. Furnish flexible connections between all duct work and fans or fan coil units. Connections shall be flame proof and waterproof 16 ounce canvas of not less than 4" in length and secured in an airtight manner.

### 3.2 DIFFUSERS

- A. Diffusers, grilles and registers are scheduled on the drawings. Center all diffusers to coordinate with reflected ceilings, lighting, speakers, etc. All wall mounted outlets



shall be prime coated. All ceiling mounted outlets and returns shall be natural aluminum satin finished; air testing in accordance with SMACNA standards.

- B. Furnish opposed blade volume controls to provide control of the air flow for all supply and return diffusers and registers. Operation shall be from face of the grille with a removable key.
- C. Door grilles shall be slight tight core and vision proof from any angle. Grilles shall be prime coated unless otherwise shown on the drawings. Center the door fixed panel.
- D. Diffusers, grilles and registers as manufactured by Titus, Barber Coleman, Kruger, Carnes or Grillmaster.
- E. Contractor to balance the airflow as indicated on the drawings in accordance with ASHRAE Standards.

### 3.3 INSULATION

- A. Rectangular duct work, both supply and return, shall be insulated with 1" thick 2 pound density duct liner with vinyl sprayed surface to the air side. The liner shall be installed in accordance with duct liner standards of SMACNA. Return duct insulated only if indicated on the plans.
- B. Round duct work shall be insulated with 2" thick fiberglass insulation with fire resistive vapor barrier jacket.
- C. Insulate kitchen exhaust duct with 2" thick fiberglass with fire resistive vapor barrier jacket.

### 3.4 FLUES

- A. All gas flues shall be double wall type B with 6" clearance between roofing material and flue. Flues shall terminate above roof with rain cap, roof jack and counter flashing, in compliance with the gas code.

END OF SECTION

## SECTION 26 00 00 ELECTRICAL

### PART 1 - GENERAL

#### 1.1 CONDITIONS

- A. Furnish all labor, materials, equipment and services to complete the electrical work as shown on the drawings or as specified. Refer to the General Conditions, Supplemental General Conditions and other sections below, as they apply.

#### 1.2 RELATED SECTIONS

- A. Section 220000 - Mechanical General

#### 1.3 SCOPE

- A. Furnish and install all electrical systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the drawings or mentioned in these specifications.
- B. The work shall consist of, but is not limited to the following general items:
  - 1. Lighting Fixtures and Lamps
  - 2. Raceways
  - 3. Wiring Devices and Plates
  - 4. Branch Circuits
  - 5. Control Wiring
  - 6. Panelboards

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 013300
- B. Submit shop drawings for:
  - 1. Lighting Fixtures and Lamps
  - 2. Wiring Devices and Plates
  - 3. Safety Disconnect Switches
  - 4. Control Wiring for all Mechanical Systems
  - 5. Panelboards

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Submit material lists for all raceways and connectors, conductors and their connectors, boxes and grounding facilities.

## PART 3 - EXECUTION

### 3.1 RACEWAYS

- A. **GENERAL:** Provide raceways for all wiring systems, minimum 3/4 inch. Raceways shall include rigid galvanized steel, conduit, rigid aluminum conduit, (EMT) electrical metallic tubing, flexible metallic conduit, surface metal raceways, wire ways and troughs. Raceways shall be mechanically and electrically continuous from service entrance to final outlet. Raceways shall be run perpendicular and parallel to building construction. Except in Mechanical Rooms or as otherwise noted, all raceways shall be concealed. All breaks and turns with exposed raceways shall be made with malleable iron cadmium or hot dipped galvanized conduit fittings and covers. Raceways shall be rigidly supported with malleable iron conduit clamps or trapeze supports and clamps at intervals not exceeding 7 feet with 12 inches of all outlet boxes, elbows, and changes or direction. Concealed raceways shall be supported from structural members and not furring. All raceway systems shall be completely installed and secured and swabbed out, and all work in the area shall have progressed sufficiently to prevent injury to cables, before any conductors are installed. Provide caps and plugs on ends of raceways and openings in boxes to prevent foreign material from entering during construction. Provide double locknuts where 1 1/2 inch and larger conduits terminate, where No. 4 and larger conductors are installed, and where required by NEC. Do not use running threads. Leave No. 12 pull wire (identified at both ends) in all empty raceways. Provide plastic insulating busing on all conduit connections and fiber inserts on all tubing connections. Surface metal raceways, surface wiremold and surface metal troughs shall be installed only where shown on the drawings.
- B. **RIGID CONDUIT:** Provide rigid galvanized steel conduits for service entrance, panel feeders and all motor feeders. Threadless fittings, all thread and running threads shall not be used. Rigid conduits shall be provided for all raceway systems run underground or embedded in concrete or solid masonry. Rigid conduit shall be as manufactured by Youngstown, Allied, Triangle, or equal. Conduits located underground shall be PVC or shall be rigid galvanized steel and have an additional coat or polyvinylchloride and shall be manufactured by Robroy, or equal.

- C. **ELECTRICAL METALLIC TUBING (EMT):** Electrical metallic tubing (EMT) may be used for conduits concealed in furred ceilings or walls, run exposed in the building, or embedded in hollow masonry construction above grade. EMT shall be as manufactured by Triangle, Allied, Republic, or equal. EMT fittings shall be ferrous metal galvanized or plated to resist corrosion and shall be of the compression-ring type, rain-tight and concrete-tight. Set screw, indenter or friction type fittings will not be allowed. All fittings shall be wrench tight and shall have insulated throats. Fittings shall be as manufactured by Steel City, Racco, Appleton, or equal.
- D. **FLEXIBLE CONDUIT:** Provide flexible conduit for all connections to motors and other equipment subject to vibration or motion with a maximum length of 18 inches. Flexible conduit may be used for final connection to lighting fixtures in lay-in ceilings. Conduit shall be rigidly supported where connection to flexible conduit is made. Conduit and fittings shall be self-grounding and, in addition, copper bonding jumpers shall be used. Flexible conduit shall be as manufactured by Republic, Anaconda, Pittsburg, or equal. Connectors shall be ferrous metal, galvanized or plated to resist corrosion, of the two (2) screw clamp type, or the squeeze type, as manufactured by Racco, Appleton, Steel City, or equal. Flexible conduit and fittings used outdoors or in other areas subject to moisture shall be of the liquid-tight type with connectors having an O-ring assembly. Liquid tight connectors shall be Racco type 3500, Appleton STB, or equal.
- E. **CONDUIT HANGERS AND SUPPORTS:** All conduits shall be rigidly supported and securely fastened to structural members. Perforated iron straps or wire shall not be used for support. Maximum support spacing shall be five (5) foot for one (1) inch and smaller conduits, and seven (7) foot for conduits larger than one (1) inch. All conduit shall be installed to permit expansion and contraction, and type hanger, method of support, location of support, etc. shall be governed in part by this consideration.

### 3.2 OUTLET, JUNCTION AND PULL BOXES

- A. Provide outlet and junction boxes where shown on the drawings or as required by Code. Boxes shall be independently rigidly supported and accessible. All outlet boxes shall be minimum of two (2) inches deep. Provide a four (4) inch square box with plaster ring and cover at each switch and receptacle location. Wiring device boxes located in brick, block or concrete walls shall be approved for the type of installation being at mortar joints. Multi-gang boxes shall be installed for more than two (2) adjacent devices; sectional boxes will not be allowed. All exposed cover plates as manufactured by Crouse Hinds, or equal. Outlets exposed to the weather shall be type FD with weatherproof gaskets and covers. Pull boxes shall be constructed of code gauge galvanized steel and shall be sized not less than 1 1/2 times all dimensions as recommended by the NEC. All conductors in pull boxes shall be identified with tags.

### 3.3 CONDUCTORS

- A. All conductors shall be rated 600 volts, and shall be copper with type THHN insulation. Minimum size shall be No. 12 and No. 8, and larger shall be stranded. All conductors shall be color coded, with sizes through No. 10 being of the solid compound coating. Stripes, bands or hash marks with respective color coding may be used for conductors No. 8 and larger. Color coding shall be phase A - black, phase B - red, phase C - blue, neutral - white, and ground - green. All conductors shall be by the same manufacturer and shall be Triangle, Simplex, Anaconda, General, Okonite, or equal.
- B. Mains and feeders shall be run continuous without joints or splices. Branch circuit splices shall be made with 3M "Scotchloks," or equal. In panelboards and boxes, conductors shall be neatly placed in phase groups and supported away from all enclosure sides. Lacing shall be done at intervals not greater than six (6) inches and shall be done with linen cord or T & B self-locking "Ty-Raps," or equal.

### 3.4 LIGHTING FIXTURES

- A. Provide all lighting fixtures as noted on the drawings. Fixtures shall be suspended from structural members or from ceiling structural members, by standard bar hangers, or other approved means. Structural steel necessary to support fixtures shall be furnished and installed under this Section. Provide plaster frames as required. All fixtures shall be grounded. Fixtures shall be completely wired and lamped and shall be in perfect condition and operating at the time of completion. New building fixtures shall not be used for construction lighting.
- B. Fixture locations shall be coordinated with ceiling patterns or other details or notes as shown on the drawings.
- C. If a lighting fixture for a specific location is not clearly noted, the Contractor shall bring it to the attention of the Engineer prior to bidding, or the Contractor shall furnish and install a fixture similar and comparable in cost to that specified for other like location.

### 3.5 LAMPS

- A. Provide and install lamps in lighting fixtures.

### 3.6 WIRING DEVICES AND PLATES

- A. Furnish and install all wiring devices and plates where shown on the drawings and herein specified. All devices shall be NEMA rated specification grade, with all parts except terminals totally enclosed, and with each device separately packaged upon arrival at job site. Height of wiring device shall work with brick joints and concrete

block joints, but in general, lighting switches shall be mounted 4'-0" above floor, and receptacles and telephone outlets shall be mounted 12" above floor. Adjacent wiring devices shall be mounted as close to each other as possible. All wiring devices shall be side wired.

- B. In general, wiring devices and plates located in finished unpaneled areas shall be ivory. Wiring devices and plates located in finished paneled areas shall be brown. In unfinished areas, plates shall be 302 stainless steel.

### 3.7 SAFETY DISCONNECT SWITCHES

- A. Furnish and install safety disconnect switches where shown on the Drawings or as required by NEC. Switches shall be NEMA heavy duty, horsepower rated, with pad-locking provisions and with a nameplate identifying equipment served. In wet or exterior locations, switches shall be in NEMA 3R enclosures. Switches shall be as manufactured by Square "D", General Electric, Westinghouse, ITE, or equal.

### 3.8 GROUNDING

- A. The entire electrical system and the building structure shall be grounded, or as indicated on the drawings. The electric service, equipment and enclosures, conduits and raceways, switches, breakers and panels, motors, controllers, lighting fixtures and receptacles shall be grounded. Each branch or power circuit shall have an independent grounding conductor whether shown or not, with the exception of lighting switches.
- B. Bonding jumpers shall be installed to maintain continuity at water meters, connections shall be made with approved clamps as manufactured by Burndy.

### 3.9 GROUND FAULT CIRCUIT INTERRUPTERS

- A. Conformance with UL Std. 943, Class A.
- B. Temperature tolerance level of -31° to 158°F.
- C. Equal to Leviton Suregard V, NEMA 5-15R, Model 6598-W with indicator light, 15A, 125 volt.

END OF SECTION

**Section 26 56 00**  
**Lighting**

**PART 1 - GENERAL**

- 1.1 SUMMARY: Decorative walkway lighting with foundation and equipment complete with frames, yokes, hangers, poles, straps, ballasts, lamps and other related items.
- A. Section Includes:
- a. Luminaires and lampholders.
  - b. Lamps.
  - c. Ballasts.
  - d. Poles and brackets.
- B. Related Sections:
1. Section 26 00 00 Electrical
- 1.2 REFERENCES: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- A. CODE OF FEDERAL REGULATIONS (CFR)
1. 21 CFR 1040.30 Multi-vapor Lamp Extinguishment When Exterior Envelope Compromised
- B. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) One Batterymarch Park, Quincy, MA 02269-9101
1. NFPA 70-96, National Electrical Code
  2. NFPA 101. Life Safety Code
- C. SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCCI ) PUBLIC SAFETY TESTING AND EVALUATION SERVICES, INC., 900 Montclair Road, Suite A, Birmingham, AL 35213-1206
1. 1999 Arkansas Fire Prevention Code (AFPC)
- 1.3 SUBMITTALS:
- A. Product Data: Provide product data for each luminaire and lighting unit.
  - B. Operating and Maintenance Instructions: Provide maintenance and operating instructions for battery powered lighting units.
  - C. Shop Drawings: Indicate construction details for Products which are not manufacturer's standard.
  - D. Provide color sample for owner/landscape architect approval.
- 1.4 QUALITY ASSURANCE:
- A. Manufacturer: Company specializing in manufacturing exterior lighting fixtures of period appearance with five years documented experience.
  - B. Regulatory Requirements: Conform to requirements of ANSI/NFPA 70. Comply with NFPA 101 Life Safety Code and Arkansas Fire Prevention and local regulations and ordinances. Furnish products listed by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction.
  - C. Inspections, Permits, And Fees:
    1. Contractor: Obtain and pay for all required permits, and inspections in connection with this work under the Contract. Deliver to the Owner a copy of each certificate of approval from each inspection agency. Pay for required testing. Pay any and all fees in connection to all utilities and pay all utilities bills during construction. Bear all costs of correcting deficiencies of any work that does not comply with the requirements of the applicable building codes, state laws, local ordinances, industry standards, and utility company regulations.
- 1.5 DELIVERY, STORAGE AND HANDLING: Deliver, store, protect, and handle products to site under provisions of Section 01600.
- A. Packing, Shipping, Handling, and Unloading: Handle in a manner to prevent damage, bending, breakage, and/or contamination.
  - B. Acceptance at Site: Deliver and store materials in original containers with seals unbroken and labels in accordance with manufacturer's instructions.
  - C. Storage and Protection: Store equipment and materials in original containers, suitably sheltered from the elements, but readily accessible for inspection by Landscape Architect until installed. Store all items subject to moisture damage in dry, heated places. Tightly cover equipment and protect against dirt, water, and chemical or mechanical injury and theft. At completion of the work, fixtures, equipment, and materials shall be free of defects and damage cleaned and turned over to the Owner in first class condition. Contractor repair or make good damage or defects developing before acceptance of the work shall be made good at the Contractor's expense.
  - D. Waste Management and Disposal: Remove rejected materials from site immediately.

**PART 2 - PRODUCTS**

ITT TRAINING CENTER for the  
ECONOMIC DEVELOPMENT ADMINISTRATION  
NEWPORT, ARKANSAS

## 2.1 MANUFACTURERS:

- A. Sternberg Vintage Lighting, 7411 Oak Park Avenue, Niles, Illinois 60714 (847) 588-3400 Style 130ALED/5P/2512FP/24L40T5-MDL014/1-LP-GFI/1UC/1-DBA/VG.
- B. KIM Lighting Products, 17760 Rowland Street, Rowland Heights, CA 91748, Phone 626-968-5666; Models LTV 81DM and LTV767NF and SP.
- C. VistaPro Lighting, 1625 Surveyor Ave, Simi Valley CA 93063, phone (805)-527-0987 Model 4261m-LED-LB2ND Cool Color Temperature Option, Pewter finish. Transformer to be ES-150 Pewter Finish.
- D. Beacon Lighting Products 2041 58th Avenue Circle East Bradenton, fl 34203 Phone: (800) 345-4928 Fax: (941) 751-5535
- E. ANP Lighting products 9044 Del Mar Avenue, Montclair, CA 91763 Call: 800.548.3227 • Fax: 1.800.242.5483
- F. Substitutions: approved equivalent. Contractor must demonstrate that substitute product is equivalent to product shown in item A above including producing equivalent light distribution and coverage.
- G. Provide lighting fixture, pole and accessories from the same manufacturer for consistency of finish and fitting of components.
- H. See Sheet L7.1 for addition product requirements.

## 2.2 ACCESSORIES/FINISHES

- A. Sign Poles:
  - 1. Sternberg Vintage Lighting, 7411 Oak Park Avenue, Niles, Illinois 60714 (847) 588-3400 Model as noted on details.
  - 2. Substitutions: Approved Equivalent.
  - 3. Material: Aluminum.
  - 4. Finish: Shop finished. Verde Green

## PART 3 - EXECUTION

**3.1 EXAMINATION:**Site verification of Conditions: Examine adjacent surfaces to determine that surfaces are ready to receive work.

**3.2 INSTALLATION:** Install luminaires and accessories in accordance with manufacturers instructions.

- 1. Luminaire Pole Bases: Construct as indicated on Drawings. Install poles on bases plumb; provide for adjustment.
- 2. Embedded Luminaire Poles: Depth as indicated. Install plumb.
- 3. Install lamps in luminaires and lampholders.

**3.3 ADJUSTING:** Align luminaires and clean lenses and diffusers at completion of work. Aim adjustable luminaires and lampholders as indicated or as directed. Touch up luminaire and pole finish at completion of work. Relamp luminaires which have failed lamps at completion of work.

**3.4 CLEANING:** Clean paint splatters, dirt and debris from installed luminaires.

**End of Section**



## SECTION 31 10 00 EARTHWORK

### PART 1 - GENERAL

#### 1.1 CONDITIONS

- A. Requirements of the Conditions of the Contract apply to all work under this Section. This includes all labor, materials, equipment and services necessary to complete all work indicated on the drawings and herein specified, or both.
- B. Carefully read the General Conditions of the Specifications, which shall be considered as and made a part of this section.

#### 1.2 SCOPE

- A. The work required under this section consists of all excavating, filling, grading, dewatering, and related items necessary to complete the work indicated on the Drawings and described in these Specifications, including but not necessarily limited to the following:
  - 1. Excavating and disposal of existing concrete, building and site rubble, removal of top 12" of on-site soils (stripping) and stockpile for landscaping purposes.
  - 2. Rough grading and subgrade preparation. Filling to top of subgrade with ordinary fill (locally available soil) approved by the Engineer.
  - 3. Providing and installing geofabric under all areas of fill except slabs.
  - 4. Providing and installing controlled fill materials, footings and slabs.

#### 1.3 EXAMINATION OF SITE AND DOCUMENTS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation at the site.
- B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period as no allowance will be made for any errors or inaccuracies that may be found herein.

## 1.4 SUBSURFACE CONDITIONS

- A. Subsurface conditions are to be assumed substantially as shown on the Drawings.

## 1.5 REQUIREMENTS OF REGULATORY AGENCIES

- A. All work shall conform to the Drawings and Specifications and shall comply with applicable codes and regulations.
- B. Comply with rules, regulations, laws and ordinances of all authorities having jurisdiction.
- C. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.
- D. The Contractor shall not close or obstruct any street, sidewalk, alley or passageway without permission from authorities having jurisdiction. The Contractor shall so conduct his operations as to interfere as little as possible with the use ordinarily made of roads, driveways, alleys, sidewalks, or other facilities near enough to the work to be affected thereby.

## PART 2 - MATERIALS AND EQUIPMENT

### 2.1 FILL MATERIALS

- A. Gravel Fill. Well graded natural sand and gravel free from ice, organic or other deleterious materials, conforming to the following gradations:

<u>U.S. Sieve No.</u>	<u>Percent Passing by Weight</u>	
	<u>Maximum</u>	<u>Minimum</u>
4 Inch	---	100
1 Inch	100	60
No. 4	85	25
No. 40	35	5
No. 200	5	0

- B. Ordinary Fill. Well-graded, natural, inorganic soil shall consist of sand or gravel clays approved by the Architect/Engineer and meeting the following requirements:
1. It shall be free of organic and other weak or compressive materials, of frozen materials, and of stones larger than 6 inches maximum dimension.

2. It shall be of such nature and character that it can be compacted to the specified density of 100% Standard Proctor in a reasonable length of time.
  3. It shall be free of highly plastic clays, of all materials subject to decay, decomposition, or dissolution, and of cinders or other materials which will corrode piping or other materials.
  4. It shall have a plasticity index (PI) of less than 15.
  5. Ordinary fill shall be used to fill to the top of subgrade.
- C. Controlled Fill/Base Material Under Footings Slabs, Paved (both Rigid and Flexible) Driveways and Parking Areas.
1. The controlled fill under the floor slabs and footings shall consist of clayey sand or clayey gravel with a plasticity index less than 15. Samples of materials proposed shall be submitted for approval.
- D. Granular Material Under Concrete Slabs.
1. The granular material under floor slabs shall consist of porous sands or crushed fine limestone with no more than 5% passing a No. 200 sieve (absence of fines), as approved by the Engineer.
- E. Topsoil. Fertile, friable, natural topsoil of loamy character, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sands, stones, plants, roots, sticks, brick and other foreign materials, with acidity range of between pH 6.0 and 6.8. Disturbed areas to be seeded shall receive a 3" minimum of approved topsoil. Areas that shall receive beds and sod shall receive a 3" minimum layer of approved topsoil
1. Identify source location of topsoil proposed for use on the project.
  2. Provide topsoil free of substances harmful to the plants, which will be grown in the soil.

## 2.2 SOURCE QUALITY CONTROL

- A. All fill materials shall be subject to quality control testing. A qualified laboratory will be selected and paid by the Contractor to perform tests on materials. Test results and laboratory recommendations will be available to the Owner.

## 2.3 COMPACTION EQUIPMENT

- A. Provide sufficient equipment units of suitable types to spread, level and compact fills promptly upon delivery of materials.
- B. Contractor may use any compaction equipment or device which he finds convenient and economical, but the Architect/ Engineer retains the right to disapprove equipment which, in his opinion, is of inadequate capacity or unsuited to the character of materials being compacted.

## PART 3 - EXECUTION

### 3.1 GENERAL

#### A. Site Preparation

1. To prepare for construction, all topsoil, vegetation, roots, and any soft soils in the building or pavement areas shall be stripped from the ground surface and either wasted or stockpiled for later use in landscaping. Some old foundation slabs may be encountered.
2. Site grading should include removal of the surficial organic soil zone in the building and pavement areas. Depth of stripping is estimated to be on the order of 12 inches, although potentially greater in localized soft and/or moist areas during wetter seasons.
3. Following stripping, and prior to placing fill, the site should be proof-rolled with a minimum 20,000 pound pneumatic tired roller, loaded tandem-wheeled dump truck, or similar equipment. Soft or loose zones should be undercut and be processed and re-compacted or undercut and replaced with approved select fill. Additional undercutting in excess of the 12 inches will be considered a part of "site work" in the lump sum bid schedule and no additional compensation will be made.
4. Subgrade shall be compacted to 98% Standard Proctor. A subgrade support fabric such as Mirafi 500x (or equal) shall be placed between the compacted fill and the natural ground to improve site stability of soils.
5. Undercutting to depths of 3 to 4 feet are possible under extremely wet conditions, or if excessive disturbance occurs due to heavy construction equipment. To reduce undercut potential, the use of light dozers is recommended for stripping. In addition, operation of heavy rubber-tired equipment should be limited. See Soils Report, Appendix A.

6. Fill required for backfill or to raise existing grade should consist of select clayey sand (SC), sandy clay (CL), or clayey gravel (GC) having a liquid limit less than 40, or an approved alternate. Since the footings will be supported in fill, a compaction criteria of at least 100 percent of Standard Proctor dry density (ASTM D-1557) with a moisture content range of -2 to +3 percent of optimum is recommended. In pavement areas, a compaction criteria of at least 100 percent of maximum Standard Proctor dry density (ASTM D-698) for base course, at a moisture content near optimum is recommended. Fill should be placed in maximum 8 inch lifts. Each lift or fill should be properly compacted, tested, and approved prior to placing subsequent lifts.

B. Layout and Grades

1. All lines and grade work not presently established at the site shall be laid out by the Contractor in accordance with the Contract Drawings and Specifications. The Contractor shall establish permanent bench marks determined by a Registered Land Surveyor Professional Civil Engineer. Maintain all established bounds and bench marks and replace as directed any which are destroyed or disturbed.
2. The words "finished grades" as used herein shall mean the required final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas outside of the buildings shall be given uniform slopes between points for which finished grades are indicated or between such points and existing established grades.
3. The word "subgrade" as used herein means the required surface of subsoil, ordinary fill or compacted fill. The surface is immediately beneath the site improvements, specially dimensioned fill, paving, loaming, or other surfacing materials.

C. Disposition of Existing Utilities

1. Active utilities existing on the site shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings and both the Architect/Engineer and the utility owner notified in writing.
2. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect/Engineer.

D. Frost Protection

1. Make no excavations to the full depth indicated when freezing temperatures may be expected, unless the footings or slabs can be placed immediately after the excavation has been completed. Protect the bottom so excavated from frost if placing of concrete is delayed. Should protection fail, remove frozen materials and replace with gravel fill as directed, at no cost to the Owner.
2. The underside of in-place beams and slabs shall be protected from freezing temperatures.

E. Disposal

1. All excavated materials which are not used for fill or backfill, and all surplus excavated materials shall be removed from the site and disposed of at no cost to the Owner.

3.2 EXCAVATION

- A. Excavate all materials as required to allow construction of the foundations for the structure as shown on the Drawings. Attention is called to "General Notes" on Structural Drawings and to the requirements contained therein which may affect the work under this section.
- B. If rock is encountered, trenches shall be excavated to 6 inches below bottom of pipe. Trenches for storm and sanitary sewers shall have a continuous slope in the direction of flow.
- C. When the depth of backfill over the pipes exceeds ten (10) feet, keep the trench below the level of the top of the pipe as narrow as practicable.

3.3 DEWATERING

- A. Provide, maintain and operate pumps and related equipment, including standby equipment, of sufficient capacity to keep excavation free of all water at all times and under any and all contingencies that may arise until the structures attain their full strength.

3.4 PLACING FILLS

A. General

1. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place

when fill materials or layers below it are frozen.

2. Notify the Architect/Engineer when excavations are ready for inspection. Filling and backfilling shall not be started until conditions have been approved by the Architect/Engineer.
3. Furnish approved materials. Place fill in layers not exceeding 6 inches compacted thickness and compact as specified below for various fill conditions.
4. Before backfilling against walls, the permanent structures (including basement floor slabs) shall be cast and sufficiently aged to attain strength required to resist backfill pressures without damage. Temporary bracing will not be permitted except by written permission from the Architect/Engineer. When filling on both sides of a wall or pier, place fill simultaneously on each side. Correct any damage to the structure caused by backfilling operations at no cost to Owner. Place no stones closer than eighteen (18) inches to wall surfaces.
5. Backfill trenches only after pipe has been inspected, tested, and location of pipes and appurtenances have been recorded.
6. Pipe bed shall be shaped by means of hand shovels to give full and continuous support to lower third of pipe. Backfill by hand around pipe and for a depth of twelve (12) inches above the pipe; use sand and tamp firmly in layers not exceeding six (6) inches in thickness, taking care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper to achieve the compaction specified below for various fill conditions.
7. Where soft materials of poor bearing qualities are found in trenching, a concrete foundation may be required to insure a firm foundation for the pipe. Such concrete foundation shall be bedded with six (6) inches of sand tamped in place so as to provide a uniform bearing for the pipe between joints.
8. All exposed subgrade shall be proof-rolled prior to fill placement to aid in identifying areas of loose or soft subgrade soils. Random compaction tests shall be performed to verify a subgrade soil compaction of 98% Standard Proctor of the top 6" of subgrade soil prior to ordinary fill or base course fill placement.

B. Placing Ordinary Fill

1. Ordinary fill as specified in Paragraph 2.1.B. hereinabove shall be provided

behind all walls and for all backfill and fill where gravel fill has not been specified hereinabove or on Drawings.

2. Place ordinary fill in lifts not exceeding eight (8) inches, uncompacted thickness, and compact to 100% standard proctor density (ASTM D-698).

C. Placing Controlled Fill

1. The controlled fill should be scarified and then processed to a moisture content between three percentage points below and two percentage points above the Standard Proctor optimum. The subgrade soils should be recompacted to a dry density of at least 98% of the standard Proctor maximum dry density for depths of at least 6 inches below the surface.
2. After subgrade preparation and inspection have been completed, fill placement may begin. Fill materials should be free of organic or other deleterious materials, have a maximum particle size of 3 inches, and have a plasticity index of less than 15. If a fine-grained (silt or clay) soil is used for fill, very close moisture content control will be required to achieve the recommended degree of compaction.
3. Fine-grained and granular structural fill should be compacted to at least 100% of the maximum Standard Proctor dry density as determined by ASTM Designation D-698. The fills under the concrete pavements shall have some plasticity. Select clayey sand or clayey gravel with a plasticity index between 4 and 15 shall be used.
4. Fill should be placed in maximum lifts of eight inches of loose material and should be compacted within the range of two percentage points above to three percentage points below the optimum moisture content as determined by the standard Proctor test. If water must be added, it should be uniformly applied and mixed into the soil by disk or scarifying.
5. Each lift of compacted soil should be tested and approved by the soils Architect/ Engineer or his representative prior to placement of subsequent lifts. As a guideline, it is recommended that field density tests be taken at a frequency of not less than one test per 2500 square feet of surface area per lift of fill in the building areas. This testing frequency may be reduced to one test per 5000 square feet of surface area per lift of fill in the pavement areas.

