

# SPECIFICATIONS AND CONTRACT DOCUMENTS



CONWAY, ARKANSAS

FAULKNER COUNTY

## **DONAGHEY AVE. IMPROVEMENTS PHASE 1 (DAVE WARD DR. TO ADA AVE.)**

CONWAY JOB NO. 18-110  
GARVER PROJECT NO. 18147010

Prepared For:

City of Conway

May 2020







000001 – CERTIFICATIONS


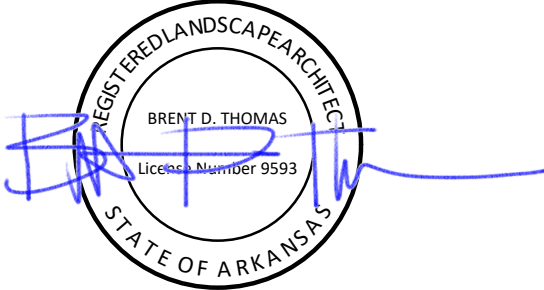
**DONAGHEY AVE. IMPROVEMENTS – PHASE 1**  
**GARVER PROJECT NO. 18147010**  
**CITY OF CONWAY PROJECT NO. 18-110**

I hereby certify that the applicable portions of this project plans and specifications were prepared by me or under my direct supervision and that I am a duly Licensed Engineer or Landscape Architect under the laws of the State of AR.

SEAL AND SIGNATURE	APPLICABLE DIVISION OR PROJECT RESPONSIBILITY
<p>Dustin Tackett, P.E.</p>  <p>Digitally Signed: 5/22/2020</p>	<p>Project Manager</p> <p>And</p> <p>Roadway and Drainage Improvements</p>
<p>David Pearce, P.E.</p>  <p>Digitally Signed: 5/22/2020</p>	<p>Traffic Signal Design</p>



000001 – CERTIFICATIONS

SEAL AND SIGNATURE	APPLICABLE DIVISION OR PROJECT RESPONSIBILITY
<p>Madison McEntire, P.E.</p>  <p>Digitally Signed: 5/22/2020</p>	<p>Structural Design – Drainage Structures</p>
<p>Brent Thomas, PLA, ASLA</p>  <p>Digitally Signed: 5/22/2020</p>	<p>Landscaping and Irrigation</p>



000001 – CERTIFICATIONS

**GARVER, LLC CERTIFICATE OF AUTHORIZATION:**

**AR ENGINEERING AND SURVEYING:**



Expiration Date: 12-31-2020





**CITY OF CONWAY**

**DONAGHEY AVE. IMPROVEMENTS – PHASE 1 (DAVE WARD DR. TO ADA AVE.)  
CITY OF CONWAY JOB NO. 18-110**

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## 010000 - ADVERTISEMENT FOR BIDS

Sealed bids for **BID NO. 2020-14, DONAGHEY AVE. IMPROVEMENTS - PHASE 1**, to be constructed for CITY OF CONWAY, ARKANSAS, will be received at City Hall, 1111 Main Street, Conway, Arkansas 72032 until 2:00 P.M., WEDNESDAY, JUNE 10, 2020, at which time the bids shall be publicly opened and read aloud via livestream with witnesses. Bidders and other interested parties are encouraged to view the public bid opening via livestream. Sealed bids shall be sent to City Hall, Attn: Jamie Brice, 1111 Main Street, Conway, Arkansas 72032. A link to the livestream feed of the public bid opening is available at <https://conwayarkansas.gov/transportation/projects/#18-110>.

The project includes, but is not limited to, 5,710 LF of roadway improvements including roadway reconstruction, mill and inlay, a two-lane roundabout, a reinforced concrete box culvert, reinforced concrete pipe, curb inlets, curb and gutter, sidewalks, bicycle facilities, traffic signals, landscaping, irrigation, and retaining walls as shown on the plans and indicated in the specifications.

Digital copies of the bid documents are available at <http://planroom.garverusa.com> for a fee of \$50. These documents may be downloaded by selecting this project from the "Plan Room" link, and by entering Quest Project Number 7108751 on the "Browse Projects" page. For assistance and free membership registration, contact QuestCDN at 952.233.1632 or [info@questcdn.com](mailto:info@questcdn.com). Addendums to the bid package will be issued through the online Garver Plan Holders List; therefore, all prime bidders shall be responsible for downloading the bid documents from the Garver online plan room in order to be included in the Plan Holders List. Bidders must enter the addenda numbers in the Proposal to verify receipt.

Proposals shall be accompanied by a cashier's or certified check upon a national or state bank in an amount not less than five percent (5%) of the total maximum bid price payable without recourse to the Owner, or a bid bond in the same amount from a reliable surety company, as a guarantee that the Bidder will enter into a contract and execute performance and payment bonds within ten (10) days after notice of award of Contract to him. Such bid guarantee shall be made payable to CITY OF CONWAY.

The successful bidder must furnish a performance and payment bond upon the form provided in the amount of one hundred per cent (100%) of the contract price from an approved surety company holding a permit from the State of AR to act as surety, or other surety or sureties acceptable to the Owner.

Bidders must be licensed under the terms of Arkansas Code Annotation §§17-25-101, et. Seq.

City of Conway reserves the right to reject any or all bids, to waive irregularities in the bids and bidding deemed to be in the best interests of City of Conway, and to reject nonconforming, nonresponsive, or conditional bids.

Bids must remain in effect for 60 days after the bid opening date.

City of Conway, Arkansas  
Bart Castleberry, Mayor



## 010200 - INSTRUCTIONS TO BIDDERS

### 1. PREPARATION OF BID

Each bid must be submitted on the prescribed form (Proposal) and Unit Price Schedule(s). All blank spaces must be filled in legibly (either typed or written with ink). All blank spaces for bid prices on the Unit Price Schedules must be filled in and the extended total for each item shall be entered in figures only. If the unit price and the extended total of any item are not in agreement, the unit price shall govern and the extended total is corrected to conform thereto. Erasures or other corrections on the Proposal form or Unit Price Schedules shall be initialed by the signer of the bid. All bids must be signed in ink by an individual authorized to bind the Bidder. All bids must be regular in every respect and no interlineations, excisions, or special conditions shall be made or included in the Proposal by the Bidder.

There must be a bid on all items that may appear on the Unit Price Schedule(s). No bid will be considered which covers only a part of the work. A conditional bid will not be considered.

The Proposal and Unit Price Schedule(s), along with other specific section items required in Section 17 below for the sealed bid, shall not be altered and these sections shall be submitted in their entirety. Submission must be at the place, and at or prior to the time specified in the Advertisement for Bids.

Each bid must be submitted in a sealed envelope clearly marked on the outside that it contains a bid for **Bid No. 2020-14, Donaghey Ave. Improvements – Phase 1 (Dave Ward Dr. to Ada Ave.)** and with the time and date of bid opening shown thereon. The name, address, and AR Contractor's License Number of the Bidder shall appear in the upper left-hand corner of the envelope. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope.

A bid that obviously is unbalanced may be rejected.

### 2. INTERPRETATIONS AND ADDENDA

No oral interpretation will be made to any Bidder as to the meaning of the Contract Documents or any part thereof. Every request for such an interpretation shall be made in writing to Garver, 831 Parkway, Suite C, Conway, AR 72034, or by email to [DLTackett@GarverUSA.com](mailto:DLTackett@GarverUSA.com). Any inquiry received forty-eight (48) hours prior to the opening of bids will be given consideration. Every interpretation made to a Bidder will be in the form of an Addendum to the contract Documents, and when issued, will be sent to the Plan Holders list located in the electronic plan room at least twenty-four (24) hours before bids are opened. It shall be the Bidder's responsibility to make inquiry to the electronic plan room as to the Addenda issued. All such Addenda shall become part of the Contract and all Bidders shall be bound by such Addenda, whether or not received by the Bidders.

### 3. BIDDING DOCUMENTS

Complete sets of the bidding documents may be obtained as stated in the advertisement. Owner and Engineer, in making copies of these documents available, do so only for the purpose of obtaining bids for the work, and do not authorize or grant a license for any other use. Complete sets of the documents shall be used in preparing bids; neither the Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

### 4. INSPECTION OF SITE

Each Bidder shall visit the site of the proposed work and fully acquaint himself with the existing conditions there relating to construction and labor, and shall fully inform himself as to the facilities involved, laws and regulations, and the difficulties and restrictions in attending the performance of the Contract.

The Bidder shall thoroughly examine and familiarize himself with the Plans, Technical Specifications, other

Contract Documents, and referenced items. The Bidder shall also carefully study all available reports of explorations and tests of subsurface conditions at or adjacent to the Site.

The Contractor, by the execution of the Contract, shall not be relieved of any obligation under it due to his failure to receive or examine any form or legal instrument or to visit the site and acquaint himself with the conditions there existing, and the Owner will be justified in rejecting any claim based on facts regarding which he should have been on notice as a result thereof.

It is the responsibility of each Bidder before submitting a bid to agree that the submission of a bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of the Contract Documents, that without exception the bid and all prices in the bid are premised upon performing and furnishing the work required by the Contract Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Contract Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the work.

## 5. BID GUARANTY

The bids must be accompanied by a Bid Guaranty, which shall not be less than five percent (5%), of the amount of the bid. At the option of the Bidder, the guaranty may be a certified check, or may be a Bid Bond that is similar to the attached form. No bid will be considered unless it is accompanied by the required guaranty. Certified check must be payable to the order of City of Conway. Cash deposits will not be accepted. The Bid Guaranty shall insure the execution of the Agreement and the furnishing of the surety bond or bonds by the successful Bidder, all as required by the Contract Documents.

The guaranty of the apparent successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid Guaranty will be released. If the successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 10 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid Guaranty of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

The Bid Guaranty of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the effective date of the Contract or 61 days after the Bid opening, whereupon Bid Guaranty furnished by such Bidders will be released.

Bid Guaranty of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be returned upon request as soon as feasible after the opening of the bids.

## 6. COLLUSION; SUBCONTRACTS

A Bidder submitting a Proposal to the Owner for the work contemplated by the Documents on which bidding is based shall not collude with any other person, firm, or corporation in regard to any bid submitted.

Before executing any subcontract, the successful Bidder shall submit Section 010440, LIST OF PROPOSED SUBCONTRACTORS for prior approval of the Owner.

If requested by Owner, the list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity.

If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent



successful Bidder to submit an acceptable substitute, in which case the apparent successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Award. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder.

If apparent successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in the General Conditions.

#### 7. STATEMENT OF BIDDER'S QUALIFICATIONS

Each Bidder shall submit, on the form furnished for that purpose (a copy of which is included in the Contract Documents), a statement of the Bidder's qualifications, his experience record in construction of work similar to that which here is involved, and his organization and equipment available for the work contemplated; and when specifically requested by the Owner, a detailed financial statement. The Owner shall have the right to take such steps as it deems necessary to determine the ability of the Bidder to perform his obligations under the Contract and the Bidder shall furnish the Owner all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available evidence or information does not satisfy the Owner that the Bidder is qualified to carry out properly the terms of the Contract.

#### 8. BALANCED BIDS; VARIATIONS IN QUANTITIES

The lump sum price and unit price for each of the several items in the Proposal of each Bidder shall be balanced and shall include its pro rata share of overhead.

The Owner shall have the right to increase or decrease the extent of the work, to change the location or gradient, or the dimensions of any part of the work, provided that the length of the improvement is not increased or decreased in excess of twenty-five percent (25%) of the length as determined by the Contract, or that the quantities of work to be done or the materials to be furnished are not increased or decreased in money value in excess of twenty-five percent (25%) of the total contract as determined by the Contract. Such changes shall not be considered as a waiver of any conditions of the Contract nor invalidate any of the provisions thereof. The Contractor shall perform the work as increased or decreased within the qualifying limits named and no allowance will be made for anticipated profits or increases or decreases so incurred. Change in length or in money value, within the twenty-five percent (25%) limits set out, shall not be cause for adjustment of any lump sum or unit price. Changes in items of work covered by unit prices and/or lump sum prices, within the twenty-five percent (25%) limits set out, shall not be cause for adjustment of any other (non-involved) lump sum or unit price.

Increases or decreases in items of work, and the cost thereof, shall be done in accordance with the Section entitled, CHANGES IN THE WORK under GENERAL CONDITIONS.

#### 9. TIME FOR RECEIVING BIDS

A bid received prior to the advertised hour of opening will be kept securely and will remain sealed until the hour of opening. The officer whose duty it is to open them will decide when the specified time has arrived, and any bid received subsequent to that time will be returned unopened.

#### 10. OPENING OF BIDS

At the time and place fixed for the opening of bids, the Owner will cause the bids to be opened and publicly read aloud, irrespective of any irregularities therein. Bidders and other persons properly interested may be

present, in person or by representative. Bid qualification may be evaluated before and/or after the bid opening, at the Owner's discretion.

#### 11. WITHDRAWAL OF BIDS

Bids may be withdrawn on written request if the request is received prior to the time fixed for the opening of bids. Bidder may withdraw its Bid within 24 hours after Bids are open and Bid Guaranty will be returned if Bidder files a duly signed written notice with the Owner and promptly demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid. The Bidder shall not be allowed to submit a revised Bid.

#### 12. AWARD OF CONTRACT; REJECTION OF BIDS

The Contract will be awarded to the responsive and responsible Bidder submitting the lowest total bid complying with the conditions of the Advertisement for Bids and other parts of these Contract Documents.

The criteria which will be used to determine the lowest responsive and responsible Bidder are as follows:

- 12.1 Responsive Bidder: Means a Bidder who has submitted a complete bid which conforms in all material respects and requirements to the Contract Documents.
- 12.2 Responsible Bidder: Means a Bidder who has the capacity and capability in all respects to perform fully the contract requirements and who has the integrity and reliability to assure good faith performance. Among factors to be considered in determining whether the Bidder meets these standards are the Bidder's financial responsibility, performance responsibility, technical feasibility, his equipment, and his past performance in completing similar work.

A Bidder's failure to submit a complete bid or required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

The Bidder to whom the award is made will be notified at the earliest possible date, but not later than sixty (60) days after the opening of bids. The Owner, however, reserves the right to reject any or all bids and to waive any informality in bids received whenever such rejection or waiver is in its interests. The Owner also reserves the right to consider as unqualified to do the work any Bidder who does not habitually perform with his own forces the major portions of such work as is involved in construction of these improvements.

#### 13. EXECUTION OF CONTRACT; PERFORMANCE AND PAYMENT BOND

Subsequent to the award and within ten (10) days after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the Owner a Contract in the form included in the Contract Documents in such number of copies as the Owner may require.

Having satisfied all conditions of award as set forth elsewhere in these Documents, the successful Bidder shall, within the period specified above, furnish a surety bond in a penal sum not less than the amount of the Contract as awarded, as security for the faithful performance of the Contract, and for the payment of all persons, firms or corporations to whom the Contractor may become legally indebted for labor, materials, tools, equipment, or services of any nature, including utility and transportation services employed or used by him in performing the work. Such bond shall be as included in the Contract Documents and shall bear the same date as, or a date subsequent to, that of the Agreement. The current power of attorney for the person who signs for any surety company shall be attached to such bond.

The failure of the successful Bidder to execute such Contract and to supply the required bond or bonds within ten (10) days after the prescribed forms are presented for signature, or within such extended period as the Owner may grant, based upon reasons determined sufficient by the Owner, shall constitute a default, and the Owner may either award the Contract to the next lowest responsible Bidder or re-advertise for bids.

#### 14. BONDS AND INSURANCE

Attention of Bidders is called to Arkansas Code Annotation §§ 22-9-401 et. Seq., which has certain requirements pertaining to Performance Bonds, labor bonds, employer's liability insurance, public liability insurance, workmen's compensation insurance, and property damage insurance.

All companies furnishing Bid Bonds and Performance Bonds shall furnish evidence of being on the U.S. Treasury Department's most current list (Circular 570, as amended) and be authorized to transact business in the State of Arkansas.

#### 15. CONTRACTOR'S LIABILITY INSURANCE REQUIREMENTS

The Bidder shall provide with the Proposal a listing of both automobile and personal liability insurance coverage currently in force, along with a copy of a Certificate of Insurance as verification of that coverage.

In the event the Owner determines that the low Bidder's coverage in force is inadequate, the Owner may require the low Bidder to procure additional coverage in accordance with the requirements as specified herein.

In the event the lower Bidder is unable, after diligent effort, to procure such additional coverage as may be required by the Owner, the Owner may provide such additional coverage, naming the Contractor as insured or, at the option of the Owner, reduce the amount of additional coverage required or waive any requirement for additional coverage.

#### 16. THIRD PARTY COVERAGE

The Contractor shall provide insurance coverage for the Engineer and the Owner as indicated in Section 010800, GENERAL CONDITIONS.

#### 17. SIGNATORY AND CONTRACT SUBMITTALS

The Contract Documents call for all Bidders, and for the awarded Contractor, to complete and/or submit information concerning equal employment opportunity, quality control, labor items, etc. A list of required items to be submitted with each bid is listed in the Bidders Checklist.

The following is a list of completed forms/submittals that the apparent low Bidder will be required to complete before execution and award of the contract:

- Contract (all pages)
- Performance Bond
- Payment Bond
- Certificates of Insurance and Insurance Policies

The following is a list of completed forms/submittals that the awarded Contractor will be required to submit before construction begins:

- Construction Schedule

Additional certifications and submittals will be required for construction materials and other items in the technical specifications.

#### 18. LEGAL QUALIFICATIONS

All Bidders, in order to submit a bonafide Proposal, must comply with the applicable terms of AR Code.

The successful Bidder, if a corporation created under the laws of some state other than the State of AR, will be required to qualify, or to have qualified, with the Secretary of State of AR to do business in the State of AR.

19. MODIFICATION OF BID

No modification of any bid already submitted will be considered unless such modification is received in writing, signed and witnessed by persons authorized to so act on behalf of the bidder, prior to the time set for opening of bids.

END OF INSTRUCTIONS TO BIDDERS

## 010300 - BID BOND

### 1. BID DEFAULT

Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Contract required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

This obligation shall be null and void if:

- 1.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Contract required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
- 1.2 All Bids are rejected by Owner, or
- 1.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and consented to by Surety).

### 2. BOND PAYMENT DUE

Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

### 3. PROCEEDING REQUIREMENTS

Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed the time required by the Bidding Documents without Surety's written consent.

No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default is received by Bidder and Surety and in no case later than one year after the Bid due date. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

### 4. STATUTORY REQUIREMENTS

This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

**BID BOND**

Conforms with The American Institute of  
Architects, A.I.A. Document No. A-310

KNOW ALL BY THESE PRESENTS, That we, Weaver-Bailey Contractors, Inc.

\_\_\_\_\_ as Principal, hereinafter called the Principal,  
and the Travelers Casualty and Surety Company of America,

of One Tower Square, Hartford, Connecticut, a corporation duly organized under

the laws of the State of Connecticut, as Surety, hereinafter called the Surety, are held and firmly bound unto

City of Conway, Arkansas as Obligee, hereinafter called the Obligee,

in the sum of Five Percent of Amount of Bid

Dollars (\$ 5% of Bid ), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Donaghey Ave. Improvements - Phase 1 (Dave Ward Dr. to Ada Ave.),  
Conway, Arkansas

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

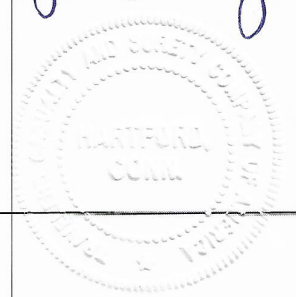
Signed and sealed this 10th day of June, 2020

[Signature]  
\_\_\_\_\_  
Witness

Weaver-Bailey Contractors, Inc. (Seal)  
Principal  
{ [Signature]  
\_\_\_\_\_  
President Title

[Signature]  
\_\_\_\_\_  
Witness

Travelers Casualty and Surety Company of America  
By [Signature]  
\_\_\_\_\_  
Holly Clevenger Attorney-in-Fact





**Travelers Casualty and Surety Company of America  
Travelers Casualty and Surety Company  
St. Paul Fire and Marine Insurance Company**

**POWER OF ATTORNEY**

**KNOW ALL MEN BY THESE PRESENTS:** That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Holly Clevenger** of **LITTLE ROCK**

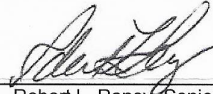
**Arkansas**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

**IN WITNESS WHEREOF**, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **17th** day of **January**, **2019**.



State of Connecticut

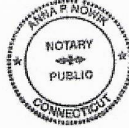
City of Hartford ss.

By:   
Robert L. Raney, Senior Vice President

On this the **17th** day of **January**, **2019**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

**IN WITNESS WHEREOF**, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June**, **2021**



  
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

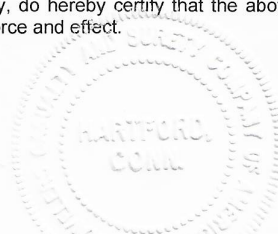
**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **10th** day of **June**, **2020**



  
Kevin E. Hughes, Assistant Secretary

**To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.  
Please refer to the above-named Attorney-in-Fact and the details of the bond to which this Power of Attorney is attached.**





010400 - PROPOSAL

Place 1111 MAIN ST, CONWAY, AR 72032

Date JUNE 10, 2020

Proposal of WEAVER-BAILEY CONTRACTORS, INC

a corporation organized and existing under the laws of the State of ARKANSAS

or

Proposal of \_\_\_\_\_

a partnership consisting of \_\_\_\_\_

or

Proposal of \_\_\_\_\_

an individual doing business as \_\_\_\_\_

To: City of Conway

*5.12 PERCENT OF BIDDING*

This bid results from your advertisement for bids for the construction of the **Donaghey Ave. Improvements - Phase 1 (Dave Ward Dr. to Ada Ave.)**.

The undersigned Bidder, having visited the site of the work, having examined the Plans, Specifications, and other Contract Documents including all Addenda, and being familiar with all of the conditions relating to the construction of the proposed project, hereby agrees to comply with all other conditions or requirements set forth in the Plans, Specifications, and other Contract Documents, and further proposes to; furnish all material, supplies, equipment, and appliances; to furnish all labor, tools, equipment and incidentals to complete the work in accordance with the Plans, Specifications, and other Contract Documents at and for the lump sum and unit prices proposed in the attached Unit Price Schedule(s).

The undersigned Bidder agrees to begin work within ten (10) calendar days after the issuance by, or on behalf of, the Owner of a "Work Order" or "Notice to Proceed" and to complete the work within three hundred sixty (360) consecutive calendar days thereafter (except as modified in accordance with the GENERAL CONDITIONS of these Contract Documents). Should the work fail to be completed within the time herein stated, the Contractor shall pay to the Owner, as fixed and agreed liquidated damages, and not as a penalty, the sum, for each day of delay until the work is completed and accepted, as stipulated in GENERAL CONDITIONS of these Contract Documents. It is understood that additional time for the completion of the project is to be allowed only for delays as stipulated in GENERAL CONDITIONS of these Contract Documents.

Bidder acknowledges receipt of the following addendum (addenda):

#1 5-29-20 and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_

The undersigned Bidder agrees that this bid shall be good and shall not be withdrawn for a period of sixty (60) calendar days after the opening thereof. If written notice of the acceptance of this Proposal is mailed, telegraphed, or delivered to the undersigned within sixty (60) days after the opening thereof, or at any time thereafter before this Proposal is withdrawn, the undersigned agrees to execute and deliver an Agreement (Contract) in the prescribed form, and furnish the required Performance and Payment Bond, within ten (10) days after the Agreement is presented to him for signature.

It is understood by the undersigned Bidder that the Owner reserves the right to reject any or all bids.

Accompanying this Proposal as bid security is a ~~certified check~~ bid bond (*strike one*)

in the amount of FIVE PERCENT OF AMOUNT BID Dollars  
(\$\_\_\_\_\_), being not less than five percent (5%) of the total amount of the bid. If the undersigned Bidder is the successful Bidder, but fails or refuses to execute the contract and furnish the required bond within the prescribed ten (10) days of the notification of award, then this bid security is to become the property of the Owner as liquidated damages for the delay and additional expense to the Owner caused by such failure or refusal.

BIDDER: [Indicate correct name of bidding entity]

WEAVER-BAILEY CONTRACTORS, INC

By:  
[Signature]

Don L Weaver

[Printed name]

Don L Weaver

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:  
[Signature]

[Signature]

[Printed name]

JOURNAN FOSTER

Title:

V.P.

Submittal Date:

June 10, 2020

Address for giving notices:

PO Box 60

EL PASO, AR 72045

Telephone Number:

501-796-2301

Contact Name and e-mail address:

Don L Weaver

P.O. Box 60 El Paso, Ar. 72045

Bidder's License No.:

0000060520  
(where applicable)

NOTES:

Sign in ink. Do not detach.  
Items must be bid upon as specified  
in the Unit Price Schedule.



CITY OF CONWAY  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
1	E1-4.1	Site Preparation	L.S.	1	\$ 570,000.00	\$ 570,000.00
2	E2-6.1	Unclassified Excavation	C.Y.	9,446	\$ 17.88	\$ 168,894.48
3	E2-6.2	Embankment Construction	C.Y.	1,141	\$ 18.85	\$ 21,507.85
4	E2-6.3	Undercut Excavation and Backfill	C.Y.	24,296	\$ 18.03	\$ 438,056.88
5	E4-5.1	Trench and Excavation Safety System	L.S.	1	\$ 13,000.00	\$ 13,000.00
6	I1-5.1	Maintenance of Traffic	L.S.	1	\$ 152,000.00	\$ 152,000.00
7	I2-4.1	Concrete Ditch Paving	S.Y.	23	\$ 74.18	\$ 1,706.14
8	I3-6.1a	18" Reinforced Concrete Pipe, Class III	L.F.	583	\$ 58.07	\$ 33,854.81
9	I3-6.1b	24" Reinforced Concrete Pipe, Class III	L.F.	774	\$ 77.25	\$ 59,791.50
10	I3-6.1c	30" Reinforced Concrete Pipe, Class III	L.F.	345	\$ 97.21	\$ 33,537.45
11	I3-6.1d	36" Reinforced Concrete Pipe, Class III	L.F.	281	\$ 120.36	\$ 33,821.16
12	I3-6.1e	22" x 14" Reinforced Concrete Arch Pipe, Class III	L.F.	1,749	\$ 71.81	\$ 125,595.69
13	I3-6.1f	29" x 18" Reinforced Concrete Arch Pipe, Class III	L.F.	680	\$ 92.10	\$ 62,628.00
14	I3-6.1g	29" x 18" Reinforced Concrete Arch Pipe, Class IV	L.F.	186	\$ 114.55	\$ 21,306.30
15	I3-6.1h	36" x 23" Reinforced Concrete Arch Pipe, Class III	L.F.	974	\$ 120.84	\$ 117,698.16
16	I3-6.1i	44" x 27" Reinforced Concrete Arch Pipe, Class III	L.F.	96	\$ 173.21	\$ 16,628.16
17	I3-6.1j	59" x 36" Reinforced Concrete Arch Pipe, Class III	L.F.	325	\$ 212.64	\$ 69,108.00
18	I3-6.2a	22" x 14" Reinforced Concrete Arch Flared End Section	EACH	1	\$ 1,545.40	\$ 1,545.40

Corrected



CITY OF CONWAY  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
19	I3-6.2b	29" x 18" Reinforced Concrete Arch Flared End Section	EACH	1	\$ 1,831.59	\$ 1,831.59
20	I4-5.1	12' x 5' Reinforced Concrete Box Culvert	C.Y.	209	\$ 1,021.18	\$ 213,426.62
21	I5-6.1a	Drop Inlet (Type MO)	EACH	55	\$ 3,885.75	\$ 213,716.25
22	I5-6.1b	Drop Inlet (Type C)	EACH	5	\$ 6,025.93	\$ 30,129.65
23	I5-6.1c	Drop Inlet (Reverse Throat)	EACH	2	\$ 6,727.28	\$ 13,454.56
24	I5-6.1d	4' Extension	EACH	35	\$ 1,272.56	\$ 44,539.60
25	I5-6.1e	Junction Box (Type ST)	EACH	9	\$ 5,742.45	\$ 51,682.05
26	I7-6.1	4" Pipe Underdrain	L.F.	451	\$ 12.58	\$ 5,673.58
27	I8-5.1a	Permanent Pavement Repair	S.Y.	310	\$ 80.41	\$ 24,927.10
28	I8-5.1b	Temporary Pavement Repair	S.Y.	28	\$ 47.65	\$ 1,334.20
29	I10-4.1	Wood Privacy Fence	L.F.	73	\$ 39.38	\$ 2,874.74
30	I12-5.1	Temporary Erosion Control	L.S.	1	\$ 64,495.71	\$ 64,495.71
31	I13-5.1	Sodding	S.Y.	8,512	\$ 6.86	\$ 58,392.32
32	I15-5.1a	Concrete Island (8")	S.Y.	162	\$ 65.29	\$ 10,576.98
33	I15-5.1b	Concrete Truck Apron (12")	S.Y.	439	\$ 82.15	\$ 36,063.85
34	I16-5.1a	Sidewalk	S.Y.	7,734	\$ 50.49	\$ 390,489.66
35	I16-5.1b	Ramps (Type 3)	S.Y.	342	\$ 181.09	\$ 61,932.78
36	I16-5.1c	Ramps (Type 5)	S.Y.	14	\$ 181.23	\$ 2,537.22

Corrected





**CITY OF CONWAY**  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
37	I16-5.1d	Ramps (ARDOT-Type 3)	S.Y.	13	\$ 233.80	\$ 3,039.40
38	I16-5.1e	Ramps (Island)	S.Y.	55	\$ 174.39	\$ 9,591.45
39	I16-5.1f	Concrete Steps	S.Y.	4	\$ 1,162.33	\$ 4,649.32
40	I17-5.1a	Concrete Combination Curb and Gutter (Type A) (2'-0")	L.F.	9,522	\$ 17.48	\$ 166,444.56
41	I17-5.1b	Concrete Combination Curb and Gutter (Type A) (6'-0")	L.F.	257	\$ 72.52	\$ 18,637.64
42	I17-5.1c	Concrete Combination Curb and Gutter (Type E-1) (2'-0")	L.F.	251	\$ 27.69	\$ 6,950.19
43	I18-4.1	Roadway Construction Control	L.S.	1	\$ 57,033.49	\$ 57,033.49
44	I19-6.1	Mailbox Relocation	L.S.	1	\$ 1,848.00	\$ 1,848.00
45	I20-5.1	Delineator	EACH	180	\$ 84.00	\$ 15,120.00
46	I21-5.1	Brick Pavers	S.Y.	557	\$ 281.16	\$ 156,606.12
47	I22-5.1	Flowable Fill	C.Y.	58	\$ 142.66	\$ 8,274.28
48	I23-5.1	Concrete Island Behind Walk (8")	S.Y.	36	\$ 65.26	\$ 2,349.36
49	L1-6.1	Plant Materials	L.S.	1	\$ 7,245.00	\$ 7,245.00
50	L2-6.1	Irrigation	L.S.	1	\$ 18,480.00	\$ 18,480.00
51	L3-6.1	Modular Block Wall	S.F.	600	\$ 59.85	\$ 35,910.00
52	M3-4.1	Cold Milling Asphalt Pavement	S.Y.	16,052	\$ 1.94	\$ 31,140.88
53	M5-5.1	Pipe Embedment	C.Y.	894	\$ 47.85	\$ 42,777.90
54	P1-5.1	Aggregate Base Course (Class 7)	TON	8,074	\$ 25.09	\$ 202,576.66



**CITY OF CONWAY**  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
55	P3-5.1a	ACHM Surface Course	TON	6,476	\$ 87.62	\$ 567,427.12
56	P3-5.1b	ACHM Binder Course	TON	3,360	\$ 62.27	\$ 209,227.20
57	P5-5.1a	Commercial Driveway	S.Y.	1,140	\$ 83.71	\$ 95,429.40
58	P5-5.1b	Residential Driveway	S.Y.	465	\$ 73.41	\$ 34,135.65
59	P5-5.1c	ArDOT Driveway	S.Y.	269	\$ 64.61	\$ 17,380.09
60	P6-4.1a	Portland Cement Concrete Base (6")	S.Y.	837	\$ 42.68	\$ 35,723.16
61	P6-4.1b	Portland Cement Concrete Base (8")	S.Y.	2,036	\$ 65.58	\$ 133,520.88
62	T1-5.1a	Thermoplastic Pavement Marking - 4" White	L.F.	9,153	\$ 0.71	\$ 6,498.63
63	T1-5.1b	Thermoplastic Pavement Marking - 4" Yellow	L.F.	12,557	\$ 0.71	\$ 8,915.47
64	T1-5.1c	Thermoplastic Pavement Marking - 6" White	L.F.	7,721	\$ 0.78	\$ 6,022.38
65	T1-5.1d	Thermoplastic Pavement Marking - 12" White	L.F.	1,960	\$ 6.56	\$ 12,857.60
66	T1-5.1e	Thermoplastic Pavement Marking - 24" White	L.F.	288	\$ 17.38	\$ 5,005.44
67	T1-5.1f	Thermoplastic Pavement Marking - Green	S.F.	6,181	\$ 10.87	\$ 67,187.47
68	T1-5.1g	Thermoplastic Pavement Marking - (Bicycle & Arrow)	EACH	49	\$ 309.75	\$ 15,177.75
69	T1-5.1h	Thermoplastic Pavement Marking (Arrows)	EACH	51	\$ 393.75	\$ 20,081.25
70	T1-5.1i	Thermoplastic Pavement Marking (Words)	EACH	8	\$ 288.75	\$ 2,310.00
71	T1-5.1j	Thermoplastic Pavement Marking (Yield Line)	L.F.	72	\$ 18.90	\$ 1,360.80
72	T2-4.1a	Standard Roadside Sign	S.F.	311	\$ 36.75	\$ 11,429.25



**CITY OF CONWAY**  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
73	T2-4.1b	Guide Sign	S.F.	28	\$ 78.75	\$ 2,205.00
74	T2-4.1c	Street Name Sign	S.F.	26	\$ 42.00	\$ 1,092.00
75	W2-5.1	Valve, Meter, or Pull Box Adjusted to Grade	EACH	20	\$ 262.50	\$ 5,250.00
76	SP & 701	System Local Controller TS2-Type 2 (8 Phases)	EACH	1	\$ 1,693.91	\$ 1,693.91
77	SP & 701	System Local Controller TS2-Type 2, E-NET (8 Phases)	EACH	1	\$ 24,870.04	\$ 24,870.04
78	SP	Ethernet Switch, T100 Hardened (8-Port)	EACH	1	\$ 3,423.26	\$ 3,423.26
79	SP	E-NET Cable (Exterior CAT 5E)	L.F.	314	\$ 1.94	\$ 609.16
80	SP	Local Radio (E-NET 5.8) with Antenna	EACH	1	\$ 4,054.05	\$ 4,054.05
81	SP	Local Repeater Radio with Antenna	EACH	1	\$ 2,893.80	\$ 2,893.80
82	SP	Battery Backup System	EACH	1	\$ 9,560.25	\$ 9,560.25
83	SP	Relocate PTZ Camera System	EACH	1	\$ 477.75	\$ 477.75
84	SP & 706	Traffic Signal Head, Led, (3 Section, 1 Way)	EACH	11	\$ 963.27	\$ 10,595.97
85	SP	Traffic Signal Head, Led, (3 Section, 1 Way, 8 Inch, Bicycle)	EACH	4	\$ 1,374.45	\$ 5,497.80
86	SP & 706	Traffic Signal Head, Led, (4 Section, 1 Way)	EACH	1	\$ 1,308.30	\$ 1,308.30
87	SP & 706	Traffic Signal Head, Led, (5 Section, 1 Way)	EACH	4	\$ 1,543.50	\$ 6,174.00
88	SP	Traffic Signal Modification	L.S.	1	\$ 9,525.60	\$ 9,525.60
89	SP	Pedestrian Signal Head Relocation	EACH	3	\$ 477.75	\$ 1,433.25
90	SP & 707	Countdown Pedestrian Signal Head, LED	EACH	12	\$ 1,617.00	\$ 19,404.00

Corrected



**CITY OF CONWAY**  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
91	708	Traffic Signal Cable (5C/14 A.W.G.)	L.F.	5,360	\$ 1.79	\$ 9,594.40
92	708	Traffic Signal Cable (7C/14 A.W.G.)	L.F.	771	\$ 2.00	\$ 1,542.00
93	708	Traffic Signal Cable (12C/14 A.W.G.)	L.F.	188	\$ 3.15	\$ 592.20
94	708	Traffic Signal Cable (20C/14 A.W.G.)	L.F.	239	\$ 5.04	\$ 1,204.56
95	SP	Electrical Conductors-in-Conduit (1C/8 A.W.G., E.G.C.)	L.F.	773	\$ 1.42	\$ 1,097.66
96	SP	Electrical Conductors-in-Conduit (1C/12 A.W.G., E.G.C.)	L.F.	150	\$ 1.05	\$ 157.50
97	SP	Electrical Conductors-in-Conduit (2C/6 A.W.G.)	L.F.	67	\$ 2.57	\$ 172.19
98	SP	Electrical Conductors for Luminaires	L.F.	622	\$ 1.58	\$ 982.76
99	709	Galvanized Steel Conduit (2")	L.F.	30	\$ 37.64	\$ 1,129.20
100	710	Non-Metallic Conduit (2")	L.F.	303	\$ 11.29	\$ 3,420.87
101	710	Non-Metallic Conduit (3")	L.F.	350	\$ 22.79	\$ 7,976.50
102	711	Concrete Pull Box (Type 2)	EACH	2	\$ 529.20	\$ 1,058.40
103	711	Concrete Pull Box (Type 2 HD)	EACH	9	\$ 772.54	\$ 6,952.86
104	713	Span Wire Assembly (Temporary)	EACH	1	\$ 1,680.00	\$ 1,680.00
105	SS & 714	Traffic Signal Mast Arm and Pole with Foundation (26')	EACH	1	\$ 12,587.40	\$ 12,587.40
106	SS & 714	Traffic Signal Mast Arm and Pole with Foundation (34')	EACH	2	\$ 12,955.95	\$ 25,911.90
107	SP	LED Luminaire Assembly	EACH	3	\$ 755.37	\$ 2,266.11
108	SS & 715	Traffic Signal Pedestal Pole with Foundation	EACH	4	\$ 3,050.25	\$ 12,201.00

Corrected





CITY OF CONWAY  
**DONAGHEY AVE. IMPROVEMENTS - PHASE 1 (DAVE WARD DR. TO ADA AVE.)**  
**JOB 18-110 - UNIT PRICE SCHEDULE**

ITEM NO.	SPEC. NO	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
109	SP	Service Point Assembly (2 Circuits)	EACH	2	\$ 2,447.55	\$ 4,895.10
110	SP	Removal Of Traffic Signal Equipment	L.S.	1	\$ 3,616.20	\$ 3,616.20
111	716	Treated Wood Pole (Class 2, 40')	EACH	2	\$ 2,806.65	\$ 5,613.30
112	716	Treated Wood Pole (Class 6, 20')	EACH	2	\$ 801.15	\$ 1,602.30
113	SP & 726	Standard Sign	S.F.	45	\$ 5.25	\$ 236.25
114	SP	18" Street Name Sign	EACH	3	\$ 918.75	\$ 2,756.25
115	733	Video Detector Relocation	EACH	3	\$ 273.00	\$ 819.00
116	SP & 733	Video Detector (CLR)	EACH	3	\$ 3,138.45	\$ 9,415.35
117	733	Video Cable	L.F.	1,077	\$ 5.30	\$ 5,708.10
118	733	Video Monitor (CLR)	EACH	2	\$ 1,153.95	\$ 2,307.90
119	SP & 733	Video Processor, Edge Card (2 Camera)	EACH	5	\$ 6,291.60	\$ 31,458.00
120	SP & 733	Video Edge Card Extender	EACH	1	\$ 3,542.70	\$ 3,542.70
121	SP & 733	Vehicle Detector Rack (16 Channel)	EACH	2	\$ 3,050.25	\$ 6,100.50
122	SP19-5.1	Electrical Infrastructure	L.S.	1	\$ 14,105.07	\$ 14,105.07

Corrected

Total Bid \$ 5,499,893.90



## 010420 - STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder.
2. Permanent main office address.
3. When organized.
4. If a corporation, where incorporated.
5. How many years have been engaged in the contracting business under your present firm or trade name?
6. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion).
7. General character of work performed by your company.
8. Have you ever failed to complete any work awarded to you?
9. Have you ever defaulted on a Contract?  
If so, where and why?
10. Have you ever been fined or had your license suspended by a Contractor's Licensing Board?  
If so, where and why?
11. List the more important projects recently completed by your company, stating the approximate cost for each, and the month and year completed.
12. List your major equipment available for this Contract.
13. Experience in construction work similar in importance to this project.
14. Background and experience of the principal members of your organization, including the officers.
15. Background and experience of the Master Electrician(s) licensed in the state of Arkansas (issued by the Arkansas Board of Electrical Examiners) who have proper skills in supervising, performing, and maintaining the electrical work.
16. Credit available: \$\_\_\_\_\_.
17. Give Bank reference: \_\_\_\_\_.
18. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner?
19. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner, in verification of the recitals comprising this statement of Bidder's Qualifications.