D. Field Quality Control

1. See overlapping procedures in Source of Quality Control.



2. Cooperate with laboratory in obtaining field samples of in-place materials after compaction. Furnish identical field labor in connection with these tests.

E. Construction Procedures

1. It is anticipated that the surficial silty clay soils encountered over portions of the site may be subject to significant loss in shear strength upon exposure and saturation. Therefore, adequate drainage of surface runoff should be established during the early phases of site grading and continued throughout construction to prevent ponding and subsequent saturation of subgrade soils.
2. It is anticipated that if construction is initiated during wetter seasons limited perched ground water may be encountered above excavation depths. Further, if the silty clay surficial soils within the building area are near saturation, pumping of these soils may occur during fill placement, requiring additional undercutting or the use of a "bridge" lift procedure. The potential for these problems to occur is considered to be significantly reduced if the site is dry.
3. Foundation excavations should be free of all loose or soft soils and water prior to placing concrete. Concrete should be placed as soon as possible after excavation, cleaning and inspection are complete to minimize possible changes in soil conditions due to the effects of wetting and drying. The Contractor shall notify the Architect/Engineer so he can be present during foundation excavation to monitor soil conditions at foundation depths.
4. Care should be taken to adequately slope or brace the sides of foundation excavations to prevent sloughing or caving. All applicable safety requirements (OSHA) regarding trench excavations should be adhered to.

3.5 CLEAN UP

- A. Remove all excess earth, debris, topsoil or other materials associated with this work from the job site.
- B. Keep driveways and city streets free from mud or trash deposited by equipment used in performing work under this section.

END OF SECTION

## SECTION 32 11 23 AGGREGATE BASE COURSE

### PART 1 - GENERAL PROVISIONS

#### 1.1 DESCRIPTION

- A. This work shall include the installation of aggregate base course.

### PART 2 - MATERIALS

#### 2.1 BASE COURSE

- A. Crushed Stone Base. This material shall consist of crushed run stone or a mixture of crushed stone and natural fines uniformly mixed and so proportioned as to meet all the requirements hereinafter specified, with the further provision that a mixture of crushed stone and natural fines shall contain not less than 90 percent crusher produced material. The stone shall be hard and durable with a percent of wear of 45 by Los Angeles Test (AASHTO T 96). For the purpose of this specification, shale and slate are not considered to be stone. The material furnished shall not contain more than 5 percent by weight of shale, slate and other deleterious matter.

The class or classes of crushed stone base course material that may be used on any particular job will be those called for on the proposed schedule.

#### GRADING REQUIREMENTS

Size of Sieve <u>Total Retained</u>	Percent by Weight	
	Class <u>SB-2</u>	Class <u>SB-3</u>
1 1/2"	0	---
1"	---	0
3/4"	10-50	0-35
No. 4	50-75	50-75
<u>Total Passing</u>		
No. 40	10-30	10-30
No. 200	3-10	3-10

The fraction passing the No. 200 sieve shall not be greater than two-thirds the fraction passing the No. 40 sieve. The fraction passing the No. 40 sieve shall have a liquid limit not greater than 25 and a plasticity index of not greater than 6.

When it is necessary to blend two or more materials, each material shall be proportioned separately through mechanical feeders to insure uniform production. Premixing or blending in the pit to avoid separate feeding will not be permitted. Blending materials on the roadway in order to obtain a mixture that will comply with the above requirements will not be permitted.

## PART 3 - APPLICATION

### 3.1 APPLICATION

- A. Crushed Stone Base Construction. The base course material shall be placed on a completed and approved subgrade or existing base that has been bladed to conform to the grade and cross section shown on the plans.

The subgrade shall be prepared as specified and shall be free from an excess or deficiency of moisture at the time of placing the base course. The subgrade shall also comply, where applicable, with the requirements of other items that may be contained in the contract that provide for construction, reconstruction or shaping of the subgrade or the reconstruction of the existing base course.

Base course material shall not be placed on a frozen subgrade or subbase.

The crushed stone gravel shall be placed on the subgrade or other base course material and spread uniformly to such depth and lines that when compacted it will have the thickness, width and cross-section shown on the plans.

If required, the compacted depth of the base course exceeds six inches (6"), the base shall be constructed in two or more layers of approximate equal thickness. The maximum compacted thickness of any one layer shall not exceed six (6) inches. When vibrating or other approved type of special compacting equipment is used, the compacted depth of a single layer of the base course may be increased to 8 inches upon approval.

The spreading shall be done the same day that the material is hauled and it shall be performed in such manner that no segregation of coarse particles or nests or hard areas caused by dumping the gravel on the subgrade will exist. To insure proper mixing, the gravel shall be bladed entirely across the roadbed before being spread. Care must be taken to prevent mixing of subgrade or

shoulder material with base course material in the blading and spreading operation.

Each course shall be compacted by any satisfactory method that will produce the density hereinafter specified. The gravel shall be substantially maintained at optimum moisture during the mixing, spreading, and compacting operations. The density of the compacted material in each course, as determined by AASHTO T-191, shall not be less than 95 percent of the density obtained in the laboratory by AASHTO T-180. The crushed stone shall be compacted across the entire width of application.

The laboratory density shall be obtained as follows. The sample is prepared by removing the aggregate retained at the 3/4 inch sieve and adding aggregate passing the 3/4 inch sieve and retained on the No. 4 sieve in an amount equal to that removed. The sample so prepared is compacted at various water contents in five equal layers in a mold 6 inches in diameter and 7 inches in height. Each layer is compacted by 55 blows of a 10 pound hammer 2 inches in diameter dropped from a height of 18 inches. The density used is the dry weight obtained at the optimum water content.

The compacted base course shall be tested for depth and any deficiencies corrected by scarifying, placing additional material, mixing, reshaping, and recompact to specified density, as directed.

The Contractor shall maintain the base course in a satisfactory condition until accepted.

END SECTION

**SECTION 32 13 13  
RIGID PAVEMENT**

**PART 1 - GENERAL**

**1.1 SUMMARY:** Concrete sidewalk paving, curbs and gutters and decorative bands.

- A. Related Sections: Section 03001 Concrete
- B. Unit Prices: Unit prices are full compensation for removing, clearing, salvaging, storing, and disposing of all materials removed; and furnishing of all labor, materials, tools, equipment, and apparatus of every description to construct, erect, and finish the Work. Unit prices do not include costs of engineering, advertising, printing and appraising.
  - 1. Provide unit price per square yard ( square meter ) for ADA Curb Ramps.
  - 2. Measurement Procedures: The quantity of ADA Curb Ramps completed and accepted as determined by the Landscape Architect shall be measured in square yards ( square meters ).
  - 3. Payment Procedures: If the required quantities of the items listed above are increased or decreased by change order, the unit prices bid shall apply to such quantities. Quantities of ADA Curb Ramps, as measured above, will be paid for at the respective contract unit prices. Payment will constitute full compensation for the construction and completion of the ADA Curb Ramps , including furnishing all labor and incidentals necessary to complete the work required by this section.

**1.2 REFERENCES:**

- A. AMERICAN CONCRETE INSTITUTE INTERNATIONAL(ACI) P.O. Box 9094, Farmington Hills, MI 48333-9094, (248) 848-3800, <http://www.aci-int.org>
  - 1. ACI 301 Specifications for Structural Concrete for Buildings
  - 2. ACI 318 Building Code Requirements for Reinforced Concrete
  - 3. ACI 614 Recommended Practice for Measuring Mixing and Placing Concrete
- B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, (610) 832-9500, <http://www.astm.org>
  - 1. ASTM A184/A184M Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
  - 2. ASTM C270 Standard Specification for Mortar for Unit Masonry
  - 3. ASTM C476 Standard Specification for Grout for Masonry
  - 4. ASTM A496 Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement
  - 5. ASTM A497 Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
  - 6. ASTM A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
  - 7. ASTM C33 Standard Specification for Concrete Aggregates
  - 8. ASTM C94 Standard Specification for Ready-Mixed Concrete
  - 9. ASTM C150 Standard Specification for Portland Cement
  - 10. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete
  - 11. ASTM C 216 Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
  - 12. ASTM C260 Standard Specification for Air-Entraining Admixtures for Concrete
  - 13. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
  - 14. ASTM C330 Standard Specification for Lightweight Aggregates for Structural Concrete
  - 15. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
  - 16. ASTM C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
  - 17. ASTM C979 Standard Specification for Pigments for Integrally Colored Concrete
  - 18. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

**1.3 SUBMITTALS:** Submit under provisions of Division One.

- I. Quality Control/Assurance Submittals: Submit the test report results of trial mix at least 14 days prior to commencing concrete placing operations. Submit with trial mix results a statement giving the maximum nominal coarse aggregate size and the proportions of all ingredients that will be used in the manufacture of each strength of concrete. Base the aggregate weights on the saturated surface dry condition. Accompany statement by test results from an independent commercial testing laboratory, attesting that the proportions selected will produce concrete of the qualities indicated. Specifically state "Concrete Mix For Pumping" on the mix design test reports of concrete mixes designed for pumping. Submit certified copies of laboratory test reports, including all test data, for aggregate, cement and pozzolan, showing materials meet all requirements specified in PART 2 - PRODUCTS. **DO NOT** make substitutions of the materials used in the work without additional tests to show that the quality of the concrete is satisfactory.

1.4 **QUALITY ASSURANCE: Regulatory Requirements:** Perform work in accordance with ACI 301 and Division One.

- A. **Inspections, Permits, and Fees:** Contractor obtain and pay for all required permits, and inspections in connection with this work under the Contract. Deliver to the Owner a copy of each certificate of approval from each inspection agency. Pay for required testing. Pay any and all fees in connection to all utilities and pay all utilities bills during construction. Bear all costs of correcting deficiencies of any work that does not comply with the requirements of the applicable building codes, state laws, local ordinances, industry standards, and utility company regulations.
- I. **Testing Facilities:** An approved commercial testing laboratory; or Facilities furnished by the Contractor. **DO NOT** perform any work requiring testing until the facilities have been inspected and approved by the Landscape Architect. The first inspection of the testing facility is at the expense of the Owner. Required subsequent inspection because of first inspection failure is the expense Contractor at no additional cost to the Owner.

1.5 **DELIVERY, STORAGE AND HANDLING:**

- 1. **Storage and Protection:** Contractor repair or make good damage or defects developing before acceptance of the work shall be made good at the Contractor's expense.
- B. **Waste Management and Disposal:** Remove rejected materials from site immediately.

1.6 **PROJECT/SITE CONDITIONS: Project/Site Environmental Requirements:**

- 1. **Cold Weather Requirements:** IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- 2. **Hot Weather Requirements:** IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction.

**PART 2 - PRODUCTS**

**2.1 MATERIALS:** Concrete materials specified in Division One. Water - Potable, clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.

**2.2 CONCRETE MIX:** Mix and deliver concrete in accordance with ASTM C94. Provide concrete for sidewalk, curbs and gutters, and paver base of the following characteristics:

- 1. Compressive Strength at 7 days: 1,875 psi (12.9 MPa)
- 2. Compressive Strength at 28 days: 3,500 psi (20.6 MPa)
- 3. Slump: 3 inches (75 mm) maximum, 2 inches (50 mm) minimum.
- 4. Air Entrainment: 5 to 7 percent.

**2.3 ACCESSORIES:** Joint Filler: ASTM D1751 Premolded asphaltic board, 1/2 inch (12 mm) thick.

**PART 3 - EXECUTION**

A. **EXAMINATION:** Verify gradients and elevations of base. Verify compacted subgrade and/or granular base is ready to support paving and imposed loads.

B. **PREPARATION:** Moisten substrate to minimize absorption of water from fresh concrete.

**3.2 MORTAR MIXING:** Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270. Do not use anti-freeze compounds to lower the freezing point of mortar.

**3.3 FORMING:** Place and secure forms to correct location, dimension, and profile. Place joint filler in joints, vertical in position, in straight lines. Secure to formwork. Place expansion joints at as indicated. Align joints. Place joint filler between paving components and other appurtenances.

**3.4 REINFORCEMENT:** Place reinforcement at mid-height of paving slabs. Interrupt reinforcement at expansion joints. Place dowels with one end lubricated, the other to bond to concrete. Place dowels to achieve pavement and curb alignment.

**3.5 PLACING CONCRETE:** Place concrete in accordance with ACI 301 and Section 03001. Do not disturb reinforcement or formwork components during concrete placement. Place concrete continuously between predetermined joints.

**3.6 FINISHING:**

- A. Sidewalk and Curb and Gutter Surfaces: Light broom, radius and trowel joint edges.
  - B. Curbs and Gutters: Light broom.
  - C. Apply curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
- 3.7 CLEANING: Remove all trash and debris from the site. Keep areas clean of excess materials and rubbish during and after application. Remove all spatters, spillage and soiling with appropriate cleaning agents and procedures from adjacent and surrounding equipment, surfaces and substrates and leave area in neat and clean condition. Keep pavements broom clean and work area in orderly condition.
- 3.8 PROTECTION: Protect finished installation until Final Acceptance.

**End of Section**

## SECTION 32 13 14 CONCRETE CURB & GUTTER

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. This section shall consist of the construction of Concrete Curb and Gutter at the locations shown on the Plans or as directed by the Engineer.

#### 1.2 STANDARD SPECIFICATIONS

- A. Materials and work for Concrete Curb and Gutter shall be in accordance with SECTION 634 - CURBING of the AHTD Standard Specifications.

### PART 2 - PRODUCTS

#### 2.1 FORMS

- A. Article 634.03(b) of AHTD Standard Specifications shall be augmented as follows:
  - 1. The work shall be performed with a mechanical slip-form paver.

### PART 3 - EXECUTION

#### 3.1 PLACING AND FINISHING

- A. That part of Article 634.03(c)(1) of AHTD Standard Specifications which relates to placing and finishing shall be replaced by the following requirements:
  - 1. Concrete shall be dry enough to permit use of slip-form paver; it shall not be so dry but what adequate tamping and spading will ensure adequate compaction and surfaces free from honeycomb. The subgrade shall be wetted before placing the concrete.
  - 2. The surface shall be shaped to the required section, finished with a steel trowel, and lightly brushed to produce a uniform surface of slightly roughened texture. The exposed edge of the gutter at the front form, and the exposed edge of the curb at the back form, shall be edged with an edging tool having a radius of approximately 1/8 inch.



3. If templates are used to control shape, they shall be of metal.

### 3.2 JOINTS

- A. Article 634.03(d), Joints, AHTD Standard Specifications, for Concrete Curb and Concrete Curb and Gutter shall be deleted in its entirety, and substituted therefore shall be the following:
  1. Premolded expansion joint material shall be placed between the curb and gutter and any concrete construction that otherwise would abut against it. Joint material shall be 1/2 inch thick. Premolded joint material shall be of the nonextruding type, and shall conform to AASHTO designation M 213.
  2. Expansion joints shall be constructed at the ends of curb and gutter, at the points of curvature of returns to streets and driveways. Intermediate expansion joints shall be constructed so that the maximum distance between joints is forty (40) feet. The joint material shall extend entirely through the curb and gutter section and, before the joint can be considered completed, must be trimmed to curb and gutter section.
  3. Contraction joints shall be 1/8" to 3/8" x 1-1/2" and shall be placed at ten (10) foot intervals between expansion joints. Contraction joints shall be formed by sawing, unless otherwise specified, and sealed.
  4. Joints shall be normal to the grade for gutter and the centerline of the roadway. Where curb and gutter is constructed adjacent to rigid pavement, the location and width of joints shall coincide with those in the pavement, where practicable. All joints shall be sealed with material meeting the requirements of SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Article 501.03(h) of the AHTD Standard Specifications.

### 3.3 PLACEMENT

- A. Concrete Curb and Concrete Curb and Gutter shall be one-course, monolithic, between expansion joints.

END OF SECTION

**SECTION 32 14 13  
CONCRETE PAVER MATERIALS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A.** Section includes the following:
1. Concrete Pavers
  2. Joint Sand
  3. Setting Bed Sand
  4. Base Aggregate

**1.2 REFERENCE**

- A.** ASTM International, latest edition:
1. C 33, Standard Specification for Concrete Aggregates.
  2. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  3. C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
  5. C 144 Standard Specifications for Aggregate for Masonry Mortar.
  6. D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
  8. C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
  9. C 979, Standard Specification for Pigments for Integrally Colored Concrete.
  10. D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop.
  12. D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop.
  14. C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units
  16. D 2940 Graded Aggregate Material for Bases or Subbases for Highways or

**1.3 SUBMITTALS**

- A.** Concrete Pavers:
1. Samples for verification: Three representative full-size samples of each paver type, thickness, color and finish that indicate the range of color variation and texture expected upon project completion.
  4. Accepted samples become the standard of acceptance for the product produced.
  5. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
  7. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.
- B.** Joint and Setting Bed Sand:
1. Provide three representative one pound samples in containers of Joint Sand materials.
  3. Provide three representative one pound samples in containers of Setting Bed Sand materials.
  5. Test results from an independent testing laboratory for sieve analysis per ASTM C 136 conforming to the grading requirements of ASTM C 144.
- C.** Polymeric Joint Sand:
1. Test results from an independent testing laboratory for sieve analysis per ASTM C

2. 136 conforming to the grading requirements of ASTM C 144.
3. Samples for Initial Selection: Provide three representative samples in containers of
4. Polymeric Joint Sand material, cured and dried, for color selection.
5. Samples for Verification: Provide three one pound samples in containers of Polymeric Joint Sand.

**D. Base and Subbase Aggregate:**

1. Test results from an independent testing laboratory for sieve analysis per ASTM C 136.

**E. Paving Installation Contractor:**

1. Job references from a minimum of three projects similar in size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.

#### **1.4 QUALITY ASSURANCE**

**A. Utilize a Manufacturer having at least ten years of experience manufacturing concrete**

**B. pavers on projects of similar nature or project size.**

**1. Source Limitations:**

2. Obtain Concrete Pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.
3. Obtain Joint and Setting Bed Sands from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.
4. Obtain Polymeric Joint Sand from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.

**C. Paving Contractor Qualifications:**

1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.

**D. Mockups:**

1. Install a 5 ft x 5 ft paver area per each paving pattern.
2. Use this area to determine surcharge of the Setting Bed Sand layer, joint sizes, lines, laying pattern(s) and levelness. This area will serve as the standard by which the workmanship will be judged.
3. Subject to acceptance by owner, mock-up may be retained as part of finished work.
4. If mock-up is not retained, remove and dispose legally.

#### **1.5 DELIVERY, STORAGE & HANDLING**

**A. In accordance with Conditions of the Contract and Division 1 Product Requirement Section.**

**B. Deliver Concrete Pavers in manufacturer's original, unopened and undamaged container packaging with identification labels intact.**

1. Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.
2. Deliver Concrete Pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
3. Unload Concrete Pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.

**C. Store and protect materials free from mud, dirt and other foreign materials.**

**D. Prevent Joint and Setting Bed Sand from exposure to rainfall or removal by wind with secure, waterproof covering.**

**E. Store Polymeric Joint Sand on elevated platforms, under a cover and/or in a dry location.**

#### **1.6 PROJECT/SITE CONDITIONS**

**A. Environmental Requirements:**

1. Install Concrete Pavers only on unfrozen and dry Setting Bed Sand.
2. Install Setting Bed Sand only on unfrozen and dry Base or Subbase Aggregate materials.
3. Install Base or Subbase Aggregates only over unfrozen subgrade.

4. Install Setting Bed Sand or Concrete Pavers when no heavy rain or snowfall are forecast within 24 hours.
- B. Weather Limitations for Polymeric Jointing Sand:**
  1. Install Polymeric Joint Sand only when ambient temperature is above 40°F (5°C), under dry conditions with no rain forecast for 24 hours and when surface of pavement is completely dry.

## **1.7 CONCRETE PAVER OVERAGE AND ATTIC STOCK**

- A.** Contractor to provide 100 square feet of each product and size used to owner for maintenance and repair.  
Furnish Pavers from the same production run as installed materials.
- B.** Manufacture to supply maintenance and reinstatement manuals for Concrete Paver units.

## **PART 2 - PRODUCTS**

### **2.1 CONCRETE PAVERS**

- A. Basis-of-Design Product:** The Concrete Paver shapes are based on:
  1. Unilock: Townhall Paver. Color selected by owner
  2. As manufactured by:  
Unilock  
22035 Business Park Drive,  
Toganoxie KS, 66086
  3. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.
    - a. To obtain acceptance of unspecified products, submit written requests at least 7 days before the Bid Date.
  4. Substitutions: Per the requirements of Division One.
- B. Product requirements:**
  1. Concrete Paver Type 1: Unilock Townhall
    - a. Finish: Standard
    - b. Color: As selected by owner
    - c. Edge: Chamfer, Rolled, Beveled, Zero-bevel, Micro-bevel, etc.
    - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/16 inch..
    - e. Paver size: 9.875" x 3.875" x 2.75".
- C.** Provide pavers meeting the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Efflorescence is not a cause for rejection.
  1. Average compressive strength 8000 psi (55MPa) with no individual unit under 7,200 psi (50 MPa).
  2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.
  3. Conforming to ASTM C 1645 when tested for freeze-thaw requirements.
  4. Height tolerances +/- 3.2 mm (1/8 in).
- D.** Accept only pigments in concrete pavers conforming to ASTM C 979.
- E.** Maximum allowable breakage of product is 5%.

### **2.2 JOINT SAND**

- A.** Provide natural Joint Sand as follows:
  1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
  2. Do not use limestone screenings, stone dust, or sand for the Joint Sand material that does not conform to conform to the grading requirements of ASTM C 33.
  3. Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.
  4. Gradation as shown in Table 1 below:

**TABLE 1 – JOINT SAND**

## GRADATION REQUIREMENTS FOR JOINT SAND

Sieve Size	ASTM C 144 Natural Sand Percent Passing	Manufactured Sand Percent Passing
No. 4 (4.75 mm)	100	100
No. 8 (2.36 mm)	95 to 100	95 to 100
No. 16 (1.18 mm)	70 to 100	70 to 100
No. 30 (0.600 mm)	40 to 75	40 to 75
No. 50 (0.300 mm)	10 to 30	20 to 40
No. 100 (0.150 mm)	2 to 15	10 to 25
No. 200 (0.075)	0 to 1	0 to 10

### 2.3 POLYMERIC JOINT SAND (optional depending on project needs)

#### A. Provide Polymeric Joint Sand as manufactured by:

1. Alliance Gator G2
  - a. Product Type: Dry mix, contains polymeric binding agent, activated with water.
  - b. Color: Slate Grey
2. Unicore HP Polymeric Max Sand
  - a. Product Type: Dry mix, contains polymeric binding agent, activated with water.
  - b. Color: Grey,

#### B. Provide Polymeric Joint Sand meeting the minimum material and physical properties as follows:

1. Compression Strength: proven resistance to compression of 550 PSI after drying for 7 days under controlled conditions (73°F (23°C) at 50% humidity).
  - a. Test sand sample shape: cylinder (2" (5 cm) dia. X 4" (10 cm) high).
2. Gradation as shown Table 1 above.

### 2.4 SETTING BED SAND

#### A. Provide Setting Bed Sand as follows:

1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
2. Do not use limestone screenings, stone dust, or sand material that does not conform to the grading requirements of ASTM C 33.
3. Do not use mason sand or sand conforming to ASTM C 144.
4. Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.
5. Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 2 below:

**TABLE 2 – SETTING BED SAND  
GRADATION REQUIREMENTS FOR SETTING BED SAND  
ASTM C 33**

Sieve Size	Percent Passing
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

### 2.5 BASE AGGREGATE

- #### A. Provide Base Aggregate materials conforming to ASTM D 2940 and gradation requirements as presented in Table 3.

**TABLE 3  
BASE AGGREGATE  
GRADATION REQUIREMENTS  
ASTM D 2940**

<b>Sieve Size</b>	<b>Percent Passing</b>
2 in (50 mm)	100
1-1/2 in (37.5 mm)	95 to 100
3/4 in (19 mm)	70 to 92
3/8 in (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (600 µm)	12 to 25
No. 200 (75 µm)	0 to 8

## **2.6 GEOTEXTILE**

- A.** Provide Geotextile material conforming to the following performance characteristics, measured per the test methods referenced:
  - 1. 4 oz., nonwoven needle punched geotextile composed of 100% polypropylene staple fibers that are inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.
  - 2. Grab Tensile Strength: ASTM D 4632: 115 lbs.
  - 3. Grab Tensile Elongation: ASTM D 4632: 50%
  - 4. Trapezoidal Tear: ASTM D 4533: 50 lbs.
  - 5. Puncture: ASTM D 4833: 65 lbs.
  - 6. Apparent Opening Size: ASTM D 4751: 0.212 mm, 70 U.S. Sieve
  - 7. Permittivity: ASTM D 4491: 2.0 sec -1
  - 8. Flow Rate: ASTM D 4491: 140 gal/min/s.f.
- B.** As supplied by:
  - 1. Carthage Mills – FX-40HS
  - 2. U.S. Fabrics – US 115NW
  - 3. Mirafi – 140N

## **2.7 EDGE RESTRAINTS (modify per project requirements)**

- A.** Concrete Edge Restraint as indicated.
- B.** Plastic and Metal Edge Restraints:
  - 1. Pave Tech
    - a. Material Type: Plastic
    - b. Model No.: Pave Edge Flexible,
  - 2. Snap Edge
    - a. Material Type: Plastic
    - b. Model No.: One Piece Edging, 96 inches
  - 3. Permaloc
    - a. Material Type: Aluminum
    - b. Model No.:

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A.** Examine areas indicated to receive paving for compliance with requirements for installation tolerances and other conditions affecting performance for the following items before placing the Concrete Pavers.
  - 1. Verify that subgrade preparation, compacted density and elevations conform to specified requirements.
  - 2. Verify that Geotextiles, if applicable, have been placed according to drawings and specifications.
  - 3. Verify that the Base and Subbase Aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.

4. Provide written density test results for soil subgrade, Base and Subbase Aggregate materials to the Owner, General Contractor and paver installation subcontractor.
  5. Verify location, type, and elevations of edge restraints, concrete curbing, concrete collars around utility structures, and drainage inlets.
- B.** Proceed with installation only after unsatisfactory conditions have been corrected.
1. Beginning of Bedding Sand and Concrete Paver installation signifies acceptance of Base and edge restraints.

### 3.2 PREPARATION

- A.** Verify that the subgrade soil is free from standing water.
- B.** Stockpile Setting Bed Sand, Joint Sand, Base and Subbase Aggregate materials such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.
- C.** Remove any excess thickness of soil applied over the excavated soil subgrade to trap sediment from adjacent construction activities before placing the Geotextile and Subbase Aggregate materials.
- D.** Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all Geotextile, Joint Sand, Setting Bed Sand, Base and Subbase Aggregate materials contaminated with sediment with clean materials.
- E.** Complete all subdrainage of underground services within the pavement area in conjunction with subgrade preparation and before the commencement of Base or Subbase Aggregate construction.
- F.** Prevent to damage underdrain pipes, overflow pipes, observation wells, or inlets and other drainage appurtenances during installation. Report all damage immediately.
- G.** Compact soil subgrade uniformly to at least 95 percent of Standard Proctor Density per ASTM D 698 for pedestrian areas. Compact soil subgrade uniformly to at least 98 percent Modified Proctor per ASTM D 1557 for vehicular areas. Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils.
- H.** Backfill all service trenches within the pavement area to the sub-grade level with approved material placed in uniform lifts not exceeding 4 in. (100 mm) loose thickness. Compact each lift to at least 100 percent Standard Proctor Density as specified in ASTM D 698.
- I.** Trim the subgrade to within 0 to ½ in. (0 to 13mm) of the specified grades. Do not deviate the surface of the prepared subgrade by more than 3/8 in. (10mm) from the bottom edge of a 39 in. (1m) straight edge laid in any direction.
- J.** Proof-roll prepared subgrade according to requirements in Division 31 Section "Earth Moving" to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting and replace with compacted backfill or fill as directed.
- K.** Do not proceed with further pavement construction, under any circumstances, until the subgrade has been inspected by the Architect/Engineer.

### 3.3 INSTALLATION

#### **A. EDGE RESTRAINTS**

1. Provide concrete edge restraints as indicated.
  - a.** Install job-built concrete edge restraints to comply with requirements in Division 3 Section "Cast-in-Place Concrete."
  - b.** Provide concrete edge restraint along the perimeter of all paving as indicated. Install the face of the concrete edge restraint, where it abuts pavers vertical down to the subbase.
  - c.** Construct concrete edge restraint to dimensions and level specified and support on a compacted subbase not less than 6 in (150 mm) thick.
2. Provide plastic or metal edge restraints as indicated. (Delete if not being used).
  - a.** Provide plastic or metal edge restraints along the perimeter of all paving as indicated and supported on a minimum of 6 inches (150 mm) of Base Aggregate.
  - b.** Provide 10" spiral galvanized or stainless steel spike to fasten plastic edge restraint at 24 inches on center for straight sections and 12 inches on center for curved sections.

#### **B. GEOTEXTILES** (Delete if not being used).

1. Provide separation geotextile on bottom and sides of prepared soil subgrade. Secure in place to prevent wrinkling or folding from equipment tires and tracks.
  2. Overlap ends and edges a minimum of 18 in. (450 mm) in the direction of drainage.
- C. BASE AND SUBBASE AGGREGATE**
1. Provide the Subbase Aggregate in uniform lifts not exceeding 6 in., (150 mm) loose thickness and compact to at least 100 percent Standard Proctor Density as per ASTM D 698.
  2. Compact the Subbase Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.
  3. Tolerance: Do not exceed the specified surface grade of the compacted Subbase Aggregate material more than  $\pm 3/4$  in. (20 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
  4. Provide the Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Subbase Aggregate (or Subgrade) material and compact to at least 100 percent Standard Proctor Density as per ASTM D 698.
  5. Compact the Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.
  6. Tolerance: Do not exceed the specified surface grade of the compacted Base Aggregate material more than  $\pm 3/8$  in. (10 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
  7. Compact and grade the upper surface of the base sufficiently to prevent infiltration of the bedding sand into the base both during construction and throughout its service life. Blend segregated areas of the granular base by the application of crushed fines that have been watered and compacted into the surface.
- D. SETTING BED SAND**
1. Provide, spread and screed Setting Bed Sand evenly over the compacted Base Aggregate course.
    - a. Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.
    - b. Screed only the area which can be covered by pavers in one day.
    - c. Do not use Setting Bed Sand material to fill depressions in the base surface.
  2. Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.
  3. Screed Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards. Maintain in a loose condition slightly ahead of the paving units and fully protect against incidental compaction following screeding. Loosen compacted sand by rain or screeded sand left overnight before further paving units are placed.
  4. Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.
- E. CONCRETE PAVERS**
1. Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.
  2. Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures. (Color variation occurs with all concrete products. This phenomenon is influenced by a variety of factors, e.g. moisture content, curing conditions, different aggregates and, most commonly, from different production runs. By installing from a minimum of three (3) bundles simultaneously, variation in color is dispersed and blended throughout the project).
  3. Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.
  4. Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.
  5. Use string lines or chalk lines on Setting Bed Sand to hold all pattern lines true.
  6. Set paver surface elevation a minimum of 3 mm (1/8 inch) to a maximum of 6 mm (1/4 inch) above adjacent drainage inlets, concrete collars or channels (provided the change in slope does not impede or alter the drainage or direction of flow).
  7. Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.



- a. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.
- 8. Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.
- 9. Prevent joint (bond) lines from shifting more than  $\pm 1/2$  in. ( $\pm 13$  mm) over 50 ft. (15 m) from string lines.
- 10. Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.
- 11. Cut Concrete Pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
- 12. Prevent all traffic on installed Concrete Pavers until Joint Sand has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint Sand material.
- 13. Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:
  - a. After edge pavers are installed and there is a completed surface or before surface is exposed to rain.
  - b. Compact installed Concrete Pavers to within 6 feet (2 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed Sand from becoming disturbed.
- 14. Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.
- 15. Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint Sand material.

#### F. JOINT SAND

- 1. Provide, spread and sweep dry Joint Sand into joints immediately after vibrating pavers into Setting Bed Sand course until full. Vibrate pavers and add Joint Sand material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.
- 2. Leave all work to within 3 ft. (1 m) of the laying face fully compacted with sand-filled joints at the completion of each day.
- 3. Remove excess Joint Sand broom clean from surface when installation is complete.
- 4. Polymeric Joint Sand
  - a. Install Polymeric Joint Sand per manufacturers recommended instructions.

### 3.04 FIELD QUALITY CONTROL

- A. Verify final elevations for conformance to the drawings after sweeping the surface clean.
  - 1. Prevent final Concrete Paver finished grade elevations from deviating more than  $\pm 3/8$  in. ( $\pm 10$  mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.
- B. Lippage: Paver-to-Paver Lippage:
  - 1. No greater than 3 mm (1/8 inch) difference in height between adjacent pavers.

### 3.4 REPAIRING, CLEANING AND SEALING

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.
  - 1. Clean Concrete Pavers in accordance with the manufacturer's written recommendations.
- C. Seal as indicated. (If not indicated elsewhere in the contract documents, sealing is not required and remove this section 3.05, C.)
  - 1. Apply Sealer for Permeable Concrete Pavers in accordance with the sealer and paver manufacturer's written recommendations.

### 3.5 PROTECTION

- A. Protect completed work from damage due to subsequent construction activity on the site.

END OF SECTION

**SECTION 32 80 00  
IRRIGATION SYSTEM**

**PART 1 - GENERAL**

**1.1 SUMMARY:**

- A.** Section Includes: Complete irrigation system including pipe and fittings, sleeves, mains, laterals, controllers, wiring, connectors, valves, heads and related work.
  - 1. Pipe, tubing and fittings for potable water pressure;
  - 2. water efficient irrigation heads
  - 3. Control Units and associated special valves;
  - 4. Backflow prevention devices;
  - 5. Trenching, installation and connection of system to water source, testing and backfilling;
  - 6. One year maintenance of systems.

**1.2 SYSTEM DESCRIPTION:**

- A.** Design system with a working water pressure of 15-30 pounds per square inch (psi) at the last head or emitter in each zone.
- B.** Design Requirements, Performance Requirements:
  - 1. Concentrated shrub and groundcover irrigation, uniform over the shrub or groundcover bed;
  - 2. Concentrated tree irrigation;

**1.3 SUBMITTALS:**

- A.** Submit in accordance with Division One in sufficient detail to show full compliance prior to construction.
- B.** Shop Drawings - Indicate: General arrangement of system, irrigation legend, piping layout to water source, location of sleeves under pavement; location and extent of coverage of sprinkler heads, slopes of terrain, controller, plant and landscaping features, site structures, obstructions interfering with operation, schedule of fittings to be used; type and number of heads, number of circuits, and sizes of piping, invert elevations; and type, number and location of pumps, valves and electrical connections and controls.
  - 1. Water source equipment, including existing mains, piping, valves, meters and system and supply pressures;
  - 2. Weekly precipitation requirements of the area. Requirements for irrigating the area in hours per day per cycle;
  - 3. Typical wind velocity and direction;
  - 4. gpm of emitters;
  - 5. Connection between controller and valves sleeves under walks and driveways;
  - 6. Schematic wiring between existing power and locations relative to the project site;
  - 7. Schedule and timing of control valves;
  - 8. Size, type, and assembly of backflow preventer;
  - 9. Number and extent of electrical controller circuits;
  - 10. Detail of drain pockets;
  - 11. Submit mounting details for automatic controllers
- C.** Project Record Documents:
  - 1. Record Drawings:
    - a. Keep and accurate daily record of all changes and corrections to contract documents.
    - b. Indicate piping layout to water source, location of sleeves under pavement, location and coverage of emitters, controller, plant and landscaping features, site structures and fittings used. Locate mainline piping, remote control valves, valves, intermediate electrical connections and other significant features with from permanent site features.
    - c. Locate all dimensions accurately from a minimum of two permanent reference points (buildings, monuments, sidewalks, curbs or pavements).
    - d. Change irrigation legend to indicate equipment installed.
    - e. Provide one set reproducible record drawings.
    - f. Mark drawings "Record Drawings"
  - D.** Controller charts. Provide one chart for each controller supplied. Indicate in chart area controlled by automatic controller. The chart is a reduced drawing of actual as-built system that will fit the maximum dimensions inside controller housing. Use black line print for chart and a different pastel or transparent

color to indicate each station area of coverage. After chart is completed and approved for final acceptance, seal chart between two 20-mil pieces of clear plastic.

**E. Samples:**

1. Provide one head or irrigation outlet of each type, with housing.
2. Provide one foot length of each piping type with complete permanent markings.

**F. Quality Control/Assurance Submittals:**

**1. Design Data:**

- a. System pressure calculations
- b. Irrigation requirements

**2. Test Reports:**

- a. Emitter tests
- b. Valve tests
- c. Automatic controller tests
- d. Emitter heads and accessories tests
- e. Pressure type vacuum breaker tests
- f. Reduced pressure type backflow preventer tests
- g. Water hammer arrester tests

**3. Field Test Reports**

- a. Pressure test
- b. Operation test
- c. Submit record of pressure tests conducted on recording gauge.

**4. Certificates of Compliance:**

- a. Backflow preventers: Submit a certificate of Full Approval or a current Certificate of Approval from FCCCHR for size, and make of backflow preventer being provided for this project. A Certificate of Provisional Approval will not be acceptable.

**5. Manufacturer's Instructions:**

- a. Automatic controllers
- b. Emitter heads and accessories
- c. Backflow preventers

**6. Operating and Maintenance Data: Provide three copies of operating instructions, warranty and equipment brochures manual.**

- a. Include written instructions covering full operation, care and maintenance of system and controls;
- b. Neatly bound in a three ring binder;
- c. Include names and addresses of two suppliers of all project equipment;
- d. Include all installer, suppliers, and/or manufacturers warranties;
- e. Include troubleshooting procedures with respect to valve and controller problems.
- f. Include schedule showing length of time each valve is opened to provide designed amount of water.

**1.4 QUALITY ASSURANCE:**

**A. Regulatory Requirements:**

1. Comply with Arkansas Department of Health regulations (Arkansas State Plumbing Code)

**B. Pipe Markings: Identify all pipe with the following indelible markings:**

1. Manufacturer;
2. Nominal Pipe Size;
3. Schedule or Class
4. Pressure Ratings p.s.i.
5. NSF seal of approval
6. Date of extrusion

**C. Inspections, Permits, And Fees:**

**1. Contractor:**

- a. Obtain and pay for all required permits, and inspections in connection with this work under the Contract.
- b. Deliver to the Owner a copy of each certificate of approval from each inspection agency.
- c. Pay for required testing.
- d. Pay any and all fees in connection to all utilities and pay all utilities bills during construction.
- e. Bear all costs of correcting deficiencies of any work that does not comply with the requirements of the applicable building codes, state laws, local ordinances, industry standards, and utility company regulations.

2. Testing Facilities:

- a. An approved commercial testing laboratory; or
- b. Facilities furnished by the Contractor.
- c. DO NOT perform any work requiring testing until the facilities have been inspected and approved by the Landscape Architect.
- d. The first inspection of the testing facility is at the expense of the Owner.
- e. Required subsequent inspection because of first inspection failure is the expense Contractor at no additional cost to the Owner.

D. Approved contractors:

- 1. James Landscape and Sprinkler, 5721 Studer Road, Little Rock, AR 72223-9331 501-707-7723
- 2. Go Big Outdoors, 9631 Centennial Road, Jacksonville, AR 72076-8518 501-514-1720
- 3. Little Rock Landscape, Inc. 9000 Construction Place, Little Rock AR 72206-4345 501-847-4820

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Packing, Shipping, Handling, Storage, Protection and Unloading: Deliver, store, protect, and handle products to site under provisions of division 1. DO NOT drop or dump materials from vehicles.
- B. Acceptance at Site: Inspect materials delivered to the site for damage and specification requirements. Remove damaged and unsatisfactory materials from the site immediately.
- C. Storage and Protection: DO NOT store materials directly on the ground. Keep the inside of pipes and fittings free of dirt and debris. Protect plastic materials from exposure to the direct sunlight over extended periods. Ensure equipment, and materials are free of defects and damage, at completion of the work. Clean equipment, and materials and turn over to the Owner in first class condition. Contractor repair or make good damage or defects developing before acceptance of the work at the Contractor's expense.
- D. Waste Management and Disposal: Remove rejected materials from site immediately.

1.6 PROJECT/SITE CONDITIONS:

- A. Existing Conditions: The Contractor is not liable for additional excavation expenses resulting from undisclosed, subsurface conditions, i.e. rock, water, clay pan, contaminated soils or other undiscovered conditions that are not apparent at time of estimating.

1.7 SCHEDULING:

- A. Coordinate irrigation installation with vehicular and pedestrian paving, lawns and grasses and exterior plants to ensure construction operations do not negatively impact on completed or future work.

1.8 WARRANTY:

- A. Fully warranty materials and workmanship for one year after final acceptance. Include repair or replacement of defective materials or workmanship, repair or replacement of damage caused by defect or delay in repair and the repair of backfill settlement. Provide Owner with manufacturer's certificate of equipment and materials warranties and guarantees.
- B. Special Warranty:

1.9 COMMISSIONING:

- A. Dynamically test and adjust system to provided designed precipitation rates, at correct times and duration. Instruct Owner's designated maintenance personnel in proper operation and maintenance or system.

1.10 MAINTENANCE:

- A. Extra Materials: Provide the following extra components:
  - 1. Two keys for each controller.
  - 2. Two emitters of each type and size.
  - 3. Two valve keys for manual valves.
  - 4. Two valve box keys.
  - 5. Two keys for valve markers.
  - 6. Two quick coupler keys with match swivel hose ends.
  - 7. Two wrenches for each type head core and for removing and installing each type head.
  - 8. Ten replacement cartridge filters.
  - 9. Two of each special tool required to maintain the filtration and pump system..

- B. Maintenance Service: Provide manufacturer's maintenance services on equipment and accessory items for one year from Date of Substantial Completion.
  - 1. Raise and lower heads as required to compensate for plant materials.
  - 2. Cleaning and adjustment of heads.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS:

- A. Netafim Irrigation, Inc. 5470 East Home Ave. Fresno, CA 93727, phone (559)-453-6800  
[www.netafimusa.com](http://www.netafimusa.com) (drip irrigation)
- B. Zurn, Wilkins Division, 1747 Commerce Way, Paso Robles, CA 93446-3696; (805) 238-7100 Model 500 HLR Pressure Regulator
- C. Ametek/Plymouth Products Division, 502 Indiana Ave, PO Box 1047, Sheboygan, Wisconsin 53082-1047, (800) 222-7558, <http://www.ametek-westchesterplas.com> Products Valve Boxes.
- D. NDS, Incorporated, 851 North Harvard Avenue, Lindsey, California 93247, (800) 726-1994, Product Valve Boxes
- E. Substitutions:
  - 1. Requests for substitutions will be considered under provisions of Division 1.
  - 2. All applications for substitution must include samples and technical data.
  - 3. All permitted equals must be approved in writing by the Landscape Architect.

### 2.2 SOIL MATERIALS:

- A. Topsoil: Reusable excavated or imported friable loam; free of subsoil, roots, grass, excessive amount of weeds, large stones, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 4 percent and a maximum of 25 percent organic matter.
- B. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance with ANSI/ASTM C136 within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 14	10

- C. Drainage Fill: 1/2 to 3/4 in (13 to 19 mm) washed pea gravel.

### 2.3 Piping Materials:

- A. Polyvinyl Chloride (PVC) Pipe, Fittings and Solvent Cement
  - 1. Pipe: ASTM D1785, PVC 1120 Schedule 40 and Class 200, except for lines connecting directly to heads, which are to be Rainbird Swing Pipe (minimum 18 in (460 mm) maximum 24 in (610 mm). Drip tubing is to be Netafim Techline HCVXR, 1/2" Diameter with emitters installed in dripline. Emitters and tubing to have Cupron copper oxide roof growth deterrent.
  - 2. Fittings:
    - a. Solvent Welded Socket Type: ASTM D2466, Schedule 40.
    - b. Threaded Type: ASTM D2464, Schedule 80.
  - 3. Solvent Cement: ASTM D2564.
- B. Piping:
  - 1. Water Meter, Backflow Preventer, and Isolation Valve Piping: ASTM B88 Type K Drawn Temper, copper.
  - 2. Outlets: Brass or bronze construction.
- C. Main Line Piping: Piping between source of water supply and control valves remaining pressurized unless manually isolated and drained. Schedule 40 PVC.
- D. Lateral Line Piping: Piping between control valves and irrigation head. Class 200.
- E. Risers:
  - 1. Pop-up and Rotary Risers: Lines connecting directly to heads are to be double swing joint type swing line, threaded, Schedule 80 PVC with horizontal nipples attached directly to lateral pipe or flexible pipe.
- F. Sleeves:
  - 1. Provide sleeves under all paved surfaces, curbs, walls, ramps, steps, etc.
  - 2. Provide sleeve a minimum of two pipe sizes larger than the pipe.

3. Less than 6 in (150 mm) diameter: ASTM D2241, PVC 1120 SDR 21 Class 200 or Schedule 40, ASTM D1785.
  4. 6 in (150 mm) and over: ASTM D2241, PVC 1120 SDR 26 Class 160 or Schedule 40 ASTM D1785.
  - G. Fittings: Type and style of connection to match pipe according to applicable reference.
  - H. Dielectric Fittings: Provide between copper and ferrous piping materials
    1. ASTM F441, Schedule 80, CPVC threaded pipe nipples, 4 in (10 cm) minimum length.
- 2.4 Valves:**
- A. Manufacturer's standard, of size and type indicated on irrigation details.
  - B. Gate Valves: MSS SP-80 AWWA C500, Bronze construction, non-rising stem, inside screw with threaded ends.
    1. Less than 3 In (75 mm): MSS SP80, Type 1, Class 150, threaded ends.
    2. 3 In (75 mm) and Larger: AWWA C500, bottom wedging double discs, parallel seats, non-rising stems, open by counterclockwise turning. Provide flanged end connections. Provide bronze interior construction of valves including stem containing a maximum 2 percent aluminum and maximum 16 percent zinc.
  - C. Globe Valves: [Bronze construction, non-rising stem, inside screw with threaded ends.
  - D. Angle Valves, 2 1/2 In (64 mm) and Larger: MSS SP85, Type II, Class 250 threaded ends.
  - E. Remote Control Valves: normally closed 24 v DC electric or hydraulic type with plastic body. Equip valve with capability of manual operation at the valve location. Drip control valves shall be LVCZS80-10075-LF or LVCZS80-10075-HF as manufactured by Netafim and as indicated on the irrigation shop drawings.
  - F. Drain Valve:
    1. Automatic: Plastic body automatic drain valve, designed to close at 3 psi and to open against a 6 ft (1.8 m) head in vertical or horizontal position and drain the zone with screened outlet integral filter to resist clogging by debris. Installed at the low point of each zone, upstream of the last head on the line, in a 1 cu ft (0.03 cu m) pea gravel, dry well.
  - G. Backflow Preventers: as indicated on the Drawings.
  - H. Low Volume Control Zones:
    1. Drip area control zones shall be Netafim LVCZ low flow or high flow as indicated on the shop drawings.
- 2.5 Pop-Up Spray Heads:**
- A. Manufacturer's standard unit designed to Manufacturer's standard unit designed to provide uniform coverage over entire area of spray shown on plan, and of commercial grade.
  - B. Match precipitation rates of all heads within a zone operated by the same valve.
    1. Use separate control valves for shrub planting beds and trees and groundcover areas.
  - C. Bubbler heads: adjustable flow and coverage and design for permanent aboveground mounting on riser or pop-ups at a height compatible with covered plant materials. 1-13 GPM flow rates at 15-30psi.
  - D. Emitter Heads: Self-cleaning, pressure compensating diaphragm with one or six self-piercing barbed outlet(s); each capable from 1/2 to 2 gallons per hour flow; emitter body ultraviolet stabilized, algae, and heat resistant plastic construction as specified by Netafim on the Irrigation Shop Drawings.
- 2.6 CONTROLS**
- A. Automatic Controllers, Electrical: Controller, NEMA ICS2 with 120-volt single phase service, operating with indicated stations, and grounded chassis. Provide enclosure, NEMA ICS6 Type 3R, with locking hinged cover, wall mounted. Program controller for various schedules by setting switches and dials equipped with the following features:
    1. Rainbird ESP-12 MC Controller: 12 station. Add additional controllers as needed to automate all irrigation zones.
  - B. A switch for each day of week for three schedules, allowing each station to be scheduled individually as to days of watering.
  - C. A minute switch for each station with a positive increment range of 0 to 3 hours. Set time within one percent.
  - D. A switch allowing selected schedules to be repeated after each completion of initial watering schedule and allowing each operation to be scheduled throughout a 24-hour day.
- 2.7 ACCESSORIES:**
- A. Valve Keys for Manually Operated Valves: 1/2 in (13 mm) diameter by 3 ft (91 cm) long, tee handles and key to fit valves.

- B. Valve Box and Cover: Hard plastic with green plastic cover extending below valve, with self-draining base, in the size and quantity needed to place all valves in boxes. Permanently mark covers with zone number, or equipment name. Provide box sizes that are suitable and adjustable for valve used. Cast the word "IRRIGATION" on cover. Use minimum 5 1/4 in (133 mm) shaft diameter of box.
- C. Concrete Pads: Precast or cast-in-place reinforced concrete construction for reduced pressure type backflow preventers.
- D. Pressure Gauges: ANSI B40.1, single style pressure gauge for water with 4 1/2 in (11 cm) dialbrass or aluminum case, bronze tube, gauge cock, pressure scrubber, and siphon. Provide scale range suitable for irrigation sprinkler systems.
- E. Service Clamps: Bronze flat, double strap, with neoprene gasket or "O"-ring seal.
- F. Water Hammer Arresters: ANSI A112.26.1M; stainless steel construction with an encased and sealed bellows compression chamber.
- G. Emitter Head Accessories:
  - 1. Strainer: Provide strainer at inlet to each drip line. Provide stainless steel screen having equivalent of 140-mesh filtration capacity. Incorporate flush valves within strainer to clean screen without disassembling unit.
  - 2. Pressure Regulator: Incorporate regulator into each drip system if supply pressure exceeds 50 psi.
  - 3. Riser Adapters: Required with a rigid piping system.
  - 4. Tubing Stakes: Plastic coated steel, or other non-corrosive strong material to secure tubing.
  - 5. Emitter Outlet Check Valve (Bug Cap): Provide check valves at end of each emitter outlet distribution line. Furnish valves that permit free flow of water with minimum restriction; prevent back siphoning, entry of insects, and contamination into outlet ports.
  - 6. Access Sleeve: Provide access sleeve to buried emitters placed in covered boxes. Secure lids of access sleeve with removable lugs. Secure drip hose in both vertical and horizontal axis.
  - 7. Closure Caps: Provide in accordance with manufacturer's recommendations.
- H. Solenoid Valve Wire: NFPA 70, copper conductor, Type UF.
  - 1. Size: 14 AWG (minimum) in accordance with controller manufacturer's specifications.
  - 2. Conduit: UL 651, rigid polyvinyl chloride conduit, Schedule 40, 2 in (50 mm) diameter with pull wire in locations where wire is not buried.
  - 3. Color coding: Red and White.
- I. Plastic Marking Tape:
  - 1. Acid and alkali-resistant plastic film;
  - 2. manufactured for marking and locating underground utilities;
  - 3. manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 ft (1 m) deep;
  - 4. metallic core or wires encased in a protective jacket or provided with other means to protect from corrosion.
  - 5. minimum 3 in (75 mm) wide;
  - 6. minimum thickness of 0.004 in (0.102 mm);
  - 7. minimum strength of 1750 psi (12.1 MPa) lengthwise and 1500 psi (10.3 MPa) crosswise;
  - 8. bearing a continuous printed inscription describing the specific utility;

## PART 3 - EXECUTION

### 3.1 EXAMINATION:

- A. Site verification of Conditions:
  - 1. Verify field conditions and location of existing utilities are acceptable.
    - a. Arkansas State Law requires that the excavator is to locate all existing utilities in accordance with the Arkansas Underground Facilities Damage Prevention Act. This law requires that the excavator make a telephone call to the Arkansas One-call System at 1-800-482-8998 at least two working days prior to excavating to ensure that any existing utilities can be located.
  - 2. Verify adequate pressure is available to properly operate system and system components.
    - a. Immediately notify Landscape Architect, if pressures are not adequate.
  - 3. Examine all work and/or surfaces to which work will be applied under this section.
    - a. Immediately notify Landscape Architect, if work or surfaces are not adequate.
  - 4. Verify sleeves are in place for all areas where it is necessary to cross under pavement.

### 3.2 PREPARATION:

ITT TRAINING CENTER for the  
ECONOMIC DEVELOPMENT ADMINISTRATION  
NEWPORT, ARKANSAS



- A. Submit shop drawings, data, manufacturer's information, and samples to Landscape Architect.
- B. Protection:
  - 1. Piping layout indicated is diagrammatic only.
  - 2. Route piping to avoid plants and structures.
  - 3. When rock is encountered, excavate 4 in (10 cm) deeper and backfill with silty sand (SM) or well-graded sand (SW) to pipe grade. Keep trenches free of obstructions and debris that would damage pipe. Do not mix subsoil with topsoil.
  - 4. Route lines as far from existing large trees as possible. Hand trench around roots to pipe grade when roots of 2 inches diameter or greater are encountered. Make width of trench 4 in (10 cm) minimum or diameter of pipe, whichever is wider. Backfill and hand tamp over excavation.
  - 5. Slight variations in location may require the contractor to make minor field adjustments.
  - 6. If adjustments significantly alter the arrangement or operation of the system, contact the Landscape Architect before proceeding.
- C. Surface Preparation:
  - 1. Identify required lines, levels, contours, and datum.
  - 2. Notify Landscape Architect of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
  - 3. Protection:
    - a. Identify and flag known utility locations.
    - b. Maintain and protect existing utilities to remain.
    - c. Verify foundation or basement walls are braced to support surcharge forces imposed by backfilling or excavation operations.
    - d. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.
    - e. Grade excavation top perimeter to prevent surface water run-off into excavation or to adjacent properties.
  - 4. Stake locations of all heads for approval of Landscape Architect before proceeding.
    - a. Do not exceed manufacturer's recommended spacing.

### 3.3 INSTALLATION:

- A. Trenches:
  - 1. Trench in accordance with OSHA requirements.
  - 2. Fill, contour, and compact entire site prior to trenching for irrigation.
  - 3. Excavate for irrigation piping to municipal utilities.
  - 4. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
  - 5. Hand trim excavation and leave free of loose matter.
  - 6. Support pipe and conduit during placement and compaction of bedding fill.
  - 7. Clearances:
    - a. Minimum horizontal clearances between lines: 4 in (10 cm) for 2 in (5 cm) pipe and less; 12 in (30 cm) for 2 in (5 cm) pipe and more.
    - b. Minimum vertical clearances between lines: 1 in (25 mm).
    - c. Minimum Pitch: Down 6 in (15 cm) per 100 ft (30 m) in direction of drain valves.
- B. Thrust Blocks: Place concrete so that sides subject to thrust or load are against undisturbed earth, and valves and fittings are serviceable after concrete has set.
- C. Valves and Accessories:
  - 1. Manual Valves: Install in a valve box extending from grade to below valve body, with a minimum of 4 in (10 cm) cover measured from finish grade to top of valve stem.
  - 2. Automatic Valves: Plumb valve in a valve box extending from grade to below valve body, with minimum of 4 in (10 cm) cover measured from grade to top of valve. Install automatic valves beside sprinkler heads with a valve box.
  - 3. Drain Valves: Provide entire system with automatic drain valves. Equip low point of each underground line with drain valve draining into an excavation containing gravel. Cover gravel with building paper. Backfill with excavated material and 6 inches of topsoil.
  - 4. Valve Boxes: Set box covers at finish grade elevations.
  - 5. Sprinkler Heads and Quick Coupling Valves: Install plumb and level with terrain.
- D. Backflow Preventers: Install backflow preventer in new connection to existing water distribution system, between connection and control valves. Install with concrete pads.

1. Reduced Pressure Type: Install as follows:
  - a. Flush pipe lines prior to installing device.
  - b. Protect device by a strainer located upstream.
  - c. DO NOT INSTALL in pits or where any part of device could become submerged in standing water.