**STATEMENT OF BIDDER'S QUALIFICATIONS**

1. Weaver-Bailey Contractors, Inc.
2. P. O. Box 60; El Paso, AR 72045
3. 1960
4. 1967 Conway, AR
5. 53 years
6. LIT Terminal Ramp \$9,887,975.97 9/30/21  
AHTD 061506 \$1,235,328.83 11/15/20
7. Outstanding
8. No
9. No
10. No
11. AHTD CA0605 \$87,000,000.00 5/31/19  
LRAP Taxi A&B \$16,000,000.00 6/31/17  
AHTD BB0602 \$12,600,000.00 3/15/16  
AHTD 100402 \$11,700,000.00 10/31/15  
AHTD 061244 \$78,000,000.00 11/30/15
12. Caterpillar Motor Graders-6 each  
Gomaco Paving Equipment-15 pieces  
Rex Model S Concrete Plants – 3 each  
Over 100 pieces of other equipment
13. LRAP-Taxiway A&B, LRNA-Taxiway F, Taxiway D, Runway 18, Runup Pad on 18-36R  
NLR Airport Runway  
Stuttgart Airport  
Hope Airport Taxiway  
Conway Airport – Runway, Taxiway, Corporate and Terminal Apron, and Access Road
14. Charles Weaver, Owner. Over 50 years in construction  
Don Weaver, President. Over 40 years with Weaver-Bailey Contractors.  
Jonathan Foster, Vice President. Over 20 years, 7 years with Weaver-Bailey.  
Harold Woodward, Paving Supt. Over 40 years plus with Weaver-Bailey.  
Jim Jolly, General Supt. Over 45 years, 30 years plus with Weaver-Bailey.
15. None Pending
16. 15,000,000.00
17. Centennial Bank of Conway  
Susan Cole
18. Yes
19. See signature page
20. Weaver-Bailey Contractors is not involved in any known legal or administrative proceedings.



010440 - LIST OF PROPOSED SUBCONTRACTORS

I, the undersigned General Contractor, hereby certify that proposals from the following Subcontractors were used in the preparation of my bid. I agree that if I am the successful Bidder and if the following subcontracts are approved, I will not enter into contracts with others for these divisions of the work without prior written approval from the Engineer and the Owner.

For Annual Gross Receipts:

- Enter 1 for Less than \$1 Million
- Enter 2 for More than \$1 Million, Less than \$5 Million
- Enter 3 for More than \$5 Million, Less than \$10 Million
- Enter 4 for More than \$10 Million, Less than \$15 Million
- Enter 5 for More than \$15 Million

**Type of Work:** STRIPING  
Subcontractor's Name: CONTRACTOR'S SPECIALTY  
AR License No.: 0022490421  
Address: PO BOX 1058 BRYANT, AR 72089  
DBE:  Yes / No (circle one) Contract Amount: \$142,222.09  
Date Firm Established: 1989  
Annual Gross Receipts (enter the range only): 5

**Type of Work:** ELECTRICAL  
Subcontractor's Name: CM + M ENTERPRISE LLC  
AR License No.: 0385160520  
Address: PO BOX 711 NORTH LITTLE ROCK, AR 72115  
DBE: Yes /  No (circle one) Contract Amount: \$270,657.30  
Date Firm Established: 2018  
Annual Gross Receipts (enter the range only): 2

**Type of Work:** .....  
Subcontractor's Name: .....  
AR License No.: .....  
Address: .....  
DBE: Yes / No (circle one) Contract Amount: .....  
Date Firm Established: .....  
Annual Gross Receipts (enter the range only): .....

**Type of Work:** .....  
Subcontractor's Name: .....  
AR License No.: .....

010440 - LIST OF PROPOSED SUBCONTRACTORS

I, the undersigned General Contractor, hereby certify that proposals from the following Subcontractors were used in the preparation of my bid. I agree that if I am the successful Bidder and if the following subcontracts are approved, I will not enter into contracts with others for these divisions of the work without prior written approval from the Engineer and the Owner.

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- Enter 1 for Less than \$1 Million
- Enter 2 for More than \$1 Million, Less than \$5 Million
- Enter 3 for More than \$5 Million, Less than \$10 Million
- Enter 4 for More than \$10 Million, Less than \$15 Million
- Enter 5 for More than \$15 Million

Type of Work: ASPHALT PAVING  
Subcontractor's Name: ROGERS GROUP INC  
AR License No.: 0039470720  
Address: 1223 FRONT ST CONWAY, AR 72032  
DBE: Yes /  No (circle one) Contract Amount: \$824,136.40  
Date Firm Established: 1908  
Annual Gross Receipts (enter the range only): 5

Type of Work: EROSION CONTROL  
Subcontractor's Name: ENVIROTRAC  
AR License No.: 0253790321  
Address: PO Box 985 DANVILLE, AR 72833  
DBE:  Yes / No (circle one) Contract Amount: \$84,579.38  
Date Firm Established: 2011  
Annual Gross Receipts (enter the range only): 2

Type of Work: LANDSCAPE + IRRIGATION  
Subcontractor's Name: LITTLE ROCK LANDSCAPE, INC  
AR License No.: 0025080421  
Address: 9700 HWY 5 NORTH ALEXANDER, AR 72002  
DBE: Yes /  No (circle one) Contract Amount: \$38,698.00  
Date Firm Established: 1978  
Annual Gross Receipts (enter the range only): 2

Type of Work: SIGNS  
Subcontractor's Name: TIME STRIPING  
AR License No.: 0017280420



Address: PO Box 1236 VAN BUREN, AR 72957

DBE:  Yes /  No (circle one) Contract Amount: \$82,075.00

Date Firm Established: 1988

Annual Gross Receipts (enter the range only): 5

**Bidder** (General Contractor): WEAVER-BAILEY CONTRACTORS, INC

AR License No.: 0000060520

Address: PO Box 60 EL PASO, AR 72045

DBE: Yes /  No (circle one)

Date Firm Established: 1960

Annual Gross Receipts (enter the range only): 5

By: Dan Weaver \*

Title: President

Percent of Contract to be Completed by DBE: 5.6%

\*Signature must be the same as on the Proposal form.

**Notes:**

- (1) This form must be completed and submitted at the time of the bid opening.
- (2) General contractor and subcontractors shall have a certificate of license with the proper classification from the State Contractors Licensing Board before his or her bid is submitted.
- (3) Certificates of license shall be provided with this form at the time of the bid opening.





# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

6/18/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> The Cashion Company P.O. Box 550  Little Rock AR 72203		<b>CONTACT NAME:</b> Julie Martin <b>PHONE (A/C No. Ext):</b> (501)376-0716 <b>FAX (A/C No):</b> (501)376-2118 <b>E-MAIL ADDRESS:</b> juliem@cashionco.com	
		<b>INSURER(S) AFFORDING COVERAGE</b>	
		<b>NAIC #</b>	
		INSURER A: Zurich American Ins. Co. 16535	
		INSURER B: Navigators Specialty Insurance Co. 36056	
		INSURER C: Westchester Surplus Lines Inc. Co. 10172	
		INSURER D: Great American Insurance Co. 16691	
		INSURER E:	
		INSURER F:	

**COVERAGES****CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY			GLO1125134	5/1/2020	5/1/2021	EACH OCCURRENCE	\$ 1,000,000	
	<input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 500,000	
	<input checked="" type="checkbox"/> Incl Contractual	X	Y				MED EXP (Any one person)	\$ 15,000	
	<input checked="" type="checkbox"/> XCU Included						PERSONAL & ADV INJURY	\$ 1,000,000	
GEN'L AGGREGATE LIMIT APPLIES PER:							GENERAL AGGREGATE	\$ 2,000,000	
	<input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						PRODUCTS - COMP/OP AGG	\$ 2,000,000	
	OTHER:						Employee Benefits	\$ 1,000,000	
A	<b>AUTOMOBILE LIABILITY</b>			BAP1125135	5/1/2020	5/1/2021	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000	
	<input checked="" type="checkbox"/> ANY AUTO						BODILY INJURY (Per person)	\$	
	<input type="checkbox"/> ALL OWNED AUTOS	<input type="checkbox"/> SCHEDULED AUTOS	X				Y	BODILY INJURY (Per accident)	\$
	<input checked="" type="checkbox"/> HIRED AUTOS	<input checked="" type="checkbox"/> NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	\$
								\$	
B-D	<b>UMBRELLA LIAB</b>	<input checked="" type="checkbox"/> OCCUR		H020EXCZ058VPIC	6/1/2020	5/1/2021	EACH OCCURRENCE	\$ 30,000,000	
	<input checked="" type="checkbox"/> EXCESS LIAB	<input type="checkbox"/> CLAIMS-MADE		G71810008001	6/1/2020	5/1/2021	AGGREGATE	\$ 30,000,000	
	DED <input checked="" type="checkbox"/> RETENTION \$ 0		X	Y	TUE5578150 14	6/1/2020	5/1/2021		\$
A	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b>			WC1125133	5/1/2020	5/1/2021	<input checked="" type="checkbox"/> PER STATUTE		
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	Y/N	N/A				Y	E.L. EACH ACCIDENT	\$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below							E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
								E.L. DISEASE - POLICY LIMIT	\$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Project: Donaghey Ave. Improvements Phase 1;

If project awarded, 60 day notice of cancellation will be provided to the Owner &amp; Garver, LLC

See Attached Comments/Remarks Section

**CERTIFICATE HOLDER****CANCELLATION**

City of Conway  
& Garver, LLC  
831 Parkway, Suite C  
Conway, AR 72034

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

M Cashion, Jr./JKM001

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## COMMENTS/REMARKS

WEAVER BAILEY CONTRACTORS, INC.

**ENDORSED ADDITIONAL INSURED:**

If required by written contract, certificate holder is included as an additional insured on a primary and noncontributory basis.

("X" denotes coverage.)

**ENDORSED WAIVER OF SUBROGATION:**

If required by written contract, waiver of subrogation applies in favor of certificate holder.

("Y" denotes coverage.)

**010480 - BIDDER'S CHECKLIST OF REQUIRED ITEMS**

This Bidder's Checklist is provided to ensure all required forms are completed and returned as part of the bid submission. All forms must be included as indicated for a bid to be considered a complete, responsive bid. Appropriate signatures and date are required on each document. If an item is missing, the bid may be declared unresponsive and therefore rejected. **This sheet will serve as the cover sheet for the bid submission.**

<b>Spec. Section</b>	<b>Description</b>	<b>Completed*</b>
	Acknowledgement of All Addenda	<input checked="" type="checkbox"/>
	<b>Bid contains the following forms:</b>	
010200	1. Insurance Coverages (Current Auto and Liability Insurance)	<input checked="" type="checkbox"/>
010300	2. Bid Bond	<input checked="" type="checkbox"/>
010400	3. Proposal	<input checked="" type="checkbox"/>
010410	3. Unit Price Schedule	<input checked="" type="checkbox"/>
010420	4. Statement of Bidder's Qualifications	<input checked="" type="checkbox"/>
010440	5. List of Proposed Subcontractors	<input checked="" type="checkbox"/>

\*Check when filled out, signed, and included with submission of bid packet.

**Within three (3) days after Bid Opening:**

Bidder acknowledges to provide within three (3) days after Bid Opening (Low Bidder and Second Low Bidder Only):

- |        |  |
|--------|--|
| 010430 | <ul style="list-style-type: none"> <li>1. Bidder's Qualifications of Subcontractor (if requested)</li> <li>2. List of Manufacturers (if applicable)</li> <li>3. Bid breakdown shall be provided to form the basis for the making of Progress Partial Payments (if applicable)</li> </ul> |
|--------|--|

**Within ten (10) days after Notice of Award:**

Bidder acknowledges that within ten (10) days after Notice of Award, Successful Contractor is required to complete the following before execution and award of the contract:

- |        |  |
|--------|--|
| 010600 | 1. Contract (all pages and supporting documents) |
| 010700 | 2. Performance Bond                              |
| 010720 | 3. Payment Bond                                  |
| 010900 | 4. Maintenance Bond (if applicable)              |
| 010800 | 5. Statutory Bond (if applicable)                |
| 010800 | 6. Completed Certificates of Insurance           |

**Prior to Construction:**

Contractor required to submit Construction Schedule before construction begins.



Seal (if incorporated)

Bidder Name: WEAVER-BAILEY CONTRACTORS, INC

Address: PO Box 60

City, State, Zip Code: El Paso, AR 72045

Contractor Number: 0000060520

Contact Name: DON WEAVER

Title: PRESIDENT

Contact Number: 501-796-2301

Contact Email: don@weaverbailey.com

Signature of Authorized Agent for Bidder:

A handwritten signature in black ink that reads "Don Weaver". The signature is written in a cursive style and is positioned above a horizontal line.

Date: JUN 10, 2020

**010600 - CONTRACT**

THIS AGREEMENT made this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, by and between  
Weaver-Bailey Contractors, Inc. a Corporation  
organized and existing under the laws of the State of Arkansas hereinafter called the  
"Contractor", and City of Conway, hereinafter called the "Owner".

**W I T N E S S E T H:**

That the Contractor and the Owner for the consideration stated herein mutually agree as follows:

**ARTICLE 1. Statement of Work.** The Contractor shall furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment, incidentals and services, including utility and transportation services and perform and complete all work required for the construction of **Donaghey Ave. Improvements – Phase 1 (Dave Ward Dr. to Ada Ave.)** in strict accordance with the Contract Documents.

**ARTICLE 2. The Contract Price.** The Owner will pay the Contractor, because of his performance of the Contract, for the total quantities of work performed at the lump sum and unit prices stipulated in the Proposal subject to additions, and deductions as provided in the Section entitled "CHANGES IN THE WORK" under GENERAL CONDITIONS.

**ARTICLE 3. Contract Time.** The Contractor agrees to begin work within ten (10) calendar days after issuance by the Owner of a "Work Order" or "Notice to Proceed" and to complete the work within three hundred sixty (360) consecutive calendar days thereafter (except as modified in accordance with the GENERAL CONDITIONS of these Contract Documents). If the Contractor shall fail to complete the work within the time specified, he and his Surety shall be liable for payment to the Owner, as liquidated damages ascertained and agreed, and not in the nature of a penalty, the amount specified in GENERAL CONDITIONS of these Contract Documents for each day of delay. To the extent sufficient in amount, liquidated damages shall be deducted from the payments to be made under this Contract.

**ARTICLE 4. Contract.** The executed Contract Documents shall consist of the following:

- a. Executed Contract
- b. Addenda (if any)
- c. Advertisement for Bids
- d. Instructions to Bidders
- e. Proposal
- f. Unit Price Schedule
- g. Statement of Bidder's Qualifications
- h. List of Proposed Subcontractors
- i. Performance and Payment Bonds
- j. General Conditions
- k. Special Conditions
- l. Special Provisions and Supplemental Specifications
- m. Technical Specifications
- n. Drawings
- o. Certificates of Insurance and Insurance Policies

This Contract together with other Documents enumerated in this Article 4, which said other Documents are as fully a part of the Contract Documents as if hereto attached or herein repeated, form the Contract between the parties hereto. In the event that any provisions in any component part of this Contract conflicts with any

provision of any other component part, the conflict shall be resolved by the Engineer whose decision shall be final.

ARTICLE 5. Surety. The Surety on the Performance and Payment Bonds shall be a surety company of financial resources satisfactory to the Owner, authorized to do business in the State of the Project, and shall comply with applicable state laws.

IN WITNESS WHEREOF, the parties hereto have caused this Contract to be executed in four (4) counterparts, each of which shall be considered an original on the day and year first written.

Weaver-Bailey Contractors, Inc.  
(Contractor)

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

Title: \_\_\_\_\_

2564 Hwy 5  
(Street)

El Paso, AR 72045  
(City)

City of Conway, Arkansas  
(Owner)

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

Title: \_\_\_\_\_

\_\_\_\_\_  
(Print the names underneath all signatures)



## 010700 - PERFORMANCE BOND

### 1. NOTIFICATION

The Surety's obligation under this Bond shall arise after:

- 1.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Default. Such notice shall indicate that the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. Unless the Owner agrees otherwise, any conference requested under this Paragraph shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- 1.2 The Owner declares a Default, terminates the Construction Contract and notifies the Surety.

Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Failure on the part of the Owner to comply with the notice requirement shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations.

The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

### 2. SURETY'S ACTIONS

When the Owner has satisfied the conditions of Paragraph 1, the Surety shall promptly and at the Surety's expense take one of the following actions:

- 2.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
- 2.2 Undertake to perform and complete the Construction Contract itself, through its mutually acceptable agents or independent contractors;
- 2.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 3 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
- 2.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
  - 2.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
  - 2.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

### 3. SURETY OBLIGATIONS

If the Surety elects to act under Paragraph 2.1, 2.2, or 2.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

- 3.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- 3.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 2; and
- 3.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

### 4. SURETY DEFAULT

If the Surety does not proceed as provided in Paragraph 2 with reasonable promptness, the Surety shall be deemed to be in default on this Bond ten days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 2.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

### 5. PROCEEDINGS

Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

### 6. STATUTORY REQUIREMENTS

When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted hereto and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

7. PERFORMANCE BOND CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS:

THAT WE, \_\_\_\_\_

as Principal, hereinafter called "Principal", and \_\_\_\_\_

\_\_\_\_\_, State of \_\_\_\_\_, as

Surety, hereinafter called "Surety", are held and firmly bound unto the City of Conway, Conway, AR, as Obligee, hereinafter called "Owner", in the amount of:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_),

in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal entered into a Contract with the Owner by written agreement dated the \_\_\_\_ day of \_\_\_\_\_, 20\_\_, a copy of which is attached hereto and made a part hereof, hereinafter referred to as the Contract,

**"Donaghey Ave. Improvements – Phase 1 (Dave Ward Dr. to Ada Ave.)"**

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract, including without limitation the maintenance warranty thereof, during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

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 an extension of time for the performance of the Contract, or any other forbearance on the part either of the Owner or the Principal to the other shall not release in any way the Principal and Surety, or either of these, their heirs, personal representatives, successors, or assigns from their liability hereunder, notice to the Surety of any alteration, extension or forbearance hereby being waived.

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

This bond is executed pursuant to the terms of Arkansas Code Annotation §§ 18-44-501 et. Seq., as amended.



Executed on this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

SEAL

\_\_\_\_\_  
Principal

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

By \_\_\_\_\_  
Print Name and Title

SEAL

\_\_\_\_\_  
Surety

By \_\_\_\_\_  
Attorney-In-Fact - Signature

By \_\_\_\_\_  
Attorney-In-Fact - Print Name and Title

Surety Address for giving Notices: \_\_\_\_\_  
\_\_\_\_\_

NOTES: Attach Power of Attorney.

Date of Bond must not precede date of Contract.

A copy of this Bond must be filed with the  
Circuit Clerk in each county wherein the work  
is to be performed.



## 010720 - PAYMENT BOND

### 1. NOTIFICATION

The Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in the Bond Certificate) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations. When the Owner has made notification, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

The Surety's obligations to a Claimant under this Bond shall arise after Claimants have furnished a written notice of non-payment to the Contractor, Surety, or Owner, stating with substantial accuracy the amount claimed and the name of the party to whom the materials, labor, or equipment was furnished or supplied. It is sufficient if a notice of non-payment is given to the Contractor by the Owner.

### 2. SURETY'S OBLIGATION

When a Claimant has satisfied the conditions of Paragraph 1, the Surety shall promptly and at the Surety's expense take the following actions:

- 2.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
- 2.2 Pay or arrange for payment of any undisputed amounts.
- 2.3 The Surety's failure to discharge its obligations under Paragraph 2.1 or 2.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 2.1 or 2.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

### 3. DEDICATION OF BOND FUNDS

Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

### 4. OTHER OBLIGATIONS

The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make

payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

#### 5. PROCEEDINGS

No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

#### 6. STATUTORY REQUIREMENTS

When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted hereto and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.



7. PAYMENT BOND CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS:

THAT WE, \_\_\_\_\_

as Principal, hereinafter called "Principal", and \_\_\_\_\_

\_\_\_\_\_, State of \_\_\_\_\_, as

Surety, hereinafter called "Surety", are held and firmly bound unto the City of Conway, Conway, Arkansas, as Obligee, hereinafter called "Owner", in the amount of:

\_\_\_\_\_  
Dollars (\$ \_\_\_\_\_),

in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal entered into a Contract with the Owner by written agreement dated the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is attached hereto and made a part hereof, hereinafter referred to as the Contract,

**"Donaghey Ave. Improvements – Phase 1 (Dave Ward Dr. to Ada Ave.)"**

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor performed in such work, whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

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 an extension of time for the performance of the Contract, or any other forbearance on the part either of the Owner or the Principal to the other shall not release in any way the Principal and Surety, or either of these, their heirs, personal representatives, successors, or assigns from their liability hereunder, notice to the Surety of any alteration, extension or forbearance hereby being waived.

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

This bond is executed pursuant to the terms of Arkansas Code Annotation §§ 18-44-501 et. Seq., as amended.



Executed on this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

SEAL

\_\_\_\_\_  
Principal

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

By \_\_\_\_\_  
Print Name and Title

SEAL

\_\_\_\_\_  
Surety

By \_\_\_\_\_  
Attorney-In-Fact - Signature

By \_\_\_\_\_  
Attorney-In-Fact - Print Name and Title

Surety Address for giving Notices: \_\_\_\_\_

\_\_\_\_\_

NOTES: Attach Power of Attorney.

Date of Bond must not precede date of Contract.

A copy of this Bond must be filed with the  
Circuit Clerk in each county wherein the work  
is to be performed.



## 010800 - GENERAL CONDITIONS

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## GC.1 DEFINITIONS

Wherever used in any of the Contract Documents, the following meanings shall be given to the terms herein defined:

(1) "Addendum" means any change, revision, or clarification of the Contract Documents which has been duly issued by the Owner, or the Engineer, to prospective Bidders prior to the time of receiving bids.

(2) "Award" means the acceptance by the owner of the successful bidder's proposal.

(3) "Balance of the Contract Price" means the total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

(4) "Bidder" means any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.

(5) "Calendar Day" means every day shown on the calendar.

(6) "Change Order" means a written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for the scope of work affected by the change. The work covered by the change order shall be within the scope of the contract.

(7) "Claim" means (a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

(8) "Contract" means the Contract executed by the Owner and the Contractor of which these GENERAL CONDITIONS form a part.

(9) "Contract Documents" means and shall include, but not be limited to, the following: Executed Contract, Addenda (if any), Advertisement For Bids, Instructions to Bidders, Statement of Bidders Qualifications, List of Proposed Subcontractors, Proposal, Performance-Payment Bond, General Conditions, Special Conditions, Technical Specifications, and Drawings.

(10) "Contractor" means the person, firm, or corporation entering into the Contract with the Owner to construct and install the improvements embraced in this project.

(10) "Default" means the failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Contract Documents.

(11) "Defective" means Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents, or does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to Engineer's recommendation of final payment.

(11) "Engineer" means the Owner or any other person or persons employed by said Owner to furnish engineering services in connection with the construction embraced in the Contract.

(12) "Local Public Agency" or "Owner" means the City of Conway, which is authorized to undertake this Contract.

(13) "Plans" or "Drawings" means the official drawings or exact reproductions which show the location, character, and details of the work contemplated, and which are to be considered part of the contract, supplementary to the specifications.

(14) "Proposal" means the written offer of the Bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the Plans and Specifications.

(15) "Specifications" means a part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials, or testing, which are sited in the specifications by reference shall have the same force and effect as if included in the contract physically.

(16) "Subcontractors" shall mean the individual, partnership or corporation entering into an agreement with the Contractor to perform any portion of the work covered by the Plans and Specifications.

(17) "Surety" shall mean any person, firm, or corporation that has executed, as Surety, the Contractor's Performance Bond securing the performance of the Contract.

(18) "Technical Specifications" means that part of the Contract documents which describes, outlines and stipulates the quality of the materials to be furnished; the quality of workmanship required; and the controlling requirements to be met in carrying out the construction work to be performed under this Contract. This also includes Special Provisions.

(19) "Work" shall mean the furnishing of all necessary labor, tools, equipment, appliances, supplies, and material other than materials furnished by the Owner as specified to complete the construction covered by the Plans and Specifications.

(20) "Substantial Completion" shall mean the completion of the project to the extent that all component parts are suitable for their intended use and the final punch list has been completed. The Owner, at his or her sole discretion, may waive punch list items required for substantial completion.

## GC.2 SUPERINTENDENCE BY CONTRACTORS

Except where the Contractor is an individual and gives his personal superintendence to the work, the Contractor shall provide a competent superintendent, satisfactory to the Owner and the Engineer, on the work at all times during working hours with full authority to supervise and direct the work and who shall be the Contractor's agent responsible for the faithful discharge of the Contractor's obligations under the Contract. During working hours, the Contractor's superintendent shall be equipped with a mobile phone or other communication device suitable to the Engineer for contact by the Engineer or Owner.

The Owner shall have the authority to require the Contractor to remove from the work any incompetent or insubordinate superintendent.

## GC.3 CONTRACTOR'S EMPLOYEES

The Contractor shall employ only competent skillful workers and shall at all times enforce strict discipline and good order among the employees.

The Contractor shall neither permit nor suffer the introduction or use of alcoholic beverages or controlled substances upon or about the work embraced in this Contract.



The Contractor shall be responsible to conduct business and carry out the work on this Project utilizing the highest level of respect, manners, deportment, attitude, demeanor, appearance, and all other positive ways when working, explaining, discussing, occupying, or other in the presence of the public or on private or public property. The use of foul language, offensive or lewd behavior, unprofessional attire, parking on private property, storage of materials on private property or other undesirable conduct shall be strictly forbidden and shall be grounds for the termination of this Agreement. There shall be no tolerance for unprofessional behavior on the part of the Contractor, his/her employees, Subcontractors or laborers on this Project.

The Owner may require the Contractor to dismiss from the work such employee or employees as the Owner or the Engineer may deem incompetent, careless, or insubordinate.

#### GC.4 SAFETY

The Contractor shall be responsible for the safety of all persons on the Site who may be affected during the progress of the work as well as the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage to persons or property which may result from their failure or their improper construction, maintenance, or operation. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

#### GC.5 SUBCONTRACTS

The Contractor is responsible to the Owner for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by the subcontractors and is aware that nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Owner.

#### GC.6 OTHER CONTRACTS

The Owner may award, or may have awarded other Contracts for additional work, and the Contractor shall cooperate fully with such other contractors, by scheduling his own work with that to be performed under other Contracts as may be directed by the Owner. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor as scheduled.

#### GC.7 BOND

Coincident with the execution of the Contract, the Contractor shall furnish a good and sufficient surety bond, in the full amount of the Contract sum, guaranteeing the faithful performance of all covenants, stipulations, and agreements of the Contract, the payment of all bills and obligations arising from the execution of the Contract, (which bills or obligations might or will in any manner become a claim against the Owner), and guaranteeing the work included in this Contract against faulty materials and/or poor workmanship for one (1) year after the date of completion of Contract.

All provisions of the bond shall be complete and in full accordance with Statutory requirements. The bond shall be executed with the proper sureties through a company licensed and qualified to operate in the state and approved by the Owner. The issuing agent's power of attorney shall be attached to the bond and the bond shall be signed by an agent resident in the state and date of bond shall be the date of execution of the Contract. If at any time during the continuance of the Contract the surety on the Contractor's bond becomes irresponsible, the Owner shall have the right to require additional and sufficient sureties which the Contractor shall furnish to the satisfaction of the Owner within ten (10) days after notice to do so. In default thereof, the Contract may be suspended and all payments or money due the Contractor withheld.

## GC.8 CONTRACTOR'S INSURANCE

Contractor shall obtain insurance of the types and in the amounts described below. The insurance shall be written by insurance companies and on forms acceptable to Owner.

**Owner and Garver, LLC shall be included as an additional insured under the CGL, (using ISO Additional Insured Endorsement CG 20 10 11 85 or a substitute providing equivalent coverage), and under the commercial automobile liability (using ISO Additional Insured Endorsement CA 2048 or a substitute providing equivalent coverage), and commercial umbrella, if any. This insurance, including insurance provided under the commercial umbrella, if any, shall apply as primary and non-contributory insurance with respect to any other insurance or self-insurance programs afforded to, or maintained by, Owner.**

### GC.8.1 Commercial General and Umbrella Liability Insurance

Contractor shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance, with a limit of not less than \$5,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it shall apply separately to the Project.

CGL insurance shall be written on ISO occurrence form CG 20 10 (11-85) (or a substitute combination of the following forms CG 20 10 (10-01) and CG 20 37 (10-01) providing equivalent coverage) and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury and liability assumed under an insured contract.

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, or amending the contractual coverage in the ISO occurrence form.

### GC.8.2 Continuing CGL Coverage – *Not Used*

### GC.8.3 Owner's and Contractor's Protective Liability Insurance.

Contractor shall maintain Owner's and Contractor's Protective Liability (OCP) insurance on behalf of Owner and Garver, LLC, as named insured, with a limit of \$1,000,000.

### GC.8.4 Railroad Protective Liability Insurance – *Not Used*

### GC.8.5 Commercial Auto and Umbrella Liability Insurance

Contractor shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than \$1,000,000 each accident.

Such insurance shall cover liability arising out of any auto (including owned, hired and non-owned autos).

Commercial auto coverage shall be written on ISO form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01.

If the Contract Documents require Contractor to remove and haul hazardous waste from the Project site, or if the Project involves such similar environmental exposure, pollution liability coverage equivalent to that provided under the ISO Pollution Liability-Broadened Coverage for Covered Autos Endorsement (CA 99 48) shall be provided, and the Motor Carrier Act Endorsement (MCS 90) shall be attached.

### GC.8.6 Workers' Compensation Insurance

Contractor shall maintain workers' compensation and employer's liability insurance.

The employer's liability, and if necessary commercial umbrella, limits shall not be less than \$500,000 each accident for bodily injury by accident or \$500,000 each employee for bodily injury by disease.

If Contractor leases its employees, the alternate employer endorsement (WC 00 03 01 A) shall be attached showing Owner in the schedule as the alternate employer.

Where applicable, U.S. Longshore and Harborworkers Compensation Act Endorsement shall be attached to the policy.

Where applicable, Nonappropriated Fund Instrumentalities Act (NFIA) shall be attached to the policy. NFIA extends the coverage of the Longshore and Harbor Workers' Compensation Act to civilian employees working on United States military bases throughout the world who are not paid with funds appropriated by Congress. These employees, working in facilities operated for the comfort, contentment, and improvement of armed forces personnel, are instead compensated with funds generated from earnings of their facility.

Where applicable, Outer Continental Shelf Lands Act Endorsement shall be attached to the policy.

Where applicable, the Maritime Coverage Endorsement shall be attached to the policy.

If project is located in a state where workers compensation is secured via monopolistic state funds, include evidence of the "Stop Gap" endorsement to the general liability policy.

#### GC.8.7 Property Insurance

If applicable, Contractor shall purchase and maintain property insurance for the Work. Such insurance shall be written in an amount at least equal to the initial contract sum as well as subsequent modifications of that sum. The insurance shall apply on a replacement cost basis. If the insurance obtained in compliance with this paragraph is builders risk insurance, coverage shall be written on a completed value form.

The property insurance as required above shall name as insureds the Owner, Contractor, and all subcontractors and sub-subcontractors on the Project.

#### GC.8.8 Primary and Non-contributory

Contractor agrees that the insurance listed above, including insurance provided under the commercial umbrella, if any, shall apply as primary and non-contributory insurance with respect to any other insurance or self-insurance programs afforded to, or maintained by, Owner.

#### GC.8.9 Waiver of Subrogation

Contractor waives all rights against the Owner and Garver, LLC and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the commercial general liability, commercial umbrella liability insurance, automobile liability insurance and workers compensation insurance maintained pursuant to paragraph GC.8 of this agreement.

#### GC.8.10 No Implied Waiver

Contractor shall furnish certifications matching the coverage requirements. Failure of Owner or Engineer to demand such certificate or other evidence of full compliance with these insurance requirements or failure of Owner or Engineer to identify a deficiency from evidence that is provided shall not be construed as a waiver of the contractors obligations to furnish and maintain such insurance, or as a waiver to the enforcement of any of the provisions at a later date.

Any waiver of the contractor's obligation to furnish such certificate or maintain such evidence must be by written change order and signed by a Managing Member (Officer) of the Engineer and the Owner.

GC.8.11 Cancellation, Non-Renewal, and/or Impairment Notification

The Contractor shall not cause any insurance policy to be cancelled or permit it to lapse and all insurance policies shall include an endorsement to the effect that the insurance policy or certificate shall not be subject to cancellation or to a reduction in the required limits of liability or amounts of insurance until notice has been mailed to the Owner and Engineer, stating the date when such cancellation or reduction shall be effective, which date shall not be less than (60) days after such notice.

Notice shall be sent via email and regular mail to the following persons and addresses:

Owner:

City of Conway  
Finley Vinson, PE  
100 East Robins Street  
Conway, Arkansas 72058

Garver:

Dustin Tackett, PE  
831 Parkway, Suite C  
Conway, Arkansas 72034  
DLTackett@GarverUSA.com



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
(must be dated)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Agency Name Agency Address	CONTACT NAME: Agency contact
	PHONE (A/C, No, Ext): Agency ph# FAX (A/C, No):
www.stephens.com INSURED Named Insured on the policies	E-MAIL ADDRESS: Agency contact email address
	INSURER(S) AFFORDING COVERAGE NAIC #
	INSURER A: Carrier Name (AM Best Rating)
	INSURER B:
	INSURER C:
	INSURER D:
	INSURER E:
	INSURER F:

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY <input checked="" type="checkbox"/> PRG JECT <input type="checkbox"/> LOC	X	X	XXXXXXXXXX		EACH OCCURRENCE \$ 5,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 5,000,000 PRODUCTS - COMP/OP AGG \$ 5,000,000
	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS	X	X	XXXXXXXXXX		COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	<input checked="" type="checkbox"/> UMBRELLA LIAB EXCESS LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$ XXXXX	X	X	XXXXXXXXXX		EACH OCCURRENCE \$ AGGREGATE \$ \$ \$
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	X	XXXXXXXXXX		<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000
	DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)			XXXXXXXXXX		

Owner & Garver, LLC shall be included as an Additional Insured by endorsement #CG2010(11/85) on the General Liability and #CA2048 on the Automobile and Umbrella or substitute endorsement providing equivalent coverage. Coverage shall be Primary and non-contributory with respect to any other insurance or self-insurance programs afforded to the Owner and Garver LLC. Waiver of Subrogation applies in favor of the Owner and Garver LLC on all policies. 60 day notice will be provided to the Owner and Garver LLC in the event of cancellation, non-renewal and/or impairment of the Contractor's policies.

<b>CERTIFICATE HOLDER</b>  Owner and Garver LLC	<b>CANCELLATION</b>  SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE  (must be signed by the Contractor's Insurance Agent)

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#### GC.10 CONTRACTOR'S AND SUBCONTRACTOR'S INDEMNIFICATION PROVISION

(1) INDEMNIFICATION: The CONTRACTOR and/or SUBCONTRACTOR shall indemnify and hold harmless the OWNER, ENGINEER, ENGINEER'S Consultants and the officers, directors, employees, agents and other consultants 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) caused by, arising out of or resulting from the performance of the Work, provided that any such claim, cost, loss, or damage (i) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and (ii) is caused in whole or in part by a negligent act or omission of the Contractor, any Subcontractor or Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work.

(2) NO LIMITATION UPON LIABILITY: In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors or employees by any employee (or the survivor or personal representative or such employee) of CONTRACTOR, any Subcontractor or Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph (1) shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefits acts or other employee benefit acts.

(3) ENGINEER/ARCHITECT EXCLUSION: The indemnification obligations of CONTRACTOR under paragraph (1) shall not extend to the liability of ENGINEER and ENGINEER'S Consultants, officers, directors, employees, or agents caused by the professional negligence, errors, or omissions of any of them, arising out of: the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications.

#### GC.11 FITTING AND COORDINATION OF THE WORK

The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, Subcontractors, or materialmen engaged upon this Contract. He shall be prepared to guarantee to each of his Subcontractors the locations and measurements which they may require for the fitting of their work to all surrounding work.

#### GC.12 KNOWLEDGE OF CONDITIONS

The Contractor states that he has examined all the available records and has made a field examination of the site and right-of-way and that he has informed himself about the character, quality, and quantity of surface and subsurface materials and other conditions to be encountered; the quantities in various sections of the work; the character of equipment and facilities needed for the prosecution of the work; the location and suitability of all construction materials; the local labor conditions; and all other matters in connection with the work and services to be performed under this contract.

#### GC.13 MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect or through failure to comply with any applicable Government regulations by the Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the work, the Contractor shall settle with such other Contractor or Subcontractor by agreement or arbitration, if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against the Owner on account of any damage alleged to have been so sustained, the Owner will notify this Contractor, who shall defend at his own expense any suit based upon such claim, and, if any judgment or claims against the Owner shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith.

## GC.14 PAYMENT TO CONTRACTOR

The Engineer will prepare (with the required assistance from the Contractor) the application for partial payment. If the bid contains lump sum prices, the Contractor shall furnish to the Engineer, upon request, a detailed cost breakdown of the several items of work involved in the lump sum prices. The Engineer will use this cost breakdown to determine the amount due the Contractor as progress payment. A cut-off time shall be established near the last day of the month such as to allow sufficient time for the application to be prepared, approved by the Contractor, and submitted by the Engineer to the Owner by the first day of the successive month.

The amount of the payment due to the Contractor shall be determined by the total value of work completed to date, deducting five percent (5%) for retainage (to assure faithful performance of the contract), adding the value of submitted paid invoices covering construction materials, properly stored on the site or in a bonded warehouse, and deducting the amount of all previous payments.

If the project has specific phased construction work in which completion can occur on a partial occupancy, the five percent (5%) retainage value shall be in direct proportion to that phase or part of the capital improvement project. Any proportional retainage withheld in this manner shall be released within thirty (30) days of completion of that phase of the project.

The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit and lump sum prices contained in the Proposal. The value of materials properly stored on the site or in a bonded warehouse shall be based upon the estimated quantities of such materials and the invoice prices. Copies of paid invoices, covering construction materials for which material payments are made, shall be furnished to the Engineer before such material payments are made.

Note: It has been the policy of the Owner to make payments for properly stored materials/equipment based upon invoice price and allow the Contractor to submit paid invoices within 30 days (or the next partial payment period). If paid invoices are not provided within the time allowed, then the materials/equipment so paid for will be removed from the next partial payment.

Monthly or partial payments made by the Owner to the Contractor are monies advanced for the purpose of assisting the Contractor to expedite the work of construction. All material and complete work covered by such monthly or partial payments shall remain the property of the Contractor, and he shall be responsible for the care and protection of all materials and work upon which payments have been made. Such payments shall not constitute a waiver of the right of the Owner to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the Owner in all details.