### 3.4 CONSTRUCTION:

- A. Site Tolerances:
  1. Top Surface of Exposed Subgrade: Plus or minus one in (25 mm).
  2. Top of Topsoil: Plus or minus 1/2 in (13 mm).

### 3.5 REPAIR/RESTORATION:

- A. Replace all plantings or structures damaged by irrigation installation.

### 3.6 FIELD QUALITY CONTROL:

- A. Site Tests, Inspection:
  1. Notify Landscape Architect in writing a minimum of five days prior to:
    - a. Hydrostatic test of piping;
    - b. Operation Test;
    - c. Substantial completion inspection.
  2. Hydrostatic tests:
    - a. Hydrostatically test system for leakage before piping is covered to 150 psi at farthest point of system, for one hour, with no leakage or pressure drop of 5 psi before backfilling system.
  - 1) At conclusion of pressure test, install sprinkler heads or emitter heads, quick coupling assemblies, and hose valves, and test entire system for operation under normal operating pressure.
  - b. Testing pumps and filtration system to 250 psi.
  - 1) Manufacturer may test components at factory and provide certification. All field joints and compounds will be tested on site after installation.
  3. Operation Test:
    - a. Test entire system for operation under normal operating pressure.
    - b. Acceptance: Operation test is acceptable if system operates through at least one complete cycle for areas to be sprinkled.

### 3.7 ADJUSTING:

- A. Adjust control system to achieve time cycles required.
- B. Make final adjustments to pumping, filtration and irrigation system, after installation is complete.
  1. Adjust irrigation heads and emitters for proper operation and directional alignment.
  2. Adjust rotary and pop-up sprays for proper arc of operation. Adjust for prevailing winds.
- C. After grading, seeding, and rolling of planted areas, adjust sprinkler heads flush with finished grade. Make adjustments by providing new nipples of proper length or by use of heads having an approved device, integral with head, which will permit adjustment in height of head without changing piping.

### 3.8 STERILIZATION:

- A. Sterilize sprinkler system fed from a potable water system upstream of backflow preventer in accordance with AWWA C651. Sterilize new waterlines for a minimum of 24-hours, to meet state, health test requirements before placing in service. Make the minimum retention period 3 hours.

### 3.9 CLEANING:

- A. Keep site clean of materials and debris.
- B. Keep pavements broom clean and work area in orderly condition.
- C. Restore all ground surfaces to original condition upon completion of Work.
- D. Remove all excess irrigation material and equipment, waste and debris from the site.
- E. Leave stockpile area and site clean and raked, ready to receive landscaping.
- F. Leave pavements broom clean and work area in orderly condition.

### 3.10 DEMONSTRATION:

- A. Demonstrate operation and adjustment of system to owner.

**3.11 PROTECTION:**

- A.** Protect installed irrigation equipment and accessories from damage until Final Acceptance.
- B.** Protect trees, shrubs, groundcovers, structures and features installed or remaining as part of the Work from damage.
- C.** Replace or provide replacement cost of property damaged during system installation. Repair and replacement includes plant materials at no additional charge to Owner.

**End of Section**

**SECTION 32 92 23**  
**LAWNS AND GRASSES (SODDING AND SOIL SUPPLEMENTS)**

**PART 1 - GENERAL**

**1.1 SUMMARY:**

- A.** Fine grade all areas not covered by buildings or structure, paving, planting areas or designated use areas. Furnish and install sod, topsoil, soil supplements, and accessories. Perform specified maintenance and turf establishment. In the event construction prevents planting of the zoysia sod areas during the specified planting season, apply an approved temporary erosion control method to stabilize soil until sod is established in specified planting season.
- B.** Section Includes: Preparation of subsoil; placing topsoil, soil amendments, mulch, fertilizer, sod installation; installation of edging, erosion control; and maintenance.

**1.2 DEFINITIONS:**

- A.** Noxious Weeds (Prohibited): Presence of any of these weeds in sod or cultural medium is unacceptable and the materials will be rejected and immediately removed from the site.
  - 1.** Aeginetia (Aeginetia spp.); Ageratina (Ageratina adenophora); Alectra (Alectra spp.); Amur Silvergrass (Imperata brasiliensis); Animated Oats (Avena sterilis); Arrowhead (Sagittaria sagittifolia); Asphodel (Asphodelus fistulosus); Bindweed (Convolvulus spp.); Bramble, Blackberry, Indian Raspberry, Blackberry (Rubus spp. i.e. moluccanus fruticosus); Borreria (Borreria alata); Bromegrass (Bromus spp.); Cane (Saccharum spontaneum); Carthamus (Carthamus oxycantha); Chrysopogon (Chrysopogon aciculatus); Crabgrass (Digitaria spp. i.e. abyssinica, scalarum and velutina); Crupina (Crupina vulgaris); Cuscuta (Cuscuta spp.); Dayflower (Commelina benghalensis); Dodder (Cuscuta spp.); Drymaria (Drymaria arenarioides); Emex (Emex spp. i.e. australis and spinosa); Giant Hogwart (Heracleum mantegazzianum); Goat's Rue (Galega officinalis); Ground Ivy (Glechoma hederacea); Indian Rhododendron (Melastoma malabathricum); Ischaemum (Ischaemum rugosum); Johnson Grass (Sorghum halepense); Leafy spur (Euphorbia esula); Leptochloa (Leptochloa chinensis); Matrimony Vine, Box Thorn (Lycium ferocissim); Mikania (Mikania micrantha); Mimosa (Mimosa spp. i.e. invisa and pigra); Morning Glory (Ipomoea triloba); Nassella (Nassella trichotoma); Nimblewill (Muhlenbergia shreberi); Nutgrass or Nutsedge (Cyperus spp.); Orobanch (Orobanch spp.); Paperbark Tree, Punk Tree, Tea Tree, Swamp Tea Tree (Melaleuca quinquenervia); Paspalum (Paspalum scrobiculatum); Pennisetum (Pennisetum spp. i.e. clandestinum, macrourum, pedicellatum and polystachion); Peppergrass, Pepperwort, Tongue-grass (Lepidium repens); Perennial Sorrel (Oxalis spp.); Perennial Sowthistle (Sonchus arvensis); Poison Ivy (Toxicodendron radicans); Poison Oak (Toxicodendron toxicarium); Prickly Pear (Opuntia aurantiaca); Prosopis (Prosopis spp. i.e. alapataco, argentina, articulata, burkartii, caldenia, calingasta, campestris, castellano denudans, elata, farcta, ferox, fiebrigii, hassleri, humilis, kuntzei, pallida, palmeri, reptans, rojasiana, ruizlealii, ruscifolia, sericantha, strombulifera and torquata); Quackgrass (Agropyron repens); Wild Rice (Oryza spp. i.e. longistami, punctata and rufipogon); Rope Mikania (Mikania cordata); Rottboellia (Rottboellia spp. i.e. colchinensis and exaltata); Russian Knapweed (Centaurea picris); Salsola (Salsola vermiculata); Salvinia (Salvinia spp. i.e. biloba, herzogii and molesta); Setaria (Setaria pallide-fusca); Shoofly Joyweed (Alternanthera sessilis); Silvergrass (Imperata cylindrica); Solanum (Solanum spp. i.e. torvum and viarum); Striga (Striga spp.); Thistle (Cirsium spp.); Tridax (Tridax procumbens); Urochloa (Urochloa panicoides); Whitetop (Lepidium draba, Hymenos-physa pubescens) and Wild Garlic (Allium vineale).
- B.** Weeds (Restricted): Presence of any of these weeds in sod covering 2% or more is unacceptable and the materials will be rejected and immediately removed from the site.
  - 1.** Bentgrass (Agrostis spp.); Bermudagrass (Cynodon dactylon); Annual Bluegrass (Poa annua); Tall fescue (Festuca eliator); Barnyardgrass (Echinochloa crus-galli); Burclover (Medicago hispida); Chickweed (Stellaria media); Chess (Bromus spp.); Dandelion (Taraxacum officinale); Dallisgrass (Paspalum dilatatum); Dock (Rumex spp.); English Daisy (Bellis perrene); Foxtail (Alopecurus spp.); Henbit (Lamium amplexicaule); Horsetail (Equisetum arvense); Jimsonweed (Datura stramonium); Knotweed (Polygonum aviculare); Lambsquarter (Chenopodium album); Mallow or Cheeseweed (Malva spp.); Mustard (Sisymbrium spp.); Plantain (Plantago spp.); Purslane (Portulaca oleracea); Ragwort (Senecio spp.); Rush grass (Juncus spp.); Spotted spurge (Euphorbia maculata); Veronica or Speedwell (Veronica filiformis) and Wild Onion (Allium canadense).
- C.** Broken or torn pads of sod or pads with torn or uneven ends are damaged.
- D.** Sod Sources:
  - 1.** Certified Turfgrass Sod: grown from certified high quality seed of known origin or from plantings of certified grass sprigs or stolons. Inspected by the official certification agency of the area to assure satisfactory varietal identity and purity, overall high quality and freedom from noxious weeds or excessive amounts of other crop and weedy plants at the time of harvest.

It may be of either one variety or composed of two or more varieties or species. However, all seed in a mixture must be certified. The turfgrass sod must meet the areas published standards for sod.

2. Approved Turfgrass Sod: superior sod, grown from approved seed of known origin or from plantings of approved grass sprigs or stolons. Field standards for approved sod are similar to those of certified sod. It is inspected by the official certification agency of the area to assure satisfactory varietal identity and purity, overall high quality and freedom from noxious weeds or excessive amounts of other crop and weedy plants at the time of harvest. It may be of either one variety or composed of two or more varieties or species. However, all seed in a mixture must be approved.
3. Nursery (Cultivated) Turfgrass Sod: Any turfgrass sod planted on cultivated agricultural land; grown specifically for turfgrass sod purposes; mowed regularly and carefully; maintained from planting to harvest to assure reasonable quality and uniformity; contains no noxious weeds; maximum five grassy or broadleaf weeds per 100 sf (10 sq m); free of nematodes and soil-borne insects; and free of thatch, maximum 1/2 in (15 mm) uncompressed.
4. Field (Pasture) Turfgrass Sod: all turfgrass sod other than "certified," "approved," or "nursery;" may be harvested from pastures or meadows, grown primarily for forages; contains no noxious weeds; contains a maximum of ten weeds per 100 sf (10 sq m) Free of nematodes and soil-borne insects and free of thatch, maximum 1/2 in (15 mm) uncompressed.

**E. Sod Grades:**

1. Premium Grade: contain only the species and variety of turfgrass shown on the invoice/sales slip; no surface soil visible when mowed to a height of 1-1/2 in (4 cm); maximum mowing height: 2-1/2 in (6 cm); contains no noxious weeds; free of nematodes and soil-borne insects; free of thatch, maximum 1/2 in (15 mm) uncompressed; maximum one percent undesirable grass species; maximum two weeds per 50 sq yds (42 sq m).
2. Commercial Grade: contain only the species and variety of turfgrass shown on the invoice/sales slip; no surface soil visible when mowed to a height of 1-1/2 in (4 cm); maximum mowing height: 2-1/2 in (6 cm); contains no noxious weeds; free of nematodes and soil-borne insects; free of thatch, maximum 1/2 in (15 mm) uncompressed; maximum ten percent undesirable grasses species; maximum ten weeds per 50 sq yds (42 sq m) and any grass other than the grass shown on the invoice/sales slip is undesirable.

**1.3 SUBMITTALS:**

**A. Samples:**

1. Edging: 1 ft (30 cm) sample of edging including stake and staking bracket
2. Topsoil: Samples taken from several locations at the source.
3. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
4. One gal sample of soil amendments.
5. One gal sample of mulch;
6. One gal sample of compost;
7. One gal sample of peat moss;
8. One gal sample of fertilizer.
9. One gal sample of lime;

**B. Quality Control/Assurance Submittals:**

1. Test Reports:
  - a. Results of soil analysis for existing and imported topsoils with recommended soil amendments. Provide analysis of topsoil under provisions of Division 1. Analyze to ascertain textural class, particle size, percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
2. Seed. Classification, botanical name, common name, percent pure seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.
3. Package standard products with manufacturer's certified analysis.
4. Fertilizer: For chemical analysis, composition percent.
5. Compost: For man made materials, total solids, pH, metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc), fecal coliform population and salmonella population.
6. For other material provide analysis by a recognized laboratory, made in accordance with methods established by the association of official Agricultural Chemists.

**C. Certificates:** Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements.

1. Submit shipping tags to Owner's Representative upon delivery of materials.

2. Department of Agriculture certificates from the state or point of origin (or purchase) declaring that the material is alive, in good health and free from insects and disease.
3. Inspection certificates complying with all state, local, and federal regulations.
4. Sod:

- a. For species, mixture percentage, percent purity, field location and state certification.
- b. Labeled invoice or sales slip for each load of turfgrass sod.
- c. State certification labels from each load of sod.
- d. State "Approved Sod" labels from each load of sod.

5. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.
6. pH Adjuster. Calcium carbonate equivalent and sieve analysis.
7. Fertilizer. Chemical analysis and composition percent.
8. Agricultural Limestone: For calcium carbonate equivalent and sieve analysis.
9. Peat: For compliance with ASTM D2980 AND D4427.
10. Compost: Composition and source.
11. Pesticide. EPA registration number and registered uses.

**D. Maintenance Data:**

1. Submit maintenance data for continuing Owner maintenance under provisions of Division 1.
2. Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

**E. Qualification Statements:**

1. Nursery supplier: submit evidence of experience and license.
2. Landscape Contractor: submit evidence of experience and license.

**1.4 QUALITY ASSURANCE:**

**A. Sod Producer:** Company specializing in sod production and harvesting with minimum three years experience.

**B. Regulatory Requirements:**

1. Comply with all applicable state and local regulations.

**A. Inspections, Permits, And Fees:**

**1. Contractor:**

- a. Obtain and pay for all required permits, and inspections in connection with this work under the Contract.
- b. Deliver to the Owner a copy of each certificate of approval from each inspection agency.
- c. Pay for required testing.
- d. Pay any and all fees for connection to all utilities and pay all utilities bills during construction.
- e. Bear all costs of correcting deficiencies of any work that does not comply with the requirements of the applicable building codes, state laws, local ordinances, industry standards, and utility company regulations.

**1.5 DELIVERY, STORAGE AND HANDLING: DELIVER, STORE, PROTECT, AND HANDLE PRODUCTS TO SITE UNDER PROVISIONS OF SECTION DIVISION 1.**

**A. Packing, Shipping, Handling, and Unloading:**

1. Fertilizer: Deliver in the original, unopened waterproof bags showing weight, chemical analysis, and name of manufacturer.
2. Turfgrass Sod: Protect exposed roots from dehydration. Do not deliver more sod than can be laid within 24 hours. Handle in a manner to prevent contamination, desiccation, and damage.
3. Soil Amendments: Deliver in the original, unopened containers bearing the manufacturer's chemical analysis. Soil amendments may be furnished in bulk. Provide a chemical analysis for bulk deliveries.
4. Pesticide: Deliver in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses.
5. Labeling: Accompany each turfgrass sod shipment with an invoice/sales slip indicating whether material is of a single variety, or a mixture; the quality or grade of the turfgrass sod. Label any turfgrass sod of over 90 percent of one variety as that variety; label any turfgrass sod grown from a mixture of turfgrass species or varieties as a mixture and identify each species varieties and the percentages by weight of each sown variety; label any turfgrass sod not sown and maintained as a nursery sod crop as "Pasture Sod."
  - a. Label fertilizer with name, trade name or trademark and warranty of producer/manufacturer.

**B. Acceptance at Site:**

1. Packaged materials not in original containers, in damaged containers, with seals broken, or incompletely labeled are **UNACCEPTABLE**.
2. Owner's Representative will inspect sod upon arrival at the job site for type, species and quality; Conformance to TPI Guideline Specifications to Turfgrass Sodding; free of noxious weeds, nematodes and soil-borne insects and Meet or exceed all requirements for quality and grade of turfgrass sod;
  - a. Wet, moldy, or damaged turfgrass sod is **UNACCEPTABLE**;
  - b. Pad Soil thickness: maximum 1/2 in (15 mm);
  - c. Strength: Minimum age of 18 months, with root development that will support its own weight, without tearing, when suspended vertically by holding the upper two corners. Harvested, delivered and installed within 24 hours unless suitable preservation method approved prior to delivery;

**1.6 ENVIRONMENTAL REQUIREMENTS:**

- A. Perform planting operations only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, stop the work.
- B. **DO NOT** plant when ambient temperatures may drop below 35 deg F or rise above 90. **DO NOT** plant when ground is frozen, snow covered, muddy, or when air temperature exceeds 90 deg F (32 deg C).
- C. When special conditions warrant a variance to the planting operations, submit proposed planting times Owner's Representative for approval.

**1.7 SCHEDULING:**

- A. Coordinate the work of this Section with installation of underground sprinkler system piping and watering heads. Installation of exterior plants, to prevent damage to plants and planting areas. Coordinate with the installation of other site work by other contractors.

**1.8 WARRANTY:**

- A. Warranty sod lawn areas through one growing season. Provide one year replacement warranty including one continuous growing season under provisions of Division 1 including coverage of lawns or grass areas for death or unhealthy conditions.

**1.9 MAINTENANCE:**

- A. Maintain installed lawn for one year from Date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.1 SOD MATERIALS:**

- A. Sod: TPI Certified grade; cultivated grass sod; type indicated below; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft.
- B. Zoysiagrass:
  1. "Zenith" or "Crowne" Zoysia grass.

**2.2 SOIL MATERIALS:**

1. Topsoil: Deliver imported topsoil and amend as recommended by the soil test for the specified plants.

**2.3 ACCEPTABLE SOIL AMENDMENT SUPPLIERS:**

- A. A. M. Leonard Incorporated; 241 Fox Drive; P.O. Box 816; Piqua, Ohio 45356; (800) 543-8955; <http://www.amleo.com>  
Products Safety and Snow Fence, Tree wrap, Eyebolts, Turnbuckles, Tree Anchors, Tree Stakes, Guying Hose, Erosion Control Mats and Blankets, Fertilizers and Planting Tablets.
- B. The Scotts Company, 41 South High Street. Suite 3500, Columbus, Ohio 43215, (614) 719-5500,  
<http://www.scottscompany.com>

**2.4 SOIL AMENDMENTS: PH ADJUSTERS, FERTILIZER, ORGANIC MATERIAL, AND SOIL CONDITIONERS MEETING THE FOLLOWING REQUIREMENTS.**

- A. **DO NOT** use vermiculite.

- B. pH Adjuster:** an agricultural liming material in accordance with ASTM C 602 (i.e. burnt lime, hydrated lime, ground limestone, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.
1. Hydrated Lime with minimum calcium carbonate equivalent of 110 percent; minimum 100 percent passing a #8 sieve (2.36 mm) and minimum 97 percent passing a #60 sieve (0.250 mm).
  2. Burnt Lime with minimum calcium carbonate equivalent of 140 percent; minimum 95 percent passing a #8 sieve (2.36 mm) and minimum 35 percent passing a #60 sieve (0.250 mm).
  3. Soil sulphur (Flowers of sulphur): minimum 90 percent passing a #10 (2 mm) sieve and minimum 50 percent passing a #60 (0.250 mm) sieve.
  4. Aluminum sulfate: minimum 90 percent passing a #10 (2 mm) sieve and minimum 50 percent passing a #60 (0.250 mm) sieve.
  5. Ferrous sulphate: minimum 90 percent passing a #10 (2 mm) sieve and minimum 50 percent passing a #60 (0.250 mm) sieve.
- C. Fertilizer:** FS O-F-241, Type I, Grade A controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio, derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylene diurea (IBDU) recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil as indicated in analysis.:

**D. Organic Material**

1. Peat: A natural, granulated, or shredded commercial Sphagnum Peat Moss derived from a bog, swampland or marsh, containing not more than fifteen (15) percent decomposed organic matter by weight, low in content of woody material, free of materials harmful to plant life; with a pH of from 4 to 6, a moisture content of not over 30% and a moisture absorbing capacity from 1100% to 2000%.
2. Compost: Screened stable humus mixture of partially aerobically decomposed weed free organic materials. with no objectionable odors or substances toxic to plants
  - a. Screened;
    - 1) 100% passing a 3/8 in (10 mm) screen
    - 2) Minimum 95% by weight less than 1/4 in (6 mm) diameter.
    - 3) Maximum 5% greater than 1/4 in (6 mm) diameter.
    - 4) Maximum 65% greater than 3/64 in (1 mm) diameter.
    - 5) Minimum 35% less than 3/64 in (1 mm) diameter.

**2.5 WATER:**

- A.** Clean, fresh, and free of substances or material which could inhibit vigorous growth of grass.

**2.6 ACCESSORIES:**

- A.** Sod Pegs: pieces of plaster's lath approximately 10 inches in length or equivalent.
- B.** Stakes: Softwood lumber, chisel pointed
- C.** String: Organic fiber.
- D.** Edging:

**1. MANUFACTURERS:**

- a. Collier Metal Specialties Incorporated, 3333 Miller Park South, Garland Texas 75042, (800) 829-8225, <http://www.colmet.com>.
- b. Joseph T. Ryerson and Son Incorporated, P.O. Box 8000, Chicago, Illinois 60680, (773) 762-2121 Style.
- c. ProSteel, 5121 Kaltenbrun Road, Fort Worth, Texas 76119, (800) 542-4518, <http://www.prosteel.com>.
- d. Substitutions: Under provisions of Division 1.

**2.7 MIXES:**

- A.** Planting soil mix: Five parts topsoil, three parts sand, three parts compost, three part peat moss. Add fertilizer as required.

**2.8 EQUIPMENT:**

- A.** Heavy lawn roller: minimum 225 lbs.

**2.9 CONCRETE GRID PAVERS:**

- A.** Tileco inc. "Grass Block" unit paver. Tileco, Inc. Campbell Industrial Park 91-209 Hanua Street Kapolei, HI 96707 Phone: 808.682.5737 Fax: 808.682.1013 Paver dimensions: 17 1/4"x11 1/2"x3 1/2" Unit weight 32 lbs. 4000psi Compressive strength.



## PART 3 - EXECUTION

### 3.1 EXAMINATION:

- A. Site verification of Conditions: Verify subsoil is not frozen, muddy, excessively wet or in conditions detrimental to grading or turfgrass sod installation. Verify sufficient time has elapsed to ensure dissipation of all toxic materials (chemicals, herbicides, pesticides, etc.) from the subsoil and topsoil. Contractor is responsible for any loss or damage to turfgrass sod arising from improper use of chemicals or due to failure to allow sufficient time to permit dissipation of toxic residues. Verify that prepared soil base is ready to receive the work of this Section.
- B. Beginning installation means acceptance of existing site conditions.

### 3.2 PREPARATION:

- A. Protection: Protect areas with prepared surfaces from compaction and damage by vehicular or pedestrian traffic and surface erosion.
- B. Preparation of Turfgrass Sod Planting Bed: Eliminate all existing vegetation from sod planting bed by herbicide. Spray planting bed with glyphosate herbicide following manufacturer's instructions. Maintain planting bed bare and moist for three weeks. Spray planting bed with second herbicide application. Maintain planting bed bare and moist for one week following second herbicide application. **DO NOT** apply sod for at least one week after last herbicide application to allow herbicide to completely breakdown. Clear the turfgrass planting bed to a depth of 4 in (10 cm) of all roots, brush, wire, grade stakes, surface trash or other objects that would hinder installation or maintenance of turfgrass sod and other plantings.
- C. Preparation of Subsoil: Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas. Remove foreign materials, weeds, and undesirable plants and their roots. Remove contaminated subsoil. Immediately prior to the placement and spreading of topsoil, disk or scarify subsoil to a minimum depth 3 in where topsoil is to be placed to permit bonding of the topsoil to the subsoil. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
- D. Preparation and Adding Topsoil: Scarify areas to receive topsoil to a depth of 2 in (5 cm) to bond topsoil with subsoil. Spread topsoil to a minimum depth of 3 in over area to be sodded after firming. Place topsoil during dry weather and on dry unfrozen subgrade. Remove vegetable matter and foreign non-organic material while spreading. Grade to eliminate rough, low, or soft areas and to ensure positive drainage. Install edging at periphery of sodded areas in straight lines to consistent depth.
- E. Soil Amendments: Spread soil amendments uniformly over the designated area(s).
  - 1. Fertilizer: Apply after smooth raking of topsoil and no more than 48 hours prior to installation of sod. Apply fertilizer in accordance with manufacturer's instructions.
  - 2. Lime: Apply lime at the rate recommended by the soil test.
  - 3. Compost: Spread compost uniformly over the soil to a minimum depth of 3 in. Thoroughly incorporate by tillage into the soil to a minimum depth of 4 in (10 cm). Uniformly incorporate compost into top 2" of soil by disking, harrowing, or other approved method.
- F. Surface Preparation: Remove debris and stones over 5/8 in (16 mm) in any dimension from the surface. Bring areas to be topsoiled to specified subgrade. Compact graded subsoils where necessary. Set the prepared surface a maximum of 1 in (25 mm) below the adjoining grade of any surfaced area. Blend new surfaces to existing areas. Roll prepared surface and complete by a light raking to remove debris.

### 3.3 TRANSPLANTING TURFGRASS SOD:

- A. Transplant within 24 hours of harvesting to prevent deterioration unless a suitable preservation method is approved prior to delivery. Lightly moisten the prepared planting bed immediately prior to transplanting. Place top elevation of sod 1/2 in below adjoining paving. Lay the first row of turfgrass sod in a straight line. align with adjoining grass areas. Place subsequent rows tightly against and parallel to first row and each other with no open joints visible. Stagger the lateral joints 12 in (30 cm) minimum to promote uniform growth and strength. Do not stretch or overlap sod pieces. Butt all joints together tightly to prevent air drying of the roots.
- B. Sloping Surfaces:
  - 1. 3:1 {33%} {4 in per foot (33 cm/m)} slopes: Lay traditional size, 1 sq yd (1 sq m) turfgrass sod pieces across the angle of the slope (perpendicular). Lay Large-roll turfgrass sod in the direction of the slope. Temporarily secure sod by pegging, or other approved methods.

- C.** Swales and Intermittent Waterways: Consider maximum channel velocities for storms of a designated intensity. Lay and peg traditional size, 1 sq yd (1 sq m) turfgrass sod pieces perpendicular to the direction of flow. Lay Large-roll turfgrass sod in the direction of flow and secure by pegging, stapling or other approved methods.
- D.** Water the turfgrass sod immediately after transplanting to prevent excessive drying during the progress of transplanting.
- E.** Lightly roll completed sections of sod, perpendicular to the length of the sod pads to ensure good contact between sod planting bed and turfgrass sod and to remove minor depressions and irregularities.
- F.** Water rolled turfgrass sod sufficient to thoroughly wet the underside of the turfgrass sod pad and the soil immediately below.

### **3.4 MAINTENANCE:**

- A.** Watering: Water to prevent grass and soil from drying out.
- B.** Mowing: **DO NOT** mow until turfgrass sod is firmly rooted and securely in place. **DO NOT** mow turf with dull mower cutting blades. Mow grass when grass height is 1/4 to 1/3 taller than recommended mowing height. Do not cut more than 1/3 of grass blade at any one mowing. Mow grass at regular intervals to maintain at a recommended mowing height of 2 in.
  - 1.** Trimming: Neatly trim edges and hand clip where necessary.
  - 2.** Immediately remove clippings after mowing and trimming.
- C.** Roll surface to remove minor depressions or irregularities.
- D.** Weed Control: Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides. Immediately replace sod in areas which show deterioration or bare spot.

- 3.5 CLEANING:** Keep pavements broom clean and work area in an orderly condition. After topsoil spread and final grade approved, clear turfgrass sod planting bed of grade stakes, surface trash or other objects that would hinder installation or maintenance of turfgrass sod and other plantings. Promptly remove any soil brought on the surfacing by hauling operations. Keep wheels of all vehicles clean to avoid tracking soil on the surfacing of paved areas.

### **3.6 INSPECTION AND ACCEPTANCE:**

- A.** Owner's Representative will, upon request, make an inspection to determine acceptance, after completion of maintenance.

**End of Section**

**SECTION 32 93 00  
EXTERIOR PLANTS**

**PART 1 - GENERAL**

**1.1 SUMMARY:**

- A. Section Includes: Preparation of soil, planting pits, areas and beds; planting of trees, shrubs and ground covers; preparation of subsoil and topsoil; topsoil bedding; trees, plants, and ground cover; mulch; fertilizer and maintenance.