### GC.14.1 Withholding Payments

The Owner may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Owner and if it so elects may also withhold any amounts due from the Contractor to any Subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and his Subcontractors or material dealers, or to withhold any monies for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any monies from the Contractor shall not impair the obligations of any Surety or Sureties under any bond or bonds furnished under this Contract. Such withholding may also occur as a result of the Contractor's failure or refusal to prosecute the work with such diligence as will insure its completion within the time specified in these Contract Documents, or as modified as provided in these Contract Documents, or if the Contractor fails to comply with any applicable regulations promulgated by the U.S. Government or any other Government agencies.

### GC.14.2 Final Payment

After final inspection and acceptance by the Owner of all work under the Contract, the application for final payment including retainage shall be prepared which shall be based upon the carefully measured or computed quantity of each item of work at the applicable unit and lump sum prices stipulated in the Unit Price Schedule. The total number of the final payment due the Contractor under this Contract shall be the amount computed as described above less all previous payments. All prior payments shall be subject to correction in the final payment. Final payment to the Contractor shall be made within thirty (30) days after the construction contract has been completed, subject to his furnishing the Owner with a release in satisfactory form of all claims against the Owner arising under and by virtue of his Contract, other than such claims, if any, as may be specifically excepted by the Contractor from the operation and the release as provided under the section entitled DISPUTES under GENERAL CONDITIONS.

The Owner, before paying the final estimate, may require the Contractor to furnish releases or receipts from all Subcontractors having performed any work and all persons having supplied materials, equipment (installed on the Project), and services to the Contractor, if the Owner deems the same necessary in order to protect its interest. The Owner, however, may, if it deems such action advisable, make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments so made shall not impair the obligations of any Surety or Sureties furnished under this Contract.

Withholding of any amount due the Owner under the section entitled LIQUIDATED DAMAGES FOR DELAY under GENERAL CONDITIONS, shall be deducted from the payments due the Contractor.

All equipment warranties and general guarantee shall become effective for one year upon date of final acceptance of the completed project by the Owner.

#### GC.14.3 Payments Subject to Submission of Certificates

Each payment to the Contractor by the Owner shall be made subject to submission by the Contractor of all written certifications required of him.

#### GC.15 USE OF COMPLETED PORTIONS

The Owner shall have the right to use any completed or partially completed portion of the work and such use shall not be considered as an acceptance of any work.

#### GC.16 CHANGES IN THE WORK

The Owner may make changes in the scope of the work required to be performed by the Contractor under the Contract or make additions thereto, or omit work therefrom without invalidating the Contract, and without relieving or releasing the Contractor from any of his obligations under the Contract or any guarantee given by him pursuant to the Contract provisions, and without affecting the validity of the Guaranty Bonds, and without relieving or releasing the Surety or Sureties of said bonds. All such work shall be executed under the terms of the original Contract unless it is expressly provided otherwise.

Except for the purpose of affording protection against any emergency endangering life or property, the Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the improvements, or supply additional labor, services or materials beyond that actually required for the execution of the Contract, unless in pursuance of a written order from the Owner authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract price will be valid unless so ordered.

After the work is complete, a final change order may be prepared to be accepted by the Owner and Contractor to adjust final payment as required to cover the actual units of work acceptably completed.

If the applicable unit prices are contained in the Proposal (established as a result of either a unit price or a Supplemental Schedule of Unit Prices) the Owner may order the Contractor to proceed with desired changes in the work, the value of such changes to be determined by the measured quantities involved and the



applicable unit and lump sum prices specified in the Contract; provided that in case of a unit price Contract the net value of all changes does not increase or decrease the original total amount shown in the Agreement by more than twenty-five (25) percent .

If applicable unit prices are not contained in the Unit Price Schedule as described above or if the total net change increases or decreases the total Contract price more than twenty-five (25) percent, the Owner shall, before ordering the Contractor to proceed with a desired change, request an itemized Proposal from him covering the work involved in the change after which the procedure shall be as follows:

- (1) If the Proposal is acceptable the Owner will prepare the Change Order in accordance therewith for acceptance by the Contractor and
- (2) If the Proposal is not acceptable and prompt agreement between the two (2) parties cannot be reached, the Owner may order the Contractor to proceed with the work on a Force Account basis, under which the net cost shall be the sum of the actual costs that follow:
  - (A) Labor, including foremen;
  - (B) Materials entering permanently into the work;
  - (C) The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
  - (D) Power and consumable supplies for the operation of power equipment;
  - (E) Insurance;
  - (F) Social Security and old age and unemployment contributions.

To the net cost shall be added a fixed fee agreed upon, but not to exceed fifteen (15) percent of the net cost, to cover supervision, overhead, bond, and any other general expense, and profit.

Each Change Order shall include in its final form:

- (1) A detailed description of the change in the work.
- (2) The Contractor's Proposal (if any) or a conformed copy thereof.
- (3) A definite statement as to the resulting change in the Contract price and/or time.
- (4) The statement that all work involved in the change shall be performed in accordance with Contract requirements except as modified by the Change Order.

#### GC.17 CLAIMS FOR EXTRA COST

If the Contractor claims that any work encountered related to the project involves additional cost or extension of time beyond what has been required in the contract documents, he shall immediately notify the Engineer, and within ten (10) days after encountering such additional work or delays, and in any event before proceeding to execute the work, submit his claim for additional project time or additional compensation thereto in letter format to the Owner, with a copy to the Engineer. No such claim will be considered unless so made and within the 10 day timeframe.

At a minimum, the following information shall be numbered as follows and must be provided with the submitted claim:

- (1) Project name
- (2) Claim number
- (3) Date encountered
- (4) Nature of the event
- (5) Location of the event
- (6) Cause of the event
- (7) Impact of the event
- (8) Items of work affected by the event
- (9) The name, title, and activity of each of the Owner's representative knowledgeable about facts that gave rise to such claim
- (10) The name, title, and activity of each Contractor or employee knowledgeable about facts that gave rise to such claim
- (11) The cost or extension of time associated with the event
- (12) Any additional supporting information

Claims for additional compensation for extra work, due to alleged errors in ground elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted or would result in handling more material, or performing more work, than would be reasonably estimated from the Drawings and maps issued.

Any discrepancies which may be discovered between actual conditions and those represented by the Drawings and maps shall at once be reported to the Owner, and work shall not proceed except at the Contractor's risk, until written instructions have been received by him from the Owner.

The Owner will provide documentation of the decision in writing to the Contractor whether the decision be approval of the claim, denial of the claim or a request for additional information. The Owner's decision on any claim will be the final resolution to the claim.

If, on the basis of the available evidence, the Owner determines that an adjustment of the Contract Price and/or Time is justifiable, the procedure shall then be as provided in the Section entitled CHANGES IN THE WORK under GENERAL CONDITIONS.

#### GC.18 OWNER'S RIGHT TO TERMINATE CONTRACT

If the Contractor shall be adjudged as bankrupt or shall file a petition for an arrangement or reorganization under the Bankruptcy Act, or if he should make a general assignment 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 should fail, except under conditions where extension of time is approved, to supply adequate workmen, equipment and material, or disregard laws, ordinances, or the instructions of the Engineer, or otherwise be guilty of a violation of any provisions of the Contract; provided further that if the Contractor at any time fails to comply with any applicable Federal or State regulation which prevents either the Owner or the Contractor from fulfilling its obligations under these Contract Documents, then the Owner upon 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 ten (10) days' written notice, terminate the employment of the Contractor. At the expiration of the said ten (10) days, the Owner may immediately serve notice upon the Surety to complete the work.

In the case the Surety fails to comply with the notice within thirty (30) days after service of such notice, the Owner may complete the work and charge the expense of the completion. Contractor shall not be entitled to receive any further payment until the work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by

Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the work performed.

Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

Owner may not proceed with termination of the Contract if Contractor within ten days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

Upon ten days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract for convenience. In such case, Contractor shall be paid for completed and acceptable work executed in accordance with the Contract Documents prior to the effective date of termination. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### GC.19 SUSPENSION OF WORK

Should contingencies arise to make such action necessary, the Owner shall have the right to suspend the whole or any part of the work for a period not to exceed ninety (90) days by giving the Contractor notice in writing three (3) days prior to the suspension.

The Contractor, after written notice to resume work, shall begin within ten (10) days from the date of such notice.

If the work or any part thereof shall be stopped by the Owner's notice and the Owner fails to notify the Contractor to resume work within ninety (90) days, the Contractor may abandon that portion of the work so suspended. The Contractor shall be paid for all acceptable work not deemed as defective that has been performed on the portion so suspended at unit prices quoted in the Unit Price Schedule for completed work involved, at agreed prices on any extra work involved, and at a fair and equitable price for partially completed work involved.

The Engineer may suspend work pending the settlement of any controversy. The Contractor shall not be entitled to any claim for loss or damage by reason of such delay, nor shall he be entitled to any extension of time; but an extension may be granted by the Owner at his discretion.

#### GC.20 CONTRACT TIME – DELAYS – EXTENSION OF TIME

##### GC.20.1 Contract Time

The time allowed for the completion of the work will be as specified in the contract as Fixed Completion Date or Calendar Day. It is understood and agreed by and between the Owner and the Contractor that the time of completion herein set out is a reasonable time. The Contractor shall perform fully, entirely, and in an acceptable manner, the work contracted for within the contract time stated in the Contract. The contract time shall be counted from ten days after the effective date of the "Notice to Proceed", or the date work commences, whichever occurs first.

(1) FIXED COMPLETION DATE: When the contract time is specified as a fixed date, it will be the date on which all work on the project shall be substantially complete without exception.

(2) CALENDAR DAY: Calendar day contract time includes delays for all holidays, weekends including Saturday and Sunday, and normal weather-related events, such as rain, snow, and freezing temperatures

that may affect the progress of the construction on a per-month basis as hereinafter set out. Only weather-related delays in excess of these amounts will be considered for time extensions if requested by the Contractor. Time extensions due to weather delays will only be considered if the work was impeded by those conditions. Days Included in Contract Times for Normal Weather-Related Events and holidays are:

(On A Monthly Basis)

Month	Normal Weather-Related Events	Holidays
January	18	2
February	14	1
March	13	0
April	11	0
May	11	1
June	6	0
July	9	1
August	8	0
September	5	1
October	8	1
November	9	3
December	13	2

Saturdays and holidays which may be declared in writing by the Owner for certain special or unusual circumstances will be optional to the Contractor as working days and time will not be assessed unless work is performed that requires observation. Sunday work shall not be permitted.

Holidays that shall be observed are the following: New Year's Day (January 1); Dr. Martin Luther King Jr.'s Birthday (3rd Monday in January); President's Day (3rd Monday in February); Memorial Day (last Monday in May); Independence Day (July 4); Labor Day (1st Monday in September); Columbus Day (2nd Monday in October); Veterans Day (November 11); Thanksgiving Day (4th Thursday in November); Day after Thanksgiving (Friday following Thanksgiving); Christmas Eve (December 24); and Christmas Day (December 25). If a holiday falls on a Saturday or Sunday, the observed day shall be the Friday preceding the Saturday or the Monday following the Sunday.

#### GC.20.2 Excusable Delays

The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged for any contract time due:

- (a) To any acts of the Government, including controls or restrictions upon requisitioning of materials, equipment, tools, or labor by reason of war, National Defense, or any other national emergency;
- (b) To any acts or neglect of the Owner or employees that can be proven to have delayed the project;
- (c) To causes not reasonably foreseeable by the parties of this Contract which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God or of the public enemy, acts of another Contractor in the performance of some other Contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones, and other extreme weather conditions resulting in weather delays in excess of the normal weather-related events.
- (d) To inaccessibility to a necessary portion of the work due to utility conflict or utility work,

either of which prevents utilization of 60% normal forces and equipment to prosecute the work required for at least 60% of the normal working hours.

- (e) To any delay of any subcontractor occasioned by any of the causes specified in subparagraphs (a), (b), (c), and (d) of this paragraph.

No compensation will be made for monetary damages due to excusable delays.

#### GC.20.3 Extension of Time

Extensions of time for construction contract completion may be granted for such reasonable time as determined by the Owner for the circumstances stated below:

- (a) Excusable delays as previously specified;
- (b) If the satisfactory execution and completion of the Contract shall require work or material in greater amounts or quantities than those set forth in the Contract, then the Contract time may be increased in the same proportion as the additional work bears to the original contracted work;
- (c) The Owner shall have the authority to grant additional extensions of time as the Owner may deem justifiable.

For clarification purposes, the below items are ineligible for time extensions:

- (a) Workload of the Contractor;
- (b) Normal precipitation amounts and soil conditions;
- (c) Contractor's plea that insufficient contract time to perform construction scope of work was specified;
- (d) The ability of vendors, suppliers, and subcontractors to provide materials and/or services within the Contractor's control;
- (e) All calendar days elapsing between the effective dates of any orders of the Owner or Engineer for suspension of the prosecution of the work due to the fault of the Contractor.

Extensions of contract time will not be granted automatically. The Contractor shall be required to follow the below procedure to be granted a time extension and no other:

- (a) For weather days exceeding the monthly normal weather day events, the Contractor shall submit a report listing the date and description of the weather events on the last working day of each month to the Owner or Engineer for review. Upon approval, the extension of time for each month will be recorded on the monthly pay estimate and signatures of the Contractor, Engineer, and Owner will signify agreement.
- (b) For all other instances, the Contractor shall submit a time extension request in writing to the Owner or Engineer with dates and supporting documentation as proof of extraordinary delays beyond the Contractor's control that meet the required criteria. The request shall be made within ten (10) calendar days of the occurrence of the delay.
- (c) In event of a continuing cause of delay, only one claim is necessary.
- (d) If the Contractor does not provide written notice within the allotted time, no subsequent requests for review will be considered.

- (e) In case of disagreement between the representative of the Owner and the Contractor, as to the classification of any day, the matter shall be referred to the Owner whose decision shall be final.

It is, therefore, agreed that if there is a delay in the completion of the work beyond the period elsewhere herein specified which has not been authorized by the Owner as set forth above, then the Owner may deduct from the Contract price the amount stated in the section entitled LIQUIDATED DAMAGES FOR DELAY under the GENERAL CONDITIONS, bound herewith, as liquidated damages.

#### GC.21 PROGRESS SCHEDULE

The Contractor shall submit a construction contract schedule of the bar graph (or other approved) format seven (7) calendar days prior to the preconstruction conference showing the following information as a minimum:

- (1) Actual date construction is scheduled to start.
- (2) Planned contract completion date.
- (3) Beginning and completion dates for each phase of work.
- (4) Respective dates for submission of shop drawings/material submittals and the beginning of manufacture, the testing of, and the installation of materials, supplies, and equipment.
- (5) All construction milestone dates.
- (6) A separate graph showing work placement in dollars versus contract time. The schedule shall incorporate contract changes as they occur. The schedule shall be maintained in an up-to-date condition and shall be available for inspection at the construction site at all times.

The construction contract schedule shall be submitted in conjunction with and/or in addition to any other specification requirements concerning schedules

#### GC.22 LIQUIDATED DAMAGES FOR DELAY

The number of calendar days allowed for completion of the project is stipulated in the Proposal and in the Contract and shall be known as the Contract Time. The Contractor agrees that time is a critical element for this Contract. Loss will accrue to the Owner due to delayed completion of the work; and the cost to the Owner of the administration of the Contract, including engineering, inspection, and supervision, will be increased as the time occupied in the work is lengthened. The Contractor agrees that for each day of delay beyond the number of calendar days herein agreed upon for the completion of the work herein specified and contracted for (after due allowance for such extension of time as is provided for in General Conditions), the Owner may withhold, permanently, from the Contractor's total compensation, the sum of One Thousand Dollars (\$1,000.00) as stipulated damages for each day of such delay. Should the amount otherwise due the Contractor be less than the amount of such ascertained and liquidated damages, the Contractor and his Surety shall be liable to the Owner for such deficiency.

#### GC.23 DISPUTES

All disputes arising under this Contract or its interpretation, whether involving law or fact or both, or extra work, and all claims for alleged breach of Contract shall within thirty (30) days of commencement of the dispute be presented by the Contractor to the Owner for decision. In the meantime, the Contractor shall proceed with the work as directed. Any dispute not presented within the time limit specified within this paragraph shall be deemed to have been waived.

The Contractor shall submit in letter format the details of the dispute and proof thereof. Each decision by the governing body of the Owner will be in writing.

If the Contractor does not agree with any decision of the Owner, he shall in no case allow the dispute to delay the work, but shall notify the Owner promptly that he is proceeding with the work under protest, and he may then except the matter in question from the final release. Substantial completion of the project will not be granted until pending disputes are resolved. As such, the Owner shall withhold final payment and retainage release until all pending disputes are resolved.

At any time after initiation of a dispute, Owner and Contractor may mutually agree to mediation of the dispute. Owner and Contractor shall each pay one-half of the mediator's fees and costs. If mediation is unsuccessful, the Owner or Contractor shall give written notice to the other party of the intent (if they so intend) to submit the dispute to a court of competent jurisdiction.

#### GC.24 ASSIGNMENT OR NOVATION

The Contractor shall not assign or transfer, whether by an assignment or novation, any of its rights, duties, benefits, obligations, liabilities, or responsibilities under this Contract without the written consent of the Owner; provided, however, that assignments to banks, trust companies, or other financial institutions may be made without the consent of the Owner. No assignment or novation of this Contract shall be valid unless the assignment or novation expressly provides that the assignment of any of the Contractor's rights or benefits under the Contract is subject to a prior lien for labor performed, services rendered, and materials, tools, and equipment, supplied for the performance of the work under this Contract in favor of all persons, firms, or corporations rendering such labor or services or supplying such materials, tools, or equipment.

#### GC.25 TECHNICAL SPECIFICATIONS AND DRAWINGS

Three (3) sets of Plans and Specifications shall be furnished to the Contractor, at no charge, for construction purposes. Additional copies may be obtained at the approximate cost of reproduction upon request.

The Contractor shall keep one (1) copy of all Drawings and Contract Documents in good condition readily accessible at the site of the work available to the Engineer and his authorized representatives.

The Drawings and this Specification are to be considered cooperative. All work necessary for the completion of the facility shown on the Drawings, but not described in this Specification, or described in this Specification but not shown on the Drawings, OR REASONABLY IMPLIED BY EITHER OR BOTH, shall be executed in the best manner, the same as if fully shown and specified. When no figures or memoranda are given, the Drawings shall be accurately followed, but in all cases of discrepancy in figures or details, the decision of the Engineer shall be obtained before proceeding with the Work. If the Contractor adjusts any such discrepancy without first having obtained the approval of the Engineer, it shall be at his own risk, and he shall bear any extra expense resulting therefrom.

#### GC.26 RECORD DRAWINGS

Before any work is started, the Contractor shall obtain at his own expense one set of Plans to be used for Record Drawings. The Engineer will supply the Plans at printing cost to the Contractor. Record Drawings will be kept on full-size plan sheets; no half-size sheets will be permitted. The Record Drawings shall be stored and maintained in good condition at all times by the Contractor and shall be made available to the Engineer at the work site immediately at the Engineer's request. All writing, notes, comments, dimensions, etc. shall be legible. The Record Drawings shall be stored flat and shall not be rolled. The Record Drawings shall be submitted to the Engineer before the project can be accepted.

The Contractor shall accurately identify and document the locations of all underground and/or concealed work that he has performed and/or has been affected by his work. This shall include all equipment, conduits, pipe lines, valves, fittings and other appurtenances and underground structures that are part of the

Contractor's work and their proximity to existing underground structures and utilities to the extent known. The Contractor will certify accuracy of the Record Drawings by endorsement.

The Contractor's work shall be documented on the Record Drawings in an on-going manner. Distances, offsets, depths, etc. shall be accurately measured from permanent fixed objects so that the Owner can expose any item of the work in the future with a minimum of effort. All such measurements shall be made before the items of work are covered or backfilled. The Contractor shall be required to expose and recover/backfill the work at his own expense if, in the Engineer's opinion, the measurements need to be verified.

#### GC.27 SHOP DRAWINGS

Shop Drawings shall be required for all equipment, materials, and as required by the Engineer. All Shop Drawings, Machinery Details, Layout Drawings, etc., shall be submitted to the Engineer for review (unless otherwise specified) in one of the two following manners: six (6) hardcopies or a single electronic copy in PDF format. This shall be completed sufficiently in advance of requirements to afford ample time for checking, including time for correcting, resubmitting, and rechecking if necessary. The Contractor may proceed, only at his own risk, with manufacture or installation of any equipment or work covered by said Shop Drawings, etc. until they are reviewed, and approved; and no claim, by the Contractor, for extension of the Contract time will be granted by reason of his failure in this respect.

Any Drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any Drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of Contract price and/or time; otherwise, the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though the Drawings have been reviewed.

The review of Shop Drawings by the Engineer shall be considered an accommodation to the Contractor to assist him in the execution of the Contract. The Engineer's review of such Drawings shall not relieve the Contractor of his responsibility to perform the work in strict accordance with the Plans and Specifications, and approved changes.

If the Shop Drawing is in accordance with the Contract or involves only a minor adjustment in the interest of the Owner not involving a change in Contract price or time, the Engineer shall so stamp the Drawing and shall contain in substance the following:

"Corrections or comments made on the shop drawings during this review do not relieve Contractor from compliance with requirements of the contract documents. This check is only for review of general conformance with the design concept of the project and general compliance with the requirements of the contract documents. The Contractor is responsible for the quality of work, confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating the work of all trades and subcontractors; and performing the work in a safe and satisfactory manner".

#### GC.28 SUBMITTALS

The Contractor shall prepare and submit information required by the individual Specification sections sufficiently in advance of the related work to allow an appropriate review time by the Engineer. The types of submittals are indicated in the individual Specification sections.

During the preconstruction conference, the Engineer and the Contractor shall review the submittal schedule and procedures. Submittals will be transmitted via email as PDF electronic files directly to the Engineer's designated representative, through the project management software as instructed by the Engineer. Unless otherwise directed by the Engineer, electronic submittals shall be compatible with Adobe Acrobat (\*.PDF) format and shall be legible when printed.



Submittals shall be neat, organized, and easy to interpret. Assemble complete submittal package into a single indexed electronic file or hard cover bound book, incorporating submittal requirements of an individual Specification section, the transmittal form with unique submittal numbering system, and electronic links or tabs enabling navigation to each item. Unless approved otherwise by the Engineer, all submittals for the individual Specification section shall be submitted at one time.

Submittals must come directly from the Prime Contractor; submittals from subcontractors or suppliers will not be reviewed.

Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review. Faxed submittals or submittals with extremely small or otherwise unreadable print will not be accepted. Submittals not required by the Contract Documents will be returned by the Engineer without action.

The Contractor shall retain complete copies of submittals on project site. Use only final submittals that are marked with approval notation from Engineer's submittal review stamp with comments form.

The Contractor will implement, in conjunction with the Engineer and Owner, project-specific procedures/policies for construction management services during construction to assist in obtaining completed Projects in accordance with the purpose and intent of the construction documents including, but not limited to the following:

1. Use required web based construction management software such as Newforma Info Exchange, and require all Subcontractors and any other project participants to use this software as well. Access to this system will be provided at no cost to the Contractor.

Resubmittals shall continue the unique, sequential, submittal numbering system. Resubmittals without unique numbering, example resubmittals transmitted as 005A or 005REV, are unacceptable and will be returned un-reviewed.

The Engineer's costs related to the third and subsequent reviews of complete or partial submittals/shop drawings, required due to previously incomplete or unacceptable submittals/shop drawings, may be withheld by the Owner from payments due the Contractor.

#### GC.29 REQUESTS FOR SUPPLEMENTARY INFORMATION

It shall be the responsibility of the Contractor to make timely requests of the Owner for any additional information not already in his possession which should be furnished by the Owner under the terms of this Contract, and which he will require in the planning and execution of the work. Such requests may be submitted from time to time as the need is approached, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and shall list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two (2) weeks after the Contract award and shall be as complete as possible at that time. The Contractor shall, if requested, furnish promptly any assistance and information the Engineer may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for any delay in his work or to others arising from his failure to comply fully with the provisions of this Section. Failure of the Owner to provide any additional information shall not be considered ground for increase in charges above those contained in the Proposal.

#### GC.30 REFERENCE TO MANUFACTURER OR TRADE NAME - "OR EQUAL CLAUSE"

If the Plans, Specifications, or Contract Documents, laws, ordinances or applicable rules and regulations permit the Contractor to furnish or use a substitute that is equal to any material or equipment specified, and if the Contractor wishes to furnish or use a proposed substitute, he shall make written application to the Engineer for approval of such a substitute certifying in writing that the proposed substitute will perform

adequately the functions called for in the general design, be similar and of equal substance to that specified, be suited to the same use and capable of performing the same functions as that specified, and identifying all variations of the proposed substitute from specified and indicating available maintenance service; the use of such substitute will not require revisions of related work. No substitute shall be ordered or installed without the written approval of the Engineer who will be the judge of equality and may require the Contractor to furnish such other data regarding the proposed substitute as he considers pertinent. No substitute shall be ordered or installed without such performance guarantee and bonds as the Owner may require which shall be furnished at Contractor's expense.

Where such substitutions alter the design or space requirements indicated on the Contract Drawings, detailed drawings shall be prepared and submitted by the Contractor delineating any changes in, or additions to, the work shown on the Contract Drawings, and such drawings and changes or additions to the work shall be made by the Contractor at no additional expense to the Owner. In all cases, the burden of proof that the material or equipment offered for substitution is equal in construction, efficiency, and service to that named on the Contract Drawings and in these Contract Documents shall rest on the Contractor, and unless the proof is satisfactory to the Engineer, the substitution will not be approved.

#### GC.31 SAMPLES, CERTIFICATES, AND TESTING

The Contractor shall submit all material, product, or equipment samples, descriptions, certificates, affidavits, etc., as called for in the Contract Documents or required by the Engineer, promptly after award of the Contract and acceptance of the Contractor's bond. No such material or equipment shall be manufactured or delivered to the site, except at the Contractor's own risk, until the required samples or certificates have been approved in writing by the Engineer. Any delay in the work caused by late or improper submission of samples or certificates for approval shall not be considered just cause for an extension of the Contract time. Submit four (4) copies of data for Engineer's review.

Each sample submitted by the Contractor shall carry a label giving the name of the Contractor, the project for which it is intended, and the name of the producer. The accompanying certificate or letter from the Contractor shall state that the sample complies with Contract requirements, shall give the name and brand of the product, its place of origin, the name and address of the producer, and all specifications or other detailed information which will assist the Engineer in passing upon the acceptability of the sample promptly. It shall also include the statement that all materials or equipment furnished for use in the project will comply with the samples and/or certified statements.

Approval of any materials shall be general only and shall not constitute a waiver of the Owner's right to demand full compliance with Contract requirements. After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the work, the Engineer will have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable, at the Contractor's expense.

Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:

- (1) The Contractor shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes, except those samples taken on the project by the Engineer;
- (2) The Contractor shall assume all costs of re-testing materials which fail to meet Contract requirements;
- (3) The Contractor shall assume all costs of testing materials offered in substitution for those found deficient; and
- (4) The Owner will pay all other expenses.

Quality assurance testing and inspection of materials used in the work shall be done by an approved commercial laboratory employed and paid for directly by the Owner, unless otherwise specified in the Contract Documents. Contractor shall give timely notice for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

Inspections and tests required to be arranged and paid for by the Contractor include those by manufacturers of equipment furnished under the Contract Documents, testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the work, and for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the work.

If any work (or the work of others) that is to be inspected, tested, or approved is made un-accessible by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### GC.32 TEST BORINGS/SUBSURFACE INFORMATION

Soil characteristics provided in any geotechnical reports, or as shown or referenced in the construction contract documents are not a warranty of subsurface conditions. Subsurface conditions may vary significantly from the data available. Any errors or omissions that may be contained in the available geotechnical data, or variations found at other locations, are not the responsibility of the Owner, Engineer, or Engineer's consultants, and no claim may be made against them for such. Any reliance on the data is at Contractor's sole risk.

The Contractor may not rely upon or make any claim against Owner, Engineer, or Engineer's Consultants with respect to (1) the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor and safety precautions and programs incident thereto, (2) other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings, (3) any Contractor interpretation or other conclusion drawn from any data, interpretations, opinions, or information.

Any subsurface information, whether referenced in the plans, specifications, or otherwise made available to Contractor, was obtained and intended for the Owner's design and estimating purposes only and is **not** part of the Construction Contract Documents. The Contractor may perform his own geotechnical investigation, as approved by the Owner.

#### GC.33 PERMITS AND CODES

The Contractor shall give all notices required by and comply with all applicable laws, ordinances, and codes of the local governments. All construction work and/or utility installations shall comply with all applicable ordinances, and codes including all written waivers.

Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility at variance with any applicable ordinance or code, including any written waivers, the Contractor shall remove such work without cost to the Owner.

The Contractor shall at his own expense, secure and pay to the appropriate department of the local government the fees or charges for all permits for street pavements, sidewalks, sheds, removal of abandoned water taps, sealing of house connection drains, pavement cuts, building, electrical, plumbing, water, gas, and sewer permits required by the local regulatory body or any of its agencies.

The Contractor shall comply with applicable local laws and ordinances governing the disposal of surplus

excavation, materials, debris, and rubbish on or off the site of the work, and commit no trespass on any public or private property in any operation due to or connected with the Improvements embraced in this Contract.

#### GC.34 RIGHTS-OF-WAY

The Owner will secure easements across public or private property permanently required for the work at no cost to the Contractor. The Contractor shall lease, buy, or otherwise make satisfactory provision, without obligating the Owner in any manner, for any land required outside the land provided by the Owner. The Owner will secure State Highway and Railroad Crossing Permits. All other permits and licenses necessary for the prosecution of the work shall be secured and paid for by the Contractor.

#### GC.35 CARE OF WORK

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any injury, including death, to any person, and for any damage to property which may result from their failure, or from their improper construction, maintenance, or operation. He shall indemnify and save harmless the Owner and the Engineer and their employees and agents, against any judgment with costs, which may be obtained as a result of such injury or property damage, because of the alleged liability of the Owner or of the Engineer.

The Contractor shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance, whether or not the same has been covered in whole or in part by payments made by the Owner.

The Contractor shall provide sufficient competent watchmen, as required to protect the work both day and night, including Saturdays, Sundays, and holidays, from the time the work is commenced until final completion and acceptance.

In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without special instructions or authorization from the Owner, is authorized to act at his discretion to prevent such threatened loss or injury, and he shall so act. He shall likewise act if instructed to do so by the Owner. Any compensation claimed by the Contractor on account of such emergency work will be determined by the Owner as provided in the Section entitled CHANGES IN THE WORK under GENERAL CONDITIONS.

The Contractor shall avoid damage, as a result of his operations, to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, equipment, etc., and he shall at his own expense completely repair any damage thereto caused by his operations, to the satisfaction of the Owner and Engineer. After damage discovery, the Contractor shall immediately coordinate with the Owner and the Engineer on the complete repair and/or replacement work required. Following written notice of work required, the Contractor shall expeditiously begin and finish this work with all labor and materials required. All repair and/or replacement work, labor, and materials shall be supplied and installed by the Contractor. If the Contractor fails to promptly perform the repair work and correct all deficiencies, the Owner shall have the option of remedying the defects at the Contractor's cost.

The Contractor shall shore up, brace, underpin, secure, and protect as may be necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the Improvements embraced in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of any work. The Contractor shall indemnify and save harmless the Owner, and the Engineer, from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which it may be claimed that the Owner, or the Engineer, is liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

#### GC.36 QUALITY OF WORK AND PROPERTY

All property, materials, and equipment shall be new and free of defects upon completion of the Contractor's performance and, unless different standards are specified elsewhere in the Contract Documents, shall be of the best type and quality available for the purpose. All of the Contractor's work shall be performed with the highest degree of skill and completed free of defects and in accordance with the Contract Documents. Any work, property, materials, or equipment not in conformance with these standards shall be considered defective. If any work, property, materials or equipment is discovered to have been defective or not in conformance with the Contract Documents, whether said discovery is made before or after completion of performance, the Contractor, at his expense, after written notice from the Owner or Engineer, shall promptly replace or correct the deficiency and pay any engineering costs and consequential expense or damage incurred by the Owner in connection therewith. If the Contractor fails to promptly correct all deficiencies, the Owner shall have the option of remedying the defects at the Contractor's cost. If the Contractor is required to furnish shop drawings or designs, the above provisions shall apply to such drawings or designs.

Neither the Owner's payment, acceptance, inspection or use of the work, property, materials, or equipment, nor any other provision of the Contract Documents shall constitute acceptance of work, property, materials, or equipment which are defective or not in accordance with the Contract Documents. If the Contractor breaches any provision of the Contract Documents with respect to the quality of the work, property, materials, equipment or performance, whether initial or corrective, his liability to the Owner shall continue until the statute of limitations with respect to such breach of contract has expired following discovery of the defect. All parts of this section are cumulative to any other provisions of the Contract Documents and not in derogation thereof. If it is customary for a warranty to be issued for any of the property to be furnished hereunder, such warranty shall be furnished, but no limitations in any such warranty shall reduce the obligations imposed under the Contractor in the Contract Documents or by applicable State Law; but if any greater obligations than imposed in this Contract are specified in any such warranty or by applicable State Law, those greater obligations shall be deemed a part of this Contract and enforceable by the Owner.

#### GC.37 BARRICADES, LIGHTS, AND WATCHMEN

Where the work is carried on or adjacent to any street, alley or public place, the Contractor shall, at his own cost and expense, furnish and erect such barricades, fences, lights and danger signals, shall provide such watchmen, and shall provide such other precautionary measures for the protection of persons or property and of the work as are necessary.

Barricades shall be painted in a color that will be visible at night. From sunset to sunrise the Contractor shall furnish and maintain at least one light at each barricade and sufficient number of barricades shall be erected to keep vehicles from being driven on or into any work under construction. The Contractor shall furnish watchmen in sufficient numbers to protect the work.

The Contractor will be held responsible for all damage to the work due to failure to barricades, signs, lights, and watchmen to protect it, and whenever evidence is found of such damage the Engineer may order the damaged portion immediately removed and replaced by the Contractor at his cost and expense. The Contractor's responsibility for the maintenance of barricades, signs and lights, and for providing watchmen, shall not cease until the project shall have been accepted by the Owner.

#### GC.38 FENCES AND DRAINAGE CHANNELS

Boundary fences or other improvements removed to permit the installation of the work shall be replaced in the same location and left in a condition as good as or better than that in which they were found except as indicated on the Drawings.

Where surface drainage channels are disturbed or blocked during construction, they shall be restored to their original condition of grade and cross section after the work of construction is completed.

#### GC.39 WATER FOR CONSTRUCTION

Water used for the mixing of concrete, testing, or any other purpose incidental to this project, shall be

furnished by the Contractor. The Contractor shall make the necessary arrangements for securing and transporting such water and shall take such water in a manner and at such times that will not produce a harmful drain or decrease of pressure in the Owners' water system. No separate payment will be made for water used but the cost thereof shall be included in the work items represented in the Unit Price Schedule.

#### GC.40 MATERIAL STORAGE

Materials delivered to the site of the work in advance of their use shall be stored so as to cause the least inconvenience and in a manner satisfactory to the Engineer.

#### GC.41 EXISTING UTILITIES AND SERVICE LINES

The Contractor shall be responsible for the protection of all existing utilities or improvements crossed by or adjacent to his construction operations. Where existing utilities or service lines are cut, broken, or damaged, the Contractor shall replace or repair immediately the utilities or service lines with the same type of original material and construction or better, at his own expense. If the Contractor fails to promptly perform the repair work and correct all deficiencies, the Owner shall have the option of remedying the defects at the Contractor's cost.

#### GC.42 DEFECTIVE WORK

It is the Contractor's obligation to assure that the work is not defective. The Engineer has the authority to determine whether work is defective, and to reject defective work. Contractor shall correct all such defective work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective work, remove it from the project and replace it with work that is not defective. Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective work, fines levied against Owner by governmental authorities because the work is defective, and the costs of repair or replacement of work of others resulting from defective work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective work, then Owner may impose a reasonable set-off against payments due.

If Contractor fails within a reasonable time after written notice from Engineer to correct defective work, or to remove and replace rejected work as required by Engineer, or if Contractor fails to perform the work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after ten days written notice to Contractor, correct or remedy any such deficiency. Owner may exclude Contractor from all or part of the Site, take possession of all or part of the work and suspend Contractor's services related thereto, and incorporate in the work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

All claims, costs, losses, and damages incurred or sustained by Owner will be charged against Contractor as set-offs against payments. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective work.

If the Owner prefers to accept defective work, Owner may do so explicitly in writing (subject to Engineer's confirmation, if such acceptance occurs prior to final payment). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the work to the extent not otherwise paid by Contractor.

If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of work so accepted, then Owner may impose a reasonable set-off against payments due. If the acceptance of defective work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the work attributable to the exercise by Owner of Owner's rights and remedies under this General Condition.

#### GC.43 ACCIDENT PREVENTION

The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work. The safety provisions of applicable laws and building and construction codes, including applicable parts of the State's labor safety code, shall be observed. The Contractor shall take or cause to be taken such safety and health measures, additional to those herein required, as he may deem necessary or desirable. Machinery, equipment, and all hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, Inc., to the extent that such provisions are not in conflict with applicable local laws.

The Contractor shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract. The Contractor shall promptly furnish the Owner with reports concerning these matters.

The Contractor shall indemnify and save harmless the Owner, and the Engineer, from any claims for damages resulting from personal injury and/or death suffered or alleged to have been suffered by any person as a result of any work conducted under this Contract.

#### GC.44 TRENCH AND EXCAVATION SAFETY SYSTEMS

This section covers trench and excavation safety system required for constructing improvements that necessitate open excavations on the project. All work under this item shall be in accordance with the current edition of the "Occupational Safety and Health Administration Standard for Excavation and Trenches Safety System, 29 CFR 1926, Subpart P.

The Contractor, prior to beginning any excavation, shall notify the State Department of Labor (Safety Division) that work is commencing on a project with excavations greater than five feet.

The Contractor shall notify all Utility Companies and Owners in accordance with OSHA Administration 29 CFR 1926.651(b) (2) for the purpose of locating utilities and underground installations.

Where the trench or excavation endangers the stability of a building, wall, street, highway, utilities, or other installation, the Contractor shall provide support systems such as shoring, bracing, or underpinning to ensure the stability of such structure or utility.

The Contractor may elect to remove and replace or relocate such structures or utilities with the written approval of the Owner of the structure or utility and the Project Owner.

The work required by this item will be paid for at the price bid for "Trench and Excavation Safety Systems". After award of the contract, the Contractor shall submit to the Engineer a breakdown of cost for work involved in the price bid for "Trench and Excavation Safety Systems" and shall, with each periodic payment request, submit a certification by the Contractor's "competent person" as defined in Subpart "P" 1926.650(b) that the Contractor has complied with the provisions of "Occupational Safety and Health Administration Standard for Excavation and Trenches Safety System", 29 CFR 1926 Subpart P for work for which payment is requested.

#### GC.45 UNDERGROUND FACILITIES

All work in this contract shall be in accordance with applicable state Underground Facilities Damage Prevention Acts, or similar state requirements which protect underground facilities. The Contractor shall abide by the most current edition of these requirements.

Underground utilities may exist within and adjacent to the limits of construction. An attempt has been made to locate these utilities on the plans. However, all existing utilities may not be shown, and the actual locations of the utilities may vary from the locations shown. Prior to beginning any type of excavation, the Contractor shall contact the utilities involved and make arrangements for the location of the utilities on the ground. The Contractor shall maintain the utility location markings until they are no longer necessary.

#### GC.46 SANITARY FACILITIES

The Contractor shall furnish, install, and maintain ample sanitary facilities for the workers. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required by the sanitary codes of the State and County. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations.