**1.2 DEFINITIONS:**

- A. Noxious Weeds (Prohibited): Presence of any of these weeds in cultural medium is unacceptable and the materials will be rejected and immediately removed from the site.
1. Aeginetia (*Aeginetia* spp.); Ageratina (*Ageratina adenophora*); Alectra (*Alectra* spp.); Amur Silvergrass (*Imperata brasiliensis*); Animated Oats (*Avena sterilis*); Arrowhead (*Sagittaria sagittifolia*); Asphodel (*Asphodelus fistulosus*); Bindweed (*Convolvulus* spp.); Bramble, Blackberry, Indian Raspberry, Blackberry (*Rubus* spp. i.e. *moluccanus fruticosus*); Borreria (*Borreria alata*); Bromegrass (*Bromus* spp.); Cane (*Saccharum spontaneum*); Carthamus (*Carthamus oxycantha*); Chrysopogon (*Chrysopogon aciculatus*); Crabgrass (*Digitaria* spp. i.e. *abyssinica*, *scalarum* and *velutina*); Crupina (*Crupina vulgaris*); Cuscuta (*Cuscuta* spp.); Dayflower (*Commelina benghalensis*); Dodder (*Cuscuta* spp.); Drymaria (*Drymaria arenarioides*); Emex (*Emex* spp. i.e. *australis* and *spinosa*); Giant Hogwart (*Heracleum mantegazzianum*); Goat's Rue (*Galega officinalis*); Ground Ivy (*Glechoma hederacea*); Indian Rhododendron (*Melastoma malabathricum*); Ischaemum (*Ischaemum rugosum*); Johnson Grass (*Sorghum halepense*); Leafy spur (*Euphorbia esula*); Leptochloa (*Leptochloa chinensis*); Matrimony Vine, Box Thorn (*Lycium ferocissim*); Mikania (*Mikania micrantha*); Mimosa (*Mimosa* spp. i.e. *invisa* and *pigra*); Morning Glory (*Ipomoea triloba*); Nassella (*Nassella trichotoma*); Nimbwill (*Muhlenbergia shreberi*); Nutgrass or Nutsedge (*Cyperus* spp.); Orobanche (*Orobanche* spp.); Paperbark Tree, Punk Tree, Tea Tree, Swamp Tea Tree (*Melaleuca quinquenervia*); Paspalum (*Paspalum scrobiculatum*); Pennisetum (*Pennisetum* spp. i.e. *clandestinum*, *macrourum*, *pedicellatum* and *polystachion*); Peppergrass, Pepperwort, Tongue-grass (*Lepidium repens*); Perennial Sorrel (*Oxalis* spp.); Perennial Sowthistle (*Sonchus arvensis*); Poison Ivy (*Toxicodendron radicans*); Poison Oak (*Toxicodendron toxicarium*); Prickly Pear (*Opuntia aurantiaca*); Prosopis (*Prosopis* spp. i.e. *alapatata*, *argentina*, *articulata*, *burkartii*, *caldenia*, *calingasta*, *campestris*, *castellano denudans*, *elata*, *farcta*, *ferox*, *fiebrigii*, *hassleri*, *humilis*, *kuntzei*, *pallida*, *palmeri*, *reptans*, *rojasiana*, *ruizlealii*, *ruscifolia*, *sericantha*, *strombulifera* and *torquata*); Quackgrass (*Agropyron repens*); Wild Rice (*Oryza* spp. i.e. *longistami*, *punctata* and *rufipogon*); Rope Mikania (*Mikania cordata*); Rottboellia (*Rottboellia* spp. i.e. *colchinensis* and *exaltata*); Russian Knapweed (*Centaurea picris*); Salsola (*Salsola vermiculata*); Salvinia (*Salvinia* spp. i.e. *biloba*, *herzogii* and *molesta*); Setaria (*Setaria pallide-fusca*); Shoofly Joyweed (*Alternanthera sessilis*); Silvergrass (*Imperata cylindrica*); Solanum (*Solanum* spp. i.e. *torvum* and *viarum*); Striga (*Striga* spp.); Thistle (*Cirsium* spp.); Tridax (*Tridax procumbens*); Urochloa (*Urochloa panicoides*); Whitetop (*Lepidium draba*, *Hymenos-physa pubescens*) and Wild Garlic (*Allium vineale*).
- B. Weeds (Restricted): Presence of any of these weeds in cultural medium covering 2% or more of surface is unacceptable and the materials will be rejected and immediately removed from the site.
1. Bentgrass (*Agrostis* spp.); Bermudagrass (*Cynodon dactylon*); Annual Bluegrass (*Poa annua*); Tall fescue (*Festuca eliator*); Barnyardgrass (*Echinochloa crus-galli*); Burclover (*Medicago hispida*); Chickweed (*Stellaria media*); Chess (*Bromus* spp.); Dandelion (*Taraxacum officinale*); Dallisgrass (*Paspalum dilatatum*); Dock (*Rumex* spp.); English Daisy (*Bellis perrene*); Foxtail (*Alopecurus* spp.); Henbit (*Lamium amplexicaule*); Horsetail (*Equisetum arvense*); Jimsonweed (*Datura stramonium*); Knotweed (*Polygonum aviculare*); Lambsquarter (*Chenopodium album*); Mallow or Cheeseweed (*Malva* spp.); Mustard (*Sisymbrium* spp.); Plantain (*Plantago* spp.); Purslane (*Portulaca oleracea*); Ragwort (*Senecio* spp.); Rush grass (*Juncus* spp.); Spotted spurge (*Euphorbia maculata*); Veronica or Speedwell (*Veronica filiformis*) and Wild Onion (*Allium canadense*).
- C. Botanical Name: Botanical classification of a plant by genus, species, and cultivar or variety, i.e. *Rhododendron obtusum* 'Hindodegiri,' in accordance with the International Code for Botanical Nomenclature and the International Code for Cultivated Plants.
- D. Caliper: plant size measurement, diameter of a plant trunk measured six in (15 cm) above grade (used only on plants six in (15 cm) caliper or less).
- E. Cultivar: Plant variety bred to exhibit desirable characteristics from domestic parent stock. Generally cannot maintain themselves out of cultivation. Main method of reproduction is asexual. Denoted by single quote marks, i.e. *Ulmus parvifolia* 'Drake.'
- F. Diameter Breast Height (DBH) : plant size measurement, diameter of a plant trunk measured at 4'-6" (1.37 m) above the ground (used only on plants over six in (15 cm) caliper).

- G. Genus: A group of closely related plants distinguished by species. Denoted by a capitalized and italicized Latin name for group, i.e. *Ulmus parvifolia* 'Drake.'
- H. Holotype: The typical example of a species, cultivar or variety for size, growth pattern, foliage, flowers, fruit and color.
- I. Stand of Wildflowers: 95 percent ground cover of the established specified species.
- J. Species: A recognizable individual group of plants that can breed with like plants to produce fertile offspring with the characteristics of their parents. Denoted by lowercase italicized Latin following genus name, i.e. *Ulmus parvifolia* 'Drake'.
- K. Plant Material Quality:
  - 1. Specimen Quality: A plant of the specified botanical name, exhibiting superior holotype characteristics of growth pattern, foliage, flowers, fruit and color from all sides. Conform to proportions and exceeds all ANLA/ANSI Z60.1 requirements and standards. Exceeds specified height and spread of Plant Material Schedule. Furnish the indicated form of growth.
  - 2. Select Quality: A plant of the specified botanical name, exhibiting one or more superior holotype characteristics of growth pattern, foliage, flowers, fruit and color from all sides. Conform to proportions and meets all and exceeds some ANLA/ANSI Z60.1 requirements and standards. Meets or exceeds specified height and spread of Plant Material Schedule. Furnish the indicated form of growth.
  - 3. Standard Quality: A plant of the specified botanical name, exhibiting holotype characteristics of growth pattern, foliage, flowers, fruit and color. Conform to proportions and meets all ANLA/ANSI Z60.1 requirements and standards. Meets specified height and spread of Plant Material Schedule. Furnish the indicated form of growth.
  - 4. Common Quality: A plant of the specified botanical name, exhibiting holotype characteristics of growth pattern, foliage, flowers, fruit and color. Conform to proportions and meets most ANLA/ANSI Z60.1 requirements and standards. Meets specified height and spread of Plant Material Schedule. Furnish the indicated form of growth.
  - 5. Liner Quality: A plant of the specified botanical name, exhibiting holotype characteristics of growth pattern, foliage, flowers, fruit and color. Conform to proportions and will achieve smallest ANLA/ANSI Z60.1 standards three years after field planting. Meets specified height and spread of Plant Material Schedule. Furnish the indicated form of growth.
  - 6. Unique Specimen: A plant of the specified botanical name, exhibiting some superior holotype characteristics of foliage, flowers, fruit and color. A tree, shrub or groundcover well-branched and pruned naturally which may not be in accordance with natural growth habit of the species, variety or cultivar. Conform to proportions and meets most ANLA/ANSI Z60.1 requirements and standards. Furnish the indicated form of growth.
- L. Single stem: Trees or shrubs with reasonably straight, symmetrical trunks, symmetrical crown and a persistent main leader.
- M. Multi-stem: Trees or shrubs where all countable stems, in aggregate, average the caliper specified. be Any division of the trunk which branches more than 6 in (150 mm) from ground level is a branch and not a stem.
- N. Variety: A subclassification of a plant species. Denoted by italicized lower case after genus and species, i.e. *Rhododendron campanulatum aeruginosum*.

### 1.3 SUBMITTALS:

- A. Product Data: Manufacturer's literature, including physical characteristics, product description and finish, product criteria, limitations, applications, technical data, application, installation instructions and recommendations for: equipment; chemical treatment material; fertilizer tree spikes planting tablets briquettes; root stimulators; anti-desiccants; borer deterrents; mulch; weed control fabric; root control barrier; edging; metal anchors.
- B. Shop Drawings: Tagged plant locations.
- C. Samples:
  - 1. Edging: 1 ft (300 mm) sample of edging including stake and staking bracket;
  - 2. Topsoil: Samples taken from several locations at the source.
    - a. Submit minimum 10oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
  - 3. One gal sample of soil amendments.
  - 4. One gal sample of mulch;
  - 5. One gal sample of compost;
  - 6. One gal sample of peat moss;
  - 7. One gal sample of fertilizer
  - 8. One gal sample of lime;
  - 9. One examples of each plant type for quality assurance inspection. If the plant nursery is within 30 miles of the project site the submittals will be examined at the nursery. If the nursery is over 30 miles from the site, the submittals will be examined at the project site
  - 10. One oz (28.3 g) sample of Root activator.

11. One oz (28.3 g) sample of Anti-desiccant.
  12. One oz (28.3 g) sample of Borer deterrent.
  - D. Quality Control/Assurance Submittals:
    1. Test Reports:
      - a. Results of soil analysis for existing and imported topsoils with recommended soil amendments. Provide analysis of topsoil under provisions of Division 1. Analyze in accordance with DOA SSIR to ascertain textural class, particle size, percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
      - b. Seed. Classification, botanical name, common name, percent pure seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.
      - c. Package standard products with manufacturer's certified analysis.
    - 1) Fertilizer: For chemical analysis, composition percent.
    - 2) Compost: For man-made materials, total solids, pH, metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc), fecal coliform population and salmonella population.
    - 3) For other material provide analysis by a recognized laboratory, made in accordance with methods established by the association of official Agricultural Chemists.
    2. Certificates: Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Submit shipping tags to Owner's Representative upon delivery of materials. Department of Agriculture certificates from the state or point of origin (or purchase) declaring that the material is alive, in good health and free from insects and disease. Inspection certificates complying with all state, local, and federal regulations.
      - a. Topsoil: Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.
      - b. pH Adjuster: Calcium carbonate equivalent and sieve analysis.
      - c. Fertilizer: Chemical analysis and composition percent.
      - d. Agricultural Limestone: For calcium carbonate equivalent and sieve analysis.
      - e. Peat: For compliance with ASTM D2980 AND D4427.
      - f. Compost: Composition and source.
      - g. Organic Material: Composition and source.
      - h. Soil Conditioner: Composition and source.
      - i. Organic Mulch: Composition, source, and treatment against fungi growth.
      - j. Pesticide: EPA registration number and registered uses.
    3. Manufacturer's Instructions: Metal edging
    4. Maintenance Data: Submit maintenance data for continuing Owner maintenance under provisions of Division 1. Include maintenance instructions, cutting method and maximum grass height;.
    5. Qualification Statements:
      - a. Nursery supplier: submit evidence of experience and license.
      - b. Landscape Contractor: submit evidence of experience and license.
- 1.4 QUALITY ASSURANCE:**
- A. Plants will conform to ANSI Z60.1 American Standard for Nursery Stock.
  - B. Regulatory Requirements:
    1. Comply with regulatory agencies for fertilizer and herbicide composition.
    2. State Regulatory Requirements - Comply all applicable state and local codes
  - C. Nursery: Licensed company specializing in growing and cultivating the plant life specified in this Section with minimum three years' experience.
  - D. Installer: Company specializing in installing and planting the plants specified in this section with minimum three years documented experience.
  - E. Substitutions: **DO NOT** make substitutions! If specified landscape material is not available, submit to Owner's Representative: written proof of non-availability; a list of all suppliers contacted; a proposal to use equivalent material. Adjustment to contract amount will be made, when substitution is permitted or rejected; alternate methods of production and packaging will be considered.
  - F. Inspections, Permits, and Fees:
    1. Contractor: Obtain and pay for all required permits, and inspections in connection with this work under the Contract. Deliver to the Owner a copy of each certificate of approval from each inspection agency. Pay for required testing. Bear all costs of correcting deficiencies of any work that does not comply with the requirements of the applicable building codes, state laws, local ordinances, industry standards, and utility company regulations.

2. Testing Facilities: An approved commercial testing laboratory; or Facilities furnished by the Contractor. **DO NOT** perform any work requiring testing until the facilities have been inspected and approved by the Owner's Representative .
  - a. The first inspection of the testing facility is at the expense of the Owner. Required subsequent inspection because of first inspection failure is the expense of the Contractor at no additional cost to the Owner.

#### 1.5 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store, protect, and handle products to site under provisions of Division 1.
  - B. Notify the Owner's Representative of the delivery schedule 48 hours in advance to allow plants to be inspected upon arrival at the job site. Remove unacceptable plants from the site immediately.
  - C. Packing and Shipping: Protection During Delivery: Protect plant material during delivery to prevent desiccation and damage to the branches, trunk, root system, or earth ball. Protect branches by tying-in. Cover exposed branches during transport. **DO NOT** prune prior to delivery. **DO NOT** bind or tie in such a manner as to damage bark, break branches, or destroy natural shape. Deliver with branches tied and exposed branches covered with material which allows air circulation. Deliver plant materials after preparations for planting have been completed and plant immediately upon approval. Deliver plant materials in a closed truck or treat plant materials with an approved anti-desiccant and protect from wind damage during transport. Provide protective covering and adequate ventilation during delivery. Avoid damaging plants during transport. Prevent damage to root balls and desiccation of leaves.
1. Method of Shipment to Maintain Health of Root System
    - a. Balled and Burlapped (BB) Plant Material: Make ball size and ratio in accordance with ANLA ANSI/ANLA Z60.1. Provide a ball of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. Center the plant stem or trunk in the ball. Cleanly cut all roots at the ball surface. **DO NOT** pull roots from the ground. Completely wrap the root ball with burlap or other suitable material and securely lace with biodegradable twine.
    - b. Balled and Potted (Pot) Plant Material: Make ball size and ratio in accordance with ANLA ANSI/ANLA Z60.1. Provide a ball of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. Center the plant stem or trunk in the ball. Remove the plant by hand digging or mechanical devices. Center the plant stem or trunk in the ball. Cleanly cut all roots at the ball surface. **DO NOT** pull roots from the ground. Use a rigid container to retain the ball unbroken, hold ball shape and protect root mass during shipping.
    - c. Balled and Platform (BP) Plant Material: Make ball size and ratio in accordance with ANLA ANSI/ANLA Z60.1. Prepare plants as balled and burlapped plant material and securely fasten to wood platform for shipping.
    - d. Bare-Root (BR) Plant Material: Dig with root system substantially intact but with the earth carefully removed. Provide plant material with minimum root spread in accordance with ANLA ANSI/ANLA Z60.1 and a well branched root system characteristic of the species specified. **DO NOT** pull roots from the ground. **ONLY** transplant bare-root plant material while dormant. Protect the root system from drying out by covering roots with a thick coating of mud by puddling after plants are dug or wrap with moist material immediately after digging.
    - e. Container-Grown (C) Plant Material: Provide plants with container size in accordance with ANLA ANSI/ANLA Z60.1. Provide plant material grown in a container over a duration of time for new fibrous roots to have developed and for the root mass to retain its shape and hold together when removed from the container, but not root bound.. Provide containers sufficiently rigid to hold ball shape and protect root mass during shipping.
    - f. Collected Plants: From native stands or established plantings, with good fibrous root development and vigorous growing condition.
    - g. Bare Root: Furnish a minimum root spread one-third greater than minimum root spread of bare-root nursery-grown stock.
    - h. Ball and Burlap: Provide minimum ball size of the next larger ball size than for nursery-grown stock in accordance with ANSI Z60.1.
    - i. Plantation-Grown Stock: ANSI Z60.1
  2. Deliver fertilizer and soil amendments in the original, unopened waterproof bags showing weight, chemical analysis, and name of manufacturer. Fertilizer and soil amendments in damaged packages is unacceptable. Fertilizer and soil amendments may be furnished in bulk. Provide a chemical analysis for bulk deliveries.
  3. Deliver seed mixture in the original, unopened containers. Seed in damaged packages is unacceptable.

4. Deliver Pesticide in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses. Pesticide in damaged packages is unacceptable.
  5. Handling, and Unloading: Handle in a manner to prevent damage and contamination. **DO NOT** drop or dump materials from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle all plants carefully to avoid damaging or breaking the earth ball or root structure. **DO NOT** handle the plants by the trunk or stems. Move ball and burlapped stock only when root balls are solid and well hardened. **DO NOT** remove container grown stock from containers until planting is to be done.
    - a. Specimen Plants: Protect against breaking soil from root area when digging, binding and wrapping or boxing specimen plants. Prune lightly plants dug and moved by portable hydraulic split shells or four-spade plant moving equipment or plants jerked bare root from the soil and treat the root system with vitamin B extract and plant hormone solution according to manufacturer's directions. Mulch and guy specimen plants in a basin and fertilize within 48 hours after removal from previous location.
    - b. Plant Material Identification: Label each variety of tree, each shrub, and each ground cover of with a securely attached waterproof tag bearing a legible designation in weather-resistant ink, stating the correct botanical and common plant name, legible for a minimum of 60 days after delivery to the planting site. Attach to plants, bundles, and containers of plants. Groups of plants may be labeled by tagging one plant.
  6. Place and stack skids and units to distribute weight evenly and to prevent breakage or cracking.
  7. Deliver equipment and materials to the site in original containers, suitably sheltered from the elements, but readily accessible for inspection by Owner's Representative with seals unbroken and labels intact, in accordance with manufacturer's instructions.
- D. Acceptance at Site:**
1. Wet fertilizer and soil amendments or in damaged packages is unacceptable. Topsoil containing viable plant material, plant parts, or slag, cinders, stones, lumps of soil, sticks, roots, trash or other material larger than 1-1/2 in (40 mm) diameter is unacceptable.
  2. Acceptable Plant Materials: Well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion. Exhibit typical form of branch to height ratio; and meet the caliper and height measurements specified.
    - a. Container-grown: Shows new fibrous roots and root mass retains its shape when removed from the container.
  3. Unacceptable Plant Materials: Unacceptable materials are rejected. Immediately remove unacceptable/rejected materials! Plant species, colors and sizes not meeting the requirements of the Drawings. Plants with ball sizes and ratios, quality, size, condition and grading tolerances that do not comply with ANSI Z60.1 or Plant Materials Schedule. Plants with cracked or broken rootball. Bare-root plant material that is not dormant or showing roots were pulled from the ground. Plants with displaced burlap, staves, and ropes. Plant material that measures less than specified, or has been poled, topped off or headed back. Damaged plants and plants with damaged or missing serialized tags. Container-grown Plants: Root-bound plants; without new fibrous roots; or root mass does not retain its shape when removed from the container.
  4. Inspection: Owner's Representative will inspect all plant materials, for compliance with requirements for name, variety, color, size and quality. Submittal plants may be inspected at their place of origin, if it is within 30 miles of the Site or at the site. Owner's Representative will inspect all plant materials on site prior to planting.
- E. Storage and Protection:**
1. Time Limitation: Except for container-grown plant material, the maximum time period from digging to installing plant material is 90 days. Maximum time period between installing the plant material and placing the mulch is 24 hours. Maximum on site storage time period is 30 days Plants exceeding time limits are unacceptable remove from site and replace immediately!
  2. Plant Storage and Protection: If planting is delayed more than 6 hours after delivery, store and protect plants not planted on the day of arrival at the site as follows: Shade and protect plants in outside storage areas from the wind and direct sunlight until planted. Heel-in bare root plants. Protect balled and burlapped plants from freezing or drying out by covering the balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss, or other approved material. Provide covering which allows air circulation. Keep plants in a moist condition until planted by watering with a fine mist spray. Do not store plant material directly on concrete or bituminous surfaces. Protect plant materials from freezing or overheating.
  3. Other Material Storage: Store other material in designated areas. Store soil amendments in dry locations and away from contaminants. Store chemical treatment material according to manufacturer's instructions and not with planting operation

material. Store materials in original containers, suitably sheltered from the elements, but readily accessible for inspection by Owner's Representative until installed. Store all items subject to moisture damage in dry, heated places.

4. Topsoil: Prior to stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation three to four weeks prior to stockpiling existing topsoil.
  5. Tightly cover equipment and protect against dirt, water, and chemical or mechanical injury and theft.
  6. Keep the inside of pipes and fittings free of dirt and debris.
  7. Protect plastic materials from exposure to the direct sunlight over extended periods.
  8. At completion of the work, turn over all materials to the Owner in first class condition, free of defects and damage.
  9. Contractor repair or make good damage or defects developing before acceptance of the work at the Contractor's expense.
- F. Waste Management and Disposal: Remove rejected materials from site immediately!

#### 1.6 PROJECT/SITE CONDITIONS:

- A. Perform planting operations only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, stop the work when directed. **DO NOT** plant when ambient temperatures may drop below 35 degrees Fahrenheit (F).
- B. When special conditions warrant a variance to the planting operations, submit proposed planting times Owner's Representative for approval.
- C. Existing Conditions: Provide Soil sample for testing at approved lab for required amendments and fertilizer.

#### 1.7 SCHEDULING:

- A. Planting season: Containerized plants may be planted year round. Plant or install ball and burlapped materials during the normal or specified planting seasons.
  1. Ball and burlapped plants:
    - a. Spring planting: From March 1 through June 15
    - b. Summer planting: From June 16 through August 31
    - c. Autumn planting: From September 1 through November 15
    - d. Winter planting: From November 16 through February 28
  2. Deciduous Material:
    - a. Spring planting: From March 1 through June 15
    - b. Summer planting: From June 16 through August 31
    - c. Autumn planting: From September 1 through November 15
    - d. Winter planting: From November 16 through February 28
  3. Evergreen Material:
    - a. Spring planting: From March 1 through June 15
    - b. Summer planting: From June 16 through August 31
    - c. Autumn planting: From September 1 through November 15
    - d. Winter planting: From November 16 through February 28
- B. Coordinate the work of this Section with installation of underground sprinkler system piping and watering heads and installation of turf.
- C. Coordinate with the installation of other site work by other contractors.
- D. Planting Coordination: Plant trees, shrubs, groundcovers and vines after final grades are established and before planting of turf unless otherwise approved by the Owner's Representative. If planting of trees and shrubs occurs after turf installation, protect the lawn areas, and promptly repair any and all damages.

#### 1.8 WARRANTY:

- A. Warranty plant material to remain in a vigorous growing condition for a minimum 12 month period, including one continuous growing season under provisions of Division 1 including coverage of plants for death or unhealthy conditions, except for defects resulting from neglect by owner, abuse or damage by others, losses due to curtailment of water supply by local authorities, or acts of God. Commence warranty on date identified in the Certificate of Substantial Completion. Provide a minimum 12 month calendar time period for the warranty of plant growth regardless of the contract time period. When plant material is determined to be unhealthy, replace the plant once under this warranty.
- B. Plant Removal and Replacement:
  1. Replacement Plant Material: Provide and install plant material, complying with the requirements indicated and specified, for replacement in accordance with Specifications and Drawings, unless otherwise directed. An extended plant establishment period is not required for replacement plant material.



2. Provide replacement plants of the same size as original plants;
  3. Only one replacement will be required at the end of the warranty period, except for losses due lack of Contractor maintenance;
  4. Replace plant materials in doubtful condition at the end of the warranty period, unless the Owner's Representative extends the warranty period for these plants a full growing season;
  5. If warranty period is extended, the Owner's Representative will inspect the plants at the end of the extended guarantee period for acceptance or rejection;
- C. Unhealthy Plant Material:

1. Tree: Considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died and at direction of Owner's Representative.
2. Shrub: Considered unhealthy or dead, when up to a maximum 25 percent of the plant has died. Determine unhealthy or dead condition by scraping on a branch an area 1/16 in (2 mm) square, maximum, to determine if there is a green cambium layer below the bark; or at the direction of Owner's Representative.
3. Contractor to determine the cause for unhealthy plant material and provide recommendations for replacement.
4. Remove unhealthy or dead plant material immediately and replace as soon as seasonal conditions permit.

## 1.9 MAINTENANCE:

1. Begin maintenance of plant materials immediately after planting and continue until termination of warranty period.

## PART 2 - PRODUCTS

### 2.1 PLANTS:

- A. Plant Material Classification: Provide nursery grown stock conforming to ANSI/ANLA Z60.1, HORTUS THIRD.
- B. Quality: Provide well shaped, well grown, vigorous plant material having healthy and well branched root systems in accordance with ANLA ANSI/ANLA Z60.1. Furnish plant material free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Supply plant material free of shock or damage to branches, trunk, or root systems, which may occur from the digging and preparation for shipment, method of shipment, or shipment. Supply plant materials with root balls, root masses and boxes free of all noxious and restricted weeds and weed seeds. Spray plants budding into leaf or having soft growth with an anti-desiccant before digging. The growing conditions, method of shipment to maintain health of the root system and growth of the trunk and crown determine plant quality as follows. Provide species and size shown in Drawings and Plant Materials Schedule. Botanical names indicated are listed in HORTUS THIRD UCDANR 4091. Furnish well-branched and densely foliated plants, when in leaf, with healthy well-developed root systems. Provide specified root condition for each plant material as indicated.
- C. Plant Material Size: Sizes specified are the size after pruning for transplanting with branches in normal position. Measure plant materials in accordance with ANSI/ANLA Z60.1. Larger sizes may be used at no additional cost: If approved, in writing, by the Owner's Representative. When larger plants are provided, increase sizes of root balls and/or containers proportionally.
- D. Growth of Trunk and Crown: Provide plant materials with a normal growth habit characteristic to the species.
  1. Deciduous Trees: Provide plant material with height to caliper relationship in accordance with ANLA ANSI/ANLA Z60.1. Provide plants with a height of branching proportional to the size and species of tree specified and with the crown in good balance with the trunk. **DO NOT** provide "poled" trees or plants with the leader removed. Provide symmetrically developed deciduous trees with a uniform habit of growth, with straight boles or stems and free from objectionable disfigurements.
    - a. Single stem: Provide plants with reasonably straight, symmetrical trunks, symmetrical crown and a persistent main leader.
    - b. Multi-stem: Furnish plants where all countable stems, in aggregate, average the size specified. Any division of the trunk which branches more than 6 in (150 mm) from ground level is a branch and not a stem.
    - c. Specimen: Supply a tree well branched and pruned naturally according to the species. Supply the form of growth indicated, which may not be in accordance with natural growth habit.
  2. Palms: Provide palms with the specified height as measured from the base of the trunk to the base of the fronds or foliage in accordance with ANLA ANSI/ANLA Z60.1. Furnish palms with straight trunk and healthy fronds or foliage typical for the variety grown in the region of the project. Retain a minimum of 6 in (150 mm) of foliage at the crown of palms trimmed or pruned for delivery as a means of determining plant health.

3. Deciduous Shrubs: Provide deciduous shrubs with the height and number of primary stems recommended by ANLA ANSI/ANLA Z60.1. Provide well shaped, symmetrically developed plant material with sufficient well-spaced side branches, a uniform habit of growth, with straight boles or stems and typical for the species grown in the region of the project and free from objectionable disfigurements
4. Coniferous Evergreen Plant Material: Provide coniferous plant material with the height-to-spread ratio recommended by ANLA ANSI/ANLA Z60.1. **DO NOT** provide "poled" trees or plants with the leader removed. Provide exceptionally heavy, well-shaped plant material trimmed to form a symmetrical and tightly knit plant. Provide the form of growth desired as indicated. Provide evergreen trees and shrubs with well-developed symmetrical tops and a typical spread of branches for each particular species or variety.
5. Broadleaf Evergreen Plant Material: Provide broadleaf evergreen plant material with the height-to-spread ratio recommended by ANLA ANSI/ANLA Z60.1. Provide well shaped plant material with sufficient well-spaced side branches and typical for the species grown in the region of the project.
6. Ground Cover and Vine Plant Material: Provide vigorous ground cover and vine plant material with the minimum number of runners and length of runner recommended by ANSI/ANLA Z60.1 and the proper age for the plants specified. Provide well branched and established groundcovers and vines with heavy, well developed and balanced crown, healthy well-developed root systems in removable containers, integral containers or formed homogeneous soil sections.
7. Growing Conditions: Provide plant material native to or well-suited to the growing conditions of the project site. Provide plant material grown under climatic conditions similar to those at the project site.
8. Plant Color: If plant color is not specified by plant list, consult Owner's Representative .

## 2.2 SOIL MATERIALS:

- A. Topsoil: Type specified in Section 02300.
- B. River sand is **NOT** acceptable.
- C. **DO NOT** obtain from bogs, marshes or steep clayey slopes.
- D. **DO NOT** strip, collect or deposit topsoil while soil is wet.
- E. **DO NOT** deliver topsoil in a frozen or muddy condition.

## 2.3 ACCEPTABLE SOIL AMENDMENT SUPPLIERS:

- A. A. M. Leonard Incorporated; 241 Fox Drive; P.O. Box 816; Piqua, Ohio 45356; (800) 543-8955; <http://www.amleo.com> Products Safety and Snow Fence, Tree wrap, Eyebolts, Turnbuckles, Tree Anchors, Tree Stakes, Guying Hose, Erosion Control Mats and Blankets, Fertilizers and Planting Tablets.
- B. The Carl Pool Co., P.O. Drawer 249, Elmentdorf, Texas, 78112, Tel. (512) 635-8205 Product Root activator.
- C. USA Products Corporation, Roots Incorporated Division, 25 Science Park, New Haven Connecticut 06511 (203) 785-5295 Product Roots Root Growth Enhancer.
- D. The Scotts Company, 41 South High Street. Suite 3500, Columbus, Ohio 43215, (614) 719-5500, <http://www.scottscompany.com>
- E. Growers Friend Premium Earthworm Castings, Three Trees Farm, 73470 Abeene Lane, Cottage Grove, Oregon 97424, (541) 942-9033,
- F. Dixon Natural Stone, 12722 I-30, Little Rock, AR 72209, (501) 455-5976 Product composted rice hulls.
- G. AllGro; P.O. Box 5287; Lakeland, FL (800) 573-5538; <http://www.allgro.com> Product Compost
- H. Substitutions: Requests for substitutions will be considered to requirements of provisions of Division 1.

## 2.4 SOIL AMENDMENTS:

- A. pH adjusters, fertilizer, organic material, and soil conditioners meeting the following requirements.
- B. **DO NOT** use vermiculite.
- C. pH Adjuster: an agricultural liming material in accordance with ASTM C 602 (i.e. burnt lime, hydrated lime, ground limestone, or shells. Use pH adjuster to create a favorable soil pH for the plant material specified.
  1. Ground agricultural limestone with a minimum calcium carbonate equivalent of 90 percent; a minimum 90 percent passing a #10 (2 mm) sieve and a minimum 50 percent passing a #60 (0.25 cm) sieve.
  2. Hydrated Lime with a minimum calcium carbonate equivalent of 110 percent; a minimum 100 percent passing a #8 sieve (2.36 mm) and minimum 97 percent passing a #60 sieve (0.25 cm).
  3. Burnt Lime with a minimum calcium carbonate equivalent of 140 percent; a minimum 95 percent passing a #8 sieve (2.36 mm) and a minimum 35 percent passing a #60 sieve (0.25 cm).
  4. Soil sulphur (Flowers of sulphur): Minimum 90 percent passing a #10 (2 mm) sieve and minimum 50 percent passing a #60 (0.25 cm) sieve.

5. Aluminum sulfate: Minimum 90 percent passing a #10 (2 mm) sieve and minimum 50 percent passing a #60 (0.25 mm) sieve.
6. Ferrous sulphate: minimum 90 percent passing a #10 (2 mm) sieve and minimum 50 percent passing a #60 (0.25 mm) sieve.
- D. Fertilizer: FS O-F-241, Type IA; controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio derived from sulfur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylene diurea (IBDU).
  1. Root stimulator - An organic fertilizer formulated to stimulate root growth, approved by Owner's Representative.
    - a. The Carl Pool Co., P.O. Drawer 249, Elmentdorf, Texas, 78112, Tel. (512) 635-8205 Product Root activator. Mix ratio 1 part to 40 parts water;
    - b. USA Products Corporation, Roots Incorporated Division, 25 Science Park, New Haven Connecticut 06511 (203) 785-5295 Product Roots Root Growth Enhancer.
    - c. Substitutions: Per Division one.
- E. Organic Material: Peat, bone meal, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.
  1. Peat: A natural, granulated, or shredded loose commercial, ASTM D 4427, Sphagnum Peat derived from a freshwater bog, swampland or marsh, containing not more than fifteen (15) percent decomposed organic matter by weight, low in content of woody material, free of materials harmful to plant life; with a pH of from 4 to 6, a moisture content of not over 30% and a moisture absorbing capacity from 1100% to 2000%; free of lumps, roots, inorganic material or acidic materials. "Dry-Peat", a commercial sphagnum peat moss containing not more than fifteen (15) percent decomposed organic matter by weight. Delivered to job site in unopened, (original containers), partially compressed bales approximately 18 x 36 in (450 x 900 mm) in size, weighing between eighty (80) and ninety (90) pounds, in a workable condition.
  2. Composted Rice Hulls: Hammer milled rice hulls, composted for a minimum of 24 months, pH 5.7, water retention 50% by weight
  3. Bone meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.
  4. Rotted Manure: Composted, unleached horse, chicken, or cattle manure, heat treated to kill weed seeds, containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials, free of stones, sticks, soil, and toxic substances harmful to plants.
  5. Decomposed Wood Derivatives: ground bark, sawdust, yard trimmings, or other wood waste material free of stones, sticks, soil, and toxic substances harmful to plants, fully composted, or stabilized with nitrogen.
- F. Compost: Screened stable humus mixture of partially aerobically decomposed weed free organic materials with no objectionable odors or substances toxic to plants.

## 2.5 MULCH:

- A. Locally Sourced Pine Straw.

## 2.6 WATER:

- A. Clean, fresh, potable and free of substances or material which could inhibit vigorous growth of plants.

## 2.7 HERBICIDE:

- A. Post-emergent:
  1. Systemic: Glyphosate (Roundup® or Kleenup®)

## 2.8 MIXES:

- A. Planting soil mix: a planting mix of 3 parts clean topsoil and 1 part approved Compost or peat moss shall be used to backfill all planting holes.

## 2.9 ACCEPTABLE PLANTING ACCESSORIES SUPPLIERS:

- A. Aquatrols Corporation, 5 North Olney Avenue, Cherry Hill, New Jersey 08003; (800) 257-7797; <http://www.aquatrols.com> Product LeafShield anti-transpirant.
- B. Wilt-Pruf Products Incorporated, P. O. Box 469, Essex, Connecticut 06426-0469, (800) 972-0726; <http://www.wiltpruf.com> Product Wilt-Pruf anti-desiccant.
- C. A. M. Leonard Incorporated; 241 Fox Drive; P.O. Box 816; Piqua, Ohio 45356; (800) 543-8955; <http://www.amleo.com> Products Safety and Snow Fence, Tree wrap, Eyebolts, Turnbuckles, Tree Anchors, Tree Stakes, Guying Hose, Erosion Control Mats and Blankets, Fertilizers and Planting Tablets, Poly-Lok II Seals.
- D. Substitutions: Requests for substitutions will be considered to requirements of provisions of Division One.

## 2.10 PLANTING ACCESSORIES:

ITT TRAINING CENTER for the  
ECONOMIC DEVELOPMENT ADMINISTRATION  
NEWPORT, ARKANSAS

- A. Anti-desiccant: Sprayable, water insoluble vinyl-vinledine complex which produce a moisture retarding barrier not removable by rain or snow. Form film at temperatures commonly encountered out of doors during planting season; and moisture vapor transmission rate (MVT) of the film maximum 10 grams per 24 hours at 70 percent humidity.
- B. Borer deterrent: 10% Dieldrin
- C. Trunk wrapping material: Two thicknesses of crinkled paper cemented together with a layer of bituminous material, a minimum of 4 in (100 mm) wide with a stretch factor of 33%. Use lightly tarred medium to coarse sisal yarn for tying.
- D. Plant Seals: Polypropylene plastic, self-locking seal, 7 1/2 in (190 mm) length, seven digit serial number, with company name.
- 1. Guying and Staking Material: Not used in project.
- E. Edging: Not Used in Project.

## 2.11 GRANULAR FILL FOR PLANT PIT AND BED DRAINAGE:

- A. Uniformly graded sand, stone, gravel, or stone screenings free from an excess of soft or unsound particles or other objectionable material.

ASTM C 136 Gradation	
Sieve Size	Percent Passing
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	85 - 100
No. 16 (1.18 mm)	45 - 80
No. 50 (300 micrometers)	10 - 30
No. 100 (150 micrometers)	0 - 10
No. 200 (75 micrometers)	0 - 3

## 2.12 SOURCE QUALITY CONTROL:

- A. The Owner's Representative will inspect plant materials at the project site and approve them. Tag plant materials for size and quality.

## PART 3 - EXECUTION

### 3.1 EXAMINATION:

- A. Verify that prepared subsoil and planters are ready to receive work. Beginning of installation means acceptance of existing conditions.

### 3.2 PREPARATION:

- A. General: Have topsoils analyzed by U.S. Department of Agriculture extension Service or and submit written analysis stating textural class, particle size, percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value. of the soil. Verify site is ready to receive the work of this Section. Till and prepare soil mixture prior to moving plants to their respective locations. **DO NOT** expose plants to drying conditions or physical damage during positioning of material. Remove rocks and other underground obstructions to the depth necessary to permit proper planting. Where underground utilities, construction, or solid masses are encountered,.
- B. Preparation of Shrub, Ground Cover, and Vine Planting Beds: Eliminate all existing vegetation from planting bed by herbicide. Spray planting bed with glyphosate herbicide following manufacturer's instructions. Maintain planting bed bare and moist for three weeks. Spray planting bed with second herbicide application. Maintain planting bed bare and moist for one weeks following second herbicide application. **DO NOT** install plants for at least one week after last herbicide application to allow herbicide to completely breakdown. Prepare subsoil to eliminate uneven areas and low spots. Maintain levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas. Remove weeds. Loosen planting pit or bed to a minimum depth of 8 in. Remove foreign materials, grass, weeds, undesirable plants and their roots, stones over 1-1/2 in (38 mm) in any dimension, and sticks, rubbish and contaminated subsoil.
  - 1. Spread planting mix to the depth indicated in the plans. Place approximately 4 in (10 cm) of topsoil and 3 in (75 mm) compost. Work into existing subgrade.
- C. Excavation for trees and shrubs: Excavate pits, beds and trenches with sloping sides and with bottom of excavation slightly raised at the center to insure proper drainage. Loosen hard subsoil in the bottom and sides of excavation.

PLANT  
TYPE

PLANT  
SIZE

DEPTH

DIAMETER

Tree	3 to 6 ft. in height	18 in (457 mm)	24 in (610 mm)
	6 to 10 ft. in height	24 in (610 mm)	30 in (762 mm)
	3/4 to 1-1/2 in (caliper)	24 in (610 mm)	30 in (762 mm)
	1-1/2 to 2 in (caliper)	28 in (711 mm)	36 in (914 mm)
	2 to 3 in (caliper)	28 in (711 mm)	42 in (1067 mm)
	3 to 4 in (caliper)	30 in (762 mm)	54 in (1372 mm)
	larger than 4 in (caliper)	adjust accordingly	adjust accordingly
Shrubs	15 to 24 in height or spread	18 in (457 mm)	18 in (457 mm)
	2 to 3 ft (height)	18 in (457 mm)	20 in (508 mm)
	4 to 5 ft (height)	24 in (610 mm)	28 in (711 mm)
Vines	All sizes to 5 gallon	18 in (457 mm)	18 in (457 mm)

1. For container grown stock, excavate as specified for balled and burlapped stock. Adjust sizes to the size of container. Dispose of subsoil removed from landscape excavations. **DO NOT** mix subsoil with topsoil or use as backfill for planting holes. Fill excavations for trees and shrubs with water and allow to percolate out before planting.

### 3.3 INSTALLATION:

#### A. Trees and Shrubs:

1. Bare Root Stock: Maximum pit width: accommodate roots fully extended. Set plant so fully extended roots do not touch pit walls and upper most roots are just below the original grade. Spread out the roots and work planting soil mix gently among roots. Prune broken roots. When plants are set, place additional backfill around the base and sides of the root ball, and work each layer to settle backfill, and eliminate voids or air pockets. When excavation is approximately 2/3 full, water thoroughly. Repeat watering until no more water can be absorbed. Place final backfill and water again.
2. Balled and Burlap Stock: Set plants on a layer of compacted planting soil mixture, plumb and in the center of the pit or trench, with the top of the ball at the same elevation as surrounding finished landscape grades. Carefully remove excess burlap and tying material. Where plastic wrap is used in lieu of burlap, completely remove wrap before backfilling. When plants are set, place additional backfill around the base and sides of the ball, and work each layer to settle backfill, and eliminate voids or air pockets. When excavation is approximately 2/3 full, water thoroughly. Repeat watering until no more water can be absorbed. Place final backfill and water again.
3. Container Grown Stock: Set as specified for balled and burlapped stock, except cut cans on two sides with an approved can cutter, and remove carefully to avoid damage to plant or roots. For plants not located in beds, dish top of backfill to allow for mulching. When plants are set, place additional backfill around the base and sides of the root ball, and work each layer to settle backfill, and eliminate voids or air pockets. When excavation is approximately 2/3 full, water thoroughly. Repeat watering until no more water can be absorbed. Place final backfill and water again. Provide additional backfill berm around excavation to form a shallow saucer to hold water.
4. Mulch pits, trenches, and planted areas within 48 hours after planting. Provide thickness of mulch as indicated on details, finished level with adjacent grades. Keep mulch off of the crowns of shrubs, buildings, sidewalks, parking lots, and other structures.
5. Prune, thin out, and shape trees and shrubs in accordance with standard horticultural practice. Prune shrubs to maintain natural character. Unless otherwise directed by Owner's Representative, **DO NOT** cut tree leaders. Remove and replace excessively pruned or malformed stock. Paint cuts over 1/2 in (13 mm) in size with tree wound dressing covering living tissue.
6. Wrap tree trunks over 1-1/2 in (38 mm) in caliper of specified specie. Start at the ground and cover the trunk to the height of the first branches. Securely attach the wrapping at 18 in (457 mm) intervals. Inspect tree trunks for injury, improper pruning, and insect infestation, and take corrective measures before wrapping.
7. Drive standard stakes vertically into the ground as indicated on the detail. **DO NOT** drive stakes close enough to the tree to damage roots. Fasten bicycle reflector flagging securely on each guy wire approximately 2/3 of the distance up from the ground.

- B. Ground Covers and Vines: Space plants as indicated. Treat groundcover area, prior to mulching, with an approved pre-emergent herbicide. If erosion control material is indicated, plant ground cover through the material after it is in place. Dig holes large enough to allow for the spreading of roots. Backfill planting holes with planting mix. Work soil under roots to eliminate air pockets. Water plants thoroughly after planting and take care not to cover the crowns of plants with soil. Protect newly planted ground cover from sun and wind. Remove protection when plants show signs of recovery from transplant shock. Mulch groundcover areas a minimum of 3 in (76 mm) thick.

- C. Label at least one tree, one shrub, and one ground cover of each variety with a securely attached waterproof tag bearing a legible designation of the botanical and common name. Submit drawing with tagged plants locations.

#### **3.4 PLANT SUPPORT:**

- A. Guying and Staking: Guy and stake all deciduous trees planted while not dormant or while in leaf (i.e., planted after Nov. 15 and before Jan. 15.) Guy and stake all evergreen trees year round. Brace plants upright in position by guy wires or stakes as shown on details

#### **3.5 MAINTENANCE:**

- A. Perform maintenance immediately following installation until final acceptance of the Work. Maintain trees, shrubs and other plants by pruning, cultivating, weeding, watering, fertilizing and all other operations necessary for healthy growth. Restore planting saucers if damaged. Tighten and replace stake and guy supports. Reset trees and shrubs to maintain proper grades and vertical. Restore and replace damaged wrappings. Keep trees and shrubs free of insects and disease. Inspect plants at least once a week during the installation period, and perform needed maintenance promptly.

#### **3.6 CLEANING:**

- A. Remove all trash and debris from the site. Promptly remove any soil brought on the surfacing by hauling operations. Keep wheels of all vehicles clean to avoid tracking soil on the surfacing of paved areas.

#### **3.7 PROTECTION:**

- A. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair and replace damaged landscape work as directed.

#### **3.8 INSPECTION AND ACCEPTANCE:**

- A. When landscape work is completed, including maintenance, request inspection. Owner's Representative will make inspection to determine acceptability. Replace rejected work, where inspected landscape work does not comply with requirements, and continue specified maintenance until reinspected by Owner's Representative and found to be acceptable. Start Date of Warranty Period: Date of written notification to Contractor by Owner's Representative of final acceptance.
- B. Termination of the Plant Warranty Period: An inspection of all plants and turf will be held at the end of the warranty period. No additional guarantee will be required for replaced plants.

**End of Section**

## SECTION 33 41 00 STORM DRAINAGE

### PART 1 - GENERAL

#### 1.1 GENERAL PROVISIONS

- A. Scope of Work. This work shall consist of a subsurface site drainage system constructed in accordance with these specifications and in reasonably close conformity with the lines, grades, and details shown on the plans or established by the Engineer.
- B. Intent of Contract. The intent of the contract is to provide for the construction and completion in every detail of the work described. The bidder is expected to examine carefully the site of the work and all documents pertaining to its construction in order to verify the work conditions and requirements established by the Engineer. The Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications and terms of the Contract.
- C. Authority of the Engineer. The Engineer shall decide all questions that may rise as to quality and acceptability of materials furnished, manner of performance and rate of progress of the work, interpretation of specifications or plans relating to the work, and acceptable fulfillment of the contract by the Contractor. Suspension of the work may be ordered by the Engineer if deemed to be in the public interest.
- D. Barricades and Warning Signs. The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs, and other traffic control devices. He shall take all necessary precautions to protect the work and to safeguard the public. Streets closed to traffic shall be protected by effective barricades, and obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to control and direct traffic properly.
- E. Protection and Restoration of Property and Landscape. The Contractor shall be responsible for preserving all public and private property. He shall protect from disturbance or damage all land monuments and property. He shall protect from disturbance or damage all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location.

During the prosecution of the work, the Contractor shall be responsible for all damage or injury to any property that results from any act, omission, neglect or misconduct in his execution of the work. He shall be responsible for all damage or

injury due to defective work or materials. Repair or replacement of damaged or injured property shall be at the Contractor's expense and shall be similar or equal to that existing before such damage or injury occurred.

- F. Construction Stakes, Lines and Grades. The Engineer shall set reference marks establishing lines and grades for the work and he shall furnish such reference and bench marks as may be necessary to lay out the work correctly. The Contractor shall maintain these reference and bench marks and use them to lay out the work he is to perform under this contract. The finished work must conform to the reference and bench marks furnished by the Engineer.

The Contractor shall notify the Engineer in writing not less than five (5) days before reference and bench marks are required. No claims shall be made because of delays if the Contractor fails to give such notice.

The Contractor shall carefully preserve reference and bench marks. If such stakes and bench marks become damaged, lost, displaced or removed by the Contractor, they shall be reset at his expense.

- G. Equipment. Design, capacity and mechanical condition of equipment and tools necessary for handling materials and performing all parts of the work shall be approved by the Engineer. Equipment shall be at the job site sufficiently ahead of the start of construction operations to be examined thoroughly and approved.
- H. Special Provisions. Any work not covered in these specifications shall be detailed by special provisions or shall be accomplished in accordance with the current standards and specifications of the State Highway Department.

## PART 2 - SITE DRAINAGE STRUCTURES & APPURTENANCES

### 2.1 PIPE CULVERT

- A. Description. Under this item, culvert pipe conforming to these specifications and of the type, size and dimensions shown on the plans, shall be furnished and placed as directed. Materials and design requirements for each type shall be prescribed for the several types hereafter designated.
- B. Reinforced Concrete Pipe.
1. The pipe shall consist of Portland Cement Concrete in which steel has been imbedded in such manner that the concrete and steel act together.



2. Design.

- (a) Pipe shall be circular in shape.
- (b) The shell thickness and amount of reinforcing shall be not less than that prescribed in the current ASTM Standards C-76 for round and C-507 for elliptical. The class of pipe to be furnished will be shown on the plans.
- (c) The ends of the pipe shall be of such design that the pipe, when laid, shall form a continuous conduit with a smooth and uniform interior surface.

3. Workmanship and Finish.

- (a) Pipe shall be substantially free from fractures, large or deep cracks and surface roughness. The planes of the ends of the pipe shall be perpendicular to the longitudinal axis.
- (b) Variation of the internal diameter shall not exceed one percent for pipe of thirty-six inch diameter or less nor exceed three-quarters of one percent for larger pipe. The shell thickness shall not be less than that intended in the design by more than five percent at any point.
- (c) The underrun in length of pipe from that specified shall be not more than one-eighth inch per foot with a maximum of one-half inch in any length of pipe.

4. Marking.

- (a) The date of manufacture and the name or trademark of the manufacturer shall be clearly stenciled on the inside of each section of pipe.
- (b) Circular pipe with elliptical reinforcing shall have the word "Top" or "Bottom" clearly stenciled on the inside of the pipe at the correct place to indicate the proper position when laid.

5. Strength Tests.

- (a) The pipe shall meet the requirements hereinafter specified when tested for crushing strength by the three-edge bearing method.
- (b) The minimum strength in pounds per foot of laying length shall be that given in the current ASTM Standards C-76 for the class specified.

- (c) The manufacturer shall furnish at the plant all facilities necessary to make crushing strength tests.
- 6. Absorption Test. The maximum average absorption shall not exceed eight percent by weight.
- 7. Inspection. In addition to the above tests, the pipe shall be inspected for defects resulting from poor manufacture or handling, and may be rejected on account of any of the following:
  - (a) Injurious cracks or fractures passing through the shell.
  - (b) Defects that indicate imperfect mixing and molding.
  - (c) Surface defects indicating honeycombed or open texture.
- 8. Flared End Sections for Pipe Culverts. The manufacture and furnishing of flared end sections for pipe culverts shall comply with Subsection 2.1 B above for concrete pipe. The flared end sections shall be of the same material as the culvert pipe for a given installation.
  - (a) Reinforced concrete flared end sections for circular, arch, or elliptical pipe shall comply with the applicable requirements for Class III or higher classes of pipe. The area of reinforcing for circular pipe flared end sections shall be according to the requirements for elliptical reinforcing for Class III pipe for the appropriate wall thickness.
  - (b) Concrete for curtain walls shall have a compressive strength of 3000 psi.
  - (c) Reinforcing steel for curtain walls shall be grade 60.
  - (d) In lieu of constructing concrete curtain walls in place, the Contractor may elect to precast the units. Precast units shall comply with all applicable requirements of Subsection 606.02(b) for concrete pipe.

C. Plastic Pipe (HDPE)

- 1. Plastic Pipe (HPE) shall be in compliance with Sure-Lok F477 pipe and shall have a smooth interior and annular exterior corrugations.
  - \*4-to10-inch (100 to 250 mm) shall meet AASHTO M252, Type S.
  - \*12 to 48 inch (300 to 1200 mm) shall meet AASHTO M294-Type S.
  - \*54 and 60 inch (1350 and 1500 mm) shall meet AASHTO MP7-97.
  - \*Manning's 'n' value for use in design shall not be less than 0.010.

- (a) Joint Performance. Pipe shall be joined with the Sure-Lok (bell and spigot) joint meeting AASHTO M252, AASHTO M294, or MP7-97. The joint shall be silt tight and non-rated watertight. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F477 with the addition that the gaskets shall not have any visible cracking when testing according to ASTM D1149 after 72 hour exposure in 50 PPHM ozone at 104° F. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.
- (b) Fittings. Fittings shall conform to AASHTO M252, AASHTO M294 or AASHTO MP7-97. Fabricated fittings, where accessible, shall be welded on the interior and exterior at all junctions.
- (c) Material Properties. Pipe and fitting materials shall be high-density polyethylene meeting ASTM D3350 minimum cell classification 324420C for 4 through 10 inch (100 to 250 mm) diameters or 335420C for 12 through 60 inch (1350 and 1500 mm) diameters.
- (d) Installation. Installation shall be in accordance with ASTM D2321 with the exception that minimum cover in trafficked areas for 4 to 48 inch (100 to 1200 mm) diameters shall be one (0.3m) and for 54 and 60 inch (1350 and 1500 mm) diameters shall be 1.5 ft. (0.5m). Provide Class II bedding in accordance with ASTM D2321.

D. Construction Methods.

1. Depth of Excavation.

- (a) All excavation shall be carried to a depth where foundation materials are satisfactory to the Engineer regardless of the elevations shown on the plans and all foundations shall be inspected and approved by the Engineer prior to placing any part of the structure.
- (b) Pipe culverts under the roadbed shall be so placed that the minimum depth of cover at the shoulder for pipe of any diameter or type shall be not less than one foot.

2. Forming Bed for Pipe.

- (a) Where the pipe is to be laid below the ground line, a trench shall be

excavated to the required depth and to the minimum width practicable for working conditions. The bottom of the trench shall be shaped as shown on the plans to conform to the bottom of the pipe to afford a uniformly firm bed throughout its entire length. Recesses shall be excavated to receive the bells where bell and spigot pipe is used. Any soft or yielding material shall be removed and replaced with gravel or other suitable material, which shall be compacted thoroughly into place with mechanical tampers. Where rock is encountered, the trench shall be excavated to a minimum depth as shown on the plans and backfilled with suitable material, which shall be tamped thoroughly with mechanical tampers.

- (b) Where pipe is not laid in a trench, a uniformly firm bed shall be made as specified above for the bottom of the pipe.

### 3. Laying Pipe.

- (a) Concrete pipe shall be laid with hubs or bells upgrade, spigot ends fully entered into the adjacent hub or bell, and true to lines and grades given.
- (b) Any pipe which is not in true alignment or which shows any settlement after laying shall be taken up and relaid by the Contractor without extra compensation. All reinforced concrete pipe shall be laid with flexible plastic gasket joints. The joint material shall be equal to "Ram-Nek" as manufactured by K.T. Snyder Co., Inc., Houston, Texas.

### 4. Backfilling.

- (a) The backfilling around the pipe shall be done with selected material which is free from large lumps or clods and the material shall be placed alongside the pipe in layers not to exceed four inches in depth and thoroughly compacted by hand tamping with mechanical tampers for the full depth of the pipe. Special care shall be taken to compact the fill under the haunches of the pipe.
- (b) The fill shall be brought up evenly on each side for the full length of the pipe to avoid displacement. The berm of thoroughly compacted material on each side of the pipe shall be as wide as the outside diameter of the pipe.

## 2.2 GRATE INLETS, CURB INLETS, AND JUNCTION BOXES (POURED IN PLACE OR BLOCK CONSTRUCTION)

- 1. Description: This item shall consist of the construction of drop inlets, curb

inlets or junction boxes in accordance with these specifications and in conformity with the locations, lines and grades shown on the plans or as directed by the Engineer.

2. Materials.

- (a) The concrete shall have a minimum compressive strength of 3000 psi. The reinforcing steel shall conform to the specifications listed in Table I immediately following this Section.
- (b) Rings and covers, grates and frames, and other appurtenances shall be made from cast iron of good quality and of such character as shall make the metal of the castings strong, tough and of even grain. The castings shall be smooth, free from scale, and from cracks or other defects that might make them unfit for the use of which they were intended.