#### GC.47 USE OF PREMISES

The Contractor shall confine his equipment, storage of materials, and construction operations to the Rights-of-Way to accommodate the permanent construction furnished by the Owner, or as may be directed otherwise by the Owner, and shall not unreasonably encumber the site of other public Rights-of-Way with his materials and construction equipment. In case such Rights-of-Way furnished by the Owner are not sufficient to accommodate the Contractor's operations, he shall arrange with the County, or with the owner or owners of private property for additional area or areas, and without involving the Owner in any manner whatsoever.

The Contractor shall comply with all reasonable instructions of the Owner and the ordinances and codes of the State and County (including but not limited to those) regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

#### GC.48 PUBLIC UTILITIES AND OTHER PROPERTY TO BE CHANGED

In case it is necessary to change or move the property of any owner or of a public utility, such property shall not be moved or interfered with until ordered to do so by the Engineer. The right is reserved to the owner of public utilities to enter upon the limits of the project for the purpose of making such changes or repairs of their property that may be made necessary by performance of this Contract.

#### GC.49 LIGHT AND POWER

The Contractor shall provide, at his own expense, temporary lighting and facilities required for the proper prosecution and inspection of the work. At the time the Owner obtains beneficial occupancy of any of the facilities placed in satisfactory service, charges for power and light for regular operation of those involved facilities will become the responsibility of the Owner.

#### GC.50 USED MATERIALS

No material which has been used by the Contractor for any temporary purpose may be incorporated in the permanent work without written consent of the Engineer.



#### GC.51 REMOVAL OF DEBRIS, CLEANING, ETC.

The Contractor shall periodically or as directed during the progress of the work, remove and legally dispose of all surplus excavated material and debris, and keep the project site and public Rights-of-Way reasonably clear. Upon completion of the work, he shall remove all temporary construction facilities, debris, and unused materials provided for the work, thoroughly clean all drainage pipes, structures, ditches, and other features, and put the whole site of the work and public Rights-of-Way in a neat and "broom" clean condition. Trash burning on the site of the work will be subject to prior approval of the Owner and existing State and local regulations.

#### GC.52 EXISTING STRUCTURES

The Plans show the locations of all known surface and subsurface structures. However, the Owner assumes no responsibility for failure to show any or all of these structures on the Plans, or to show them in their exact location. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate changes in the lines or grades, or requires the building of special work, provisions for which are not made in the Plans and Proposal, in which case the provisions in these Specifications for extra work shall apply.

The Contractor shall be responsible for protection of all existing structures and any damage caused by his operations shall be repaired immediately without cost to the Owner. If the Contractor fails to promptly perform the repair work and correct all deficiencies, the Owner shall have the option of remedying the defects at the Contractor's cost. It shall be the responsibility of the prospective Contractor to examine the site completely before submitting his bid.

#### GC.53 EMERGENCIES

In emergencies affecting the safety or protection of personnel, the general public, the work, and property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order may be issued.

#### GC.54 HAZARDOUS MATERIALS

If Contractor encounters, uncovers, or reveals a hazardous material or environmental condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the work, or if Contractor or anyone for whom Contractor is responsible creates a hazardous material or condition, then Contractor shall immediately secure or otherwise isolate such condition, stop all work in connection with such condition and in any area affected thereby (except in an emergency), and notify Owner and Engineer (and promptly thereafter confirm such notice in writing). If Contractor or anyone for whom Contractor is responsible created the hazardous material or condition in question and is unable or refuses to satisfactorily address the issue, then Owner may remove and remediate the hazardous material or condition, and impose a set-off against payments to account for the associated costs.

#### GC.55 RETURN OF OWNER'S MATERIALS, EQUIPMENT, OR PROPERTY

Any materials, equipment or other property which belongs to the Owner, removed by the Contractor, shall be delivered to the Owner's designated warehouse unless its re-use or disposal is specified in the Plans and Specifications. If the Contractor fails to deliver the materials, equipment, or other property, the value, as determined by the Engineer, shall be deducted from amounts due the Contractor.

#### GC.56 PAY ITEM DESCRIPTION

Of necessity the items described and shown as components are discussed in a general manner only, describing the major pieces of equipment and/or materials. Any item and/or appurtenance not specifically mentioned shall be considered a portion of the bid item to which, in the opinion of the Engineer, its function is most directly related. Failure to list all items and/or appurtenances does not relieve the Contractor from furnishing all apparatus, devices, labor or materials of whatever nature required for a complete installation in accordance with the intent of the Drawings, approved Shop Drawings and these Specifications.

The successful Contractor shall, as soon as possible after award of the Contract, submit a list itemizing the components of each lump sum bid item and their respective costs to be used as an aid in the preparation of partial payments.

#### GC.57 SPARE PARTS

After approval of the Shop Drawings, the Contractor shall furnish spare parts data for each different item of equipment, valves, instrumentation, etc., for which normal operation requires replacement parts for dependable service. The data shall include a complete list of parts and supplies, with source of supply; list of parts and supplies that are either normally furnished at no extra cost with the purchase of the equipment or specified hereinafter to be furnished as part of the contract and a list of additional items recommended by the manufacturer to assure efficient operation. The foregoing shall not relieve the Contractor of any responsibilities under the guaranty specified.

#### GC.58 OBSERVATION OF WORK

The Engineer, his authorized representative, and any Federal, State, County, or local authority representative having jurisdiction over any part of the work, or area through which the work is located, shall at all times have access to the work in progress.

The detailed manner and method of performing the work shall be under the direction and control of the Contractor, but all work performed shall at all times be subject to the observation of the Engineer or his authorized representative to ascertain its conformance with the Contract Documents. The Contractor shall furnish all reasonable aid and assistance required by the Engineer for the proper observation and examination of the work and all parts thereof.

The Engineer is not responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction, or safety precautions and programs incident thereto.

Observers may be appointed by the Engineer or Owner. Observers shall have no authority to permit any deviation from the Plans and Specifications except on written order from the Engineer and the Contractor will be liable for any deviation except on such written order. Observers shall have authority, subject to the final decision of the Engineer, to condemn and reject any defective work and to suspend the work when it is not being performed properly.

The observer shall in no case act as superintendent or foreman or perform other duties for the Contractor, nor interfere with the management of the work by the latter. Any advice which the observer may give the Contractor shall in no way be construed as binding to the Engineer in any way or releasing the Contractor from fulfilling all of the terms of the Contract.

Any defective work may be rejected by the Engineer at any time before final acceptance of the work, even though the same may have been previously overlooked and estimated for payment and payment therefore made by the Owner.

The Contractor shall notify the Engineer sufficiently in advance of backfilling or concealing any facilities to permit proper observation. If the facilities are concealed without approval or consent of the Engineer, the Contractor shall uncover for observation and recover such facilities all at his own expense, when so

requested by the Engineer.

Should it be considered necessary or advisable by the Engineer at any time before final acceptance of the entire work to make an examination of work already completed, by uncovering the same, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any important or essential respect, due to fault of the Contractor or his Subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, plus fifteen (15) percent of such costs to cover superintendence, general expenses and profit, shall be allowed the Contractor and he shall, in addition, if completion of the work of the entire Contract has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

Observation of materials and appurtenances to be incorporated in the Improvements embraced in this Contract may be made at the place of production, manufacture or shipment, whenever the quantity justifies it, and such observation and acceptance, unless otherwise stated in the Technical Specifications, shall be final, except as regards (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the observation of materials as a whole or in part will be made at the project site.

All condemned or rejected work shall be promptly taken out and replaced by satisfactory work. Should the Contractor fail or refuse to comply with the instructions in this respect, the Owner may, upon certification by the Engineer, withhold payment, proceed to terminate the Contract, or perform work as provided herein.

#### GC.59 REVIEW BY OWNER

The Owner, its authorized representatives and agents, shall at all times during work hours have access to and be permitted to observe and review all work, materials, equipment, payrolls, and personnel records pertaining to this Contract, provided, however, that all instructions and approval with respect to the work will be given to the Contractor only by the City through its authorized representatives or agents. Representatives of Federal, State, and City agencies also have the right of physical inspection of the work during work hours.

#### GC.60 PROHIBITED INTERESTS

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 thereof. 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 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.

#### GC.61 SUBSTANTIAL COMPLETION

When Contractor considers the entire work ready for its intended use, Contractor shall notify Owner and Engineer in writing that the entire work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the work to determine the status of completion. If Engineer does not consider the work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

If Engineer considers the work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment, along with a timeframe to complete the punch list items. Owner shall have seven days after receipt of the preliminary

certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the work.

Upon Substantial Completion, the project time for completion will stop and the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

If the Contractor does not achieve Final Completion in the specified time noted on the substantial completion punch list, the project time for completion will continue from the specified Final Completion date until all punch list items have been completed.

#### GC.62 FINAL INSPECTION AND ACCEPTANCE

When the Improvements embraced in this Contract are substantially completed and punch list items have been addressed, the Contractor shall notify the Owner in writing that the work will be ready for final inspection on a definite date which shall be stated in the notice. The notice will be given at least ten (10) days prior to the date stated for final inspection, and bear the signed concurrence of the representative of the Owner having charge of observation. If the Owner determines that the status of the Improvements is as represented, it will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as practicable. The inspection party will also include the representatives of Owner and any other involved government agencies when such improvements are later to be accepted by the Owner and/or other government agencies. Upon confirmation that all improvements have been properly constructed, Final Acceptance will be granted and the Contractor's General Guaranty will begin.

#### GC.63 CONTRACTOR'S OBLIGATION TO COMPLETE THE WORK

Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents: any review and approval of a Shop Drawing or Sample submittal; observations by Engineer or Resident Project Representative; recommendation of or payment of progress or final payment; the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner; use or occupancy of the Work or any part thereof by Owner; any inspection, test, or approval by others; or any correction of defective work by Owner.

#### GC.64 PATENTS

The Contractor shall hold and save harmless the Owner, its officers, employees, and the Engineer, from liability of any nature or kind, including costs and expenses, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including

its use by the Owner, unless otherwise specifically stipulated in the Technical Specifications.

#### GC.65 WARRANTY OF TITLE

No material, supplies, or equipment for the work shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens, or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract shall have any right to a lien upon any improvement or appurtenance thereon. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontracts and material Contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal Contract is entered into for such materials.

#### GC.66 GENERAL GUARANTY

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the Improvements embraced in this Contract by the Owner or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of twelve (12) months from the agreed upon day of final acceptance (not substantial completion) of the work. The Owner will give notice of defective materials and work with reasonable promptness.

#### GC.67 REUSE OF DOCUMENTS

Contractor and its Subcontractors and Suppliers shall not have or acquire any title to or ownership rights in any of the Contract Documents, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, or reuse any such documents or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

#### GC.68 RELEASE AND CONTRACTOR'S AFFIDAVIT

At the project's completion, the Contractor shall execute the attached Release and Lien Waiver to release all claims against the Owner arising under and by virtue of his Contract. The date of the Release shall be that agreed to for the final acceptance of the project with the Owner.



**RELEASE**

FROM: Contractor's Name \_\_\_\_\_

Address \_\_\_\_\_

TO: Owner's Name \_\_\_\_\_

Address \_\_\_\_\_

DATE OF CONTRACT: \_\_\_\_\_

Upon receipt of the final payment and in consideration of that amount, the undersigned does hereby release the Owner and its agents from any and all claims arising under or by virtue of this Contract or modification thereof occurring from the undersigned's performance in connection with the

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

project.

\_\_\_\_\_  
Contractor's Signature

\_\_\_\_\_  
Title

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:  
\_\_\_\_\_





**CONTRACTOR'S AFFIDAVIT**

FROM: Contractor's Name \_\_\_\_\_

Address \_\_\_\_\_

TO: Owner's Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

DATE OF CONTRACT: \_\_\_\_\_

I hereby certify that all claims for material, labor, and supplies entered into contingent and incident to the construction or used in the course of the performance of the work on \_\_\_\_\_

\_\_\_\_\_

have been fully satisfied.

\_\_\_\_\_  
Contractor's Signature

\_\_\_\_\_  
Title

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:  
\_\_\_\_\_

The Surety Company consents to the release of the retained percentage on this project with the understanding that should any unforeseen contingencies arise having a right of action on the bond that the Surety Company will not waive liability through the consent to the release of the retained percentage.

Dated \_\_\_\_\_  
Surety Company

By \_\_\_\_\_  
Resident Agent, State of Project



**010900 - SPECIAL CONDITIONS**

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## SC.1 GENERAL

The provisions of this section of the Specifications shall govern in the event of any conflict between them and the "General Conditions".

## SC.2 LOCATION OF PROJECT

This project is located in Conway, AR. A map showing the general location is included in the Plans.

## SC.3 SCOPE OF WORK

The project includes, but is not limited to, 5,710 LF of roadway improvements including roadway reconstruction, mill and inlay, a two-lane roundabout, a reinforced concrete box culvert, reinforced concrete pipe, curb inlets, curb and gutter, sidewalks, bicycle facilities, traffic signals, landscaping, irrigation, and retaining walls as shown on the plans and indicated in the specifications.

## SC.4 TIME ALLOTTED FOR COMPLETION

The time allotted for completion of the work shall be three hundred sixty (360) consecutive calendar days, which time shall begin within ten (10) days of the work order or notice to proceed, or upon the date the Contractor moves on the site to begin the work, whichever is the earliest date. After award of the Contract is made and the Contract Documents are completed, the Engineer shall issue a Work Order or Notice to Proceed, notifying the Contractor to proceed with the construction of the project, subject to the provisions of this paragraph.

## SC.5 ADDITIONAL INSURANCE – *Not Used*

## SC.6 MINIMUM WAGES – *Not Used*

## SC.7 REFERENCE SPECIFICATIONS

Where reference is made in these Specifications to specifications compiled by other agencies, organizations or departments, such reference is made for expediency and standardization, and such specifications (latest edition thereof) referred to are hereby made a part of these Specifications.

More specifically, if any items or materials required for completion of the work required for this project are not specified in these Contract Documents, such items or materials and requirements for installation shall conform to the standards or preferences of ARDOT or the Owner.

## SC.8 SALES TAX

The project is not tax exempt for the purchase of materials permanently incorporated into the project.

## SC.9 USE OF EXPLOSIVES

The use of explosives will not be permitted except as specifically described in the Specifications.

## SC.10 LINES AND GRADES

The Contractor will be furnished horizontal and vertical control points and/or baselines and benchmarks to control the work. The Contractor shall be responsible for the additional instrument control necessary to lay out and construct the improvements. The Contractor's instrument control of the work shall not be measured for separate payment. As a minimum, the Contractor shall provide the following instrument control for the work:

- a. For the full length and width of all areas within the limits of paving, the finished grade of the concrete surface course shall be controlled by grade wires or forms set by the Contractor to control the final surface, in accordance with the plans.
- b. For the full length and width of all areas within the limits of paving, the initial courses of bituminous pavement shall be controlled by uniform thickness. The course under the final surface course shall be controlled by grade wire, and the final surface course shall be controlled by uniform thickness. The bituminous pavement shall be constructed with a laydown machine with automatic controls and a 40-ft ski.
- c. For the full length and width of all areas within the limits of paving, the crushed aggregate base course and the subbase course will be controlled with intermediate and final surface stakes, "blue tops". Stakes shall be set as required or as directed by the Engineer to control the construction.
- d. The Contractor shall set intermediate line and grade stakes and final grade stakes, "blue tops," as required to control the construction of subgrade and shoulders.

#### SC.11 SEQUENCE OF CONSTRUCTION

Sequence of all stages of work shall be such as to provide for the least possible inconvenience to the Owner. Scheduling of work which would interfere with normal traffic operation shall be coordinated with the Owner. Material and equipment received on the project prior to time of installation shall be stored at such locations designated by the Owner.

The following are more specific instructions which must be accomplished in a certain sequence:

Stage 1 improvements shall be completed and opened to two-way traffic prior to beginning construction of Stage 2 improvements as shown in the plans.

Before any of the facilities are taken out of service to accomplish the various items of work, the Contractor shall demonstrate to the Owner and Engineer's satisfaction that all equipment and materials required to complete that particular item of work are on hand. As much preliminary work as is possible shall be accomplished prior to taking any unit out of service.

SC.12 TEMPORARY FIELD OFFICE – *Not Used*

SC.13 MAINTENANCE BOND – *Not Used*

SC.14 PREVAILING WAGE DETERMINATION – *Not Used*



If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of bulwark, rail, coaming, or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(d) *First-aid and lifesaving equipment.*

(1) Provisions for rendering first aid and medical assistance shall be in accordance with subpart D of this part.

(2) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch lifering with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the barge.

(3) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved work vests or buoyant vests.

(e) *Commercial diving operations.* Commercial diving operations shall be subject to subpart T of part 1910, §§ 1910.401-1910.441, of this chapter.

[39 FR 22801, June 24, 1974, as amended at 42 FR 37674, July 22, 1977]

**§ 1926.606 Definitions applicable to this subpart.**

(a) *Apron*—The area along the waterfront edge of the pier or wharf.

(b) *Bulwark*—The side of a ship above the upper deck.

(c) *Coaming*—The raised frame, as around a hatchway in the deck, to keep out water.

(d) *Jacob's ladder*—A marine ladder of rope or chain with wooden or metal rungs.

(e) *Rail*, for the purpose of § 1926.605, means a light structure serving as a guard at the outer edge of a ship's deck.

25059), or 9-83 (48 FR 35736), as applicable, and 29 CFR part 1911.

SOURCE: 54 FR 45959, Oct. 31, 1989, unless otherwise noted.

**§ 1926.650 Scope, application, and definitions applicable to this subpart.**

(a) *Scope and application.* This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(b) *Definitions applicable to this subpart.*

*Accepted engineering practices* means those requirements which are compatible with standards of practice required by a registered professional engineer.

*Aluminum Hydraulic Shoring* means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed, specifically to support the sidewalls of an excavation and prevent cave-ins.

*Bell-bottom pier hole* means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

*Benching* (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

*Cave-in* means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

*Competent person* means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

*Cross braces* mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

**Subpart P—Excavations**

AUTHORITY: Sec. 107, Contract Worker Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR

*Excavation* means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

*Faces* or *sides* means the vertical or inclined earth surfaces formed as a result of excavation work.

*Failure* means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

*Hazardous atmosphere* means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

*Kickout* means the accidental release or failure of a cross brace.

*Protective system* means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

*Ramp* means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

*Registered Professional Engineer* means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

*Sheeting* means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

*Shield* (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in

accordance with § 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

*Shoring* (Shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

*Sides*. See "Faces."

*Sloping* (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

*Stable rock* means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

*Structural ramp* means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

*Support system* means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

*Tabulated data* means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

*Trench* (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less



(measured at the bottom of the excavation), the excavation is also considered to be a trench.

*Trench box.* See "Shield."

*Trench shield.* See "Shield."

*Uprights* means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

*Wales* means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

#### § 1926.651 Specific excavation requirements.

(a) *Surface encumbrances.* All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(b) *Underground installations.* (1) The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

(c) *Access and egress*—(1) *Structural ramps.* (i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(2) *Means of egress from trench excavations.* A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(d) *Exposure to vehicular traffic.* Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(e) *Exposure to falling loads.* No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with § 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

(f) *Warning system for mobile equipment.* When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g) *Hazardous atmospheres—(1) Testing and controls.* In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50–1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) *Emergency rescue equipment.* (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous at-

mospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a life-line securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

(h) *Protection from hazards associated with water accumulation.* (1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

(i) *Stability of adjacent structures.* (1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably

expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(3) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(j) *Protection of employees from loose rock or soil.* (1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k) *Inspections.* (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout

the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(1) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with §1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

[54 FR 45959, Oct. 31, 1989, as amended by 59 FR 40730, Aug. 9, 1994]

#### § 1926.652 Requirements for protective systems.

(a) *Protection of employees in excavations.* (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 5 feet (1.52m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

(2) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

(b) *Design of sloping and benching systems.* The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3), or, in the alternative, paragraph (b)(4), as follows:

(1) *Option (1)—Allowable configurations and slopes.* (i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical

(34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

(2) *Option (2)—Determination of slopes and configurations using Appendices A and B.* Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(3) *Option (3)—Designs using other tabulated data.* (i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) *Option (4)—Design by a registered professional engineer.* (i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project;

(B) The configurations that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c) *Design of support systems, shield systems, and other protective systems.* Designs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4) as follows:

(1) *Option (1)—Designs using appendices A, C and D.* Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(2) *Option (2)—Designs Using Manufacturer's Tabulated Data.* (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall

be made available to the Secretary upon request.

(3) *Option (3)—Designs using other tabulated data.* (i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

(B) Identification of the limits of use of the data;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) *Option (4)—Design by a registered professional engineer.* (i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

(d) *Materials and equipment.* (1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a man-

ner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(e) *Installation and removal of support—(1) General.* (i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(vi) Backfilling shall progress together with the removal of support systems from excavations.

(2) *Additional requirements for support systems for trench excavations.* (i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and

there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(f) *Sloping and benching systems.* Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g) *Shield systems*—(1) *General.* (i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(2) *Additional requirement for shield systems used in trench excavations.* Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

#### APPENDIX A TO SUBPART P OF PART 1926—SOIL CLASSIFICATION

(a) *Scope and application*—(1) *Scope.* This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) *Application.* This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in §1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C

to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in §1926.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(b) *Definitions.* The definitions and examples given below are based on, in whole or in part, the following: American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System, The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

*Cemented soil* means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

*Cohesive soil* means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

*Dry soil* means soil that does not exhibit visible signs of moisture content.

*Fissured* means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

*Granular soil* means gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

*Layered system* means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

*Moist soil* means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

*Plastic* means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

*Saturated soil* means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

*Soil classification system* means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

*Stable rock* means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

*Submerged soil* means soil which is underwater or is free seeping.

*Type A* means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

- (i) The soil is fissured; or
- (ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- (iii) The soil has been previously disturbed; or
- (iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- (v) The material is subject to other factors that would require it to be classified as a less stable material.

*Type B* means:

- (i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- (ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- (iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
- (iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
- (v) Dry rock that is not stable; or
- (vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

*Type C* means:

- (i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- (ii) Granular soils including gravel, sand, and loamy sand; or
- (iii) Submerged soil or soil from which water is freely seeping; or
- (iv) Submerged rock that is not stable, or

(v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

*Unconfined compressive strength* means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

*Wet soil* means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) *Requirements*—(1) *Classification of soil and rock deposits*. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) *Basis of classification*. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the America Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(3) *Visual and manual analyses*. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(4) *Layered systems*. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(5) *Reclassification*. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) *Acceptable visual and manual tests*.—(1) *Visual tests*. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained

material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) *Manual tests.* Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) *Plasticity.* Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

(ii) *Dry strength.* If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) *Thumb penetration.* The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard

designation D2488—"Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) *Other strength tests.* Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

(v) *Drying test.* The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

#### APPENDIX B TO SUBPART P OF PART 1926—SLOPING AND BENCHING

(a) *Scope and application.* This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in §1926.652(b)(2).

(b) *Definitions.*

*Actual slope* means the slope to which an excavation face is excavated.

*Distress* means that the soil is in a condition where a cave-in is imminent or is likely



to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

*Maximum allowable slope* means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

*Short term exposure* means a period of time less than or equal to 24 hours that an excavation is open.

(c) *Requirements*—(1) *Soil classification*. Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) *Maximum allowable slope*. The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) *Actual slope*. (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least ½ horizontal to one vertical (½H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with §1926.651(i).

(4) *Configurations*. Configurations of sloping and benching systems shall be in accordance with Figure B-1.

TABLE B-1  
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) [1] FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3]
STABLE ROCK TYPE A [2] TYPE B TYPE C	VERTICAL (90°) ¾ : 1 (53°) 1 : 1 (45°) 1½ : 1 (34°)

NOTES:

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
2. A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).
3. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

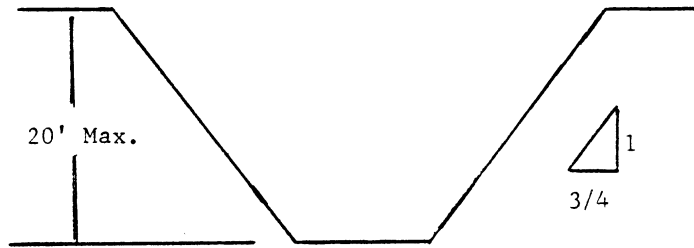
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

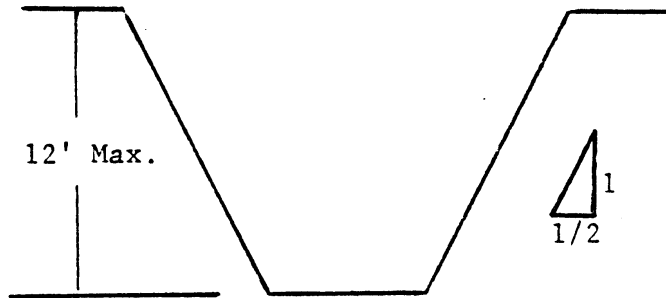
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



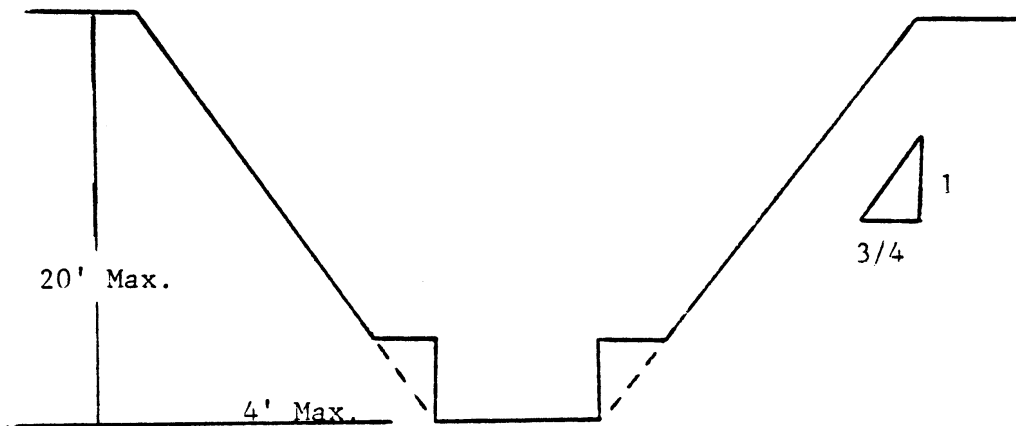
SIMPLE SLOPE—GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1.

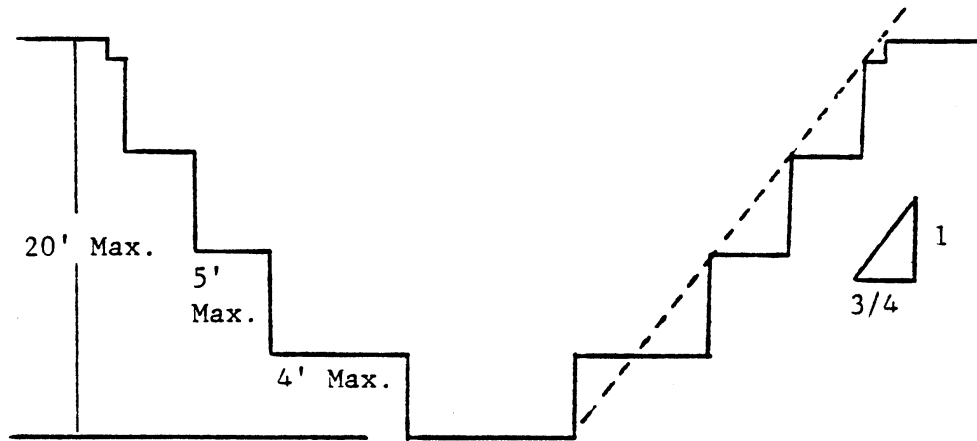


SIMPLE SLOPE—SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

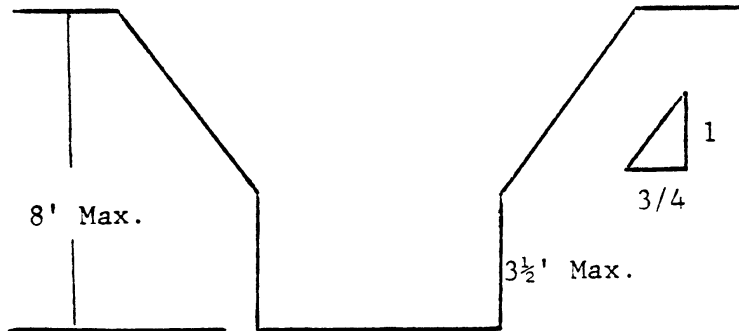


SIMPLE BENCH



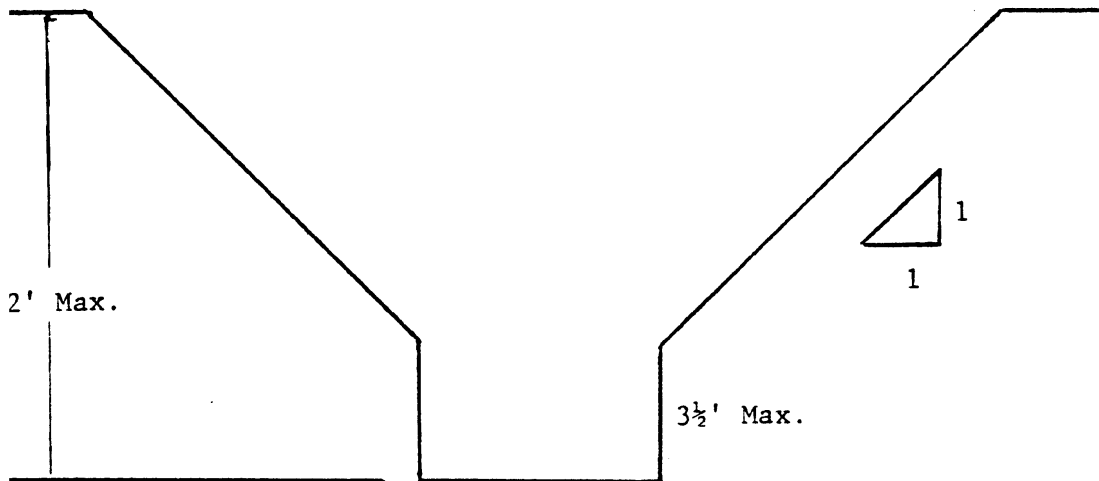
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



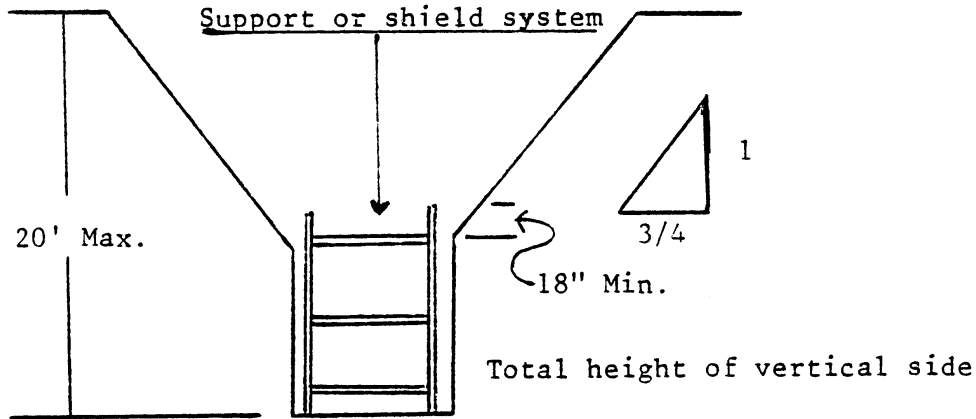
UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 8 FEET IN DEPTH

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 12 FEET IN DEPTH

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of  $\frac{3}{4}$ :1. The support or shield system must extend at least 18 inches above the top of the vertical side.

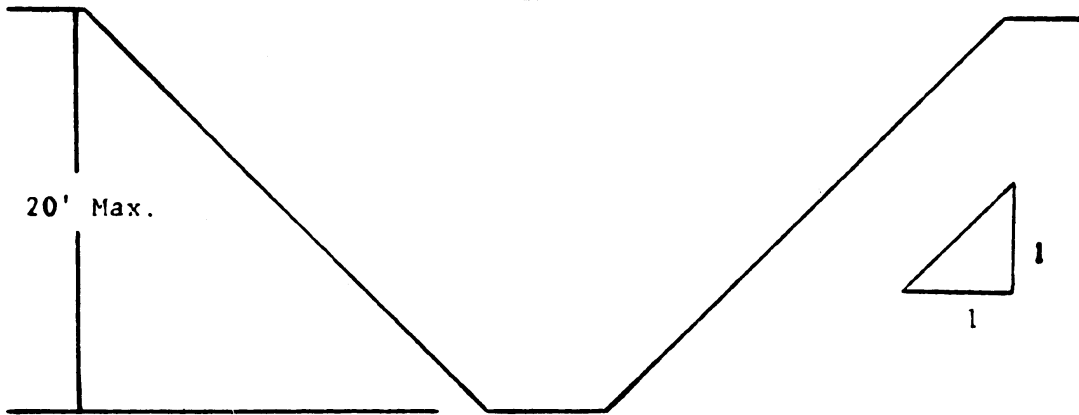


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

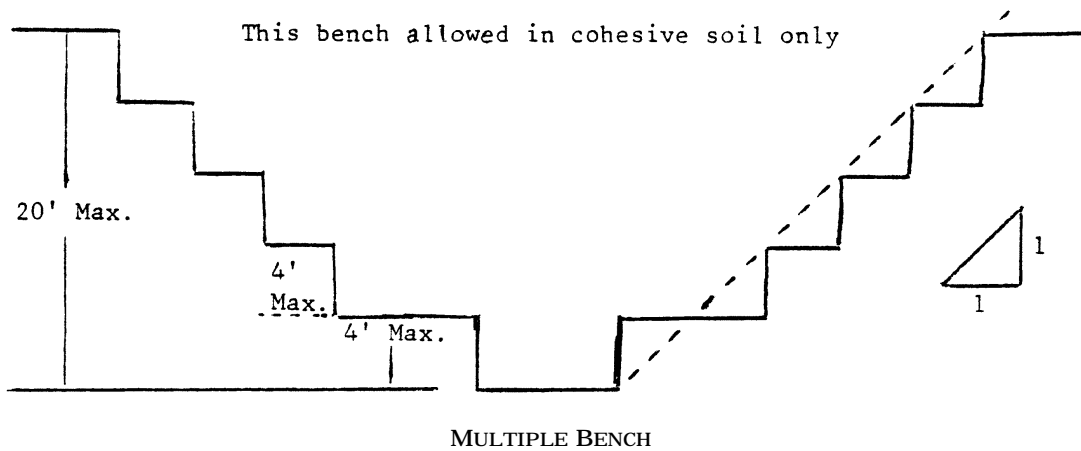
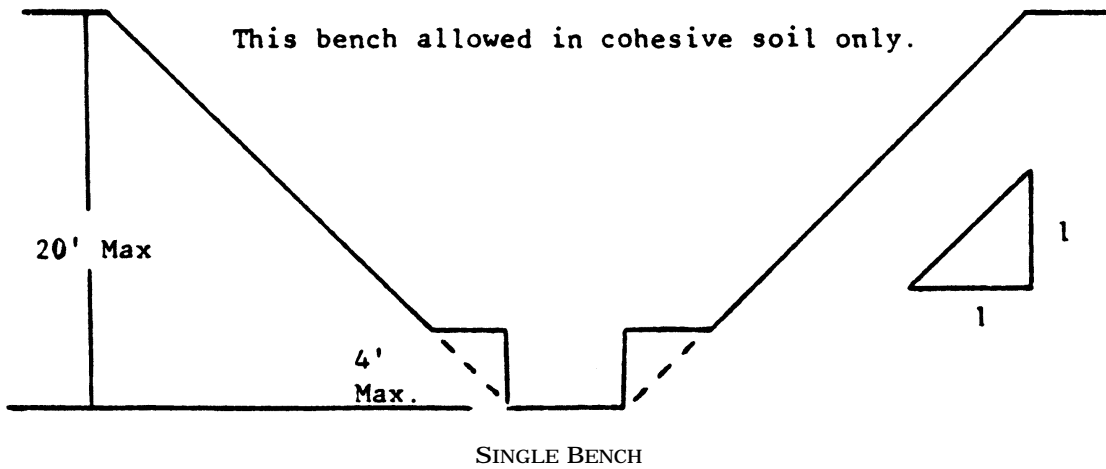
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

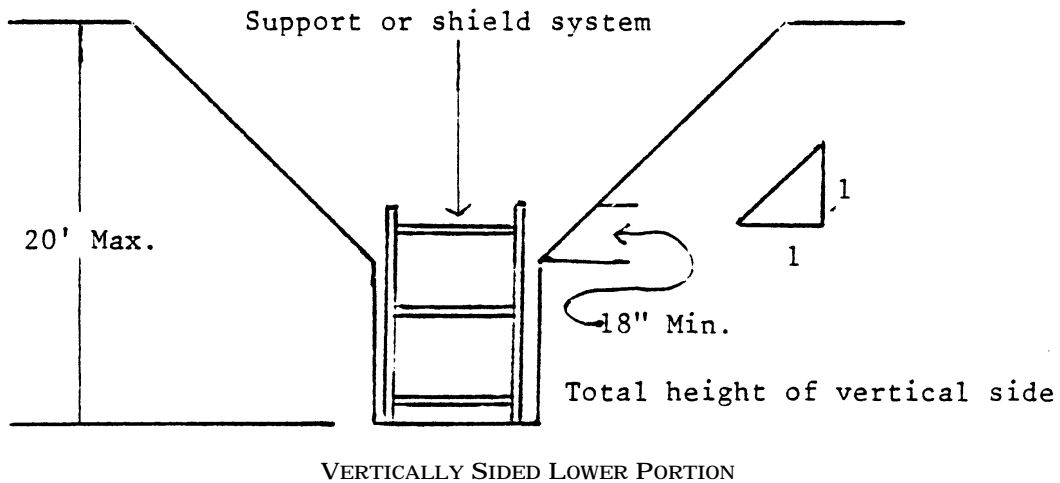


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:



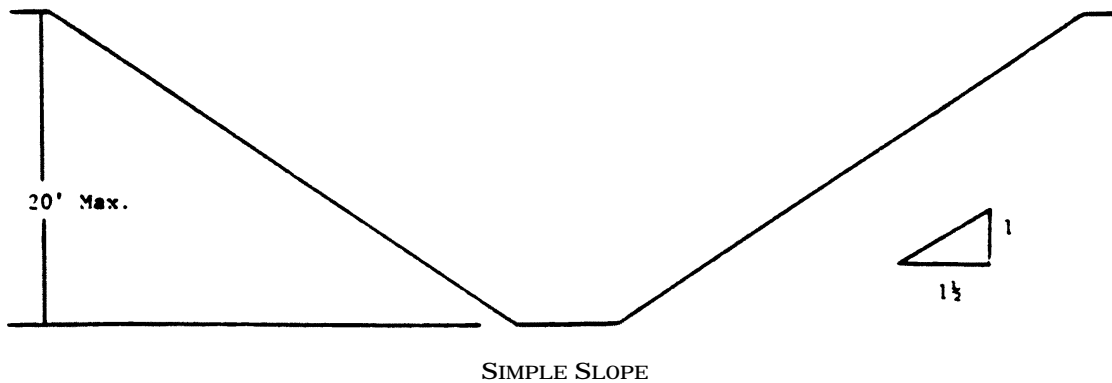
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