3. Construction Methods:

- (a) Concrete shall be proportioned, mixed, placed, finished and cured in accordance with the requirements "Class S Concrete" as provided in Section 802 of the Arkansas State Highway Commission.
- (b) Floors of drop inlets, curb inlets of junction boxes shall be poured at least 24 hours before beginning construction of the walls. The Engineer may require a longer period between the pouring of the floors and the construction of the walls if, in his judgment, weather conditions make a longer period necessary. Floors shall be constructed to full outside dimension.
- (c) Walls shall be constructed upon the floor and shall form a tight joint with the floor and around the inlet and outlet. Inlet and outlet pipes shall be cut flush with the inside surface of the walls. If it is necessary to carry sanitary sewers or other utility lines through the masonry, they shall be formed about that they will not be damaged in any way. Faces of curb inlets shall be poured as part of the curb, as shown on the plans, in order to preserve the proper alignment.
- (d) All castings shall be set accurately to the finished elevations so that no subsequent adjustment will be necessary. They shall be set in full mortar bed with firm bearing on the walls or securely fastened to the forms so no movement will occur when concrete is poured around them.
- (e) All concrete and cement finish shall be placed and maintained after disposition at a temperature above 70 degrees for seventy-two hours or

above 50 degrees for one hundred twenty hours. If two (2) pounds of calcium chloride is added for each sack of cement, the time for maintaining these temperatures may be reduced 50%.

- (f) No concrete shall be poured until the Engineer has inspected the forms, the placing of reinforcing steel and castings and has given his permission to proceed with the pouring.
- (g) Backfill shall be thoroughly compacted by tamping in not more than four inch layers by means of mechanical hand tamps.

TABLE I

<u>TYPE</u>	<u>SPECIFICATION</u>
Billet-Steel Bars for Concrete Reinforcement	AASHO M31, ASTM A15, or CSA G30.1
Rail-Steel Bars for Concrete Reinforcement	AASHO M42, ASTM A16, or CSA G30.2
Axle-Steel Bars for Concrete Reinforcement	AASHO M53 or ASTM A16
Fabricated Steel	AASHO M54, ASTM A184, or CSA G30.4
Bar or Rod Mats for Concrete Reinforcement	
Welded-Steel Wire Fabric for Concrete Reinforcement	AASHO M55, ASTM A185 or CSA G30.5

Dowell and deformed bars shall conform to the requirements of AASHO M31 or M42, ASTM A15 or A16, or CSA G30.1 or G30.2, except that rail steel shall not be used for tiebars that are to be bent and restraightened during construction.

END OF SECTION

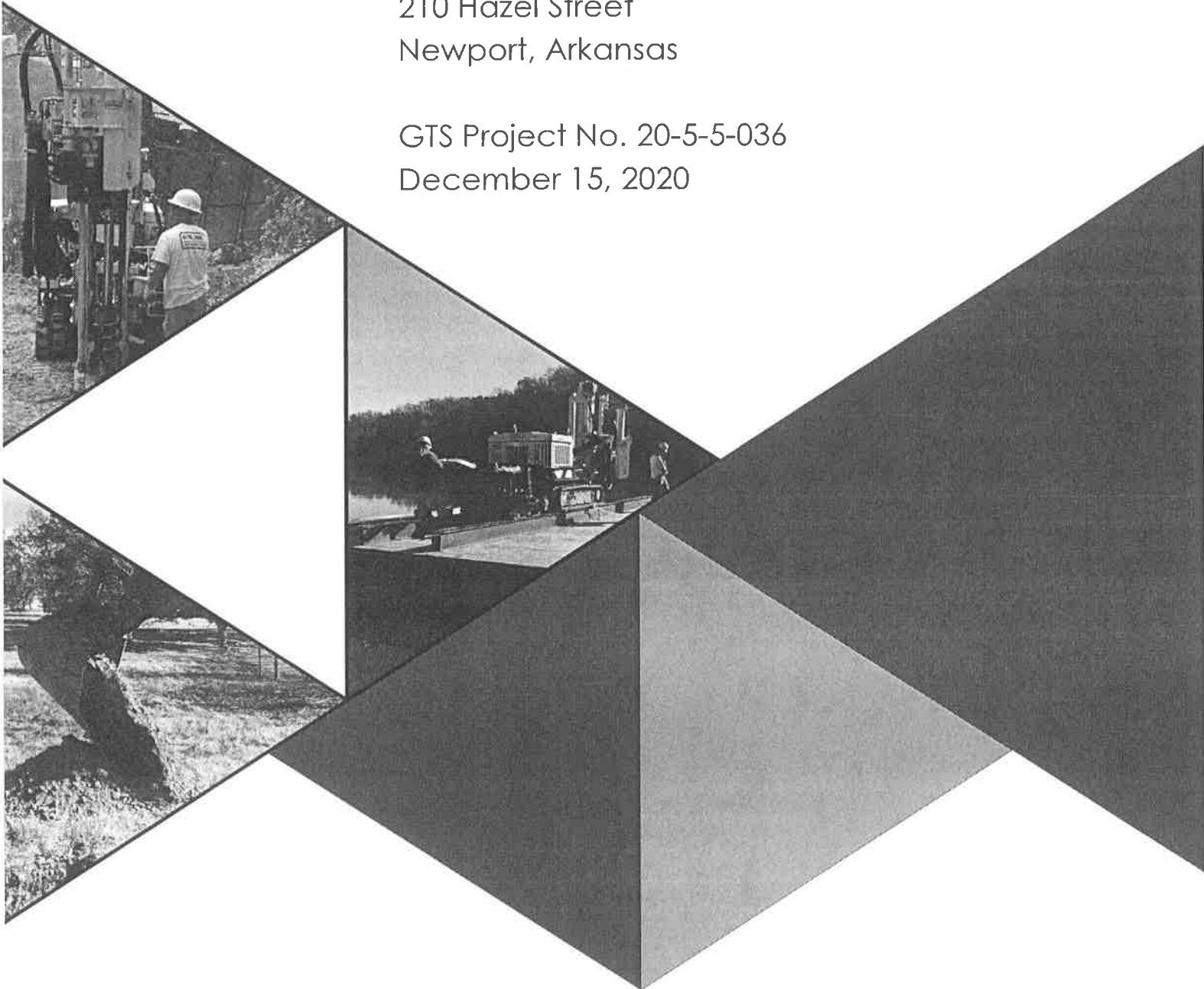
APPENDIX A  
GEOTECHNICAL REPORT

# Geotechnical Engineering Report

## Planned Newport IT Building

210 Hazel Street  
Newport, Arkansas

GTS Project No. 20-5-5-036  
December 15, 2020



*Prepared For:*

**Miller-Newell Engineers, Inc.**

Newport, Arkansas

**GTS, Inc.**  
Geotechnical & Testing Services

[www.gtsconsulting.net](http://www.gtsconsulting.net)



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Oklahoma • Texas



December 15, 2020

Miller-Newell Engineers, Inc.  
PO Box 705  
Newport, Arkansas 72112

Attention: Mr. Wayne Menley, PE

Re: Geotechnical Engineering Report  
Planned Newport IT Building  
Newport, Arkansas  
GTS Project No. 20-5-5-036

Mr. Menley:

This report provides the results of the subsurface exploration, laboratory testing, and geotechnical engineering analysis performed for the planned Newport IT building. The property evaluated by this report is located at 210 Hazel Street in Newport, Arkansas. The approximate project site boundary is shown in Figure 1 within this report.

We appreciate the opportunity to be of assistance to you on this project. We encourage retaining GTS, Inc. to be involved in any pre-bid and pre-construction meetings to allow us to discuss the following findings and recommendations.

Please contact us if further explanation or clarification is required for portions of the report.

Sincerely,



Certificate of Authorization No. 1251, expires 12/31/2021

Shaun P. Baker, P.E.  
Arkansas No. 11817

SPB:YWT  
Copies: Addressee (email)



Yonas Tanga, P.E. (Texas)  
Senior Project Engineer

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## EXECUTIVE SUMMARY

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This report uses the terms “existing grade” and “finished subgrade”. Existing grade is used in this report to describe the site elevations at the time of our field drilling and sampling. Finished subgrade is used in this report to describe the Civil Engineer-designed top-of-soil elevations at the site at completion of grading.

Current development plans include removing the existing concrete pavement to construct a new one-story building and new paved parking areas. A grading plan was not provided to GTS, Inc. (GTS). We anticipate that finished grades for the building and new pavement will remain near the existing grades. To prepare the recommendations in this report, we assumed that cut and fill depths of less than 1 foot could be required to reach finished subgrade elevations. If our assumption of site grading plans is incorrect or if the grading plans change, please contact us to allow the recommendations in this report to be reviewed and, if necessary, revised.

Based on the results of our sample borings and our current understanding of the site development, the following summary recommendations are provided. This information should not be used separately from the more detailed information provided in the body of this report.

### Subsurface Conditions

The site of the planned development area is covered by approximately 6 inches of Portland cement concrete pavement. We understand that the existing pavement will be removed in the building footprint and new pavement areas.

Native lean clays were encountered beneath the pavement and extended to the boring termination depths of about 15 feet below existing grade in two of the borings. Existing fill consisting predominantly of sand was encountered in one boring to a depth of about 8 ½ feet below existing grade. We observed a hydrocarbon odor in the sand fill materials. The existing fill was underlain by native lean clays.

Groundwater was observed while drilling and after boring completion at depths of about 8 ½ feet and 5 ½ feet, respectively, within the existing fill. Free water was not observed at these times in the two borings where native lean clay soils were observed.

### Geotechnical Design Considerations

Based on the subsurface conditions encountered at the borings, we anticipate that the soils exposed in the building subgrade could likely consist of existing fill materials in the southeastern portion of the building footprint and native lean clay soils in the remaining portion of the footprint.

We suspect that the existing fill materials might be associated with a previously backfilled underground storage tank based on the material type and the hydrocarbon odor. The existing fill soils had low shear strength from about 3 ½ to 8 ½ feet below existing grade and are not suitable for supporting the footing foundations and floor slabs. Additionally, compressible fill and/or deleterious and unsuitable materials might be buried within or by the existing fill. We recommend that the existing fill and any underlying low-strength soils be removed full-depth and backfilled with new select fill. Based on our borings, overexcavation depths of about 8 ½ feet below existing grade are anticipated to be required to remove existing fill in the southeastern portion of the building. Supplemental test pits and/or auger probe borings could be excavated prior to or during site grading to evaluate the extent of the existing fill.

Low-strength native lean clay soils were encountered in one boring between depths of about 2 feet and 3 ½ feet below existing grade. The low-strength soils are not suitable for supporting footing foundations and floor slabs in their present condition. We anticipate localized ground improvement will be necessary to support the planned building and pavements.

After removing and replacing the existing fill and any low-strength native lean clay soils with new fill, footing foundations can be designed to bear in tested and approved, native stiff lean clays and/or new select fill. Footings bearing in these soils may be designed using maximum net allowable bearing pressures of 2,500 pounds per square foot (psf) for individual, column foundations and 2,000 psf for continuous foundations.

We estimate total long-term and differential settlement of footing foundations should be less than 1 inch (total) and ¾ inch in 50 feet (differential).

New floor slabs-on-grade can be supported on new select fill or scarified and compacted native lean clay soils after preparing the subgrade as recommended in this report.

The subsurface conditions at this project site are consistent with a Site Class D per the International Building Code (IBC), 2012 Edition.

### **Construction Considerations**

The native lean clay soils are moisture-sensitive and prone to strength loss with increases in moisture content and when exposed to repetitive construction traffic. We anticipate that ground improvement will likely be required, particularly if wet conditions develop during construction.

Based on the laboratory testing results, the native lean clay soils encountered in the upper 5 feet of the borings appear to be suitable for re-use as select fill. The existing fill, if re-used, should be free of debris and deleterious materials. The existing fill should also be tested for environmental contaminants if it is desired to re-use it for fill. All on-site soils and imported soils should be tested and approved before use for fill material.

## PROJECT DESCRIPTION and INFORMATION

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### Project Site

The project site is located at 210 Hazel Street in Newport, Arkansas. At the time of the field exploration, the site was covered by Portland cement concrete pavement. The general boundary of the project site is shown in yellow in Figure 1 below.

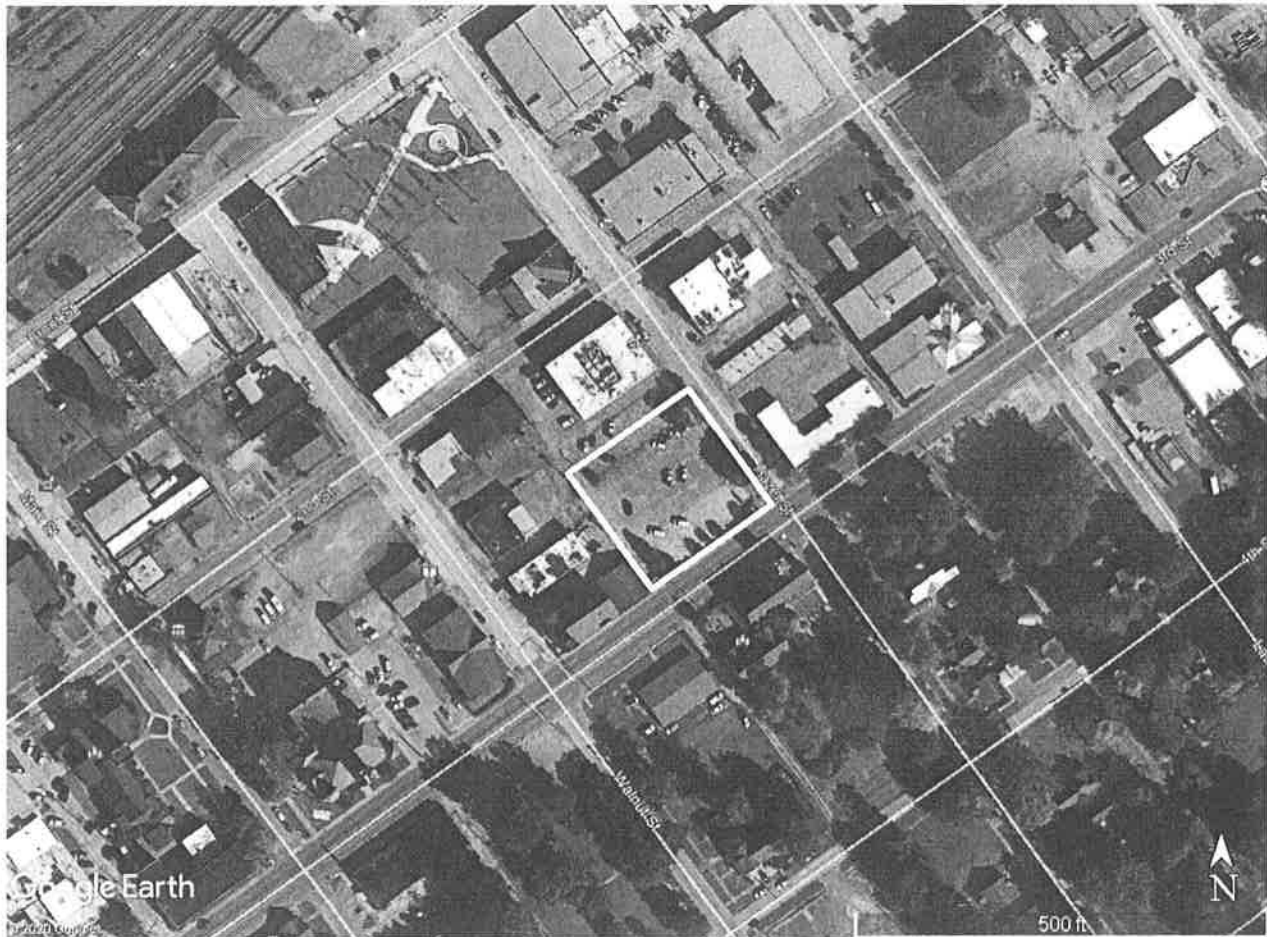


Figure 1 - General Boundary of the Project Site

### Planned Building

Current development planning includes constructing a new one-story building with a footprint area of approximately 12,000 square feet. Project plans also include paved parking and drive areas. We anticipate that the building structure will be comprised of a steel-frame with concrete slab-on-grade floors. We estimate column loads of 60 kips or less and wall loads of 2 kips per linear foot or less.

### Planned Site Grading

A site grading plan was not provided to GTS. However, based on the current site development, we assume that the existing grade is near final grade and that cut and fill depths of less than 1 foot will be required to achieve finish subgrade elevations in the building and new pavement areas.

## **SUMMARY of SUBSURFACE FINDINGS**

---

### **Site Geology**

Based on the results of our borings and available geologic maps, the project site is located in the geologic unit mapped as Quaternary Period Alluvium (Qal). The following description of this unit was obtained from the Stratigraphic Summary of Arkansas (Arkansas Geological Commission IC-36, 2004).

*Alluvial deposits of present streams and rivers. Sediments include gravels, sands, silts, clays, and mixtures of any and all of these. The partition of this unit from other Holocene alluvial deposits was based more on geomorphic considerations than lithic or age considerations. The lower contact is unconformable. The thickness is variable.*

### **Surface**

At the time of the field exploration, the project site was covered by 6 inches of Portland cement concrete pavement underlain by approximately 2 to 3 inches of sand base material.

### **Subsurface Conditions**

#### Existing Fill

Existing fill materials consisting of sand containing trace amounts of gravel and clay were encountered to a depth of about 8 ½ feet at Boring B-2, drilled in the southeastern corner of the building footprint. A hydrocarbon odor was noticed in the fill samples beginning at a depth of about 2 feet below existing grade.

The existing fill appeared to have low to moderate shear strength, generally decreasing with depth, during the exploration. Standard Penetration Test (SPT) N-values of 3 to 13 blows per foot (bpf) were recorded in the existing fill materials.

#### Stratum I – Native Lean Clay Soils

Native, medium stiff to very stiff, lean clays were encountered beneath the existing fill at Boring B-2 and beneath the pavement section at Borings B-1 and B-3. The native lean clays extended to the boring termination depths of about 15 feet. No hydrocarbon odor was noticed in the native lean clay soils underlying the existing fill at Boring B-2 or in the other two borings.

The Stratum I soils had low to moderate, yet generally moderate, shear strength during the exploration. N-values of 4 to 25 bpf were recorded in this stratum.



## Water Measurements

Water observations were made by the drill crew while drilling and immediately after completing the borings. Free water was observed within the existing sand fill at depths of about 8 ½ feet while drilling and 5 ½ feet immediately after boring completion at Boring B-2. No free water was observed in Borings B-1 and B-3 at these times. The borings were backfilled at completion of drilling and further water observations were not possible. The observations made by the drill crew are shown at the bottom of each boring log.

The depths to water are intended as isolated measurements of groundwater levels at the time of drilling. Additionally, perched water could develop in the existing sand fill underlain by less permeable native lean clay (Stratum I) soils. We interpret that the water observed in the sand fill at Boring B-2 is perched. Longer-term observations in piezometers or observation wells sealed from the influence of surface water are often required to define groundwater levels in these soil types. The installation and periodic measurement of monitoring wells would be required to establish seasonal piezometric surfaces below this project site.

## GEOTECHNICAL ENGINEERING ANALYSIS

---

### Geotechnical Considerations

#### Existing Fill

We suspect that the existing fill materials encountered at Boring B-2 might be associated with a previously backfilled underground storage tank based on the material type and the hydrocarbon odor. We recommend reviewing historical documents to determine the possible source of the buried fill. GTS could provide Environmental Phase I and/or Phase 2 studies for the property, if interested.

GTS, Inc. has no information regarding the placement and compaction history of the existing fill material throughout the project site. The existing fill soils had low shear strength from about 3 ½ to 8 ½ feet below existing grade and are not suitable for supporting the footing foundations and floor slabs. Based on the low blow counts (N-values of 3 and 5 bpf) within the fill encountered at Boring B-2, the fill does not appear to have been constructed in a controlled manner (with adequate compaction and testing).

It is our experience that properties with previously existing structures have a higher potential for encountering unknown conditions during mass grading and construction. These conditions include backfilled basements, trash pits, concrete foundations and underground utilities associated with the previous structures.

Because there can be variations in the thickness, quality, and composition of existing fill and the potential for unsuitable materials to be buried in or under the existing fill, it should be recognized that there is assumed risk of unpredictable settlement and structural performance associated with constructing shallow foundations, on-grade slabs, and pavements over existing fill. This risk cannot be eliminated unless the full depth of the existing fill is removed and replaced with approved fill. We recommend removing and replacing the existing fill full depth with new select fill in the building footprint. Based on our borings, overexcavation depths of about 8 ½ feet below existing grade are anticipated to be required to remove existing fill in the southeastern portion of the building near Boring B-2. Supplemental test pits and/or auger probe borings could be excavated prior to or during site grading to evaluate the extent of the existing fill.

Other foundation systems, such as helical piles, ductile iron piles, and micropiles, could also be installed to structurally support the building above the existing fill, if left in place. We would be pleased to discuss these alternatives with you in greater detail, if interested.

Pavements span weak zones much more effectively than concentrated foundation loading. Also, Owners typically have a higher tolerance for cracks developing in pavements compared to building structures. If the Owner elects to leave the existing fill materials in-place, the new

pavements could be constructed on tested and approved, existing fill or new select fill placed above existing fill after performing thorough testing and evaluation during site preparation and construction. However, the Client/Owner should understand that some premature surface distress and increased maintenance may occur in future pavement sections supported above the existing fill. This risk can only be eliminated by full-depth removal and replacement with new fill.

#### Low-Strength Soils

The existing fill encountered at Boring B-2 had low shear strength beginning at a depth of about 3 ½ feet. We anticipate that the native lean clay soils directly beneath the existing fill could likely have low shear strength. Low-strength, native lean clay was also encountered from depths of about 2 to 3½ feet at Boring B-1. Localized undercut of low-strength soils exposed below the existing fill and in the building and pavement subgrade could be necessary to support the planned building, pavements, and new fill. We recommend that GTS observe the subsurface conditions after the existing fill is removed and during site grading to evaluate the suitability of the native lean clay soils for supporting new fill, footings, floor slabs, and pavements.

#### Moisture-Sensitive Soils

The native lean clay (Stratum I) soils are susceptible to strength loss with increases in moisture content and/or when exposed to repetitive construction traffic. Ground improvement will likely be required during moderately wet to wet periods of the year and when wet site conditions develop. Recommendations for ground improvement are discussed in the Mass Grading Recommendations section.

#### **Footing Foundation Design Recommendations**

A footing foundation system may be used to support the planned building structure after preparing the subgrade as recommended in this report, including full depth removal and replacement of the existing fill and any low-strength soils with tested and approved, new fill. Based on the subsurface conditions encountered at the borings and preparing the building subgrade as recommended in this report, footing foundations should bear on tested and approved, native medium stiff to stiff lean clays and/or tested and approved, select fill.

Footing foundations for the planned building structure may be designed using the information provided in Table 1 on the following page.

**Table 1: Footing Foundation Recommendations**

Maximum Net Allowable Bearing Pressure (psf)	Bearing Soil Description	Depth to Bearing Soils
2,000 (continuous)	Medium Stiff to Stiff Lean Clay and/or <u>Select</u> Fill <sup>1</sup>	Anticipated within 18 inches of finished subgrade elevation
2,500 (square, column)		
1) The recommended bearing soils should be relatively undisturbed, stable and have moderate shear strength. Foundations may also be supported on compacted <u>select</u> fill, aggregate base, or flowable fill placed above tested and approved soils.		

An allowable passive pressure of 500 psf may be used for footings cast directly against near-vertical sides in relatively undisturbed native soils or select fill compacted against the vertical footing face. Passive resistance for exterior footings should be neglected in the upper 2 feet of the soil profile unless pavement or sidewalks are constructed directly against the building exterior. We recommend an ultimate coefficient of sliding friction of 0.3 for the interaction between the base of the footing and tested and approved bearing soils.

We estimate total long-term and differential settlement of footing foundations, designed and constructed as recommended in this report and per the Mass Grading Recommendations section of this report, should be less than 1 inch (total) and ¾ inch in 50 feet (differential).

## **Footing Foundation Construction Recommendations**

### General Dimensions

Continuous formed and isolated column foundations should have minimum widths of 18 inches and 30 inches, respectively. A minimum foundation depth of 18 inches below lowest adjoining final grades should be used to protect against frost heave and seasonal moisture variations.

### Allowable Backfill Materials

Compacted select soil fill, aggregate base course and flowable fill (i.e., "lean concrete") may be used to backfill foundation overexcavations, where required. A similar backfill material should be used throughout the building. Specifications regarding these materials are shown in the Geotechnical Report Requirements and Specifications section of this report.

### Construction Guidelines

We recommend that GTS evaluate the bottom of all foundation excavations before the placement of foundation backfill material, reinforcing bar and concrete.

As previously discussed, localized low-strength soils could be encountered in foundation excavations. If unsuitable bearing materials are encountered at the base of the planned footing excavation, the excavation should be overexcavated to reach suitable soil bearing materials. The footing could be extended deeper to bear directly on the approved bearing materials or the overexcavation could be backfilled with flowable fill or compacted select soil fill or aggregate base material. If aggregate base or select soil fill is used, the overexcavation should extend at least 8 inches beyond the footing perimeter for every 12 inches of depth below the bottom of footing. Aggregate base or select soil fill should be placed and compacted as recommended in the Geotechnical Report Requirements and Specifications section of this report. If flowable fill is used, it is not necessary to extend foundation excavations laterally beyond the footing perimeter.

Where new backfill material is constructed in footing excavations, the fill material should be compacted with a jumping jack or similar type of compaction equipment. After compaction, the fill exposed in the bottom of foundation excavations should be retested for in-place density each lift every 25 feet of continuous foundation length, at every individual column foundation location, and again immediately before the placement of reinforcing bar and concrete. Flowable fill, if used to backfill foundation trench overexcavations, should be tested for compressive strength each day of placement.

### **Slab-On-Grade Floor Design**

Concrete floor slabs constructed as slab-on-grade and supported on tested and approved, medium stiff to stiff native lean clay soils or select fill, prepared as recommended in this report, can be designed using a modulus of subgrade reaction (k) value of 100 pounds per square inch, per inch. We recommend that a minimum of 4 inches of free draining gravel or sand be placed beneath the slab-on-grade to act as a capillary break. This layer is termed a "subbase" layer.

To be effective as a capillary break, the subbase should have a maximum of 5 percent by dry weight passing the No. 200 sieve. The modulus of subgrade reaction value applies to the top of the subbase layer. The top of the subbase should be compacted using a vibratory plate.

If rutting of the subbase layer is a concern for concrete placement, the subbase layer may be topped with an additional 2 to 4 inches of gravel or sand having sufficient fines to allow compaction. The optional topping layer is termed the "base" layer. The base layer, if used, should be compacted to a minimum of 95 percent Standard Proctor Value (ASTM D 698) at a workable moisture content that allows the density to be achieved. The base layer should have a

percent passing the No. 100 sieve ranging from 10 to 30 percent by dry weight. ARDOT Class 7 Aggregate Base Course material is acceptable to use in the base layer.

A vapor barrier having a minimum thickness of 10 mil is recommended immediately below the concrete unless otherwise recommended by the finished flooring manufacturer or other members of the design team.

The general components of a floor slab, inclusive of the optional base course, are shown in Figure 2. The shown reinforcing steel location provides general guidance only. The location and composition of reinforcing steel should be determined by a structural engineer.

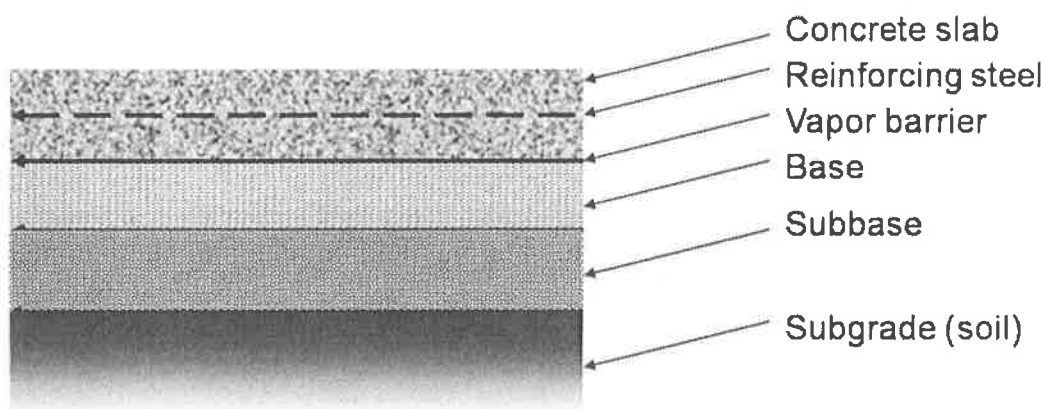


Figure 2: General Floor Slab-on-Grade Section

### IBC Site Classification

Based on our knowledge of the regional geology and the subsurface conditions encountered at the boring locations, the subsurface conditions at this project site are consistent with a Site Class D per the International Building Code (IBC), 2012 Edition.

The 2012 International Building Code (IBC) uses a site profile extending to a depth of 100 feet for seismic site classification. The boring performed at this site was extended to a maximum depth of 15 feet. The subsurface conditions below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth. These supplemental services could be provided upon request.

The following mapped acceleration parameters may be used in design.

- $S_s$ : 0.873g
- $S_1$ : 0.313g
- $F_a$ : 1.151
- $F_v$ : 1.773
- $S_{DS}$ : 0.67g
- $S_{D1}$ : 0.37g
- $PGA_M$ : 0.498g

These values were obtained using on-line seismic tools provided by the OSHPD/SEA-California (<https://seismicmaps.org>) at the site address.

## MASS GRADING RECOMMENDATIONS

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### Stripping of Surface Materials

Mass grading should extend a minimum of 5 feet outside of the building footprint in all directions and a minimum lateral distance of 2 feet behind back of curb.

At a minimum, surface organics, topsoil, trees and root balls, pavement, and any surface or subsurface structures should be removed from the areas of planned new construction. Topsoil material may be stockpiled and reused for landscaping, at the discretion of the design team. The existing pavement and concrete from the foundations and slabs could also be crushed and recycled as fill material, at the discretion of the design team.

We understand that the existing pavement will be removed. It is our experience that properties with previously existing structures have a higher potential for encountering unknown conditions during mass grading and construction. These conditions include backfilled basements, trash pits, concrete foundations, and underground utilities associated with the previous structures.

Buried utility lines should be relocated or abandoned, as necessary. Excavations after removing buried utilities should be backfilled with new select fill as recommended in this report. Abandoned utility lines should be grouted and plugged.

### Evaluation of Existing Fill

As previously discussed, existing fill materials were encountered to a depth of about 8 ½ feet at Boring B-2. We recommend removing and replacing the existing fill with new select fill full depth in the building footprint.

If the Owner/Client is willing to accept the risk of increased pavement distress and maintenance as discussed earlier in this report, the existing fill could be left in-place in the pavement subgrade provided the fill is thoroughly tested and evaluated as outlined in the following section. After stripping the planned new pavement areas, any existing fill containing debris and/or deleterious materials should be overexcavated and replaced with new select fill.

### General Mass Grading

After stripping surface materials, completing cuts necessary for grading, undercutting existing fill in the building footprint, undercutting any apparent low-strength soils, and before placing new fill, the exposed soils should be evaluated by GTS. The exposed soils should be evaluated for stability through proofrolling with a loaded, tandem-axle dump truck weighing at least 25 tons. If the areas are too small for proofrolling where the existing fill is undercut, GTS should test and evaluate the exposed soils using static and/or dynamic cone penetrometer testing and hand probes.



Where unstable soils are identified by proofrolling or testing, they should be scarified, moisture conditioned, and compacted, or removed and replaced full depth with new select fill. Other ground improvement methods could be provided during construction based on the actual site conditions at that time. The appropriate method of improvement, if required, would depend on factors such as schedule, weather, the size of area to be improved, and the nature of the instability. Performing site grading operations during warm, dry periods would help reduce the amount of subgrade stabilization required.

After proofrolling and removing and replacing any unstable or unsuitable soils, the subgrade soils should be scarified a minimum depth of 9 inches, moisture conditioned and compacted as recommended in the Geotechnical Report Requirements and Specifications section of this report. After scarification and compaction, the exposed soils are suitable to directly support footing foundations, floor slabs, or the placement and compaction of new approved fill material.

If the prepared subgrade should become saturated, desiccated, or otherwise damaged prior to construction of the floor slab and pavement section, the affected subgrade material should be scarified, moisture-conditioned and compacted prior to placing the aggregate base course material. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab and pavement aggregate base course material.

### **Weather and Instability Considerations**

Soil stability is directly related to the moisture within and below the exposed soils. If the on-site lean clay (Stratum I) soils are moist to wet or have undergone freeze-thaw cycles after mass grading and/or placement and compaction, we anticipate that the lean clays soils will likely be unstable.

If the exposed subgrade soils are unstable but otherwise suitable to remain in-place based on their classification or depth below plan finish grades, they may be scarified and allowed to dry to achieve stability if the construction timeframe and prevailing weather conditions allow.

Alternatively, the unstable soils could be undercut and replaced full depth with new select fill. For budgeting purposes, an average undercut depth of 3 ½ feet below existing grade is anticipated when the on-site soils are wet.

### **Fill Placement**

Lifts of fill material required to reach plan finished subgrade elevation should be composed of tested and approved fill material and placed per the specifications shown in this report. Fill should be placed in near-horizontal lifts beginning in areas requiring the deepest amount of fill. The fill should be benched into the native soils each lift. Fill should not be placed on frozen, saturated, or unstable soils.

The requirements to meet for select fill material, aggregate base course material and flowable fill material are provided in the Geotechnical Report Requirements and Specifications section of this report.

### **Re-Use of On-Site Soils as Fill**

The existing sand fill appears to be suitable for re-use as select fill provided it is free of debris and deleterious materials. As previously mentioned and due to the noticeable hydrocarbon odor, the existing fill materials should be tested for environmental contaminants prior to re-use.

The native lean clay soils within the upper 5 feet of existing grade appear to be suitable for re-use as select fill. The native lean clay soils encountered below a depth of about 5 feet appear to have higher plasticity and should not be re-used as select fill.

We expect that the on-site native lean clay soils and existing fill could likely be intermixed during overexcavation and/or mass site grading, and that the intermixed soils will likely meet the fill specifications. Larger, bulk samples of the on-site soils proposed for use as fill by the contractor should be sampled by GTS, Inc. during mass grading and laboratory tested to confirm the apparent classification of these soils, prior to reuse.

Imported fill should also be tested and approved prior to use as fill on this site. Imported fill containing rock will need to be screened or crushed into pieces no greater than 3 inches in any dimension prior to reuse.

### **Utility Trench Backfill**

All trench excavations should be made with sufficient working space to permit construction including backfill placement and compaction. Utility trenches are a common source of water infiltration and migration. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 inches of cohesive fill to reduce the infiltration and conveyance of surface water through the trench backfill.

### **Grading and Drainage**

During construction, grades should be developed to direct surface water flow away from or around the site. Exposed subgrades should be sloped to provide positive drainage so that saturation of the subgrade is avoided. Surface water should not be permitted to accumulate on the site to reduce the potential for strength loss of the subgrade soils.

Final grades should be sloped away from the building on all sides to promote effective drainage and prevent water from ponding. Downspouts should discharge water a minimum of 10 feet beyond the footprint of the building. This can be accomplished by using splash-blocks and

downspout extensions. Also, the interface between the building and pavements or sidewalks should be effectively sealed to prevent water from infiltrating into the floor slab-on-grade subgrade.

### **Difficult Excavation Potential**

We expect that the existing fill and the Stratum I lean clay soils can be excavated with conventional earthwork equipment. However, water was observed in the existing sand fill at depths of about 5 ½ feet after completing Boring B-2. We expect that excavation of the sand fill will be difficult at and below the water level.

Temporary dewatering will likely be required to remove perched water and to control seepage in undercuts to remove the existing fill and any underlying low-strength soils. We anticipate that sump pits and suction pumps could be used to alleviate the water seepage. Well points could also be considered prior to excavation. The need for dewatering and dewatering system design should be based on the actual subsurface water conditions encountered at the time of construction.

Temporary excavations will likely be required during grading and site development operations. The contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards.

## PAVEMENTS

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### Pavement Support Recommendations

Based on preparing the pavement subgrade as recommended in the Mass Grading Recommendations in this report, we anticipate that the pavement subgrade materials could consist of a combination of tested and approved, existing fill, new select fill, and native lean clay soils. Again, if the existing fill is left in place in the pavement subgrade, the fill should be observed, tested, and approved as recommended in the Mass Grading Recommendations section of this report.

### Pavement Design Recommendations

No pavement loading design guidance has been provided to GTS by the design team. Therefore, the pavement sections provided in this report are based on a low-volume traffic design consisting of light-duty pavement sections for automobile only traffic areas, medium-duty pavement sections for drive lanes and fire lanes, and heavy-duty pavement sections for delivery/garbage truck traffic and dumpster areas.

Pavement design recommendations assume rapid drainage away from the pavement section will be provided during and after construction to prevent saturation and weakening of the pavement subgrade materials. A design California Bearing Ratio (CBR) of 3 was used for the design of flexible pavements. A modulus of subgrade reaction (k) of 100 pounds per square inch, per inch, was used for the design of the rigid pavements. The pavement sections assume adequate drainage will be provided to allow removal of water from the pavement structure in 24 hours or less.

Recommended flexible and rigid pavement sections are recommended presented in the Tables 2 and 3 on the following page.

**Table 2: Flexible Pavement Section Recommendations**

Flexible Pavement Section:	Asphalt Surface Course	Asphalt Binder Course	Aggregate Base Course (Class 7)	Design Traffic
Light-Duty	2"	---	7"	parking areas for automobiles
Medium-Duty	3"	---	8"	drive lanes for automobiles and light trucks and fire lanes
Heavy-Duty	1 ½"	2 ½"	8"	drive lanes for automobile and occasional delivery/garbage trucks
<i>Specification<sup>1</sup></i>	<i>Section 407 PG 64-22 75 Gyrations</i>	<i>Section 406 PG 64-22 75 Gyrations</i>	<i>Section 303</i>	---
1) Standard Specification for Highway Construction, Arkansas Department of Transportation, Edition of 2014				

**Table 3: Unreinforced Rigid Pavement Section Recommendations**

Rigid Pavement Section Alternative:	4,000 psi Portland Cement Concrete Pavement	Aggregate Base Course (Class 7)	Design Traffic
Light Duty	5"	4"	parking areas for car and passenger truck
Medium Duty	6"	4"	drive lanes for passenger cars and light trucks and fire lanes
Heavy Duty	8"	4"	drive lanes for passenger cars and delivery/garbage trucks and dumpster areas
<i>Specification<sup>1</sup></i>	<i>Section 501</i>	<i>Section 303</i>	---
1) Standard Specification for Highway Construction, Arkansas Department of Transportation, Edition of 2014			

## GEOTECHNICAL REPORT REQUIREMENTS and SPECIFICATIONS

Unless otherwise stated in this report, the recommendations contained in this report are based on the compaction specifications and material types noted in Table 4, Table 5 and the paragraphs on the following page.

**Table 4: Compaction Criteria**

Type of Material	Moisture-Density Specification	Minimum Dry Density (percentage of Proctor)	Range from Optimum Moisture Content (%)
Soil Fill Material – Building Footprint and Pavement Subgrade	ASTM D698 (Standard Proctor)	95	-2 to +2
Soil Fill Material – Outside of Building Footprint and Pavement Areas	ASTM D698 (Standard Proctor)	92	-2 to +2
Scarified and Recompacted Native Soils – Building Footprint	ASTM D698 (Standard Proctor)	95	-2 to +2
Scarified and Recompacted Native Soils and Existing Fill – Pavement Subgrade	ASTM D698 (Standard Proctor)	95	-2 to +2
ARDOT Class 7 Aggregate Base Course	ASTM D1557 (Modified Proctor)	95	Adequate to Achieve Compaction
Flowable Fill Material	ARDOT Section 206	Not applicable	

**Table 5: Soil Fill Material Requirements**

Type of Soil Fill	Location/Use	Maximum LL	Maximum PI	USCS Classifications
Select	All Areas	45	20	CL, SC, SP, SP-SC, SW, GC, GP, GP-GC, GW

Fill material should have a maximum nominal aggregate size of 3 inches or less after placement and compaction. Fill needed for site grading should be placed in loose lifts not exceeding 9 inches in thickness (compacted lift thickness of approximately 6 to 7 inches). We recommend the fill be

tested for density every lift during site grading, with a minimum of one test every 2,500 square feet of building area and every 10,000 square feet in pavement areas.

Where select fill or aggregate base is used to backfill foundation trench overexcavations up to plan bottom of foundation elevations, the fill should be tested each lift, at each column location and every 25 linear feet of continuous foundation trench. Additionally, we recommend that the select fill or aggregate base be tested for in-place density immediately before placement of reinforcing bar and concrete. Flowable fill, if used to backfill foundation trench over-excavations, should have a minimum compressive strength of 400 psi and should be tested for compressive strength each day of placement.

The recommended moisture content and compaction of the fill should be maintained until fills are completed and floor slabs and pavements are constructed.

## SUBSURFACE EXPLORATION and PROCEDURES

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The subsurface exploration consisted of evaluating and sampling at three (3) sample boring locations, designated Borings B-1 through B-3. The borings were drilled to termination depths of approximately 15 feet below the existing ground surface.

The boring locations were established in the field by GTS by using a hand-held GPS unit and measuring distances with a measuring tape from existing site features. The approximate boring locations are shown on the attached Boring Location Diagram. The locations of the borings should be considered accurate only to the degree implied by the methods used to define them. The results of the borings are attached to this report.

The borings were drilled with a truck-mounted Simco 2600 drill rig. Disturbed samples and estimates of the in-situ shear strengths of the soil were obtained using an automatic-hammer-driven split-barrel sampler in general accordance with the Standard Penetration Test (SPT) at the boring locations.

An automatic SPT-hammer was used to advance the split-barrel sampler in the boreholes. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The soil samples obtained in the field were sealed to reduce moisture loss and taken to the GTS soil laboratory for further examination, testing, and classification. The results of laboratory tests on select samples are shown on the boring logs and are attached to this report.

Field logs were prepared during the drilling and sampling of the borings. These logs report sampling methods, sampling intervals, soil and groundwater conditions, and notes regarding soil and drilling conditions observed between sample depths. The final boring logs, included in this report, have been prepared based on the field logs and have been modified, where appropriate, based on the results of the laboratory observation.



## LABORATORY TESTING and PROCEDURES

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The soil samples were examined in the laboratory by an experienced geotechnical engineer and classified based on the soil's texture and plasticity, in accordance with the Unified Soil Classification System. The estimated Unified Soil Classification System group symbols are shown on the boring logs.

Hand penetrometer tests were performed on select intact cohesive samples. Hand penetrometer test values are shown on the boring logs as filled squares.

The laboratory testing was performed by GTS in general accordance with the American Society for Testing and Materials (ASTM) test designations shown in the table below:

**Table 6: Laboratory Test Method Designations**

Laboratory Test	Test Designation	Method (if applicable)
Moisture Content of Soil	ASTM D 2216-10	Method A
Visual Classification of Soil Types	ASTM D 2488	
USCS Classification	ASTM D 2487	
Atterberg Limits	ASTM D 4318	Method A

The results of the classification tests are presented on the boring logs and in Appendix B.

## GEOTECHNICAL REPORT LIMITATIONS

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The recommendations contained in this report are based on our interpretation of subsurface conditions encountered at the discrete boring locations. Variations between the subsurface conditions anticipated in this report and actual project site conditions may occur away from the boring locations.

If significant differences between the findings of the borings and site conditions are observed, GTS. should be contacted to assess the variation and, if necessary, reevaluate the recommendations contained in this report.

## ENVIRONMENTAL EXCLUSION

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A Geotechnical Engineering Report assesses the engineering properties of soil. No environmental assessment of a project site is performed during a geotechnical exploration. If the owner is concerned about the potential for environmental hazards at the project site, additional studies should be performed by GTS. We would be pleased to discuss these services, if interested.

## APPENDIX A

Boring Location Diagram

Boring Logs



Boring Location Diagram

# LOG OF BORING NO.B-1

Planned Newport IT Building  
210 Hazel Street, Newport, Arkansas

**GTS, Inc.**

Geotechnical & Testing Services

Fayetteville, AR

Project No.: 20-5-5-036

Location: Refer to Boring Location Plan, Building Footprint

DEPTH, FT	SYMBOL	SAMPLES	SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	% <#200	HAND PENETROMETER, TSF				BLOWS PER FT	PI
								LAB. COHESION, TSF ▲					
								WATER CONTENT, % ●					
								PL			LL		
					Surface Description = Pavement			20	40	60	80		
0					CONCRETE - 6 inches SAND BASE - 3 inches								
		1	10		LEAN CLAY stiff, dark gray	CL						3.0	7
2.5		2	18		LEAN CLAY medium stiff to stiff, olive-gray	CL						2.25	4
		3	10		LEAN CLAY stiff to very stiff, light gray and brown								8
5		4	18									3.25	14
7.5						CL							
10		5	12									4.5	12
12.5													
15		6	18		LEAN CLAY, with iron nodules and staining stiff to very stiff, brown, gray, and dark brown	CL						3.5	12
17.5					BOTTOM OF BORING AT ABOUT 15 FEET								

COMPLETION DEPTH: 15 ft.

DATE: 11/19/2020

RIG: Simco 2600, Truck-Mounted, Automatic Hammer

DEPTH TO WATER: DURING DRILLING: Dry

AT COMPLETION: Dry

AT 24 HOURS: N/A



# LOG OF BORING NO.B-2

Planned Newport IT Building  
210 Hazel Street, Newport, Arkansas

**GTS, Inc.**

Geotechnical & Testing Services

Fayetteville, AR

Project No.: 20-5-5-036

Location: Refer to Boring Location Plan, Building Footprint

DEPTH, FT	SYMBOL	SAMPLES	SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	% <#200	HAND PENETROMETER, TSF ■				BLOWS PER FT	PI
								LAB. COHESION, TSF ▲					
								WATER CONTENT, % ●					
					Surface Description = Pavement			PL		LL			
0					CONCRETE - 6 inches SAND BASE - 2 inches			20	40	60	80		
		1	11		FILL: Sand, trace clay and gravel brown							13	
2.5		2	12		- hydrocarbon odor in samples below 2 feet							10	
		3	10									3	
5		4	10			FILL						5	
7.5													
		5	10		LEAN CLAY stiff to very stiff, gray and brown - no hydrocarbon odor						4.5	7	
10						CL							
12.5		6	12								2.5	8	
15					BOTTOM OF BORING AT ABOUT 15 FEET								
17.5													

COMPLETION DEPTH: 15 ft.

DATE: 11/19/2020

RIG: Simco 2600, Truck-Mounted, Automatic Hammer

DEPTH TO WATER: DURING DRILLING: 8.5

AT COMPLETION: 5.5

AT 24 HOURS: N/A

▽

▽

▽

# LOG OF BORING NO.B-3

Planned Newport IT Building  
210 Hazel Street, Newport, Arkansas

**GTS, Inc.**

Geotechnical & Testing Services

Fayetteville, AR

Project No.: 20-5-5-036

Location: Refer to Boring Location Plan, Building Footprint

DEPTH, FT	SYMBOL	SAMPLES	SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	% <#200	HAND PENETROMETER, TSF				BLOWS PER FT	PI
								LAB. COHESION, TSF					
								WATER CONTENT, %					
								0.4	0.8	1.2	1.6		
					Surface Description = Pavement			PL	LL				
								20	40	60	80		
0					CONCRETE - 6 inches SAND BASE - 2 inches								
			1	15	LEAN CLAY medium stiff, dark gray	CL						7	
2.5			2	12	LEAN CLAY medium stiff, gray and olive-brown	CL						6	
			3	12	LEAN CLAY stiff, light gray and brown	CL						3.5	10
5			4	18	LEAN CLAY, with iron staining and nodules very stiff, gray, brown, and dark brown							4.5	21
7.5													
			5	18		CL						4.5	25
10													
12.5													
			6	14	LEAN CLAY, trace sand seams medium stiff, gray and brown	CL						8	
15					BOTTOM OF BORING AT ABOUT 15 FEET								
17.5													

COMPLETION DEPTH: 15 ft.

DATE: 11/19/2020

RIG: Simco 2600, Truck-Mounted, Automatic Hammer

DEPTH TO WATER: DURING DRILLING: Dry

AT COMPLETION: Dry

AT 24 HOURS: N/A



## APPENDIX B

### Results of Laboratory Classification Tests



### Plasticity Chart

For classification of fine-grained soils and fine-grained fraction of coarse-grained soils

Equation of "A" Line  
Horizontal at  $PI=4$  to  $PI=25.5$ ,  
then  $PI=0.73(LL-20)$

Equation of "U" Line  
Vertical at  $LL=16$  to  $PI=7$   
then  $PI=0.9(LL-8)$

Boring No	Depth (ft)	LL	PL	PI	% Fines	USCS Classification
B-1, S-2	2 - 3.5	36	20	16	--	LEAN CLAY, CL
B-1, S-3	3.5 - 5	41	20	21	--	LEAN CLAY, CL
B-1, S-4	5 - 6.5	42	17	28	--	LEAN CLAY, CL
B-3, S-2	2 - 3.5	32	16	16	--	LEAN CLAY, CL

**Newport IT Building  
210 Hazel Street  
Newport, Arkansas**

GTS Project No. 20-5-5-036

**GTS, Inc.**  
Geotechnical & Testing Services

APPENDIX B

HEALTH DEPARTMENT APPROVAL LETTER



# Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000  
Governor Asa Hutchinson  
José R. Romero, MD, Secretary of Health

September 9, 2021

Wayne Menley  
Miller Newell Engineers, Inc.  
PO Box 705  
Newport, AR 72111  
(870) 523-6531  
[wmenleyengr@aol.com](mailto:wmenleyengr@aol.com)

RE: Project # 116717 PD# 21-1345  
Information Technology Training Center  
201 Hazel Street  
Newport, AR

The plans and specifications for the above referenced project have been reviewed and approved by the Plumbing and Natural Gas Section of the Arkansas Department of Health. No deviations from the accepted plans, specifications, and/or addenda will be permitted during construction except by prior written acceptance. This approval is valid for one (1) year from the date on this letter or this acceptance must be re-validated by contacting this office referring to the above referenced file numbers. **Note:** Plans & specifications will be discarded after completion of the review and in no case be retained for more than a six (6) month period.

This approval letter is for the plumbing portion of this project only. The architect, engineer, designer, or agent of the owner shall provide all contractors a copy of this letter. Swimming pools, public water/sewer extensions, fire protection systems, sewage disposal systems, and water wells are regulated by other sections of the Arkansas Department of Health, and are subject to plan review approval before construction begins; and furthermore, this letter shall serve as a provisional approval for food service until an official review is completed, if applicable. For more information for food service requirements, please contact Environmental Health Protection at (501) 661-2171.

All plumbing and gas work shall meet minimum state plumbing code standards and be performed by a duly licensed master plumber. While every effort is made to ensure these plans and specifications meet the plumbing & gas codes, the final approval for this project rests with the onsite inspection of the plumbing & gas systems by the certified plumbing inspector. Please refer to any attached comments with this letter regarding required changes or the need for additional plumbing.

For more information regarding this approval, please contact us at (501) 661-2642.

Sincerely,

Josh Hazlewood, Plan Review Examiner  
Plumbing & Natural Gas Section  
Protective Health Codes

CC: Matt Myers, State Plumbing Inspector  
Municipal Plumbing Inspector

## **Project Comments and / or Needed Corrections**

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Project ID 116717 – PD # 21-1345

Job Name: Information Technology Training Center

1. Water Heater installation shall comply with Arkansas State Plumbing Code Chapter 5.
2. Tempered water for hand washing shall be supplied for public hand washing. A.S.P.C. section 416.5
3. Water Distribution system to comply with ASPC chapter 6.

APPENDIX C

ARDOT PERMIT

REPLACEMENT OF SIDEWALK ALONG THIRD STREET



ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | iDriveArkansas.com | Lorie H. Tudor, P.E., Director

DISTRICT FIVE: 1673 Batesville Blvd. | P.O. Box 2376 | Batesville, AR 72503-2376 | Phone: 870.251.2374 | Fax: 870.251.2393

D5 COUNTIES: Cleburne, Fulton, Independence, Izard, Jackson, Sharp, Stone, White

September 23, 2021

City of Newport  
Honorable Mayor David Stewart  
615 3<sup>rd</sup> St.  
Newport, AR 72112

REF: Removal of existing sidewalk  
and construction of new sidewalk.  
SP-05-2021-0020  
Highway 367, Section 21, L.M. 7.61  
Jackson County

Dear Mayor,

Your request for permission to remove the existing sidewalk and to construct a new sidewalk across the frontage of the new Newport Information Technology Training Center in Newport on State Highway 367 Section 21 at Log Mile 7.61 is hereby granted in accordance with the attached plans and under the following conditions:

- You and your agents, employees, assignees and contractors herein after referred to as "Permittee" hereby expressly agree that the Permittee shall safeguard and protect the traffic on the highway during the operations covered hereunder by necessary and proper traffic control devices in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and to hold harmless and indemnify the Arkansas State Highway Commission (ASHC), the Arkansas Department of Transportation (ARDOT), and its duly authorized agents, officers, and employees, from any and all damages, expenses, claims, or liabilities arising out of the performance or non-performance of operations related to this permit. You shall bear full responsibility for observing and complying with all applicable federal, state, and local laws or ordinances during the execution of the work.
- The Permittee shall be solely responsible for locating and protecting all utilities in the work area and to hold harmless and indemnify the ASHC, ARDOT, and its duly appointed agents, officers, and employees, from all damages, expenses, claims, or liability arising out of any alleged damages of any nature to any utilities due to the performance or non-performance of operations related to this permit.
- The permittee shall ensure that all work complies with the Americans with Disabilities Act. The Department will not inspect the work for compliance. Assurance of compliance shall be your responsibility. When required, the permittee shall correct any deficiencies found by others.
- The Permittee certifies that they are the owner or have legal right to possession and control of the property adjacent to the right of way frontage on which the proposed work will be done.



ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

DISTRICT FIVE: 1673 Batesville Blvd. | P.O. Box 2376 | Batesville, AR 72503-2376 | Phone: 870.251.2374 | Fax: 870.251.2393

D5 COUNTIES: Cleburne, Fulton, Independence, Izard, Jackson, Sharp, Stone, White

- The Permittee shall ensure that all work and materials used within the highway right of way are in accordance with the ARDOT Standard Specifications for Highway Construction, most recent edition, and any specifications or design standards supplied by the Department.
- The permittee shall not use any part of the highway right of way for storage of materials or equipment. All waste material will be disposed of on the property of the permittee.
- The permittee shall undertake measures to avoid tracking soil and mud from the work area onto the highway, and use an approved erosion control method to prevent runoff from the construction area to be allowed to enter onto the State Highway.
- The permittee shall protect existing right of way monuments from damage and shall provide for the re-establishment, by a Registered Professional Land Surveyor, of any markers that are disturbed by your activities.
- The permittee agrees that all work under this permit shall be done at no cost to the Arkansas Department of Transportation.
- The permittee shall promptly restore any portion of highway property damaged by construction.
- The permittee agrees that the beginning of work covered by this permit shall constitute full acceptance of all applicable terms and conditions contained and referenced herein. Please notify the District 5 Permit Officer, John Rodgers at 870-834-5778 of your intention to begin work at least three (3) working days prior to the anticipated start date.

This permit is unilaterally revocable by the ASHC, ARDOT, or it's duly authorized agents, employees, and assigns. All work shall be subject to the Department's irrevocable right to require the Permittee to immediately cease operations and immediately vacate the right of way of said highway.

Approved By



District Five Engineer

9-23-2021

Date



## ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

DISTRICT FIVE: 1673 Batesville Blvd. | P.O. Box 2376 | Batesville, AR 72503-2376 | Phone: 870.251.2374 | Fax: 870.251.2393

D5 COUNTIES: Cleburne, Fulton, Independence, Izard, Jackson, Sharp, Stone, White

***Return this page when the work is complete.***

City of Newport  
615 Third Steet  
Newport, AR 72112

Date: September 23, 2021

Upon the completion of the permitted work, sign and return this sheet to our office. If it is found that you have satisfied all of the conditions of the permit, your deposit, if applicable, will be returned.

With your cooperation we will be able to release your permit in a timely manner.

**Permit Number:** SP-05-2021-0020

**Date Complete:** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Month Day Year

\_\_\_\_\_  
City of Newport