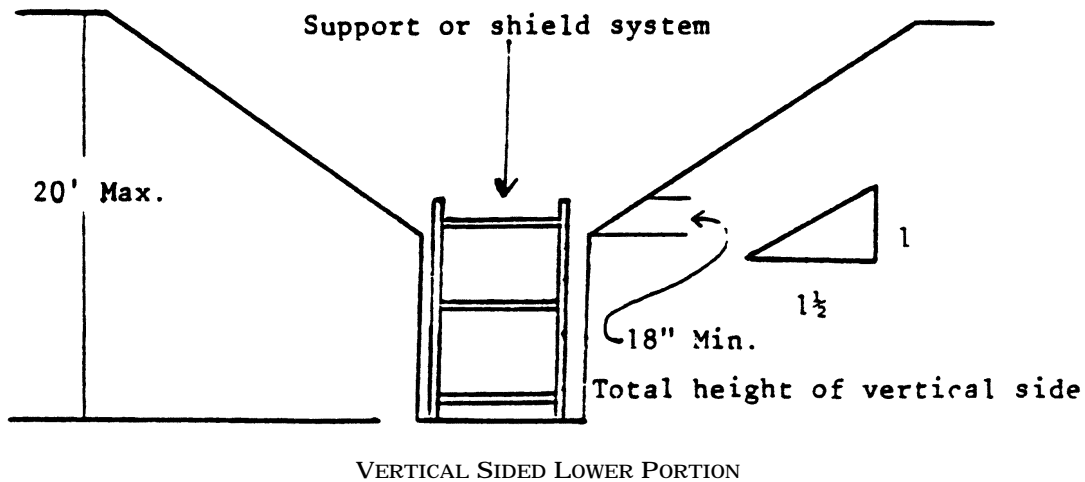
4. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

B-1.3 EXCAVATIONS MADE IN TYPE C SOIL

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



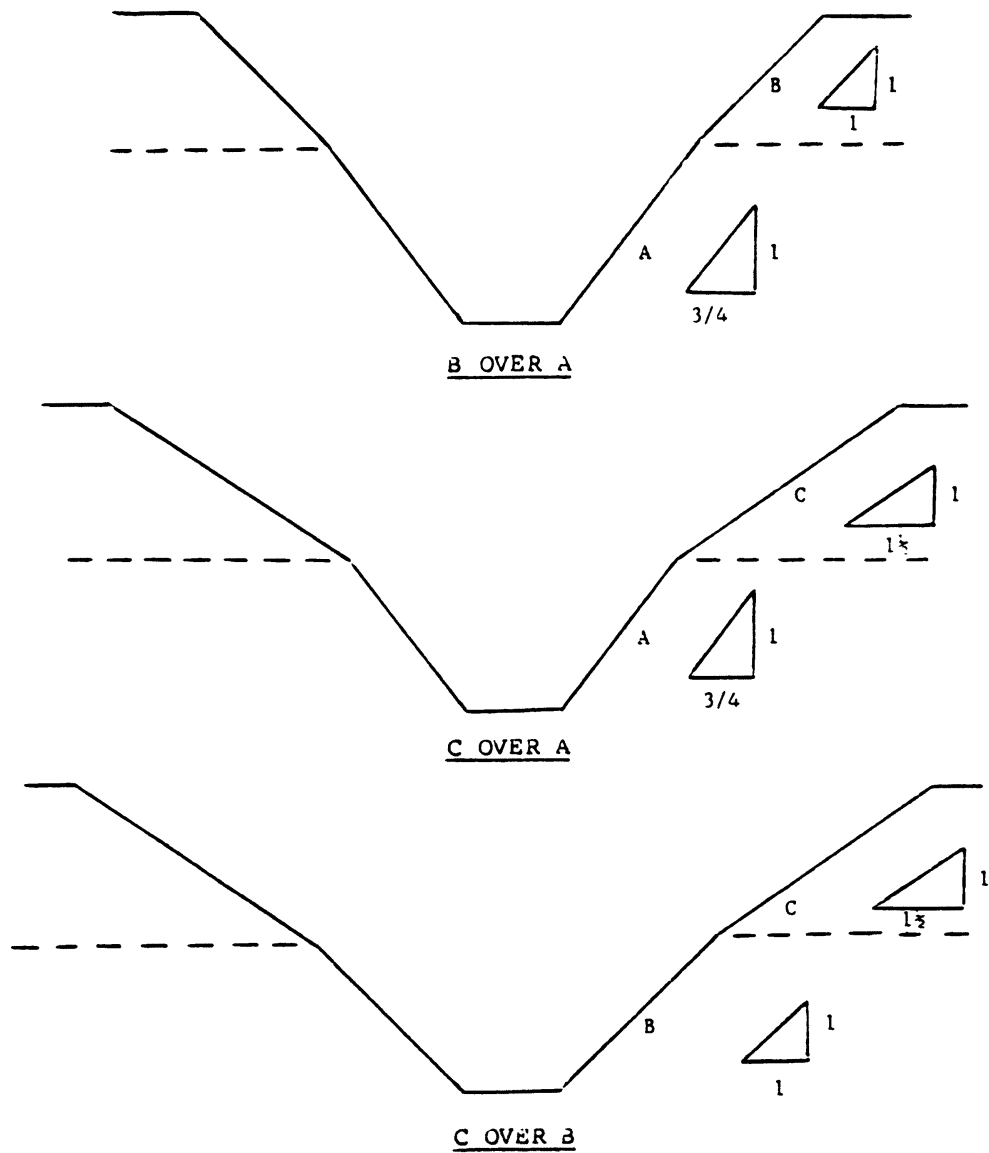
2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

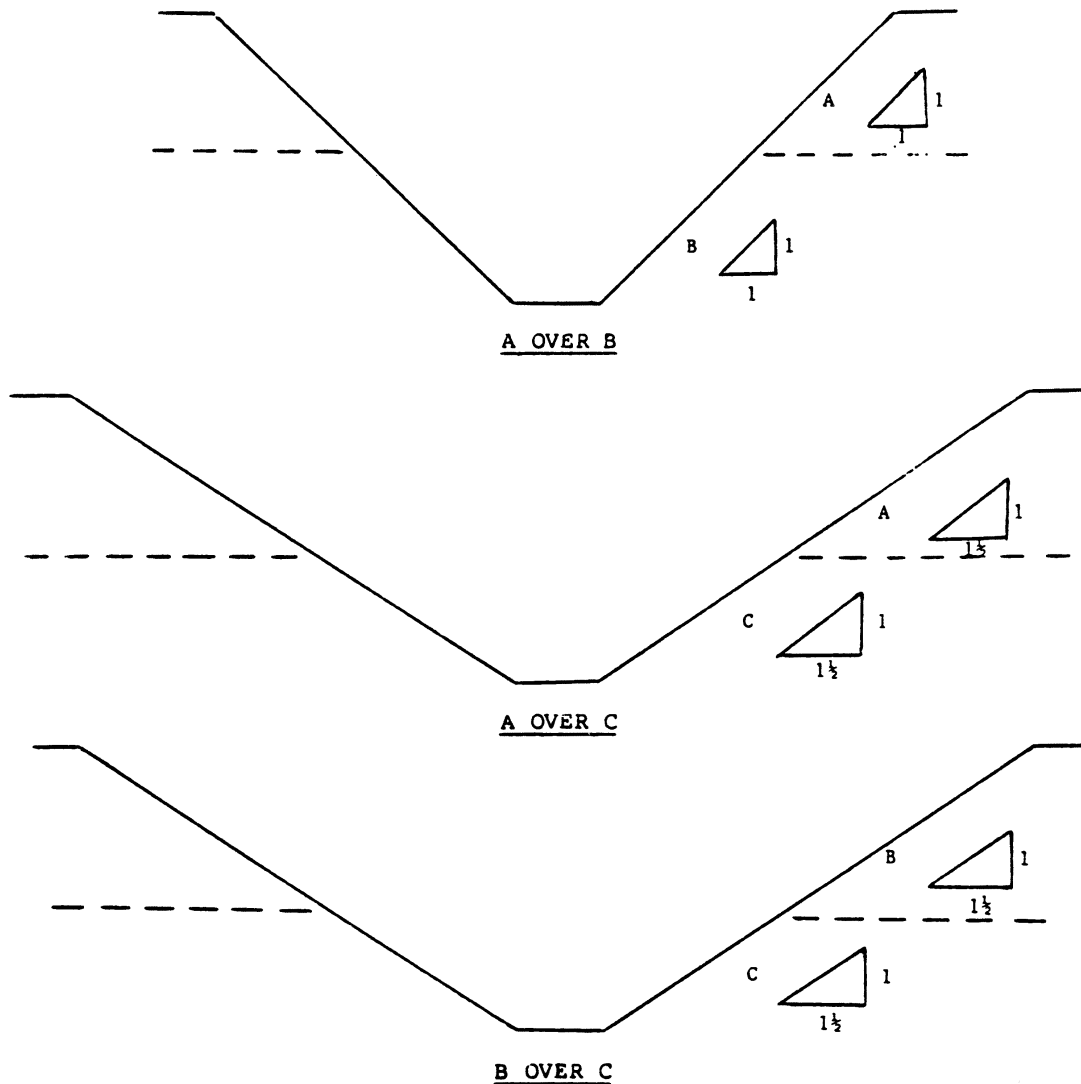


3. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

**B-1.4 Excavations Made in Layered Soils**

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.





2. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

**APPENDIX C TO SUBPART P OF PART 1926—TIMBER SHORING FOR TRENCHES**

(a) *Scope.* This appendix contains information that can be used timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with §1926.652(c)(1). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as sloping, benching, shielding, and freezing systems must be designed in accordance with the requirements set forth in §1926.652(b) and §1926.652(c).

(b) *Soil Classification.* In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of this part.

(c) *Presentation of Information.* Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables C-1.1, C-1.2, and C-1.3, and Tables C-2.1, C-2.2 and C-2.3 following paragraph (g) of the appendix. Each table presents the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil type in which the excavation or portion of



the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix, and on the tables themselves.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations regarding Tables C-1.1 through C-1.3 and Tables C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(d) *Basis and limitations of the data.*—(1) *Dimensions of timber members.* (i) The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the National Bureau of Standards (NBS) report, “Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations.” In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables C-1.1 through C-1.3 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables C-2.1 through C-2.3, or have this choice under §1926.652(c)(3), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(2) *Limitation of application.* (i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in §1926.652(c).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with §1926.652.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term “adjacent” as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) *Use of Tables.* The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(f) *Examples to Illustrate the Use of Tables C-1.1 through C-1.3.*

(1) *Example 1.*

A trench dug in Type A soil is 13 feet deep and five feet wide.

From *Table C-1.1*, for acceptable arrangements of timber can be used.

*Arrangement #B1*

Space 4×4 crossbraces at six feet horizontally and four feet vertically.

Wales are not required.

Space 3×8 uprights at six feet horizontally. This arrangement is commonly called “skip shoring.”

*Arrangement #B2*

Space 4×6 crossbraces at eight feet horizontally and four feet vertically.

Space 8×8 wales at four feet vertically.

Space 2×6 uprights at four feet horizontally.

*Arrangement #B3*

Space 6×6 crossbraces at 10 feet horizontally and four feet vertically.

Space 8×10 wales at four feet vertically.

Space 2×6 uprights at five feet horizontally.

*Arrangement #B4*

Space 6×6 crossbraces at 12 feet horizontally and four feet vertically.

Space 10×10 wales at four feet vertically.

Spaces 3×8 uprights at six feet horizontally.

*(2) Example 2.*

A trench dug in Type B soil in 13 feet deep and five feet wide. From Table C-1.2 three acceptable arrangements of members are listed.

*Arrangement #B1*

Space 6×6 crossbraces at six feet horizontally and five feet vertically.

Space 8×8 wales at five feet vertically.

Space 2×6 uprights at two feet horizontally.

*Arrangement #B2*

Space 6×8 crossbraces at eight feet horizontally and five feet vertically.

Space 10×10 wales at five feet vertically.

Space 2×6 uprights at two feet horizontally.

*Arrangement #B3*

Space 8×8 crossbraces at 10 feet horizontally and five feet vertically.

Space 10×12 wales at five feet vertically.

Space 2×6 uprights at two feet vertically.

*(3) Example 3.*

A trench dug in Type C soil is 13 feet deep and five feet wide.

From Table C-1.3 two acceptable arrangements of members can be used.

*Arrangement #B1*

Space 8×8 crossbraces at six feet horizontally and five feet vertically.

Space 10×12 wales at five feet vertically.

Position 2×6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

*Arrangement #B2*

Space 8×10 crossbraces at eight feet horizontally and five feet vertically.

Space 12×12 wales at five feet vertically.

Position 2×6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

*(4) Example 4.*

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

Space 8×10 crossbraces at six feet horizontally and five feet vertically.

Space 12×12 wales at five feet vertically.

Use 3×6 tight sheeting.

Use of Tables C-2.1 through C-2.3 would follow the same procedures.

*(g) Notes for all Tables.*

1. Member sizes at spacings other than indicated are to be determined as specified in §1926.652(c), "Design of Protective Systems."

2. When conditions are saturated or submerged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wales to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the toe of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

TABLE C-1.1  
 TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS \*  
 SOIL TYPE A  $P_a = 25 \times H + 72 \text{ psf}$  (2 ft Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **											
	CROSS BRACES					MALES			UPRIGHTS			
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)				VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	CLOSE	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)		
	UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				4	5	6	8
5	UP TO 6	4X4	4X4	4X6	6X6	6X6	4	Not Req'd			2X6	
T0	UP TO 8	4X4	4X4	4X6	6X6	6X6	4	Not Req'd				2X8
10	UP TO 10	4X6	4X6	4X6	6X6	6X6	4	8X8		2X6		
	UP TO 12	4X6	4X6	6X6	6X6	6X6	4	8X8			2X6	
10	UP TO 6	4X4	4X4	4X6	6X6	6X6	4	Not Req'd				
T0	UP TO 8	4X6	4X6	6X6	6X6	6X6	4	8X8		2X6		
15	UP TO 10	6X6	6X5	6X6	6X8	6X8	4	8X10				
	UP TO 12	6X6	6X6	6X6	6X8	6X8	4	10X10			3X8	
15	UP TO 6	6X6	6X6	6X6	6X8	6X8	4	6X8		3X6		
T0	UP TO 8	6X6	6X6	6X6	6X8	6X8	4	8X8				
20	UP TO 10	8X8	8X8	8X8	8X10	8X10	4	8X10		3X6		
	UP TO 12	8X8	8X8	8X8	8X10	8X10	4	10X10		3X6		
OVER 20	SEE NOTE 1											

\* Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS \*

SOIL TYPE B P<sub>a</sub> = 45 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS**											UPRIGHTS					
	CROSS BRACES						MALES					MAXIMUM ALLOWABLE HORIZONTAL SPACING					
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)			VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	CLOSE	2	3	2X6	2X6	2X6				
5		UP TO 6	4X6	4X6										6X6	6X6	6X6	6X6
TO	UP TO 8	6X6	6X6	6X6	6X8	6X8	6X8	6X8	5	8X10	5						
10	UP TO 10	6X6	6X6	6X6	6X8	6X8	6X8	6X8	5	10X10	5						
	See Note 1																
10	UP TO 6	6X6	6X6	6X6	6X8	6X8	6X8	6X8	5	8X8	5						2X6
TO	UP TO 8	6X8	6X8	6X8	8X8	8X8	8X8	8X8	5	10X10	5						2X6
15	UP TO 10	8X8	8X8	8X8	8X8	8X10	8X10	8X10	5	10X12	5						2X6
	See Note 1																
15	UP TO 6	6X8	6X8	6X8	8X8	8X8	8X8	8X8	5	8X10	5						3X6
TO	UP TO 8	8X8	8X8	8X8	8X8	8X10	8X10	8X10	5	10X12	5						3X6
20	UP TO 10	8X10	8X10	8X10	8X10	10X10	10X10	10X10	5	12X12	5						3X6
	See Note 1																
OVER 20	SEE NOTE 1																

\* Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS \*  
 SOIL TYPE C P<sub>a</sub> = 80 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS**											UPRIGHTS	
	GROSS BRACES			WIDTH OF TRENCH (FEET)			VERT. SPACING (FEET)		SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) (See Note 2)		
	HORIZ. SPACING (FEET)	UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	UP TO 5	UP TO 5			CLOSE	2X6	
5	UP TO 6	6X8	6X8	6X8	8X8	8X8	5	8X10	5	2X6			
10	UP TO 8	8X8	8X8	8X8	8X8	8X10	5	10X12	5	2X6			
10	UP TO 10	8X10	8X10	8X10	8X10	10X10	5	12X12	5	2X6			
	See Note 1												
10	UP TO 6	8X8	8X8	8X8	8X8	8X10	5	10X12	5	2X6			
10	UP TO 8	8X10	8X10	8X10	8X10	10X10	5	12X12	5	2X6			
15	See Note 1												
	See Note 1												
15	UP TO 6	8X10	8X10	8X10	8X10	10X10	5	12X12	5	3X6			
10	See Note 1												
20	See Note 1												
OVER 20	See Note 1												

\* Mixed Oak or equivalent with a bending strength not less than 850 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.1  
 TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS \*  
 SOIL TYPE A P<sub>a</sub> = 25 X H ± 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **											UPRIGHTS				
	CROSS BRACES						WALES					MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	CROSS BRACE	4	5	6	8
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15										
5	UP TO 6	4X4	4X4	4X4	4X4	4X6	4	Not Req'd	Not Req'd	4	4X6			4X6		
TO 10	UP TO 8	4X4	4X4	4X4	4X6	4X6	4	Not Req'd	Not Req'd	4	4X6				4X8	
10	UP TO 10	4X6	4X6	4X6	6X6	6X6	4	8X8	4	4	6X6		4X6			
10	UP TO 12	4X6	4X6	4X6	6X6	6X6	4	8X8	4	4	6X6			4X6		
10	UP TO 6	4X4	4X4	4X4	6X6	6X6	4	Not Req'd	Not Req'd	4	6X6			4X10		
TO 15	UP TO 8	4X6	4X6	4X6	6X6	6X6	4	6X8	4	4	6X6	4X6				
15	UP TO 10	6X6	6X6	6X6	6X6	6X6	4	8X8	4	4	6X6		4X8			
15	UP TO 12	6X6	6X6	6X6	6X6	6X6	4	8X10	4	4	6X6	4X6		4X10		
15	UP TO 6	6X6	6X6	6X6	6X6	6X6	4	6X8	4	4	6X6	3X6				
TO 20	UP TO 8	6X6	6X6	6X6	6X6	6X6	4	8X8	4	4	6X6	3X6	4X12			
20	UP TO 10	6X6	6X6	6X6	6X6	6X8	4	8X10	4	4	6X6	3X6				
OVER 20	UP TO 12	6X6	6X6	6X6	6X8	6X8	4	8X12	4	4	6X6	3X6	4X12			

SEE NOTE 1

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS \*  
 SOIL TYPE B P<sub>a</sub> = 45 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **													
	HORIZ. SPACING (FEET)	CROSS BRACES						VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING			
		WIDTH OF TRENCH (FEET)									CLOSE	2	3	4
	UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	UP TO 15								
5	UP TO 6	4X6	4X6	4X6	6X6	6X6	5	6X8	5					
TO	UP TO 8	4X6	4X6	6X6	6X6	6X6	5	8X8	5	3X8		3X12	4X8	4X12
10	UP TO 10	4X6	4X6	6X6	6X6	6X6	5	8X10	5			4X8		
	See Note 1													
10	UP TO 6	6X6	6X6	6X6	6X8	6X8	5	8X8	5	3X6	4X10			
TO	UP TO 8	6X8	6X8	6X8	8X8	8X8	5	10X10	5	3X6	4X10			
15	UP TO 10	6X8	6X8	8X8	8X8	8X8	5	10X12	5	3X6	4X10			
	See Note 1													
15	UP TO 6	6X8	6X8	6X8	6X8	8X8	5	8X10	5	4X6				
TO	UP TO 8	6X8	6X8	6X8	8X8	8X8	5	10X12	5	4X6				
20	UP TO 10	8X8	8X8	8X8	8X8	8X8	5	12X12	5	4X6				
	See Note 1													
OVER 20	SEE NOTE 1													

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.3  
 TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS \*  
 SOIL TYPE C P<sub>a</sub> = 80 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **																	
	CROSS BRACES				MALES				UPRIGHTS									
	HORIZ. SPACING (FEET)		WIDTH OF TRENCH (FEET)		VERT. SPACING (FEET)		SIZE (IN)		VERT. SPACING (FEET)		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)							
	UP TO	TO	UP TO	TO	UP TO	TO	UP TO	TO	UP TO	TO	CLOSE							
5 TO 10	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X8	3X6			
	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X8	3X6			
	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X8	3X6			
10 TO 15	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X8	4X6			
	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X8	4X6			
	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X8	4X6			
15 TO 20	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X10	4X6			
	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X10	4X6			
	UP TO 6	TO 8	UP TO 4	TO 6	UP TO 9	TO 12	UP TO 15	TO 15	5	5	5	8X8	8X8	8X10	4X6			
OVER 20	SEE NOTE 1																	

\* Douglas fir or equivalent with a bending strength not less than 1500 psi.  
 \*\* Manufactured members of equivalent strength may be substituted for wood.

APPENDIX D TO SUBPART P OF PART 1926—ALUMINUM HYDRAULIC SHORING FOR TRENCHES

(a) *Scope.* This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that

do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with §1926.652(c)(2).

(b) *Soil Classification.* In order to use data presented in this appendix, the soil type or types in which the excavation is made must



first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.

(c) *Presentation of Information.* Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3 and E-1.4. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soil. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soil.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations (footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.

(6) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring; Typical Installations."

(d) *Basis and limitations of the data.*

(1) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in the D-1 Tables. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(2) Hydraulic cylinders specifications. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

(3) Limitation of application.

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in § 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the Ta-

bles are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with § 1926.652.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(C) When only the lower portion or a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) *Use of Tables D-1.1, D-1.2, D-1.3 and D-1.4.* The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting, Type B soils that may require sheeting, and Type C soils that always require sheeting are found in the horizontal wale Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(f) *Example to Illustrate the Use of the Tables:*

(1) Example 1:

A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures 1 & 3 for typical installations.)

(2) Example 2:

A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures 1 & 3 for typical installations.)

(3) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The

trench is 16 feet deep and 9 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by footnote #B2) spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically, plywood (per footnote (g)(7) to the D-1 Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep and 12 feet wide. 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally. 3×12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table D-1.4: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3×12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(g) *Footnotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.*

(1) For applications other than those listed in the tables, refer to §1926.652(c)(2) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to §1926.652(c)(2) and §1926.652(c)(3).

(2) 2 inch diameter cylinders, at this width, shall have structural steel tube (3.5×3.5×0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) 2 inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4) All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 in. thick softwood or 0.75 inch. thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

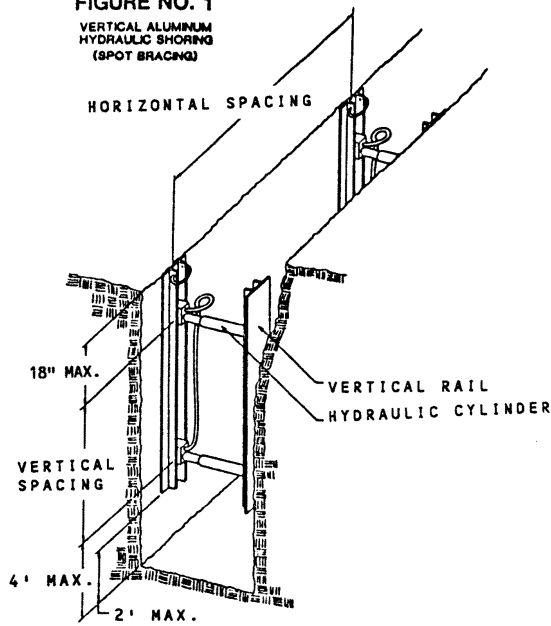
(8) See appendix C for timber specifications.

(9) Wales are calculated for simple span conditions.

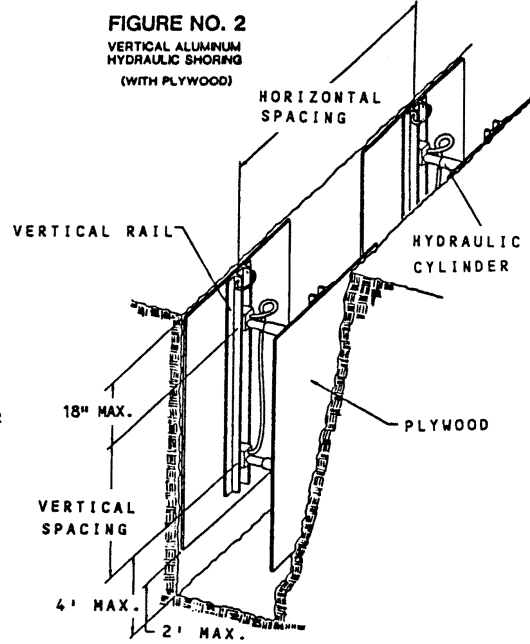
(10) See appendix D, item (d), for basis and limitations of the data.

### ALUMINUM HYDRAULIC SHORING TYPICAL INSTALLATIONS

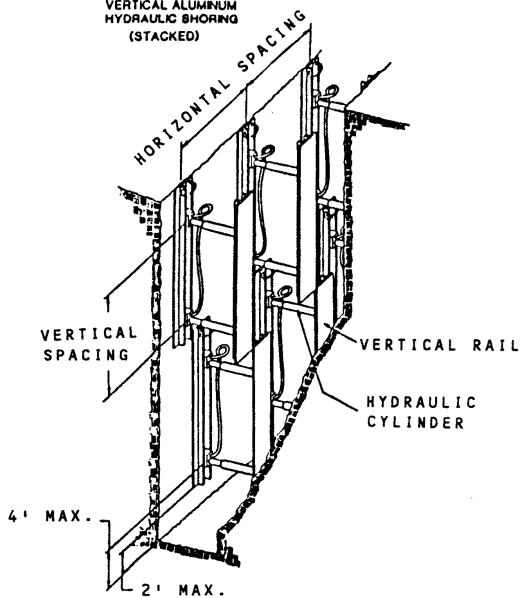
**FIGURE NO. 1**  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(SPOT BRACING)



**FIGURE NO. 2**  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(WITH PLYWOOD)



**FIGURE NO. 3**  
VERTICAL ALUMINUM  
HYDRAULIC SHORING  
(STACKED)



**FIGURE NO. 4**

ALUMINUM HYDRAULIC SHORING  
WALER SYSTEM  
(TYPICAL)

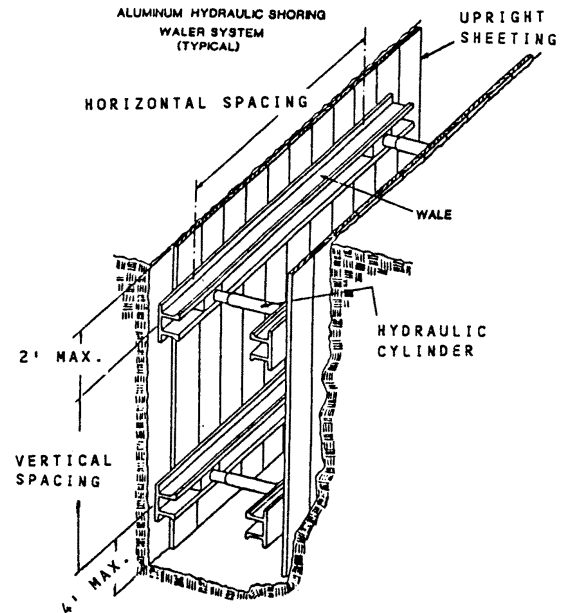


TABLE D - 1.1  
ALUMINUM HYDRAULIC SHORING  
VERTICAL SHORES  
FOR SOIL TYPE A

HYDRAULIC CYLINDERS				
DEPTH OF TRENCH (FEET)	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)	
			UP TO 8	OVER 8 UP TO 15
OVER 5 UP TO 10	8	4	2 INCH DIAMETER	3 INCH DIAMETER
OVER 10 UP TO 15	8		2 INCH DIAMETER NOTE (2)	
OVER 15 UP TO 20	7			
OVER 20			NOTE (1)	

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)  
 Note (1): See Appendix D, Item (g) (1)  
 Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.2  
ALUMINUM HYDRAULIC SHORING  
VERTICAL SHORES  
FOR SOIL TYPE B

HYDRAULIC CYLINDERS				
DEPTH OF TRENCH (FEET)	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)	
			UP TO 8	OVER 8 UP TO 12
OVER 5 UP TO 10	8	4	OVER 12 UP TO 15	
OVER 10 UP TO 15	6.5		OVER 8 UP TO 12	
OVER 15 UP TO 20	5.5		UP TO 8	
OVER 20	NOTE (1)			3 INCH DIAMETER
			2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)  
 Note (1): See Appendix D, Item (g) (1)  
 Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.3  
ALUMINUM HYDRAULIC SHORING  
WALER SYSTEMS  
FOR SOIL TYPE B

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS		
	VERTICAL SPACING (FEET)	SECTION MODULUS (IN <sup>3</sup> ) *	WIDTH OF TRENCH (FEET)						MAX. HORIZ. SPACING (ON CENTER)	SOLID SHEET	
			UP TO 8	OVER 8 UP TO 12		OVER 12 UP TO 15		2 FT.			3 FT.
			HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER			
OVER 5 UP TO 10	4	3.5	8.0	2 IN	8.0	2 IN	NOTE(2)	8.0	3 IN		
			9.0	2 IN	9.0	NOTE(2)	9.0	3 IN			
			12.0	3 IN	12.0	3 IN	12.0	3 IN			3x12
OVER 10 UP TO 15	4	3.5	6.0	2 IN	6.0	NOTE(2)	6.0	3 IN			
			8.0	3 IN	8.0	3 IN	8.0	3 IN			3x12
			10.0	3 IN	10.0	3 IN	10.0	3 IN			
OVER 15 UP TO 20	4	3.5	5.5	2 IN	5.5	NOTE(2)	5.5	3 IN			
			7.0	3 IN	6.0	3 IN	6.0	3 IN			3x12
			9.0	3 IN	9.0	3 IN	9.0	3 IN			
OVER 20			NOTE (1)								

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)  
 Notes (1): See Appendix D, item (g) (1)  
 Notes (2): See Appendix D, Item (g) (2)  
 \* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE D - 1.4  
ALUMINUM HYDRAULIC SHORING  
WALER SYSTEMS  
FOR SOIL TYPE C

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS							
	VERTICAL SPACING (FEET)	SECTION MODULUS (IN <sup>3</sup> )	WIDTH OF TRENCH (FEET)						MAX. HORIZ SPACING (ON CENTER)	SOLID SHEET						
			UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO 15									
OVER 5 UP TO 10	4	3.5	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	6.0	6.0	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	6.0	CYLINDER DIAMETER	NOTE(2)	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	2 IN	CYLINDER DIAMETER	2 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 10 UP TO 15	4	7.0	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	6.5	6.5	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	6.5	CYLINDER DIAMETER	NOTE(2)	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	2 IN	CYLINDER DIAMETER	2 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 15 UP TO 20	4	14.0	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	10.0	10.0	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	10.0	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 20	4	3.5	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	4.0	4.0	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	3.5	CYLINDER DIAMETER	NOTE(2)	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	2 IN	CYLINDER DIAMETER	NOTE(2)	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 15 UP TO 20	4	7.0	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	5.5	5.5	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	10.0	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 10 UP TO 15	4	14.0	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	8.0	8.0	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	14.0	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 5 UP TO 10	4	3.5	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	HORIZ. SPACING	2 IN	3.5	3.5	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	3.5	CYLINDER DIAMETER	NOTE(2)	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	2 IN	CYLINDER DIAMETER	NOTE(2)	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 15 UP TO 20	4	7.0	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	5.0	5.0	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	14.0	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN
OVER 10 UP TO 15	4	14.0	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	HORIZ. SPACING	3 IN	6.0	6.0	3 IN	3 FT.	2 FT.	3 FT.		
			CYLINDER DIAMETER	14.0	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN							CYLINDER DIAMETER	3 IN
			CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	3 IN	CYLINDER DIAMETER	NOTE(2)							CYLINDER DIAMETER	3 IN

NOTE (1)

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Notes (1): See Appendix D, item (g) (1)

Notes (2): See Appendix D, Item (g) (2)

\* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

APPENDIX E TO SUBPART P OF PART 1926—ALTERNATIVES TO TIMBER SHORING

Figure 1. Aluminum Hydraulic Shoring

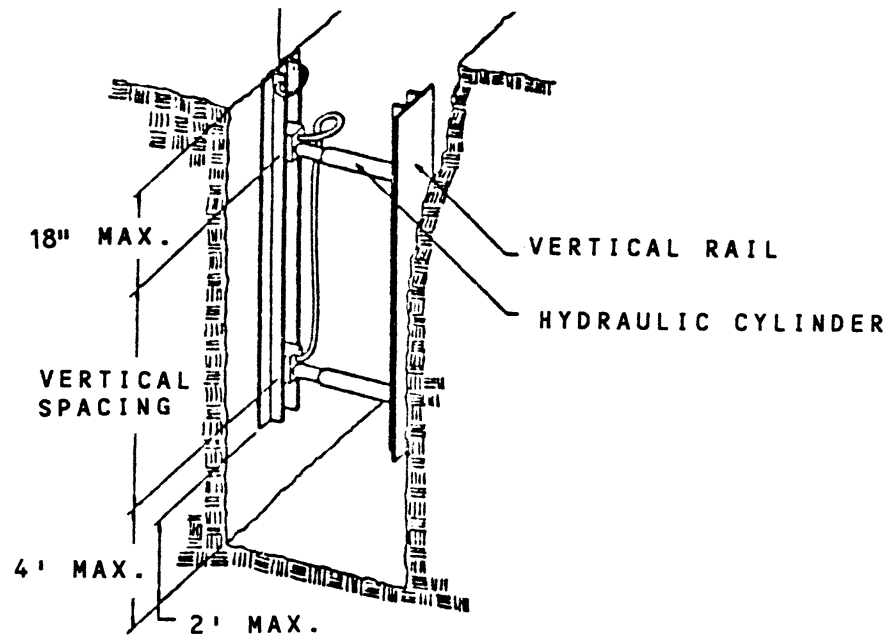


Figure 2. Pneumatic/hydraulic Shoring

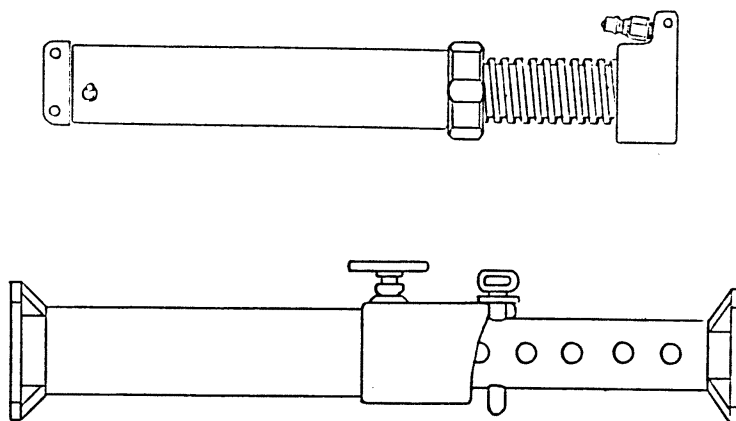




Figure 3. Trench Jacks (Screw Jacks)

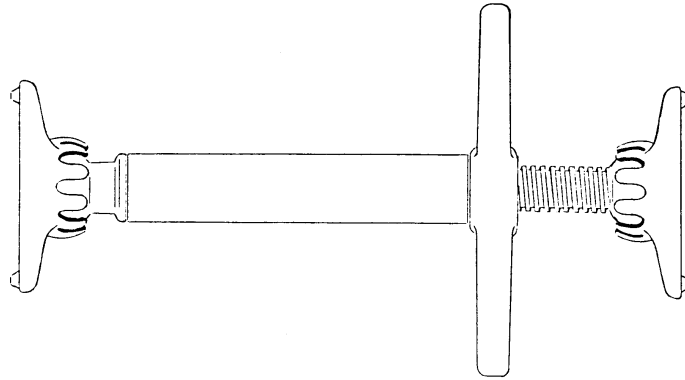
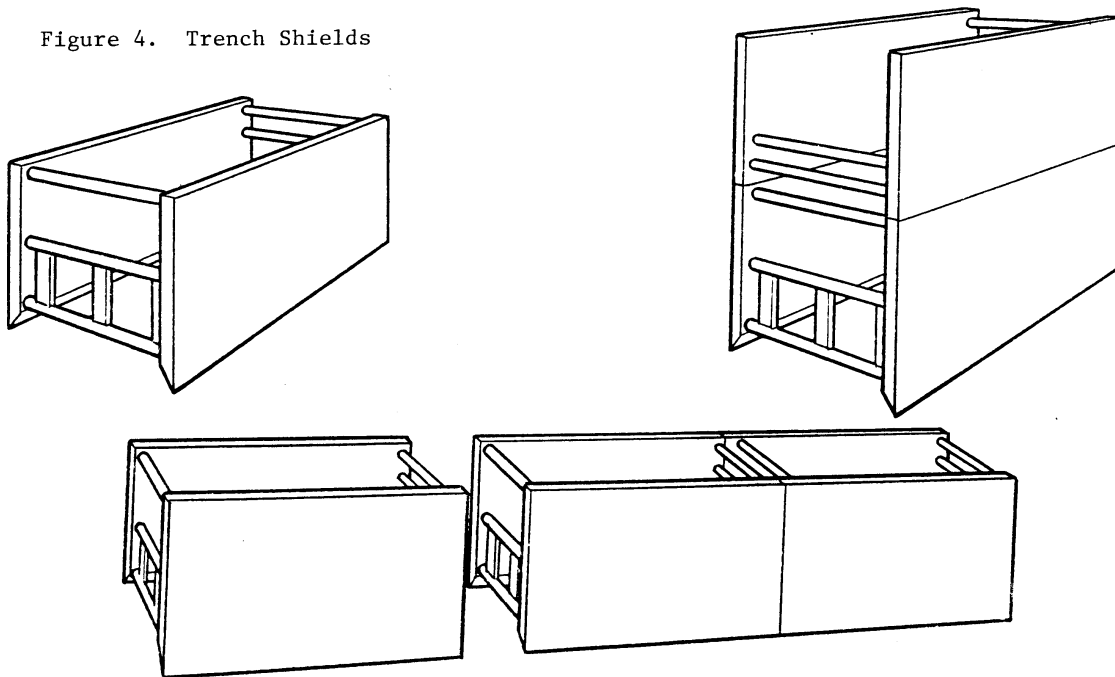


Figure 4. Trench Shields



APPENDIX F TO SUBPART P OF PART 1926—SELECTION OF PROTECTIVE SYSTEMS

The following figures are a graphic summary of the requirements contained in sub-

part P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with §1926.652 (b) and (c).

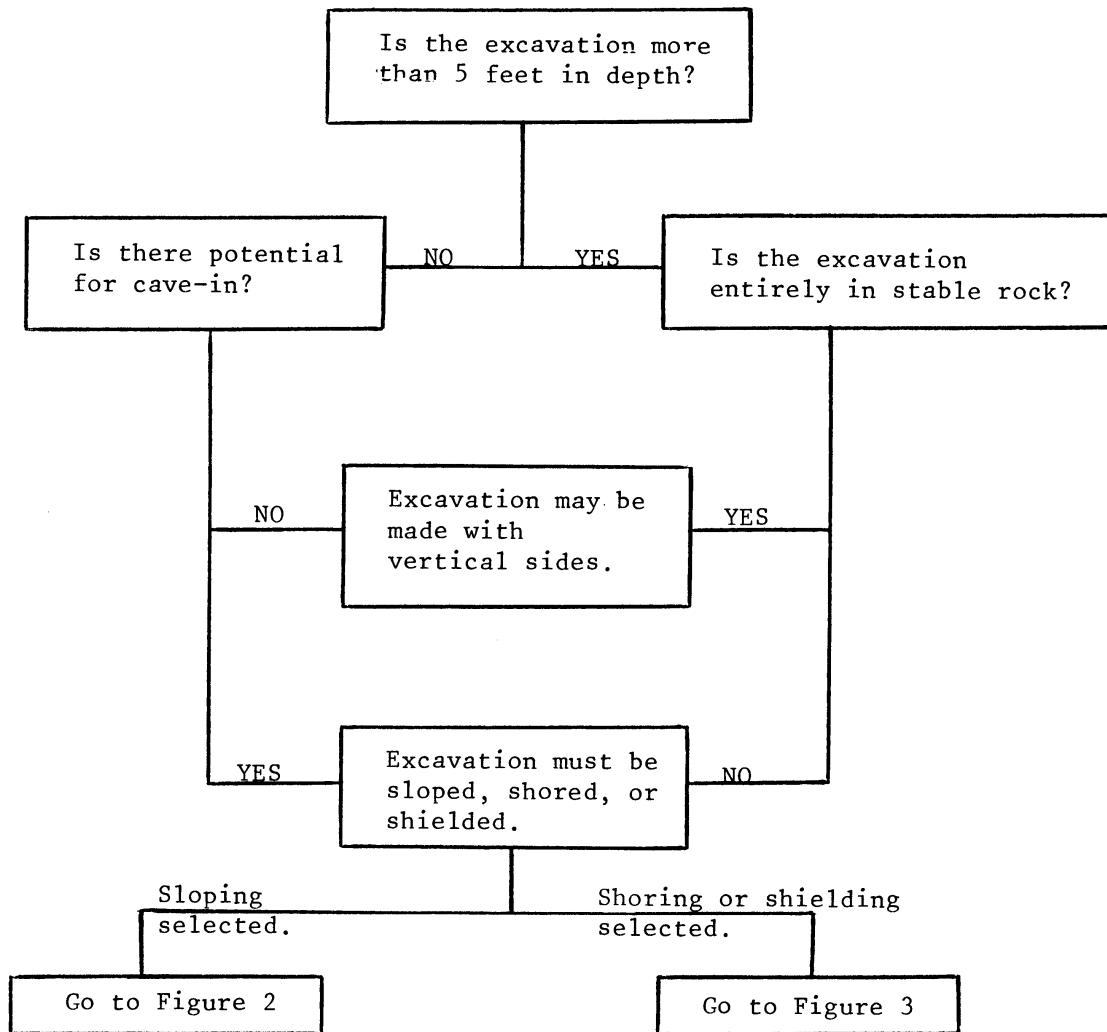


FIGURE 1 - PRELIMINARY DECISIONS

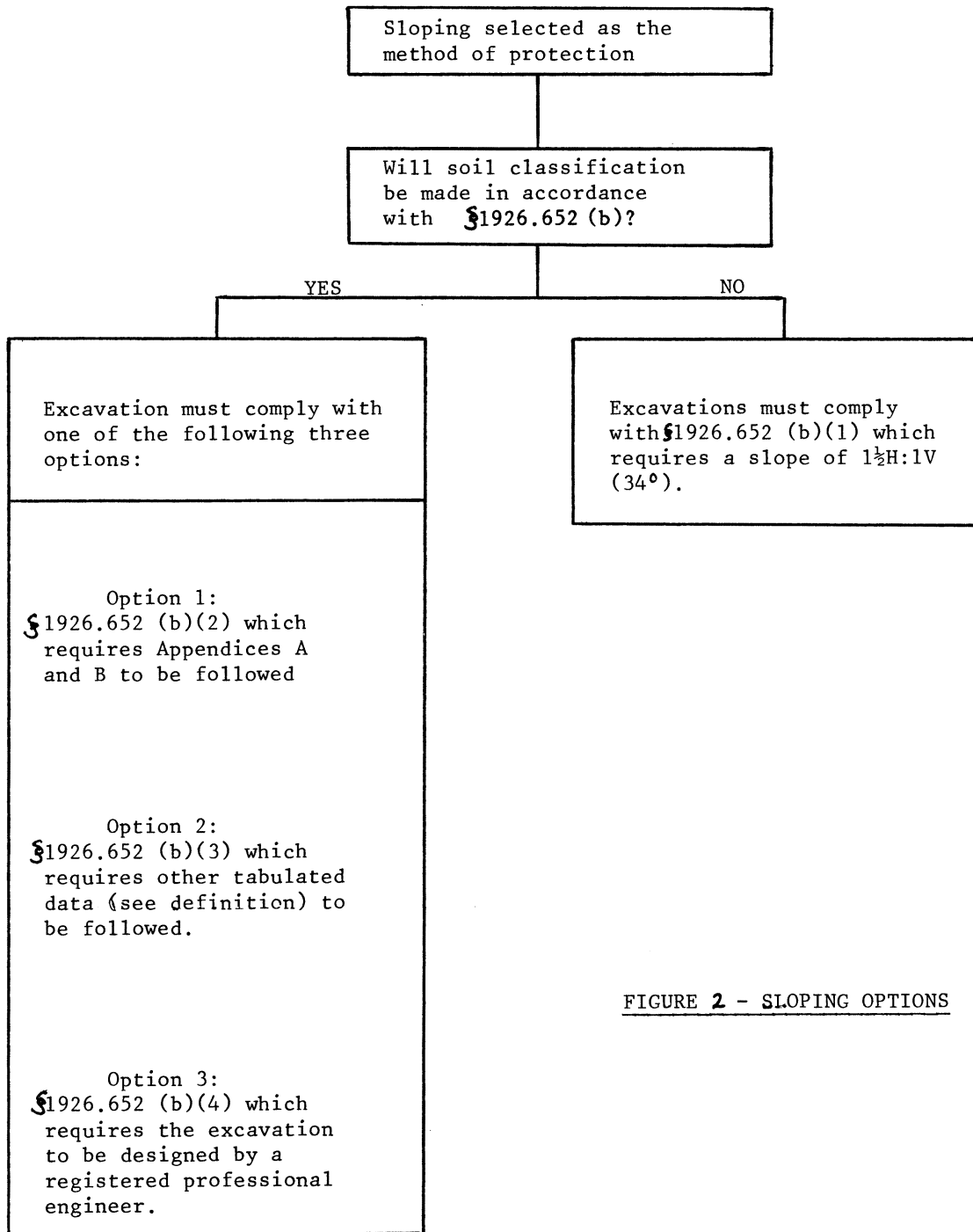


FIGURE 2 - SLOPING OPTIONS

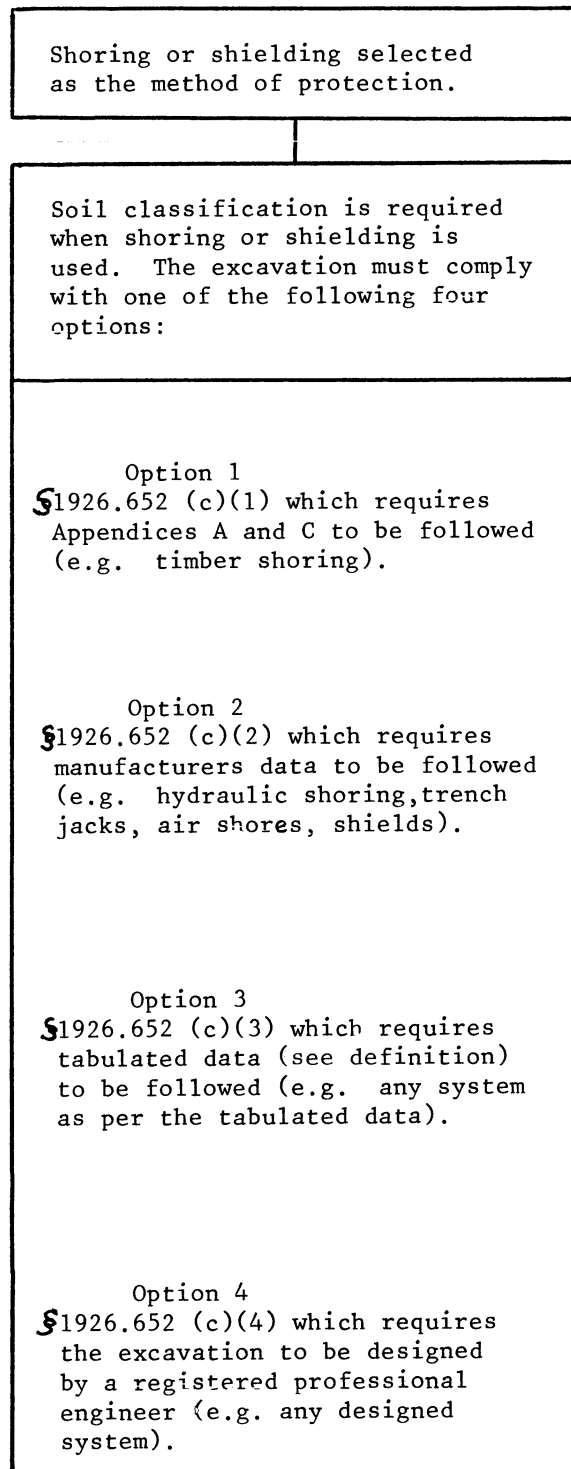


FIGURE 3 - SHORING AND SHIELDING OPTIONS

## **SUPPLEMENTAL SPECIFICATIONS**



## ARKANSAS DEPARTMENT OF TRANSPORTATION

### SUPPLEMENTAL SPECIFICATION

#### ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS

Errors noted in the printed book of Standard Specifications for Highway Construction, Edition of 2014, are listed below and this publication is hereby revised as follows:

- Page 124: The third sentence of the first paragraph of Subsection 110.03(c) should read: The Engineer will make a decision within 10 business days concerning the necessity or practicability of the request.
- Page 195: The sixth paragraph of subsection 303.02 should read: For Classes 1 through 8 materials, the fraction passing the #200 (0.075 mm) sieve shall not be greater than three-fourths of the fraction passing the #40 (0.0425 mm) sieve. For Classes 3 through 8, the fraction passing the #40 (0.425 mm) sieve shall have a liquid limit not greater than 25.
- Page 363: In the second paragraph of Subsection 502.02, the reference to ASTM 775 should be replaced by “ASTM A 775”.
- Page 636: In the second paragraph of Subsection 730.02, the references to AASHTO M 183 should be replaced with ASTM A36.
- Page 637: The last sentence of the second paragraph of Subsection 730.03 should read: All bolts, nuts, and washers shall be galvanized according to AASHTO M 232 or ASTM B 695, Class 40 or 50.
- Page 767: In the fourth paragraph of Subsection 807.06(a), the reference to ASTM B595 should be replaced by “ASTM B695”.
- Page 841: Subsection 817.04(a) should read: The treatment of lumber and timber shall meet the applicable requirements of the current edition of the AWWA, Standards U1, Commodity Specification E, Use Category UC4C.





**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**CONTRACTOR'S LICENSE**

**Section 102** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The third paragraph of **Subsection 102.01, Prequalification of Bidders** is hereby deleted and the following substituted thereof:

The attention of prospective bidders is directed to Ark. Code Ann. §17-25-101 et seq., Act 150 of the 1965 Acts of Arkansas, being an "Act Regulating the Practice of Contracting in the State of Arkansas", and any subsequent amendments made thereto. When the work offered is financed in whole with State funds and is estimated to cost \$50,000 or more, the prospective bidder must show evidence of license with the Contractors Licensing Board for the State of Arkansas before being furnished with a proposal form.

The third paragraph of **Subsection 108.01, Subletting of Contract** is hereby deleted and the following substituted thereof:

It shall be the responsibility of the Contractor to determine that all parties performing work amounting to \$50,000 or more are currently licensed by the Contractors Licensing Board for the State of Arkansas.



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTAL SPECIFICATION  
DEPARTMENT NAME CHANGE**

All references to the Arkansas State Highway and Transportation Department contained within the Standard Specifications for Highway Construction (Edition of 2014), the Qualified Products List, the Manual of Field Sampling and Testing Procedures, plan sheets, Supplemental Specifications, and all Special Provisions contained in this proposal are hereby deleted and replaced with the title of Arkansas Department of Transportation.

All references to AHTD contained within the Standard Specifications for Highway Construction (Edition of 2014), the Qualified Products List, the Manual of Field Sampling and Testing Procedures, plan sheets, Supplemental Specifications, and all Special Provisions contained in this proposal are hereby deleted and replaced with the abbreviation ARDOT.

All references to the Arkansas State Highway Commission contained within the Standard Specifications for Highway Construction (Edition of 2014), the Qualified Products List, the Manual of Field Sampling and Testing Procedures, the Standard Drawings, plan sheets, Supplemental Specifications, and all Special Provisions contained in this proposal remain in effect.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER**

**Section 108** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Subsection 108.02(b)(2)** is hereby deleted and the following is substituted therefore:

(2) The delivery to the Department for execution of the Contract and bonds properly executed on behalf of the Contractor and surety and the minimum 72 hours advance notice as required above shall constitute the Contractor's authority to begin the following items of work:

- Mobilization;
- Preparation of shop drawings and other required submissions;
- Ordering, fabrication, assembly, and/or stockpiling of materials;
- Driving Test Piling; and
- Contract surveying, when Roadway and/or Bridge Construction Control is included in the Contract.
- Erection of advance warning signs.
- Installation of netting on structures to prevent nesting of migratory birds in accordance with applicable Special Provisions (if included in the Contract).
- Set up, installation, and testing of Automated Work Zone Information Systems (if included in the Contract).
- Off-site area approval process per Section 107.10(c).

Such advance work shall be subject to the Contractor's assumption of the risk of cancellation of the award and the following:

- The Contractor shall, on commencing such operations, take all precautions required for public safety and shall observe all the provisions in the Contract;
- In the event of cancellation of the award, the Contractor shall at Contractor expense do such work as necessary to leave the site in a neat condition to the satisfaction of the Engineer;
- In the event of cancellation of the award, all work performed shall be deemed to be at the Contractor's expense; and
- All work done under this subsection in accordance with the Contract before its execution by the Commission will, when the Contract is executed, be considered authorized work and will be paid for as provided in the Contract.

Unless otherwise notified in writing, no time will be assessed for work performed prior to the effective date of a Work Order.

No payments will be made prior to the date established by the Engineer under Subsection 109.07, which date will be after the effective date of a Work Order.

The Contractor shall not be entitled to any additional compensation or an extension of time for any delay, hindrance, or interference caused by or attributable to commencement of work before the effective date of a Work Order.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**PROTECTION OF WATER QUALITY AND WETLANDS**

**Section 110** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The following is hereby added as the last paragraph of **Subsection 110.04(b)**:

On all projects let to contract after October 1, 2018, the project superintendent or supervisor (as defined in Subsection 105.06) must be certified in National Pollutant Discharge Elimination System (NPDES) through the University of Arkansas' Center for Training Transportation Professionals (CTTP). The project superintendent or supervisor must provide proof of NPDES certification before any earth disturbing activities, including clearing and grubbing, or any installation of erosion control activities are allowed to begin.





**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****UNCLASSIFIED EXCAVATION**

**Section 200** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The following is hereby added after the first paragraph of **Subsection 210.08, Excavation Operations**:

When performing excavation to construct cut slopes, the Contractor shall not excavate material below the finished slope grade. If excavation is performed more than 8 inches below the finished cut slope grade, overcut material shall be removed at no cost to the Department and replaced with clean durable stone. The stone source and gradation shall be approved by the engineer before placement. There shall be no payment for this work.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**AGGREGATE BASE COURSE**

**Section 303** of the Standard Specifications for Highway Construction, Edition 2014, is hereby amended as follows:

The second paragraph of **Subsection 303.02, Materials** is hereby deleted and the following substituted therefor:

The Contractor shall have the option of using any higher numbered class Aggregate Base Course than that specified, provided that payment will be for the class specified. Acceptance criteria shall be for the class specified. Different classes of Aggregate Base Course shall not be mixed in the same location.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**QUALITY CONTROL AND ACCEPTANCE**

**Division 300** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The first sentence of the third paragraph **Subsection 306.03 Acceptance Testing** is hereby deleted and the following substituted therefor:

If the material being furnished is crushed stone the Department will furnish the PL, LL, and PI for the material, further tests for PL, LL, and PI are waived.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**TACK COATS**

**Division 400** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 401, Prime and Tack Coats and Emulsified Asphalt in Base Course**, is hereby modified as follows:

The first sentence of **Subsection 401.03(a)** is hereby deleted and the following substituted therefore:

The surface to be treated with prime or tack coat shall be cleaned of dust, dirt, and loose or foreign material by sweeping with mechanical brooms immediately preceding the application of the prime or tack coat.

Third sentence of **Subsection 401.03(c)** is hereby deleted and the following is substituted therefore:

No dilution beyond that which is part of the emulsification process is permitted. The tack coat shall not be diluted, cut, or otherwise thinned after receipt from the manufacturer's facility.

The fifth sentence of **Subsection 401.03(c)** is hereby deleted and the following substituted therefore:

The rate of application shall be from 0.03 gallon to 0.10 gallon per square yard (0.1 L/sq m to 0.5 L/sq m) of residual asphalt as designated by the Engineer.

**Section 410, Construction Requirements and Acceptance of Asphalt Concrete Plant Mix Courses**, is hereby modified as follows:

The sixth paragraph of **Subsection 410.05** is hereby deleted and the following substituted therefore:

For foreign material, or when the time lapse between courses is more than 8 hours, the earlier course shall be cleaned and given a tack coat before placing the succeeding course. When directed, the tack coat shall be applied and paid for under Section 401. If directed by the Engineer, a tack coat shall be used even though the elapsed time has been less than 8 hours.





**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES**

**Division 400** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 404, QUALITY CONTROL OF ASPHALT MIXTURES**, is hereby modified as follows:

The third paragraph **Subsection 404.04** is hereby deleted and the following substituted therefore:

The accepted mix design shall be field verified by the Contractor at the start of mix production or after an interruption of more than 120 calendar days. The asphalt mixture shall be verified by testing mix that has been produced through the plant using the aggregate proportions shown on the accepted mix design. Production of Department approved mix designs for placement on non-ARDOT projects may be used for mix verification. The Contractor shall notify the Engineer sufficiently in advance for Department personnel to witness all testing of this production and shall provide copies of all test results to the Department.

**Section 410, Construction Requirements and Acceptance of Asphalt Concrete Plant Mix Courses** is hereby modified as follows:

The first and second sentence of **Subsection 410.09, Acceptance of the Payment and Adjustments in Payment**, is hereby deleted and the following is substituted therefore:

- (a) General. The accepted mix design shall be verified by the Contractor at the start of mix production for that design or after an interruption of more than 120 calendar days. A maximum of 200 tons (200 metric tons) of materials may be placed on the roadway during the verification process.

**Section 411, Asphalt Concrete Plant Mix** is hereby modified as follows:

The third sentence of Subsection 411.05 (B), Acceptance is hereby amended and the following is substituted therefore:

- (b) Acceptance. The accepted mix design shall be field verified by the Contractor at the start of mix production or after an interruption of more than 120 calendar days.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**PERCENT AIR VOIDS FOR ACHM MIX DESIGNS**

**Division 400** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The fourth sentence of Paragraph 1 of **Subsection 404.01(b), Design Requirements**, is hereby deleted and the following substituted therefor:

The optimum asphalt content is the asphalt binder content at 4% Air Voids (AV).

The first bullet of Paragraph 1 is hereby deleted and the following substituted therefor:

- PG 64-22 and PG 70-22 mixes will be designed using 4% air voids;

The second sentence of Paragraph 2 of **Subsection 404.04, Quality Control of Asphalt Mixtures**, is hereby deleted and the following substituted therefor:

Adjustments to the accepted mix design to conform to actual production values without re-design of the mixture shall be based on production of the mixture at a target value of 4.0% Air Voids (AV) in specimens and an asphalt binder content not less than that specified in the accepted mix design.

Table 405-1 of **Subsection 405.03 Materials** is hereby deleted and the following substituted therefor:

<b>Table 405-1</b>		
Design Requirements for Asphalt Concrete Hot Mix Base Course		
(1-1/2" [37.5 mm])		
Control Points		
Sieve (mm)	Percent Passing (%)	
2" (50.0)	100	
1½" (37.5)	90 - 100	
1" (25.0)	90 max.	
No. 4 (4.75)	-	
No. 8 (2.36)	15 - 41	
No. 16 (1.18)	-	
No. 30 (0.60)	-	
No. 50 (0.30)	-	
No. 200 (0.075)	0 - 6	
Asphalt Binder Content	Design Value	
% Air Voids	4.0	
% VMA	11.5 – 13.0	
Minimum Water Sensitivity Ratio	80.0	
% Anti-strip	As Required	
Fines to Asphalt Ratio*	0.6 – 1.6	
Wheel Tracking Test	<u>Design Gyration</u>	<u>Maximum Rut</u>
(8000 cycles, 100 psi, 64°C)	75 & 115	0.315 in. (8.000 mm)
	160	0.197 in. (5.000 mm)
	205	0.197 in. (5.000 mm)

\*Fines to asphalt ratio shall be defined as the percent materials passing the No. 200 (0.075 mm) sieve (expressed as a percent of total aggregate weight) divided by the effective asphalt binder content.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**PERCENT AIR VOIDS FOR ACHM MIX DESIGNS**

Table 406-1 of **Subsection 406.04, Construction Requirements and Acceptance**, is hereby deleted and the following substituted therefor:

<b>Table 406-1</b>		
Design Requirements for Asphalt Concrete Hot Mix Binder Course (1" [25 mm])		
	Control Points	
Sieve (mm)	Percent Passing (%)	
1½" (37.5)	100	
1" (25.0)	90 - 100	
¾" (19.0)	90 max.	
No. 4 (4.75)	-	
No. 8 (2.36)	19 - 45	
No. 16 (1.18)	-	
No. 30 (0.60)	-	
No. 50 (0.30)	-	
No. 200 (0.075)	1 - 7	
Asphalt Binder Content	Design Value	
% Air Voids	4.0	
% VMA	12.5 – 14.0	
Minimum Water Sensitivity Ratio	80	
% Anti-strip	As Required	
Fines to Asphalt Ratio*	0.6 – 1.6	
Wheel Tracking Test (8000 cycles, 100 psi, 64°C)	<u>Design Gyration</u>	<u>Maximum Rut</u>
	75 & 115	0.315 in. (8.000 mm)
	160	0.197 in. (5.000 mm)
	205	0.197 in. (5.000 mm)

\*Fines to asphalt ratio shall be defined as the percent materials passing the No. 200 (0.075 mm) sieve (expressed as a percent of total aggregate weight) divided by the effective asphalt binder content.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**PERCENT AIR VOIDS FOR ACHM MIX DESIGNS**

Table 407-1 and Table 407-2 of **Subsection 407.04, Construction Requirements and Acceptance**, are hereby deleted and the following substituted therefor:

<b>Table 407-1</b>		
Design Requirements for Asphalt Concrete Hot Mix Surface Course (1/2" [12.5 mm])		
Control Points		
Sieve (mm)	Percent Passing (%)	
3/4" (19.0)	100	
1/2" (12.5)	90 - 100	
3/8" (9.5)	90 max.	
No. 8 (2.36)	28 - 58	
No. 16 (1.18)	-	
No. 30 (0.60)	-	
No. 50 (0.30)	-	
No. 200 (0.075)	2 - 10	
Asphalt Binder Content	Design Value	
% Air Voids	4.0	
% VMA	14.0 – 16.0	
Minimum Water Sensitivity Ratio	80.0	
% Anti-strip	As Required	
Fines to Asphalt Ratio*	0.6 – 1.6	
Wheel Tracking Test (8000 cycles, 100 psi, 64°C)	<u>Design Gyration</u>	<u>Maximum Rut</u>
	75 & 115	0.315 in. (8.000 mm)
	160	0.197 in. (5.000 mm)
	205	0.197 in. (5.000 mm)

\*Fines to asphalt ratio shall be defined as the percent materials passing the No. 200 (0.075 mm) sieve (expressed as a percent of total aggregate weight) divided by the effective asphalt binder content.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**PERCENT AIR VOIDS FOR ACHM MIX DESIGNS**

**Table 407-2**

Design Requirements for Asphalt Concrete Hot Mix Surface Course (3/8" [9.5 mm])

Sieve (mm)	Control Points	
	Percent Passing (%)	
½" (12.5)	100	
3/8" (9.5)	90 - 100	
No. 4 (4.75)	90 max.	
No. 8 (2.36)	32 - 67	
No. 16 (1.18)	-	
No. 30 (0.60)	-	
No. 50 (0.30)	-	
No. 200 (0.075)	2 - 10	
Asphalt Binder Content	Design Value	
% Air Voids	4.0	
% VMA	15.0 – 17.0	
Minimum Water Sensitivity Ratio	80.0	
% Anti-strip	As Required	
Fines to Asphalt Ratio*	0.6 – 1.6	
Wheel Tracking Test	<u>Design Gyration</u>	<u>Maximum Rut</u>
(8000 cycles, 100 psi, 64°C)	75 & 115	0.315 in. (8.000 mm.)
	160	0.197 in. (5.000 mm)
	205	0.197 in. (5.000 mm)

\*Fines to asphalt ratio shall be defined as the percent materials passing the No. 200 (0.075 mm) sieve (expressed as a percent of total aggregate weight) divided by the effective asphalt binder content.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**LIQUID ANTI-STRIP ADDITIVE**

**Division 400** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 404, DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES**, is hereby modified as follows:

The following is added as the last bullet following the first paragraph of **Subsection 404.01(b), Design Requirements**:

- All ACHM mixes must contain a liquid, anti-strip additive.

**Section 409, MATERIALS AND EQUIPMENT FOR ASPHALT CONCRETE PLANT MIX COURSES**, is hereby modified as follows:

The second paragraph of **Subsection 409.02 Asphalt Binder** is hereby deleted and the following is substituted therefor:

The asphalt binder for all Asphalt Concrete Hot Mixes shall contain a heat-stable, liquid anti-strip additive. The additive shall be furnished from the Qualified Products List. The additive shall not harm the completed bituminous concrete mixture and must be compatible with the aggregate and asphalt binder supplied for the project. The anti-strip additive shall be added either by an in-line blending process just before introduction of the asphalt binder to the mixer or by blending with the asphalt binder at the asphalt binder terminal. If blended at the terminal, the bill of lading accompanying the load being delivered to the hot mix asphalt plant shall include the anti-strip manufacturer's name, product name, and quantity of all anti-strip additive included in the load.

The liquid anti-strip additive shall be added at rates as indicated below:

- For ACHM mixes where the use of an anti-strip additive is required as determined by the laboratory analysis and mix design procedures, the anti-strip additive shall be added at the rate of 0.50% to 0.75% by weight of asphalt binder as determined by the laboratory analysis and laboratory mix design procedures.
- For all other mixes, the manufacturer's recommended dosage of the additive shall be used, but the rate of liquid anti-strip additive shall not be less than 0.25% by weight of the asphalt binder.





**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**DESIGN OF ASPHALT MIXTURES**

**Section 400** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The following is added after the first sentence of paragraph 3 **Subsection 404.01 Design of Asphalt Mixtures. (b) Design Requirements:**

Any use of recycled engine oil bottoms (REOB) or other engine oil derivatives in the manufacture or modification of a binder are strictly prohibited. Ground Tire Rubber (GTR) may be added to asphalt binder with blending of GTR into asphalt occurring only at the asphalt terminal. GTR shall be Class 80-1 ground tire rubber as defined by ASTM D5603.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF  
ASPHALT CONCRETE PLANT MIX COURSES**

**Section 410, Construction Requirements and Acceptance of Asphalt Concrete Plant Mix Courses**, of the Standard Specifications for Highway Construction, Edition of 2014, is hereby modified as follows:

**Subsection 410.10 Incentives** is hereby deleted.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS**

**Section 410** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The fourth sentence of the first paragraph of **Subsection 410.08, Rolling and Density Requirements and Joints**, is hereby deleted and the following substituted therefor:

The Engineer will observe the Contractor's use of an electromagnetic surface contact device that meets ASTM D7113/D7113M or the use of a nuclear density gauge to verify that the maximum densities possible are obtained.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS**

**Section 410** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

The following is inserted after the fourth paragraph of Subsection **410.09(a)**:

The following procedures shall apply for field density testing when ACHM mixes are used as a leveling course or as a bond breaker between a base material and Portland Cement Concrete Pavement:

- If the entire subplot quantity is placed for leveling or as a bond breaker and the thickness of all of the leveling/bond breaker in that subplot is less than three times the nominal maximum aggregate size, no field density sample or test will be required. The subplot will be excluded from the calculation of the average field density for the acceptance of the lot in Subsection 410.09(a).
- If the entire subplot quantity is placed for leveling or as a bond breaker and portions of the leveling/bond breaker have a thickness greater than three times the nominal maximum aggregate size, a field density sample shall be obtained by the Contractor at a location determined by the Department using ARDOT Test Method 465; however the sampling area will be restricted to the area in which the thickness of the leveling course/bond breaker is greater than three times the nominal maximum aggregate size.
- If only a portion of the subplot quantity is placed for leveling or as a bond breaker, the Contractor shall obtain a field density sample at a location determined by the Department using ARDOT Test Method 465; however the sampling area will be restricted to the portion of the subplot where the material used as leveling or as a bond breaker has a thickness greater than three times the nominal aggregate size and to the area where the material was not used for leveling or as a bond breaker.

When field density testing for a subplot is waived by one of the above conditions, the ACHM mix used as a leveling course or as a bond breaker shall be compacted utilizing the optimum rolling pattern to achieve the maximum density required, as required by Subsection 410.08.

The first sentence of the second paragraph of Subsection 410.10 is hereby deleted and the following is substituted therefore:

When the entire quantity of either the ACHM Binder Course or ACHM Surface Course (including any sublots used for leveling) meets the following criteria, an incentive of the percentage designated will be applied to the dollar amount for all the components of the designated mix.





**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**PORTLAND CEMENT CONCRETE DRIVEWAY**

**Division 500, RIGID PAVEMENT**, of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 505, PORTLAND CEMENT CONCRETE DRIVEWAY**, is hereby modified as follows:

The first paragraph of **Subsection 505.02(b) Joint Filler** is hereby deleted and the following substituted therefore:

Material for joint filler shall comply with AASHTO M 213 or a Semi-Rigid Closed-Cell Polypropylene Foam, Preformed Expansion joint filler that meets ASTM D8139. Materials meeting ASTM D8139 shall be accepted on the basis of the manufacturer's certificates in accordance with these specifications and acceptable performance on the project.



## ARKANSAS DEPARTMENT OF TRANSPORTATION

## SUPPLEMENTAL SPECIFICATION

## INCIDENTAL CONSTRUCTION

**Sections 609, 611, 617, and 618** of the Standard Specifications for Highway Construction, Edition of 2014, are hereby amended as follows:

**Subsection 609.02(c), Materials for Drop Inlets and Junction Boxes**, is hereby deleted and the following is substituted therefor:

- (c) Steel for welded steel grates and frames shall comply with ASTM A709, Grade 36 (250).

**Subsection 611.02(a)(2), Materials for Pipe Underdrains, Outlet Protectors, and Covers**, is hereby deleted and the following is substituted therefor:

- (2) **Corrugated Polyethylene Tubing.** The tubing shall be the heavy duty type and shall comply with AASHTO M 252. The tubing shall have a minimum pipe stiffness of 46 psi (3.23 kg/cm<sup>2</sup>) at 5% deflection and shall be capable of 60 percent vertical deflection in parallel plate loading without splitting or cracking when tested in accordance with ASTM D 2412.

The second sentence of **Subsection 617.02(a)(2), Materials for Steel Posts**, is hereby deleted and the following is substituted therefor:

- (2) **Steel Posts.** The steel shall comply with ASTM A709, Grade 36 (250).

**Subsection 617.02(b)(3), Materials for Terminal Anchor Posts**, is hereby deleted and the following is substituted therefor:

- (3) The steel anchor posts shall consist of structural shapes of the section shown on the plans, or as otherwise specified, and shall comply with ASTM A709, Grade 36 (250). The upper 15" (380 mm) of the anchor assembly shall be galvanized according to AASHTO M 111.

The third sentence of the third paragraph **Subsection 618.02(a), Posts for Guard Cable**, is hereby deleted and the following is substituted therefor:

- The steel shall comply with ASTM A709, Grade 36 (250).

**Subsection 618.02(d), Materials for Bolts, Nuts, and Washers**, is hereby deleted and the following is substituted therefor:

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****INCIDENTAL CONSTRUCTION**

**(d) Bolts, Nuts, and Washers.** Bolts, nuts, and washers shall conform to the plans and shall be steel complying with ASTM A 307, ASTM F3125, Grade A325, Heavy Hex, Type 1, or ASTM A449 (Heavy Hex), galvanized according to AASHTO M 232. Threads on bolts and nuts shall conform to Unified Coarse Thread Series Class 2A, ANSI B 1.1 (Metric Coarse Thread Series, ANSI B 1.13M, 6g tolerance).

**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**RETROREFLECTIVE SHEETING FOR**  
**TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES**

**Section 604** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The following is inserted after the first paragraph of Subsection 604.02(b):

Retroreflective sheeting used on traffic drums shall meet the requirements of ASTM D4956 for Type III or IV with the additional requirements for Reboundable Sheeting. Retroreflective sheeting for delineators shall comply with section 728.

Retroreflective sheeting shall be applied to a properly treated substrate with mechanical equipment and in a manner specified by the sheeting manufacturer. Sign material (substrate) shall be of sufficient thickness and stability to maintain a substantial, effective sign for the duration of the project. One splice will be allowed in retroreflective sheeting on sign blanks. "Left", "Right", "Distances", and "Ahead" will be allowed on signs as inserts. All letters and numerals on inserts shall be of the same size and series as those on the sign face.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**CONCRETE DITCH PAVING**

**Division 600, INCIDENTAL CONSTRUCTION**, of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 605, CONCRETE DITCH PAVING**, is hereby modified as follows:

The last sentence of **Subsection 605.03(e) Expansion Joints** is hereby deleted and the following substituted therefor:

The space shall be filled with approved joint filler complying with AASHTO M 213 or a Semi-Rigid Closed-Cell Polypropylene Foam, Prefomed Expansion joint filler that meets ASTM D8139. Materials meeting ASTM D8139 shall be accepted on the basis of the manufacturer's certification in accordance with these specifications and acceptable performance on the project.





**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**CONCRETE ISLAND**

**Division 600, INCIDENTAL CONSTRUCTION**, of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 632, CONCRETE ISLAND**, is hereby modified as follows:

The last sentence of the fifth paragraph of **Subsection 632.03 Construction Requirements** is hereby deleted and the following substituted therefor:

The space shall be filled with approved joint filler complying with AASHTO M 213 or a Semi-Rigid Closed-Cell Polypropylene Foam, Prefomed Expansion joint filler that meets ASTM D8139. Materials meeting ASTM D8139 shall be accepted on the basis of the manufacturer's certification in accordance with these specifications and acceptable performance on the project.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**CONCRETE WALKS, CONCRETE STEPS, AND HAND RAILING**

**Division 600, INCIDENTAL CONSTRUCTION**, of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 633, Concrete Walks, Concrete Steps, and Hand Railing**, is hereby modified as follows:

**Subsection 633.02(E) Expansion Joints** is hereby deleted and the following substituted therefor:

A space not less than ½” (12mm) wide shall be left between the sidewalks and adjacent structures. This space shall be filled with approved joint filler complying with AASHTO M 213 or a Semi-Rigid Closed-Cell Polypropylene Foam, Preformed Expansion joint filler that meets ASTM D8139. Materials meeting ASTM D8139 shall be accepted on the basis of the manufacturer’s certification in accordance with these specifications and acceptable performance on the project. No space or joint filler is required between the sides of the walks and adjacent curbs.

Transverse expansion joints shall be placed at a maximum interval of 45’ (13.7m). Transverse joints shall be constructed using approved joint filler complying with AASHTO M 213 or a Semi-Rigid Closed-Cell Polypropylene Foam, Preformed Expansion joint filler that meets ASTM D8139. Materials meeting ASTM D8139 shall be accepted on the basis of the manufacturer’s certification in accordance with these specifications and acceptable performance on the project.



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**CURBING**

**Division 600, INCIDENTAL CONSTRUCTION**, of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Section 634, Curbing**, is hereby modified as follows:

The last paragraph of **Subsection 634.02 Materials** is hereby deleted and the following substituted therefor:

Material for the joint filler shall comply with AASHTO M 213 or a Semi-Rigid Closed-Cell Polypropylene Foam, Preformed Expansion joint filler that meets ASTM D8139. Materials meeting ASTM D8139 shall be accepted on the basis of the manufacturer's certification in accordance with these specifications and acceptable performance on the project.



**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****TRAFFIC CONTROL FACILITIES**

**Sections 712, 713, 714, 715, 728 and 730** of the Standard Specifications for Highway Construction, Edition of 2014, are hereby amended as follows:

**Subsection 712.02(a) Materials for Span Wire Support Pole With Foundation** is hereby deleted and the following is substituted therefor:

(a) Pole shafts shall comply with ASTM A 1011, SS, Grade 50 (345), ASTM A709, Grade 50 (345), ASTM A 595 Grade A, or ASTM A 572, Grade 50 or Grade 65. Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 712.02(c) Materials for Span Wire Support Pole With Foundation** is hereby deleted and the following is substituted therefor:

(c) Anchor base plates shall comply with ASTM A709, Grade 36 (250). Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 712.02(e) Materials for Span Wire Support Pole With Foundation** is hereby deleted and the following is substituted therefor:

(e) Hex nuts shall comply with AASHTO M 292 Grade 2H or ASTM A653 Grade 2H or ASTM A653 Grade DH or DH3 (Grade 10S or 10S3). The thread series shall correspond with that of the bolt furnished. Washers shall comply with ASTM F436. Galvanizing shall comply with AASHTO M 232 or ASTM B 695 Class 40 or 50. Nuts shall be galvanized by the same process as that of the bolts.

**Subsection 712.02(f) Materials for Span Wire Support Pole With Foundation** is hereby deleted and the following is substituted therefor:

(f) Concrete shall comply with Section 802 for Class S concrete. The Department will perform all acceptance sampling and testing at the frequencies shown for Contractor acceptance in Subsection 802.06. Reinforcing steel shall comply with Section 804 for Grade 60 steel.

The third paragraph of **Subsection 713.02 Materials for Span Wire Assembly** is hereby deleted and the following is substituted therefor:

Suitable cable ties shall be provided to suspend the traffic control cable at intervals not to exceed 18" (450 mm). Necessary eyebolts, washers, nuts, and fittings shall be galvanized steel complying with AASHTO M 232 or ASTM B695, Class 40 or 50.

**Subsection 714.02(a) Materials for Traffic Signal Mast Arm and Pole with Foundation** is hereby deleted and the following is substituted therefor:

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****TRAFFIC CONTROL FACILITIES**

(a) Poles and mast arms shall be ASTM A 1011, SS, Grade 50 (345), ASTM A709, Grade 50 (345), ASTM A 595 Grade A or ASTM A 572, Grade 50 or Grade 65. Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 714.02(c) Materials for Traffic Signal Mast Arm and Pole With Foundation** is hereby deleted and the following is substituted therefor:

(c) Anchor Base Plates shall be ASTM A709, Grade 36 (250). Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 714.02(e) Materials for Traffic Signal Mast Arm and Pole With Foundation** is hereby deleted and the following is substituted therefor:

(e) Hex nuts shall comply with AASHTO M 292 Grade 2H or ASTM A563 Grade DH or DH3 (Grade 10S or 10S3). The thread series shall correspond with that of the bolt furnished. Washers shall comply with ASTM F436. Galvanizing shall comply with AASHTO M 232 or ASTM B695, Class 40 or 50. Nuts shall be galvanized by the same process as that of the bolts.

**Subsection 714.02(f) Materials for Traffic Signal Mast Arm and Pole With Foundation** is hereby deleted and the following is substituted therefor:

(f) Clamp Plates shall be ASTM A709, Grade 36 (250). Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 714.02(g) Materials for Traffic Signal Mast Arm and Pole With Foundation** is hereby deleted and the following is substituted therefor:

(g) Flange and Gusset Plates shall be ASTM A709, Grade 36 (250). Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 714.02(h) Materials for Traffic Signal Mast Arm and Pole With Foundation** is hereby deleted and the following is substituted therefor:

(h) Clamp and Flange Bolts shall be ASTM F3125, Grade A325, Type 1, Heavy Hex with the requirements of Annex A2. Galvanizing shall comply with AASHTO M 232 or ASTM B695, Class 40 or 50.

**Subsection 714.02(i) Materials for Traffic Signal Mast Arm and Pole With Foundation** is hereby deleted and the following is substituted therefor:



**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****TRAFFIC CONTROL FACILITIES**

(i) Concrete shall comply with Section 802 for Class S concrete. The Department will perform all acceptance sampling and testing at the frequencies shown for Contractor acceptance testing in Subsection 802.06. Reinforcing steel shall comply with Section 804 for Grade 60 steel.

**Subsection 715.02(c) Materials for Traffic Signal Pedestal Pole With Foundation** is hereby deleted and the following is substituted therefor:

(c) Anchor Base Plates shall be ASTM A709, Grade 36 (250). Galvanizing shall comply with AASHTO M 111, Thickness Grade 100.

**Subsection 715.02(e) Materials for Traffic Signal Pedestal Pole With Foundation** is hereby deleted and the following is substituted therefor:

(e) Hex nuts shall comply with AASHTO M 292 Grade 2H or ASTM F436 Grade DH or DH3 (Grade 10S or 10S3). The thread series shall correspond with that of the bolt furnished. Washers shall comply with ASTM F436. Galvanizing shall comply with AASHTO M 232 or ASTM B695, Class 40 or 50. Nuts shall be galvanized by the same process as that of the bolts.

The fifth and sixth paragraphs of **Subsection 728.02 Materials for Delineators** are hereby deleted and the following are substituted therefor:

Steel posts for bridge rail installation shall be a 1" x 1" x 3/16" (25 mm x 25 mm x 4.76 mm) angle weighing 1.61 pounds per foot (2.4 kg/m), and manufactured from ASTM A709, Grade 36. Length of post and spacing of holes shall be as shown on the plans.

All delineators posts shall be hot dip galvanized in accordance with ASTM A123 and all fabrication, including punching or drilling holes, shall be completed before the posts are galvanized.

The second and third paragraphs of **Subsection 730.02 Materials for Breakaway Sign Support** are hereby deleted and the following are substituted therefor:

All structural steel, except pipe posts but including base plates on pipe posts, and steel fuse plates, shall comply with AASHTO M 270 Grade 50. Pipe posts shall be structural steel complying with ASTM A 53 Grade B pipe. Steel bolted or welded to the primary support posts and not affecting the breakaway function, may be AASHTO M 270 Grade 36.

All high strength bolts, nuts, and washers shall comply with ASTM F3125, Grade A325, Type 1, Heavy Hex with the requirements of Annex A2.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION**

**TRAFFIC CONTROL FACILITIES**

The third paragraph of **Subsection 730.03 Fabrication for Breakaway Sign Support** is hereby deleted and the following is substituted therefor:

All structural steel shall be galvanized after fabricating according to AASHTO M 111. All bolts, nuts, and washers shall be galvanized according to AASHTO M 232 or ASTM B695, Class 40 or 50.

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****GENERAL REQUIREMENTS FOR SIGNS**

**Section 723** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Subsection 723.02(b)** is hereby deleted and the following is substituted therefor:

**(b) Sign Panels.** Standard signs shall consist of a single sheet of aluminum alloy (ASTM B 209, Alloy 5052 H38) without stiffeners on the back. Minimum sign blank thickness shall be 0.080" (2.0 mm) for a sign size of 9 square feet (0.84 sq m) or less or 0.100" (2.5 mm) for a sign size greater than 9 square feet (0.84 sq m). Sign blanks shall be flat and straight and within commercial tolerances established by the aluminum industry.

Guide signs shall be fabricated using one piece extruded panels fabricated of aluminum alloy (ASTM B221, Alloy 6063 T6).

Extruded panel signs shall consist of sign panels; stringers or horizontal supporting members; necessary fasteners for assembling the units; reflective materials; letters; numerals; symbols; and border. All extrusions and fasteners shall be applied without causing objectionable projections on the sign face.

The one piece extruded aluminum panels shall be a minimum of 12" (300 mm) in width except one 6" (150 mm) panel may be used per sign face when necessary to construct the sign as shown on the plans.

All extruded panels shall be bolted together at every other hole (every 24" [610 mm]) with the faces and ends in alignment.

Single sheet and extruded panels to which reflective sheeting is to be applied shall be conversion coated as specified in ASTM B449 or ASTM B921 per the sheeting manufacturer's recommendations.

All fabrication, including cutting and punching of holes, excluding holes for demountable letters, numerals, symbols, and borders, shall be completed before conversion coating.

Sign panels shall be free of buckles, warp, dents, cockles, burrs, and defects resulting from fabrication. The surface of all sign panels shall be flat.

The Contractor shall submit a Certified Test Report to the Engineer covering the sign panels.

The first paragraph of **Subsection 723.02(c)** is hereby deleted and the following is substituted therefor:

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****GENERAL REQUIREMENTS FOR SIGNS**

**(c) Retroreflective Sheeting.** The retroreflective sheeting for signs shall comply with ASTM D4956 for Type III, IV, VIII, or IX retroreflective sheeting, except that Type IX retroreflective sheeting shall be used on all W1-6, W1-8, and OM-3 signs. ASTM D4956 Type XI sheeting shall be used on all R5-1 and R5-1a signs. All retroreflective sheeting shall have either Class 1 or Class 2 backing.

**Subsection 723.02(d)** is hereby deleted and the following is substituted therefor:

**(d) Legend.** All legend, which includes letters, numerals, symbols, arrows, and border, shall have a regular outline, be clean cut and sharp, and shall have a continuous stroke and border without ragged or torn edges.

All legend on guide signs shall be of the size shown on the plans. Legend on standard signs shall comply with the latest revision of FHWA Standard Highway Signs.

The legend on freeway main lane guide signs shall be demountable. Unless otherwise specified, the legend on all other guide signs shall be manufactured using either direct application or acrylic overlay film. All other signs shall be manufactured using standard industry processes, including silk screening, acrylic overlay film, and digital printing. Digitally printed signs shall be overlaid with a clear UV film per the sheeting manufacturer's recommendation.

All demountable legend shall be of the same manufacturer. The sign area outside the corner radius shall not be trimmed to match the border radius.

Frames for border strips, corners, shields, and legend shall be fabricated from 0.063" (1.6 mm) sheet aluminum complying with the requirements of ASTM B209, Alloy 5052-H38. Mounting holes shall be provided with the frames to permit the use of screws, bolts, rivets, or other fasteners of stainless steel, galvanized steel, or aluminum to fasten the frames to the sign face, subject to the condition that dissimilar metals shall be insulated to prevent corrosion.

The aluminum frames shall comply with Subsection 723.02(b).

All border material shall be secured from the same company that furnishes the cutout letters, numerals, etc. and shall be mounted in the same manner as the cutout letters.

Transparent colors, inks, paints, and films used in the sign manufacturing process shall be of the type and quality recommended by the manufacturer of the reflective sheeting and shall conform to red, blue, yellow, and green colors approved by the FHWA and shown in the MUTCD and FHWA Standard Highway Signs. The Contractor shall provide a sheeting manufacturer's full component system warranty, and shall provide certification that the materials used shall meet all MUTCD minimum requirements for retroreflectivity and contrast for the warranty period of the sheeting.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**  
**SUPPLEMENTAL SPECIFICATION**  
**CONCRETE FOR STRUCTURES**

**Section 802** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

The fourth paragraph of **Subsection 802.19(b)(1), Class 1, Ordinary Surface Finish**, is hereby deleted and the following is substituted therefor:

The tops of caps shall be properly finished with a steel trowel to a smooth finish at the plan elevation and shall not be deformed, recessed, or irregular. Any misalignment in the area of the bridge seat shall be corrected to form a level surface. All corrective action (including changes to the finished elevation of the concrete surface) greater than 1/8" (3 mm) must be submitted to the Engineer for review and approval.



**ARKANSAS DEPARTMENT OF TRANSPORTATION****SUPPLEMENTAL SPECIFICATION****REINFORCING STEEL FOR STRUCTURES**

**Section 804** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Subsection 804.02 Materials (b) Wire and Wire Fabric** is hereby deleted and the following is substituted therefor:

**(b) Wire and Welded Wire Reinforcement.** Wire, when used as reinforcement in concrete, shall conform to the requirements of AASHTO M 336. For plain wire, Grade 70 shall be furnished unless otherwise specified.

Welded wire reinforcement, when used as reinforcement in concrete, shall conform to the requirements of AASHTO M 336. For welded wire reinforcement, Grade 65 shall be furnished unless otherwise specified. The type of welded wire reinforcement shall be approved by the Engineer.





## **SPECIAL PROVISIONS**



## ITEM SP-1 – ARDOT SPECIFICATIONS

### GENERAL

SP1-1.1 The standard specifications of the Arkansas Department of Transportation (ARDOT) are bound in a book titled Standard Specifications for Highway Construction. These specifications are referred to herein as "Standard Specifications." The latest edition shall apply. A copy of these "Standard Specifications" may be obtained from the Arkansas Department of Transportation, Little Rock, Arkansas, at their customary charge.

### INCORPORATION AND MODIFICATION

SP1-2.1 Certain parts of the Standard Specifications are appropriate for inclusion in these Technical Specifications. Such parts are incorporated herein by reference to the proper section or paragraph number. The individual specification numbers noted herein may be different from those in the latest edition of the "Standard Specifications." The most current specification number shall apply. Each such referenced part shall be considered to be a part of these Contract Documents as though copied herein in full.

SP1-2.2 Certain referenced parts of the Standard Specifications are modified in the Specifications that follow. In case of conflict between the Standard Specifications and the Specifications that follow, the Specifications that follow shall govern.

SP1-2.3 Individual material test numbers change from time to time. Use the latest applicable test.

SP1-2.4 Reference in the Standard Specifications to the "Department" are herein changed to the "Owner".

END OF ITEM SP-1



**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-2 – TEMPORARY TRAFFIC SIGNAL CONSTRUCTION**

DESCRIPTION

SP2-1.1 This item shall consist of providing all labor, tools, equipment and materials necessary for construction of the temporary traffic signal controller as shown on the Plans and as specified herein. The City of Conway will provide the controller and cabinet to be installed by the contractor. The relocation of the existing video detector cabinet components will be subsidiary to this SP to provide a fully actuated traffic signal.

MATERIALS

SP2-2.1 Traffic Control Facilities Items: All materials shall meet the requirement of the applicable section of the 2014 Edition of the Arkansas State Highway and Transportation Department’s Standard Specification for Highway Construction and the applicable Special Provisions listed below in Table 1.

TABLE 1

<u>MATERIAL</u>	<u>SECTION</u>
Video Detector Relocation	733
Video Detector	SP-14
Removal of Traffic Signal Equipment	SP-13

CONSTRUCTION METHODS

SP2-3.1 Traffic Control Facilities Items: All work involved with the construction of the traffic signal controller and cabinet shall be in accordance with the details shown on the plans and the above referenced sections of the Arkansas State Highway and Transportation Department’s Standard Specification for Highway Construction, unless modified or augmented herein.

MEASUREMENT AND PAYMENT

SP2-4.1 Work completed, accepted and measured as provided above will be paid for at the contract unit price bid for each SYSTEM LOCAL CONTROLLER TS2-TYPE 2 (8 PHASES), which price shall be full compensation for furnishing all equipment required; mounting, wiring and testing; and for all materials, equipment, tools, labor, and incidentals necessary to complete the work. The provisions of this section shall govern over any reference pertaining to payment outlined in the Arkansas State Highway and Transportation Department’s Standard Specification for Highway Construction, latest edition.

Payment made under:

<b>Pay Item</b>	<b>Pay Unit</b>
SYSTEM LOCAL CONTROLLER TS2-TYPE 2 (8 PHASES)	EACH

END OF ITEM SP-2



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-3 SYSTEM LOCAL CONTROLLER**

**1. Description.** This item shall consist of furnishing and installing at locations shown on the plans or as directed, **System Local Controller** with communications interface for both **IP Addressable Ethernet** as well as **RS 232 Serial Radio** and other associated equipment, to operate as part of and existing traffic-responsive, coordinated traffic control system with either closed loop master or centralized server. All requirements of Standard Specifications for Highway Construction, Edition of 2014, **Division 700 Traffic Control Facilities**, and specifically **Section 701 Actuated Controller**, shall apply. Portions of the standard specifications may be superseded by these special provisions.

**A. General.** The existing system consists of an **Eagle Centralized ACTRA Server** traffic controls system with communications utilizing **Ubiquiti Ethernet radios**. The traffic operations system software is currently licensed to the City and to the State. All equipment shall be completely compatible with the existing traffic control coordination system hardware and software.

**2. Materials and Construction.** (Other Special Provisions in this contract may also apply). The cabinet facilities and installation, in addition to standard requirements for **Section 701 Actuated Controller**, shall incorporate the provisions listed in this special provision in order to accomplish the following:

**A. System Local Controller and Conflict Monitor.** Where specified as “TS2-Type 2 E-Net” unit shall utilize SDLC Port and Malfunction Management Unit (MMU) in monitoring for conflict display at the intersection. Where specified as type “TS1” unit shall include SDLC port but be set up in the TS1 mode and utilize a NEMA Standard 12 Channel Monitor. Unit shall have the capability of monitoring intersections utilizing the latest’s proposed operation of “Flashing Yellow Arrow” (FYA) display.

**B. Expandability.** All traffic controllers (timers) shall be not less than 8 Phases. This does not apply to cabinet facilities and conflict monitor which shall conform to the summary of quantities or other provisions in this contract. Detector wiring harnesses or rack mount detector channel slots shall, as a minimum, be wired for future connection for the number of phases as described in the Summary of Quantities or plan sheets (whichever is greater); for a minimum of 8 system detectors; or as governed by other provisions in this contract.

**C. Ethernet Cable**

**1.** The Ethernet cable shall be environmentally hardened, outdoor rated 350 MHz Category 5e cable. The cable shall be riser rated, 24 AWG solid copper, have Polyolefin insulation, UV and oil resistant PVC jacket. Pair 1 shall be Blue, White/Blue, Pair 2 shall be Orange,

## ARKANSAS DEPARTMENT OF TRANSPORTATION

### SPECIAL PROVISION

#### JOB NO. 18147010

#### SP-3 SYSTEM LOCAL CONTROLLER

White/Orange, Pair 3 shall be Green, White/Green and Pair 4 shall be Brown, White/Brown. The operating temperature shall be from -40° C to +70° C. The cable shall conform to the following standards: ISO/IEC 11801 Category 5e, NEMA WC 63, and ANSI/TIA/EIA 568-B.2 Category 5e. The cable shall be without splicing or joints for a single run. The contractor shall obtain instructions from the manufacturer about alternate architecture when length of a single run of CAT 5e cable exceeds 320 feet.

2. The RJ-45 plug connectors shall be used at both the camera and cabinet ends. The supplier of the video detection systems shall approve the Category 5e cable, RJ-45 connector and crimping tool and the manufacturer's instructions must be followed to insure proper connection.

3. Power cable shall be 14 AWG three conductor cable. This cable shall comply with the requirements of IMSA Specification 19-1.

4. Price for cable shall include removal and disposal of existing cable which is replaced for Ethernet Video Detectors.

**D. Communications.** Equipment supplied on this contract shall consist of an Ubiquiti Ethernet radios and be fully compatible with existing server and existing radio communications system. Equipment shall have the capability of communicating from serial data over IP addressable Gigabit Ethernet (1000BASE-T) and have small form-factor (SFP) slot that can be plugged for a fiber or cable modem interface. Both single mode and multimode SFPs up to 1000BASE-X shall be supported. A cable modem with power supply shall be included with the radio as necessary. The Unit shall contain a 2.4 GHz and a 5.8 GHz frequency radio and operate with 802.11 or proprietary protocol.

1. Installation - The unit including both radios and Antennas shall be mounted remote from control device with communications connection to the device utilizing an external grade Ethernet cable. Contractor shall perform any wiring, antenna or cabinet modifications necessary. This shall include antenna adjustment necessary to achieve optimal performance of radio and control equipment.

**E. Controller Manuals and Documentation.** All documentation and software shall be provided a minimum of 14 calendar days before commencement of the 30 day trial period. The 30 day trial period will not start until this as well as other requirements for system operation have been met. Controller manuals (software and software manuals), must be provided 14 calendar days prior to placing intersection into operation.



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**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-3 SYSTEM LOCAL CONTROLLER**

Two sets (no photo-copies) of controller manuals shall be provided, one copy to the City or County and one copy to the Department's Maintenance Division.

**F. System Timing and Operation Test.** The 30 day performance test shall not commence on any portion of the system until all test have been performed by the contractor to the satisfaction of the Engineer in the presence of the Department. Timing data will be provided by the Department's Maintenance Division. The contractor shall give the Engineer a minimum of 14 calendar days notice to requiring timing data for testing and setup. Contractor shall be responsible for verification that data provided shall be functional and shall notify the Department's Maintenance Division of any changes necessary prior to installation.

In the event that the contractor is not qualified to perform these test and verification, he will be responsible for seeing that a manufacturer's representative is present on the day of testing.

**G. Ethernet Switch, T100 Hardened (8 Port).** Equipment shall provide an interface between other Ethernet devices to the master site. Unit shall be hardened for environmental conditions of -30 C - +60 C and humidity (non-condensing) 5% to 95%. Installation of Unit with power supply shall be installed at control points where specified.

**3. Method of Measurement.** Completed and accepted items will be measured as follows:

- A. System Local Controller will be measured by the unit.
- B. Ethernet (E-Net) cable of the type specified will be measured by the linear foot
- C. Local Radio (E-Net 5.8) with Antenna will be measured by the unit.
- D. Local Repeater Radio with Antenna will be measured by the unit.
- E. Ethernet Switch, T100 Hardened (8 Port) will be measured by the unit.

**4. Basis of Payment.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid as follows:

- A. **System Local Controller** - Price bid for system local controller and associated equipment of the phases specified, shall be full compensation for furnishing all equipment for providing the foundation, and mounting the cabinet; for installing, wiring and testing the controller and communications unit; for excavation and backfilling; and for all materials, equipment, tools, labor and incidentals necessary to complete the work.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-3 SYSTEM LOCAL CONTROLLER**

- B. **E-Net Cable (Exterior Cat 5E)** - Price bid for E-Net Cable of the type specified shall be full compensation for furnishing, installing and testing the cable; and for all equipment, tools, labor and incidentals necessary to complete the work
- C. **Local Radio (E-NET 5.8) With Antenna** - Price bid for Local Radio (E-NET 5.8) with Antenna shall be full compensation for furnishing the radio; antenna, cable and wiring; mounting, and testing the system; and for all equipment, tools, labor and incidentals necessary to complete the work.
- D. **Local Repeater Radio with Antenna** - Price bid for Local Repeater Radio with Antenna shall be full compensation for furnishing the radio, antenna, cable and wiring; mounting, and testing the system, and for all equipment, tools, labor and incidentals necessary to complete the work.
- E. **Ethernet Switch, T100 Hardened (8-Port)** - Price bid for Ethernet Switch, T100 Hardened (8 Port) of the type specified shall be full compensation for furnishing, installing and testing the switch; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment shall be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
System Local Controller TS 2-Type 2, E-Net (___Phases)	Each
E-Net Cable (Exterior Cat 5e)	Linear Foot
Local Radio (E-Net 5.8) with Antenna	Each
Local Repeater Radio with Antenna	Each
Ethernet Switch, T100 Hardened (8-Port)	Each

END OF ITEM SP-3

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-4 ELECTRICAL CONDUCTORS FOR LUMINAIRES**

**DESCRIPTION.** This item consists of furnishing and installing electrical conductors as noted on the plans. This shall include conductors from the luminaire service point to the luminaire disconnect point and from the luminaire disconnect point to luminaires mounted on the traffic signal poles. Circuit breakers and weatherproof breaker boxes are considered subsidiary to "Electrical Conductors for Luminaires" and shall be provided and installed by the Contractor at the luminaire disconnect point.

**MATERIALS.** The electrical conductors shall consist of two conductor cables (#12 A.W.G.). Electrical conductors shall be stranded or solid copper UF rated 600 volt, suitable for underground duct installation in wet or dry locations. Electrical conductors shall comply to ASTM Specification B3, B-8 or B-787. The insulation shall be a color coded premium grade flame retardant PVC (polyvinyl chloride). The jacket shall be polyamide nylon. Circuit breakers shall be rated at 20 amps.

**CONSTRUCTION REQUIREMENTS.** The Contractor shall furnish and install a luminaire disconnect (20 amp circuit breaker assembly and weatherproof box) at the location designated on the plans that meets the requirements of the local utility company. The Contractor shall connect the circuit breaker assembly to the line side of the service point supplying the controller. Conductors for luminaires shall run directly from load side of luminaire disconnect to luminaires mounted on signal poles. Disconnect or trip of luminaire disconnect shall not effect power to controller. Luminaire disconnect shall be clearly labeled as "Street Light" circuit.

Splices are allowed at pole bases or as approved by the Engineer. Splicing methods considered acceptable are: Soldered, compression connectors of proper size employing cyclic crimping devices, terminal strips, or other method approved by the Engineer. Splices on terminal strips shall utilize proper spade lugs. All splices shall be waterproof. When taping is required, the wire shall be covered with six (6) layers of plastic electrical tape and sealed with "Scotch-Coat" or other similar electrical sealing material. Where wire nuts are used, soldering, taping and sealing is still required. Electrical insulating putty may be used to round off sharp corners of wire or connectors before applying tape. Slack cable (3 ft. min.) shall remain at each splice location or at end of luminaire arm when luminaire is not to be installed by contractor. Final connection of power from the local utility to the service point will be made by others.

**METHOD OF MEASUREMENT.** Electrical Conductors for Luminaires will be measured by the linear foot. Multiple conductors shall be measured together, not measured singularly.

10-18-2002  
02-06-2003 Rev.  
02-18-2003 Rev.  
01-17-2008 Rev.  
12-16-2016 Rev.  
11-16-2017 Rev.  
12-06-2018 Rev.

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-4 ELECTRICAL CONDUCTORS FOR LUMINAIRES**

**BASIS OF PAYMENT.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per linear foot for Electrical Conductors for Luminaires of the type and size called for on the plans, which price shall be full compensation for furnishing materials, splicing and connections and for all tools, equipment, labor, and incidentals necessary to complete the work.

Payment will be made under:

**Pay Item**

**Pay Unit**

Electrical Conductors for Luminaires

Linear Foot

END OF ITEM SP-4

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-5 ELECTRICAL CONDUCTORS-IN-CONDUIT**

**DESCRIPTION.** This item consists of furnishing and installing electrical conductors from point to point as indicated on the plan sheets.

**MATERIALS.** The electrical conductors shall consist of cables of the gauge and number of conductors specified on the plan sheets, and shall be USE rated (single conductor) or UF rated (two conductor), suitable for underground duct installation in wet or dry locations. Electrical conductors shall be solid or stranded copper unless otherwise approved by the Engineer.

Where specified "With Ground" (WG), included shall be a copper safety ground of either bare copper or green insulated; of not less than two sizes less than the load carrying conductors, whichever is greater.

Where specified "Equipment Ground Conductor" (E.G.C.), conductor shall be a copper safety ground of either bare copper or green insulated of the size and quantity shown.

**CONSTRUCTION REQUIREMENTS.** Splices are allowed at pole bases or as approved by the Engineer. Unless waterproof quick disconnects are used, Splicing methods considered acceptable are: Soldered, compression connectors of proper size employing cyclic crimping devices, terminal strips, or other method approved by the Engineer. Splices on terminal strips shall utilize proper spade lugs. All splices shall be waterproof. When taping is required, the wire shall be covered with six (6) layers of plastic electrical tape and sealed with "Scotch-Coat" or other similar electrical sealing material. Where wire nuts are used, soldering, taping and sealing is still required. Electrical insulating putty may be used to round off sharp corners of wire or connectors before applying tape. Slack cable (3 ft. min.) shall remain at each splice location.

**METHOD OF MEASUREMENT.** Electrical Conductors-In-Conduit shall be measured by the linear foot. Multiple conductors shall be measured together, not measured singularly.

**BASIS OF PAYMENT.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per linear foot for Electrical Conductors-In-Conduit of the type and size called for on the plans, which price shall be full compensation for furnishing materials, splicing, and connections and for all tools, equipment, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Electrical Conductors-In-Conduit ( _c/_ A.W.G.,_)	Linear Foot

END OF ITEM SP-5



**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-6 LED COUNTDOWN PEDESTRIAN SIGNAL HEAD**

1. **DESCRIPTION.** This item shall consist of furnishing and installing Countdown Pedestrian Signal Heads and components based on Light Emitting Diode (LED) technology according to these specifications as well as **Section 707 Pedestrian Signal Head** of the Standard Specifications for Highway Construction, Edition of 2014, subject to approval of the engineer. The basic configuration consists of the “filled”, symbolic single section design. Portions of the standard specifications will be superseded by these special provisions.
2. **MATERIALS.** The LED modules shall be suitable for span wire and mast arm mounted signals. Units must meet the following specifications to be accepted.

**(A) Physical and Mechanical.** LED pedestrian signal modules designed shall not require special tools for installation. Retrofit replacement LED signal modules shall fit into existing pedestrian signal housings built to the VTCSH Standard without modification to the housing. Installation of a retrofit replacement LED signal module into an existing signal housing shall only require the removal of the existing optical unit components, i.e., lens, lamp, and gaskets; shall be weather tight and fit securely in the housing; and shall connect directly to existing electrical wiring utilizing spade connectors. It shall not be necessary to remove reflector or lamp module. Reflector and lamp module is not required where new housings are provided.

The countdown feature will be displayed only during the flashing “Don’t Walk” segment of the pedestrian phase. This feature should be able to restart at the correct part of the signal cycle after a power outage or a signal pre-emption has been activated.

**(B) Optical Requirements.** The modules shall be measured per ITE specifications, and are required to meet luminous values that are a minimum of 115 percent greater than the required minimum values in the specifications at the time of production. The YELLOW modules shall be tested for luminous output at 25°C, allowing the modules to achieve thermal equilibrium for 60 minutes, while the modules are energized at nominal operating voltage, at a 8.3% (or 1/12) duty cycle or 5 sec on/55 sec off). The yellow modules shall meet all other ITE specifications.

**(C) Optical Unit.** LED signal modules shall meet the following requirements:

**Optical Unit Replacement** - The LED module shall be constructed to allow the replacement of the outer lens and/or the light engine when needed.

**Lens Surface** - The external lens shall be smooth on the outside to prevent excessive dirt/dust buildup.

**Chromaticity** - The measured coordinates of LED signal modules shall conform to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard.

**Environment** - The LED signal module shall be rated for use in the ambient operating temperature range, measured at the exposed rear of the module, of -40° C (-40° F) to +74°C (+165° F). The LED sign module shall be protected against dust and moisture

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intrusion per the requirements of NEMA Standard 250-1991, sections 4.7.2.1 and 4.7.3.2, for Type 4 enclosures to protect all internal LED, electronic, and electrical components. The LED signal module lens shall be UV Stabilized.

**Pre assembly** - The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing pedestrian signal housing. The power supply for the LED signal module may be either integral or packaged as a separate module. The power supply may be designed to fit and mount inside the pedestrian signal housing adjacent to the LED signal module. The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

**LED Drive Circuitry (parallel)** - The individual LED light sources shall be wired so that a catastrophic failure of one LED light source will result in the loss of only that one LED light source, and the loss of no more than 1% of the total LED'S within the LED signal module.

**Material Composition** - Materials used for the lens and signal module construction shall conform to ASTM specification for the materials where applicable. Enclosures containing either the power supply or electronic components of the signal modules shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

**Identification Markings** - Each individual LED signal module shall be identified for warranty purposes. Each LED signal module shall be identified on the backside with the manufacturer's name and serial number. The following operating characteristics shall be identified: nominal operating voltage, power consumption, and Volt-Ampere. Modules shall have a prominent and permanent vertical indexing indicator, i.e. UP ARROW or the word UP or TOP, for correct indexing and orientation inside a signal housing. Modules conforming to this specification may have the following statement: "Manufactured in Conformance with the Interim Purchase Specification of the ITE for LED vehicle Pedestrian signal Modules" on an attached label.

**(D) Manufacturer's Warranty.** The standard contract warranty shall apply with time extensions applied to materials. The contractor shall provide a written manufacturer's guarantee to the Agency (City, County or etc.) who provides electrical service and maintenance of the intersection. Warranty shall provide the following stipulations:

- Isolated Failures Warranty Period not less than 7 Years
- Design Failure Warranty Period not less than 5 Years

Warranty for isolated lens failure shall include replacement LED module at no cost for materials and shipping for a period of 7 years from the date the intersection is



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considered substantially complete by the engineer. An LED module shall be considered failed when the luminosity drops below the ITE requirements listed above.

A product "Design Failure" is considered to have occurred if, within a period of 5 years or less, a total of ten percent (10%) of the LED modules supplied on a particular Job are considered failed as described above. The supplier shall then "recall" the entire shipment at no cost to the agency maintaining the equipment. This shall include labor and equipment necessary to replace the units.

3. **CONSTRUCTION REQUIREMENTS.** Construction shall be in accordance with the standard specifications. No distinction is made for span-wire installations, post mount, mast arm mount, or other mounting methods as described on the plan sheet(s).
4. **METHOD OF MEASUREMENT.**
  - A. **Pedestrian Signal Head, LED.** Work completed and accepted and measured as provided above will be measured by unit.
  - B. **Pedestrian Signal Head, LED Lens Retrofit (Ret).** Work completed and accepted and measured as provided above will be measured by unit.
5. **BASIS OF PAYMENT.**
  - A. **LED Pedestrian Signal Head.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per each for PEDESTRIAN SIGNAL HEAD LED of the type, display and size specified, which price shall be full compensation for furnishing and installing all materials and signs; and for all labor, equipment, tools, and incidentals necessary to complete the work.
  - B. **LED Pedestrian Signal Lens Ret.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per each for PEDESTRIAN SIGNAL LED LENS RET of the type, number of sections, color and display specified, which price shall be full compensation for removing existing unnecessary hardware and modifying existing housing; and for furnishing and installing all materials; and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Countdown Pedestrian Signal Head, LED	Each

END OF ITEM SP-6



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**SP-7 LED TRAFFIC SIGNAL HEAD**

1. **DESCRIPTION.** This item shall consist of furnishing and installing 300 mm (12") diameter Traffic Signal Heads and components based on Light Emitting Diode (LED) technology according to these specifications as well as **Section 706 Traffic Signal Head** of the Standard Specifications for Highway Construction, Edition of 2014, to approval of the engineer. Portions of the standard specifications will be superseded by these special provisions.
2. **MATERIALS.** The LED modules shall be suitable for span wire and mast arm mounted signals. Units must meet the following specifications to be accepted.
  - (A) **Physical and Mechanical.** LED traffic signal modules designed shall not require special tools for installation. Retrofit replacement LED signal modules shall fit into existing traffic signal housings built to the VTCSH Standard without modification to the housing. Installation of a retrofit replacement LED signal module into an existing signal housing shall only require the removal of the existing optical unit components, i.e., lens, lamp, and gaskets; shall be weather tight and fit securely in the housing; and shall connect directly to existing electrical wiring utilizing spade connectors. It shall not be necessary to remove reflector or lamp module. Reflector and lamp module is not required where new housings are provided.
  - (B) **Optical Requirements.** The RED and GREEN modules shall be measured per ITE specifications, and are required to meet luminous values that are a minimum of 115 percent greater than the required minimum values in the specifications at the time of production. The YELLOW modules shall be tested for luminous output at 25°C, allowing the modules to achieve thermal equilibrium for 60 minutes, while the modules are energized at nominal operating voltage, at a 8.3% (or 1/12) duty cycle or 5 sec on/55 sec off). The yellow modules shall meet all other ITE specifications.
  - (C) **Optical Unit.** LED signal modules shall meet the following requirements:
    - Optical unit replacement** - The LED module shall be constructed to allow the replacement of the outer lens and/or the light engine when needed.
    - Lens Surface** - The external lens shall be smooth on the outside to prevent excessive dirt/dust buildup.
    - Tinting** - The RED, YELLOW and optionally on GREEN lens shall be tinted or shall use transparent film or materials with similar characteristics.
    - Chromaticity** - The measured coordinates of LED signal modules shall conform to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard.
    - Environment** - The LED signal module shall be rated for use in the ambient operating temperature range, measured at the exposed rear of the module, of -40° C (-40° F) to +74°C (+165° F). The LED sign module shall be protected against dust and moisture

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#### SP-7 LED TRAFFIC SIGNAL HEAD

intrusion per the requirements of NEMA Standard 250-1991, sections 4.7.2.1 and 4.7.3.2, for Type 4 enclosures to protect all internal LED, electronic, and electrical components. The LED signal module lens shall be UV Stabilized.

**Pre assembly** - The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply for the LED signal module may be either integral or packaged as a separate module. The power supply may be designed to fit and mount inside the traffic signal housing adjacent to the LED signal module. The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

**LED Drive Circuitry (parallel)** - The individual LED light sources shall be wired so that a catastrophic failure of one LED light source will result in the loss of only that one LED light source, and the loss of no more than 1% of the total LED'S within the LED signal module.

**Material Composition** - Materials used for the lens and signal module construction shall conform to ASTM specification for the materials where applicable. Enclosures containing either the power supply or electronic components of the signal modules shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

**Identification Markings** - Each individual LED signal module shall be identified for warranty purposes. Each LED signal module shall be identified on the backside with the manufacturer's name and serial number. The following operating characteristics shall be identified: nominal operating voltage, power consumption, and Volt-Ampere. Modules shall have a prominent and permanent vertical indexing indicator, i.e. UP ARROW or the word UP or TOP, for correct indexing and orientation inside a signal housing. Modules conforming to this specification may have the following statement: "Manufactured in Conformance with the Interim Purchase Specification of the ITE for LED vehicle Traffic Signal Modules" on an attached label.

**The first sentence of Subsection 706.02, Materials. (d)** is deleted and the following substituted therefore:

The Contractor shall furnish and install the proper signs [either Left Turn Signal (MUTCD R10-10) or Left Turn Yield on Flashing Yellow Arrow (MUTCD Special) or Left Turn Yield on Green (symbolic green ball (MUTCD R10-12))] adjacent to signal heads controlling an exclusive left turn lane.

**(E) Manufacturer's Warranty.** The standard contract warranty shall apply with time extensions applied to materials. The contractor shall provide a written manufacturer's

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guarantee to the Agency (City, County or etc.) who provides electrical service and maintenance of the intersection. Warranty shall provide the following stipulations:

- Isolated Failures Warranty Period not less than 7 Years
- Design Failure Warranty Period not less than 5 Years

Warranty for isolated lens failure shall include replacement LED module at no cost for materials and shipping for a period of 7 years from the date the intersection is considered substantially complete by the engineer. An LED module shall be considered failed when the luminosity drops below the ITE requirements listed above.

A product "Design Failure" is considered to have occurred if, within a period of 5 years or less, a total of ten percent (10%) of the LED modules supplied on a particular Job are considered failed as described above. The supplier shall then "recall" the entire shipment at no cost to the agency maintaining the equipment. This shall include labor and equipment necessary to replace the units.

- 3. CONSTRUCTION REQUIREMENTS.** Construction shall be in accordance with the standard specifications. No distinction is made for span-wire installations, post mount, mast arm mount, or other mounting methods as described on the plan sheet(s).

Whether complete head assembly is replaced or existing head is retrofitted with new lenses, contractor shall be responsible for aligning head properly with approach lanes. This does not include relocating head and bracket, but adjusting the alignment of the head to achieve maximum visibility to motorists.

- 4. METHOD OF MEASUREMENT.** Units are bid as "3 Section", "4 Section" or "5 Section". A 3 Section unit consists of one each: Red Ball, Yellow Ball, and Green Ball. A 4 Section unit consists of one each: Red Ball, Yellow Ball, Green Ball, and Green Arrow or Red Arrow, Yellow Ball, Yellow Arrow, and Green Arrow. A 5 Section unit consists of one each: Red Ball, Yellow Ball, Green Ball, Yellow Arrow, and Green Arrow. No distinction shall be made in the unit based on the orientation of the arrow indications.

**A. Traffic Signal Head, LED.** Work completed and accepted and measured as provided above will be measured by unit.

**B. Traffic Signal Head, LED Lens, Retrofit (Ret).** Work completed and accepted and measured as provided above will be measured by unit.

- 5. BASIS OF PAYMENT.**

**A. LED Traffic Signal Head.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per each for Traffic Signal Head, LED of the type, display and size specified, which price shall be full compensation for

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furnishing and installing all materials and signs; and for all labor, equipment, tools, and incidentals necessary to complete the work.

- B. LED Traffic Signal Lens Ret.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per each for Traffic Signal Head, LED Lens, Retrofit of the type, number of sections, color and display specified, which price shall be full compensation for removing existing unnecessary hardware and modifying existing housing; and for furnishing and installing all materials; and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Traffic Signal Head, LED, (___ Section, 1 Way)	Each
Traffic Signal Head, LED Lens, Retrofit (___ Section, 1 Way)	Each

END OF ITEM SP-7

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**SP-8 LED LUMINAIRE ASSEMBLY (BUG U0 TYPE)**

1. **DESCRIPTION.** This work shall consist of furnishing and installing LED luminaire assemblies on traffic signal poles, including the accessories, in accordance with these specifications and at the locations shown on the plans or as directed.
2. **MATERIALS AND CONSTRUCTION REQUIREMENTS.**

**A. Luminaire.** Each luminaire assembly shall consist of a “Cobra Head”, power door style; Light Emitting Diode (LED) light source capable of outputting at least 12,000 lumens, and optics to produce an IESNA Type-III light distribution with a BUG rating of U0. The rated Correlated Color Temperature (CCT) shall be 4000° K +/- 200°K, and the Color Rendering Index (CRI) shall be no less than 60. As a minimum, 40% of Light Flux values shall be maintained on the downward street side; with greater than 0.002 foot-candles per 1000 lamp lumens at a point of “1 x 4” mounting heights on the downward street side. Mesopic multipliers (i.e., effective luminance factors) shall not be used. All values shall assume photopic visual adaptation. luminaires with a Light Loss Factor using the L70 Method shall have a minimum rating of 50,000 hours, and a minimum 5 year warranty. The warranty shall provide for the repair or replacement of defective electrical parts (including light source and power supplies/drivers) for a minimum of five (5) years from the date of purchase. Luminaire shall be able to operate normally in temperatures from -40° C to +40° C. LED light source(s) and driver(s) shall be RoHS compliant.

The luminaires shall be all aluminum die cast hinged construction. Each luminaire assembly shall have a photocell and receptacle in the top of the luminaire housing and shall meet the requirements of the local utility company. The luminaires shall be rated IP-66 or better, and shall employ the use of borosilicate glass lenses. All luminaire internal components shall be assembled and pre-wired using modular electrical connections, and shall be designed for ease of component replacement and end-of-life disassembly.

All luminaires shall contain built-in drivers with power door assembly, and be of an approved streamlined design. Drivers shall be wired for line voltage as indicated on the plan sheets (plus or minus 10% line voltage, variation), 60-cycle, single phase, multiple circuit operation, with high power factor (90% or higher). The driver shall be suitable for the proper operation of the LED array inclusive to the luminaire assembly, with a minimum open circuit voltage as specified on the plan sheets, and shall be an easily replaceable part of the luminaire assembly. The luminaire shall be listed for wet locations by a U.S. Occupational Safety Health Administration (OSHA) Nationally Recognized Testing Laboratory (NRTL). The luminaire shall have lightning suppression equipment capable of meeting the performance requirements for electrical immunity as specified in ANSI C136.2, using a combination wave test level of at least 10kV/5kA.

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**SP-8 LED LUMINAIRE ASSEMBLY (BUG U0 TYPE)**

Luminaire assemblies (with accessories) shall be supplied in one style or model number from one manufacturer only. The contractor shall submit manufacturer's brochures with illustrations and data in addition to LM-79, LM-80 and TM-21 reports to the Arkansas Department of Transportation for approval of luminaires, accessories and installation details. All submitted luminaires shall be listed on the Department of Energy's LED Lighting Facts website, and all supporting calculations and test data from the LM-79, LM-80 and TM-21 reports must be in accordance with LED Lighting Facts guidance.

**B. Photo Cell.** Each luminaire assembly shall have a solid state photocell and receptacle in the top of the luminaire housing. Photocells shall have a locking-type photoelectric control with a rating of 5,000 operations minimum (13 years) on loads of 1800VA. The photocell shall operate at the same voltage rating as the luminaire driver.

3. **METHOD OF MEASUREMENT.** Completed and accepted LED Luminaire Assembly will be measured by the unit.
4. **BASIS OF PAYMENT.** Work completed and accepted under this item and measured as provided above shall be paid for at the contract unit price bid for each LED Luminaire Assembly, which price shall be full compensation for furnishing and installing the luminaires, lamps of the type described herein, driver, photocell, and all materials, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
LED Luminaire Assembly	Each

END OF ITEM SP-8



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**SP-9 STREET NAME SIGN  
(MAST ARM MOUNTED)**

**DESCRIPTION.** This item consists of furnishing and installing a Street Name Sign mounted on a traffic signal mast arm at locations designated on the plan sheets or as directed by the Engineer. All construction and materials shall be in accordance with the Standard Specifications for Highway Construction, Edition of 2014, with applicable supplemental specifications.

**MATERIALS AND CONSTRUCTION REQUIREMENTS.** Contractor shall provide all mounting hardware, sign blank, sheeting, tools, equipment and labor necessary to complete the installation. Sign design and construction shall be as shown on the plan sheets or as directed by the Engineer.

**METHOD OF MEASUREMENT.** Completed and accepted Street Name Sign shall be measured by the unit.

**BASIS OF PAYMENT.** Work completed, accepted and measured as provided above will be paid at the contract unit price bid for Street Name Sign which price shall be full compensation for furnishing the sign, mounting hardware, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
18" Street Name Sign	Each

END OF ITEM SP-9



## ARKANSAS DEPARTMENT OF TRANSPORTATION

### SPECIAL PROVISION

JOB NO. 18147010

#### SP-10 SERVICE POINT ASSEMBLY (TRAFFIC CONTROL DEVICES)

**DESCRIPTION.** This item consists of furnishing and installing a distribution panel, circuit breaker, lightning arrestor, weatherhead, clamps, wiring, ground rod, and miscellaneous fittings at locations designated on the plans and in accordance with the latest version of the National Electrical Code.

Lightning arrestor shall be SPD Type 2 (load side) per NEC and UL Code 1449.

All construction and wiring shall be in compliance with local electrical codes. The Contractor shall perform all necessary liaisons with local power companies in order to ascertain such specific requirements as the power company may apply to each location.

**MATERIALS AND CONSTRUCTION REQUIREMENTS.** Height of the service riser weatherhead shall be 20 feet or greater depending on street crossings or other obstructions, unless otherwise approved by the Engineer.

The required weatherhead, conduit nipples, couplings, clamps and other fittings exposed to the weather shall be hot dipped galvanized steel and shall be attached to the pole in such a manner as to facilitate the final steel conduit connecting weatherhead. Service disconnect, distribution cabinet and tie to underground circuits is paid for by Service Point Assembly. Galvanized steel conduit for riser shall be paid as a separate item.

The Contractor shall furnish and install service feeder wire from the distribution cabinet to the main breaker and from the main breaker past the weatherhead. Tie-in and splicing of the service feeder wire to the secondaries supplied by the local utility will be performed by others and shall not be considered a part of this contract. Grounding shall be as shown on the Standard Drawing SD-9 (Service Point).

Mounted at the service location shall be NEMA 3R enclosure(s), circuit breaker, distribution panel and main breaker of a design and model number suitable to the local power company and as approved by the Engineer. The circuit breaker shall be magnetic trip only and sized in accordance with the plans. If required, a meter base provided by the utility company shall be installed above the distribution panel. All enclosures and circuit breakers shall be rated for 240 V.A.C. or greater, unless otherwise designated on the plan sheets. A 30 amp breaker shall be provided.

Where lighting is included in the signal installation for intersection lighting, a 20 amp breaker shall be provided.

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**SP-10 SERVICE POINT ASSEMBLY  
(TRAFFIC CONTROL DEVICES)**

The Contractor shall submit to the Engineer two (2) printed copies of the applicable brochures containing the design criteria for the equipment which the Contractor proposes to install for approval. The specific items that are proposed for use shall be clearly marked in the applicable brochures. A list shall be attached to identify the item and contain the manufacturer, quantity, model, and identifying descriptions of each item. The items to be submitted: load centers and enclosures, lightning arrestor, and all circuit breakers.

**METHOD OF MEASUREMENT.** Completed and accepted Service Point Assembly will be measured by the unit.

**BASIS OF PAYMENT.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid each for Service Point Assembly for the number of circuits specified, which price shall be full compensation for furnishing and installing a treated wood pole, enclosure(s), circuit breaker(s), main breaker, distribution panel, steel conduit, conduit fittings, wiring and ground rod; for testing the service point assembly; and for all materials, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Service Point Assembly (____ Circuit(s))	Each

END OF ITEM SP-10

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**SP-11 PEDESTRIAN SIGNAL HEAD RELOCATION**

**DESCRIPTION.** This item consists of removing and reinstalling a pedestrian signal head as shown on the plans or as directed by the Engineer.

**MATERIALS.** Contractor shall furnish all tools, equipment, and hardware necessary for the relocation of the designated pedestrian signal head.

**CONSTRUCTION REQUIREMENTS.** Contractor shall be allowed to splice signal cable inside signal head, inside raintight junction boxes mounted on pole, or as approved by the Engineer. If junction boxes are required, these shall be furnished and installed by the contractor.

**METHOD OF MEASUREMENT.** Pedestrian Signal Head Relocation shall be measured by the unit.

**BASIS OF PAYMENT.** Work completed, accepted and measured as provided above will be paid for at the contract unit price bids for each pedestrian signal head removed and reinstalled; which price shall be full compensation for furnishing signal cable, wiring, equipment tools, and labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Pedestrian Signal Head Relocation	Each

END OF ITEM SP-11



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**SP-12 TRAFFIC SIGNAL CONTROLLER (MODIFICATION)**

**DESCRIPTION.** This item shall consist of furnishing all materials, equipment, tools and labor necessary, and modifying an existing traffic signal control cabinet to operate as indicated on the plan sheets. All construction and materials shall be in accordance with the Standard Specifications for Highway Construction, Edition of 2014, unless superseded by this special provision.

**MATERIALS.** Contractor shall supply all necessary load switches, relays, lightning suppression, terminal facilities, wiring harnesses and incidentals necessary to achieve operation as shown on the plan sheet(s). This shall include any reprogramming and modification of conflict monitor.

**CONSTRUCTION REQUIREMENTS.** The contractor shall perform all work possible that will minimize the time that the intersection is out of operation. If, in the opinion of the engineer, traffic conditions warrant, contractor shall provide flagmen to direct traffic while intersection is out of service.

The contractor shall make all modifications to the controller cabinet and intersection wiring necessary to accommodate entrance and wiring of the facilities. This includes wiring in place any additional wiring harnesses necessary to accommodate new or modified equipment and removing designated equipment from the cabinet.

Any equipment removed shall be disposed of as described on the plan sheets, or turned over to the Engineer.

A new set of cabinet diagrams shall be provided for any changes that are made.

**METHOD MEASUREMENT.** Traffic Signal Modification will be measured by the lump sum.

**BASIS OF PAYMENT.** Work completed, accepted and measured as provided above will be paid for at the contract lump sum price bid for each Traffic Signal Modification, which price shall be full compensation for furnishing all equipment required; mounting, wiring and testing; and for all materials, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Traffic Signal Modification	Lump Sum

END OF ITEM SP-12





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**JOB NO. 18147010**

**SP-13 REMOVAL OF TRAFFIC SIGNAL EQUIPMENT**

**DESCRIPTION.** Under this item, the contractor shall remove traffic signal heads, traffic signal poles, traffic signal pole foundations, span wire assemblies, traffic controllers and all other existing signal equipment at locations shown on the plans or as ordered by the Engineer.

**MATERIALS.** The contractor shall provide all equipment and tools necessary to remove the signal equipment at locations shown on the plans or as designated by the Engineer.

**CONSTRUCTION REQUIREMENTS.** The contractor shall maintain the existing signal operations as much as possible throughout construction until the completion of the contract. Control of the intersection shall be by police officers, flagmen, or as determined by the Engineer at anytime that the signals are not in operation.

The contractor shall remove the traffic signal pole foundations and all appurtenances such as reinforcing steel, conduit, anchor bolts and cable to a depth of 18 inches below grade. The concrete foundations shall be broken up and the material disposed of outside of the limits of the project by the contractor. The contractor shall fill with earth all holes where concrete foundations or wooden span wire poles have been removed under this item. The earth in the hole shall be thoroughly compacted until it is as firm and unyielding as the surrounding material. Concrete or asphalt surfaces shall be restored to existing conditions.

All equipment shall remain the property of the City or County and the contractor shall notify the City or County 24 hours in advance of the removal. All removed equipment shall be stored by the contractor at the construction site. The contractor shall provide a secure, weather-tight enclosure to store all electric components until they can be removed from the construction site.

**METHOD OF MEASUREMENT.** Removal of traffic signal equipment will be measured by the lump sum.

**BASIS OF PAYMENT.** Work completed and accepted and measured as provided above will be paid for at the contract lump sum price bid for Removal of Traffic Signal Equipment, which price shall be full compensation for furnishing all materials, equipment, tools, labor, and incidentals necessary to complete the work as described herein.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Removal of Traffic Signal Equipment	Lump Sum

END OF ITEM SP-13



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**JOB NO. 18147010**

**SP-14 VIDEO DETECTOR (COLOR)**

**Section 733 Video Detector with Radio Interface** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**The first sentence of Subsection 733.02, Materials. (a) Video Detector** is deleted and the following substituted therefore:

All video detectors shall consist of a color (CLR) video camera with electro-mechanically operated optical zoom lens, cable, manual pan and tilt bracket, wiring harness and all other accessories.

**Subsection 733.04 Method of Measurement (a) is deleted and the following substituted therefore:**

(a) Video Detector of the type specified shall be measured by the unit.

**Subsection 733.05 Basis of Payment. (a) Video Detector is hereby deleted and the following substituted therefore:**

Work completed and accepted under this item and measured as provided above, shall be paid for at the contract unit price bid per each for Video Detector of the type specified which price shall be full compensation for providing and installing the device, wiring and testing, aligning the zones; and shall also be for all labor equipment, tools and incidentals necessary to complete the work.

**The following Pay Item Video Detector (CLR) is added to Subsection 733.05 Basis of Payment:**

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Video Detector (CLR)	Each

END OF ITEM SP-14



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**SPECIAL PROVISION**

**JOB NO. 18147010**

**SP-15 EDGE CARD VIDEO PROCESSOR**

**Section 733 Video Detector with Radio Interface** of the Standard Specifications for Highway Construction, Edition of 2014, is hereby amended as follows:

**Subsection 733.02 Materials** is hereby amended by **adding** the following:

- (h) **Video Processor, Edge Card** - Unit shall insert into a standard NEMA Vehicle Detector Rack taking the position of **a single four-channel, 1 1/8" wide (single width) or a single four-channel 2" wide (double width) card slot**. Unit shall output to the standard vehicle channels with the provision to add extender cards for additional detector channels. Units shall be available for one or two video detector (camera) inputs.
- (i) **Video Edge Card Extender** - Unit shall insert into a standard NEMA Vehicle Detector Rack taking the position of **one card slot and be placed directly to the left of the associated Video Processor Edge Card**. Unit shall output to standard vehicle channels utilizing output channels from Video Processor Edge Card.
- (j) **Vehicle Detector Rack** – Unit consists of a standard NEMA TS2 Type 2 card rack unit with power supply, of the number of channels specified. Unit shall be configured with four (4) channels occupying one card slot of the rack. Unit shall be wired to be suitable for use with two (2) or four (4) channel card rack loop detectors, edge card video detectors, or video edge card extenders. Card rack shall be supplied with double width card slots if double width cards are utilized.
- (k) **Multi Port Edge Card Switch** – In lieu of providing a multi channel processor, contractor may utilize Video Processor, Edge Card with Extender Cards mounted in a Vehicle Detector Rack. When two or more Edge Cards are utilized, in order to achieve full functionality, the control and display of the Edge cards shall be combined into a single point switch allowing Ethernet, direct connect, and programming of the individual Edge Cards through a single unit. In lieu of a Multi Port Edge Card Switch, an environmentally hardened -35°C to +74°C rated 8 port RJ45 100/1000 Base-T Ethernet managed switch with power supply and patch cords shall be supplied.
- (l) **Video Detector Alignment Unit** – One programming module per job, for Zoom and focus of camera, shall be provided for alignment and setup of Detector. The module shall be given to the local government upon completion of the installation. The price for this unit shall be considered included in other items of the contract.

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**SPECIAL PROVISION**

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**SP-15 EDGE CARD VIDEO PROCESSOR**

**Subsection 733.03 Construction Requirements (C) Software** is hereby **deleted** and the following substituted:

- (C) Software** - Software required for monitoring, setup and programming of the system shall be supplied as subsidiary to this special provision for the item "Video Processor" or "Video Processor, Edge Card", of the number of channels specified. Two licensed copies shall be required for the job. Software shall be windows based and operate from an IBM compatible, laptop with Windows XP or later operating system. If other programming device is required, one unit shall be supplied and it shall be considered subsidiary to this special provision.

**Subsection 733.04 Method of Measurement** is hereby amended by **adding** the following:

- (i) Video Processor, Edge Card of the number of inputs specified shall be measured by the unit.
- (j) Video Edge Card Extender shall be measured by the unit.
- (k) Vehicle Detector Rack of the number channels specified shall be measured by the unit.
- (l) Multi Port Edge Card switch is included in other items of the contract.

**Subsection 733.05 Basis of Payment** is hereby amended by **adding** the following:

- (i) **Video Processor, Edge Card** - Work completed and accepted under this item and measured as provided above, shall be paid for at the contract unit price for Video Processor, Edge Card of the number inputs specified; which price shall be full compensation for providing and installing the device, wiring, configuring, and testing the device; and shall also be for all labor, equipment, tools, and incidentals necessary to complete the work.
- (j) **Video Edge Card Extender** - Work completed and accepted under this item and measured as provided above, shall be paid for at the contract unit price for Video Edge Card Extender; which price shall be full compensation for providing and installing the device, wiring, configuring, and testing the device; and shall also be for all labor, equipment, tools, and incidentals necessary to complete the work.
- (k) **Vehicle Detector Rack** - Work completed and accepted under this item and measured as provided above, shall be paid for at the contract unit price for Vehicle Detector Rack

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**SP-15 EDGE CARD VIDEO PROCESSOR**

of the number channels specified; which price shall be full compensation for providing and installing the device, wiring, configuring, and testing the device; and shall also be for all labor, equipment, tools and incidentals necessary to complete the work. Controller cabinet modifications, and removal of equipment inside the cabinet, and other work necessary for installation of the device shall be considered included in the price of this item.

- (l) Multi Port Edge Card Switch** - Work completed and accepted under this item will not be paid separately, but shall be included in the cost of other items of the contract where two or more Video Processors, Edge Card are utilized in the cabinet.
  
- (m) Video Detector Alignment Unit** - Work completed and accepted under this item will not be paid separately, but shall be included in the cost of other items of the contract.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Video Processor, Edge Card ( ___ Camera)	Each
Video Edge Card Extender	Each
Vehicle Detector Rack ( ___ channel)	Each

END OF ITEM SP-15





## ARKANSAS DEPARTMENT OF TRANSPORTATION

### SPECIAL PROVISION

JOB NO. 18147010

#### SP-16 EMERGENCY BATTERY BACKUP SYSTEM INSTALLATION

1. **DESCRIPTION.** This item consists of installing an Emergency Battery Backup System (BBS) with fully conditioned power, for a traffic signal control and communications equipment with batteries, mounted inside a separate equipment cabinet of the type and size called for at the location shown on the plans, or as directed by the Engineer, and shall conform to the following specifications. Power output to equipment shall be fully conditioned whether operating on line voltage or battery backup. No meter base is required.
2. **MATERIALS.** The Battery Backup System (BBS) shall include, but not be limited to the following:
  - Inverter/Charger, batteries, combination power transfer relay and manual bypass switch and all necessary hardware and interconnect wiring. The BBS shall provide reliable emergency power to traffic system equipment in the event of a power failure or interruption.
  - The BBS system shall be UL listed for use with traffic signal equipment. The general category shall be QQIJ Power Supplies, Specialty. The specific listing shall be DC-AC inverter with integral battery chargers, for use with traffic signal equipment.

#### A. Operation.

1. The BBS shall provide a minimum two (2) hours of full run-time operation for all equipment as indicated on plan sheet(s) but not less than a minimum 700W/1000VA active output capacity, with 80% minimum inverter efficiency.
2. The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries shall be 65 milliseconds. The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.
3. The BBS shall provide the user with two sets of three (3) double-pole double-throw (DPDT) dry relay contact closures, available on two terminal blocks (one side of each relay on each block) with #6/32 screw terminals rated at a minimum 120V/1A, and labeled so as to identify each contact. The terminal block wiring shall be protected with a clear plastic cover. There shall be a LED indication when each relay is activated. All relays should be deactivated when the inverter switch is off.
  - The first relay contact closures shall be energized whenever the unit switches to battery power. Contacts shall be labeled or marked "On Batt."

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#### SP-16 EMERGENCY BATTERY BACKUP SYSTEM INSTALLATION

- The second relay contact closures shall be energized whenever the battery approaches approximately 40% of remaining useful capacity. Contacts shall be labeled or marked "Low Batt." There shall be a manually adjustable potentiometer to variably adjust this value based on the specific load.
  - The third relay contact closures shall be energized two hours after the unit switches to battery power. Contacts shall be labeled or marked "Timer."
4. Operating temperature for the inverter/charger, and power transfer relay and manual bypass switch shall be  $-37^{\circ}\text{C}$  to  $+74^{\circ}\text{C}$ .
  5. The Power transfer relay and manual bypass switch module shall be rated at 240VAC/30 amps.
  6. The BBS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 – 4.0 mV/  $^{\circ}\text{C}$  per cell.
    - The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with seven (7') feet of wire.
  7. Batteries shall not be recharged when battery temperature exceeds  $50^{\circ}\text{C} \pm 3^{\circ}\text{C}$ .
  8. BBS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC ( $\pm 2\text{VAC}$ ).
  9. Output voltage shall be between 110 VAC and 125 VAC, pure sine wave output,  $\leq 3\%$  THD,  $60\text{Hz} \pm 0.05\text{Hz}$ .
  10. BBS shall be compatible with all traffic controllers, other equipment and cabinet components for full time operation.
  11. In cases of low (below 98VAC) or absent utility line power, when the utility line power has been restored at above  $105\text{VAC} \pm 2\text{VAC}$  for more than 30 seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode.
  12. In cases of high utility line power (above 132VAC), when the utility line power has been restored at below  $125\text{VAC} \pm 2\text{VAC}$  for more than 30 seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode.
  13. BBS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.
  14. In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC (and de-energized) state, where utility line power is connected to the cabinet.
  15. Recharge time for the battery, from "protective low-cutoff" to 80% or more of full battery charge capacity, shall not exceed ten (10) hours.

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#### SP-16 EMERGENCY BATTERY BACKUP SYSTEM INSTALLATION

##### **B. Mounting and Configuration.**

1. A mounting pad shall be constructed as shown on the plans.
2. The complete BBS, including batteries, shall fit inside a typical, fully equipped and approved stand-alone cabinet on a separate mounting pad. This cabinet/enclosure shall include vent, fan and thermostat.
3. The mounting method shall be shelf or tilt out tray-mount. The BBS dimensions shall be no deeper than 13 inches to minimize cabinet size.
  - The BBS shall be shelf-mounted with wiring, controls and meters in the front and clearly readable. The BBS should not be mounted on its side.
  - All batteries should mount on the shelves in the cabinet.
  - The Power transfer relay and manual bypass switch shall mount at a convenient location.
  - All interconnect wiring shall be provided between Power transfer relay and bypass switch and Cabinet Terminal Service Block and shall be no less than seven (7') feet of UL Style 1015 CSA TEW with the following characteristics:
    - AWG Rating: 10 AWG
    - Stranding: 105 strands of 30 AWG tinned copper
    - Rating: 600 V, 105 °C, PVC Insulation
    - Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be ten (10') feet of UL Style 1015 CSA TEW 18 AWG wire, same ratings as above, except 16 strands of 30 AWG tinned copper.

##### **C. Maintenance, Displays, Controls and Diagnostics.**

1. The BBS shall include a LED display to indicate battery voltage and standard meter probe input jacks (+) and (-) to read the exact battery voltage.
2. The BBS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.
3. The BBS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.
4. The BBS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

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5. The BBS shall include a front-panel event counter display to indicate the number of times the BBS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power. Both meters shall have push button resets.
6. Manufacturer shall include a set of equipment lists, operation and maintenance manuals, and board-level schematic and wiring diagrams of the BBS, and the battery data sheets.

#### D. RS232.

1. The BBS shall be equipped with RS232 or approved communications. The connector shall be a DB-9 female connector.
2. Connection to the BBS shall be with a standard, readily available RS232 cable. Custom cabling is not allowed.
3. The BBS system shall be monitored and controlled by using HyperTerminal or other readily available terminal emulation software. Proprietary software is not allowed.
4. The BBS Communication Interface shall display BBS Status as well as allow for inputting of BBS Commands.
5. The BBS Status shall display the following information:
  - **AC Transfer Pts.:** Displays the current setting of the AC transfer threshold points.
  - **BBS Mode:** Displays whether the BBS is in Standby or Backup mode. When in Backup mode this also indicates that 'On Batt-Relay A' is active.
  - **Outage Counter:** Displays the current number of outages since the Outage meter was last reset.
  - **Total Outages:** Displays the total number of outages since the BBS was installed. This cannot be reset.
  - **Run Time:** Displays the current Run Time of the unit since the Run Time meter was last reset.
  - **Total Run Time:** Displays the total Run Time of the unit since the BBS was installed. This cannot be reset.
  - **Batt. Level:** Displays the current battery capacity.
  - **Batt. Full:** Indicates that the battery bank is fully charged.
  - **Check Batt.:** Indicates a problem with the batteries or the charger.

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- **Low Batt. Relay:** Indicates that the battery bank has reached the Remaining Capacity point set in Section 5.1 and that 'Low Batt-Relay B', is active.
  - **Timer Relay:** Indicates that the BBS has been in backup mode for 2 hours and that 'Timer-Relay C', is active.
  - **Overload:** Indicates that an overload condition exists.
  - **High Temp:** Indicates that a high temperature condition exists.
6. The BBS Command section shall be as follows:
- **Set Time:** Set the time in the following 24HR format hh:mm
  - **Set Date:** Set the date in the following format. mm/dd/yy
  - **Status Update:** Press to update the display with current BBS information.
  - **Reset Outage Meter:** Resets both the internally stored Outage Counter and the external Outage Meter. The unit will keep a total running count of all outages.
  - **Reset Run Time Meter:** Resets both the internally stored current Run Time Meter and the external Run Time Meter. The unit will keep a total run time for the life of the unit.
  - **Display Event Buffer:** Scroll out the BBS events to the display. All events are stamped with the date and time.
  - **Change AC Level Setting:** Switches the acceptable input AC threshold range from the standard 100-130 VAC to the optional 95-134 VAC range.
  - **Model Number:** Enter the model number of the unit using ASCII-Numeric text.
  - **Serial Number:** Enter the serial number of the unit using ASCII-Numeric text.

#### E. Battery System.

1. Individual batteries shall be:
  - Voltage rating: 12V type
  - Amp-hour rating: 105 amp-hour maximum
  - Group size: 31 maximum
  - Batteries shall be easily replaced and commercially available off the shelf.

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2. Batteries used for BBS shall consist of 2 to 8 batteries to run the loads for the specified time, and a maximum system voltage of 24 VDC to comply with NEC Class 2 Voltage.
3. Batteries shall be deep cycle, sealed prismatic lead-calcium based AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid).
4. Batteries shall be certified by the manufacturer to operate over a temperature range of – 25 °C to +74 °C.
5. The batteries shall be provided with appropriate interconnect wiring.

#### **F. Battery Harness.**

1. Interconnect wiring shall be via two-piece modular harness consisting of 8 gauge welding style cable, UL listed, super K90.
2. Cable assembly shall be equipped with insulated, mating, power pole style connectors. Where two-piece power pole style connectors are used Positive (+) shall be red, Negative (-) shall be black.
3. All power pole connectors shall be assembled to ensure proper polarity and circuit configuration throughout the entire harness.
4. Part one of the two-piece harness shall consist of seven inches of appropriate colored cable with ¼ inch ring terminals for connecting to the battery terminal and the appropriate colored modular power pole style connector.
5. Battery terminals shall be covered and insulated with appropriate colored molded boots.
6. Part two of the harness shall consist of mating two-piece power pole style connectors for connecting to the batteries and a single insulated power pole connector for connecting to the BBS unit.
7. Cable length shall be a minimum of 12 inches between batteries and 60 inches between BBS unit and first battery. Other battery-to-battery lengths for different configurations can be specified with the order.

#### **G. Quality Assurance.**

1. Each BBS shall be manufactured by an ISO 9001:2000 certified company in accordance with a manufacturer Quality Assurance (QA) program.

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**SP-16 EMERGENCY BATTERY BACKUP SYSTEM INSTALLATION**

2. QA process and test results documentation shall be kept on file for a minimum period of seven years.
3. Each system shall be visually inspected for any exterior physical damage or assembly anomalies. Any defects shall be cause for rejection.
3. **CONSTRUCTION REQUIREMENTS.** The BBS shall be installed on a separated mounting pad in the vicinity of the service point and controller cabinet as shown on the plans.
4. **METHOD OF MEASUREMENT.** Battery Backup System Installation will be measured by the unit.
5. **BASIS OF PAYMENT.** Work completed and accepted under this item and measured as provided above will be paid for at the contract unit price bid for each Battery Backup System Installation; which price shall be full compensation for furnishing the cabinet and battery backup system; for mounting of the cabinet; for installing, wiring, and testing the battery backup system; for excavation and backfilling; for construction of the mounting pad; and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

Payment shall be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Battery Backup System	Each

END OF ITEM SP-16





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**JOB NO. 18147010**

**SP-17 BICYCLE SIGNAL HEAD, 8 INCH LED, (3 SECTION, 1 WAY)**

**1. Description.** This item consists of furnishing and installing 200 mm (8") diameter Bicycle Signal Heads and components based on Light Emitting Diode (LED) technology according to these specifications as well as Section 706 Traffic Signal Head of the Standard Specifications for Highway Construction, Edition of 2014, to approval of the engineer. Portions of the standard specifications will be superseded by these special provisions.

**2. Materials:** The LED modules shall be suitable for span wire and mast arm mounted signals. Units must meet the following specifications to be accepted.

(A) Materials used for the lens and signal module construction shall conform to ASTM specification for the materials where applicable. Enclosures containing either the power supply or electronic components of the signal modules shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

(B) The housing shall be yellow with the following dimensions 10.0" H x 10.0" W x 7.0" D

**3. Construction Requirements.** Construction shall be in accordance with the standard specifications. No distinction is made for span wire installations, post mount, mast arm mount, or other mounting methods as described on the plan sheet(s).

**4. Method of Measurement.** Units are bid as "3 Section". A 3 Section unit consists of one each: Red Ball with Bicycle Symbol, Yellow Ball with Bicycle Symbol, and Green Ball with Bicycle Symbol.

**5. Basis of Payment.** Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per each for Traffic Signal Head, LED of the type, display and size specified, which price shall be full compensation for furnishing and installing all materials and signs; and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Traffic Signal Head, LED, (3 Section, 1 Way, 8 Inch, Bicycle)	Each

END OF ITEM SP-17



05-28-2020 Rev.

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SPECIAL PROVISION****JOB NO. 18147010****SP-18 RELOCATION OF PAN TILT ZOOM CAMERA**

**DESCRIPTION.** This item consists of removing and reinstalling a luminaire mounted Pan Tilt Zoom (PTZ) camera as shown in the plans or as directed by the Engineer.

**MATERIALS.** Contractor shall be paid the unit price bid for furnishing and installing cable necessary for relocation of the designated PTZ Camera System. All cabinet hardware required for operation will be relocated.

**CONSTRUCTION REQUIREMENTS.** No splicing of cabling will be allowed. A separate Cat5E cable shall be installed from the controller cabinet to each PTZ Camera on the luminaire assembly unless otherwise directed.

**METHOD OF MEASUREMENT.** PTZ Camera System relocation shall be measured by the unit price bid per each.

**BASIS OF PAYMENT.** Work completed, accepted and measured as provided above will be paid for at the contract unit price bid for RELOCATE PTZ CAMERA SYSTEM removed and reinstalled, which price shall be full compensation for furnishing equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
RELOCATE PTZ CAMERA SYSTEM	Each

END OF ITEM SP-18



## ITEM SP-19 – ELECTRICAL INFRASTRUCTURE

### DESCRIPTION

SP19-1.1 This item shall consist of furnishing and installing a complete electrical infrastructure system for future lighting at the roundabout as defined in the plans and in accordance with Conway Corporation Specifications. The work includes the installation of concrete foundations, pull boxes (supplied by Conway Corporation), conduits underground and exposed, pull wires, ground rods, connections, warning tape, and all required appurtenances to construct a completed electrical infrastructure system for future lighting.

### STANDARDS

SP19-2.1 Materials and work under this item shall be in accordance with the attached Conway Corporation Detailed Specifications Part IV – Electric & CCT Conduit Installation Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

SP19-3.1 Conduit shall be directional bored at street crossing locations as shown on the plans. If and where open trenches for proposed storm sewer street crossings can be shared, as approved by the Engineer, directional boring will not be required.

SP19-3.2 The plans show diagrammatically the locations of the various electrical apparatus and the method of connecting them. With the exception of pole foundations, exact locations of these apparatus shall be determined by reference to the general plans and to all detail drawings, etc., by measurements, and in cooperation with other crafts, and in all cases shall be subject to the approval of the Engineer. The Engineer reserves the right to make any reasonable change in location of any apparatus before installation, without additional cost to the Owner.

### METHOD OF MEASUREMENT

SP19-4.1 The measurement of the electrical infrastructure system for future lighting provision shall include all components required to provide a complete and operating system as described by this section, specifications, and drawings and shall consist of one lump sum payment.

### BASIS OF PAYMENT

SP19-5.1 All work completed and accepted under this item, consisting of the installation of the electrical infrastructure system for future lighting for the work area as described herein, shall be paid for at the contract lump sum price for complete item bid for “Electrical Infrastructure,” which price shall be full compensation for furnishing all material, fixtures and accessories, and for all labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Item SP19-5.1            Electrical Infrastructure – per Lump Sum

# **CONWAY CORPORATION DETAILED SPECIFICATIONS**

## **PART IV – ELECTRIC & CCT CONDUIT INSTALLATION SPECIFICATIONS**

### **IV-1. EXCAVATION – ELECTRIC & CCT TRENCH**

Contractor shall provide approved OSHA Safety Methods for the excavation. Such Methods take precedence over any procedures outlined in these Specifications or directions of the Engineer. See Trench Excavation Safety Appendix. The Contractor is responsible for the design of excavation procedures, shoring design and placement, and any and all safety procedures.

Trenches for electric and CCT lines shall be of the width and depth necessary for the proper installation of the conduit. All electric and CCT lines shall be laid in trenches of such depth as to provide a minimum cover of forty-eight (48) inches over the conduit unless otherwise shown on the Plans, or directed by Engineer. The bottom of all conduit trenches for six (6) inch and larger conduit, except where encasement is required, shall be shaped as nearly as possible to conform to the outside of the conduit, providing adequate bell holes and taking care to support conduit throughout its entire length except at joints. The minimum trench width at the base of the trench shall be six inches from the edge of the trench to the pipe OD on each side of the trench.

If the soil at the bottom of the trench for conduits is mucky or in such condition that it cannot properly support the conduit, the Contractor shall excavate below the normal subgrade elevation as directed by the Engineer. Wherever excavation is carried below the specified subgrade, at the direction of the Engineer, the Contractor shall provide and install a fill of gravel thoroughly tamped into place up to an elevation sufficient to prepare the subgrade as specified in the preceding paragraph.

Where water occurs in trenches for conduits they shall be excavated to a depth of approximately eight (8) inches below grade and backfilled with gravel. Pumps shall then be kept operating, taking suction out of a sump below the gravel so as to hold the water level well below the bottoms of all open joints.

Where rock occurs in trenches for conduits at the planned grade of the bottom of the pipe in such way that any portion of the conduit would rest on rock, or where in the opinion of the Engineer it is necessary, the excavation shall be carried to a depth of four (4) inches, below the planned grade, for the full width of the trench. The Contractor shall provide and install a fill of gravel thoroughly tamped into place up to an elevation sufficient to prepare the subgrade as specified in preceding paragraphs.

In trenches that are not in rock, but the soil in the bottom is hard and in the opinion of the Engineer, it cannot be excavated efficiently by hand prior to placing the conduit, as described above in the bedding of the conduit, the Contractor shall undercut the trench to a depth of four (4) inches and backfill the trench with gravel or sand. After the backfill of gravel or sand has been placed and tamped, the trench shall be prepared in the same manner as described in previous paragraphs.

The excavation of trenches for conduits shall not advance more than four hundred (400) feet ahead of the completed conduit work and backfill except by permission of the Engineer.

Rock excavation shall be solid rock in formation which cannot be excavated efficiently, in the opinion of the Engineer, without blasting, or jack hammering, by adequate power shovels or excavators of recognized standard manufacture and adequate size, well handled by skilled operators. The term “excavated efficiently” as used in this classification shall be interpreted to mean that where, in the opinion of the Engineer, rock can be excavated at a lower cost per cubic yard of useful excavation by blasting, or jack hammering, it shall be so excavated and will be classified as rock.

The volume of rock excavation in trenches will be determined by the horizontal measurement of length of trench in which rock occurs, the vertical measurement of the depth of the rock, and a width of the trench.

All excavation not included under the classification of rock excavation shall be common excavation.

Common excavation shall include normal trench sloping and trench dewatering, backfilling, maintenance of backfill, disposal of waste materials, and all other work incident thereto. Trench excavation and backfill shall be measured by the linear foot of trench and depth by vertical measurement from the original ground surface to the bottom of specified trench depth. Trench excavation and backfill shall be paid for by the linear foot of trench of the different depths for which unit prices are required in the Proposal.

Conduits shall be paid for per linear foot of trench of the different sizes of conduit as required in the List of Variable Quantities. The conduit shall be determined by the horizontal measurement along the trench centerline.

Gravel or crushed stone authorized for payment as subgrade material for conduit will be measured and paid for by the ton in place in the trenches.

The lump sum contract price shall include the quantity of (Class 7) gravel for subgrade given in the List of Variable Quantities and the appropriate contract unit price will be used to adjust the lump sum contract price for variation of actual quantity from that estimated.

The prices for gravel for subgrade shall include materials, placing, and all other work incident thereto.

Trench Excavation Safety shall be paid for on the final estimate as a lump sum at the appropriate contract unit price.

#### IV-1.1. HANDLING AND LAYING EACH SCH 40 PVC CONDUIT

In transportation of the conduit, any of the conduit that is subjected to exhaust fumes must be covered to prevent contamination of the conduit. Any conduit determined by the Engineer to be contaminated by exhaust fumes shall be rejected and removed from the jobsite.

In the transportation, unloading, and handling of conduit, the conduit shall not be dropped, let roll and collide with another conduit, or be subjected to any unnecessary jar, impact, or other treatment that might crack or otherwise damage the conduit. The conduit shall not be handled by chains or cables and shall not be allowed to strike hard objects in loading and unloading. Conduit shall be handled more carefully in cold weather to prevent impact damage. All PVC conduits and fittings must be stored out of direct sunlight and away from any heat source.

Before laying conduit in trench, the bottom of the trench shall be carefully graded and prepared and bell holes excavated so the conduit shall have a uniform support along its entire length, except at bell holes, and shall not be allowed to rest on hard supports through a portion of its length only. Width of trench at the top of the conduit shall not exceed the twenty-four (24) inches.. All conduits shall have at least forty-eight (48) inches of cover unless specified by the Engineer.

All 2", 3", 4" and 6" PVC conduit that are laid in the trench shall be plugged at the open ends with Carlon Plugs P258JT, P258LT, P258NT, and P258RT respectively or an Engineer approved equal. **Duct Tape** is not allowed. Polyester Muletape No. WP1800P (printed 1800 lb strength) shall be blown through each conduit and attached to said plugs. Muletape shall be continuous runs with no splices.

Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed the maximum permissible for the type of conduit joint being installed as recommended by the conduit manufacturer. If the alignment requires deflections in excess of these limitations, special bends, or a sufficient number of shorter lengths of conduit shall be furnished to provide annular deflections. Such bends or short length of conduit shall be installed as directed by the Engineer at no additional cost to Conway Corporation.

Where exact separation is required, Carlon's Snap-loc Spacers and Accessories shall be used. For a typical two 6-inch and 3-inch conduit combination, two S288RJN base spacers, four S289RJN intermediate spacers and two S287J spac-loc reducers shall be used to keep the conduit uniformed throughout the trench. All the spacers shall use Carlon's Rebar Holders staggered from side to side of the spacers every eight (8) feet. There shall be three (3), two (2) or one (1) rebar holder used for conduit in tiers of three, two, or one, respectively. The rebar shall have a .625 outer diameter and shall be five (5) feet in length. Any other proposed spacer type or method must be approved by the Engineer before the opening of the Proposals.

The inside of conduit and all parts involved in jointing shall be cleaned of all dirt, mud, grease, and other foreign material before the conduit is laid or the joint started. Ends of conduit shall be temporarily plugged at the close of each day's work. The conduit will be plugged so that no water or mud may enter the conduit. Any conduit determined by the Engineer to be damaged and unsuitable for use shall be immediately removed from the job site.



In laying all PVC conduit, the manufacturer's recommendations for securing good joints shall be rigidly followed. Proper lubricant as recommended by conduit manufacturer will be used on all conduit joints. Apply lubricant to the clean spigot end just before pushing it into the bell. Apply firm steady pressure by hand, using a slight twisting motion, to the conduit until it slips through the bell. Conduit shall be joined using manual force only, unless directed by the Engineer.

Adequate blocks of Class "B" concrete shall be provided on all 6" 90 degree galvanized bends as shown on the Plans. See Block Detail in Construction Drawings. The concrete shall be contained within the designated area by metal or wood forms that are sufficiently tight as to keep the loss of material to a minimum, or by other means as approved by the Engineer. Concrete for blocks shall be measured and paid for as Class "B" concrete.

Conduit and fittings, except as specifically listed in the variable quantities or hereinafter specified, will be measured and paid for as conduit. The quantity of conduit shall be determined by horizontal measurement along the trench centerline. The lump sum contract price shall include the quantities of 2", 3", 4" and 6" PVC conduit given in the List of Variable Quantities and the appropriate contract unit prices will be used to adjust the contract price for variation of actual quantities from those estimated. The unit prices for 2", 3", 4" and 6" PVC conduit listed in the Variable Quantities shall be for conduit in place, that is, the unit price shall include all conduit and fittings, spacers, plugs, and all labor and equipment associated with laying the conduit in the trench not listed as a separate line item in the LVQ.

#### **IV-1.2. PVC SCH 40 CONDUIT AND FITTINGS**

Conduit shall have an integral bell and comply with NEMA Specification TC-2 and TC-3, Federal Specification W-C1094A and UL-651, and ANSI C33.91. Conduit must be homogeneous throughout; free from voids, cracks, inclusions and other defects; and uniform in gray color, density and other physical properties. Conduit surfaces shall be free from nicks, scratches, and other blemishes.

Each PVC conduit shall be 20 feet long and have the same outside diameter (OD) as galvanized steel elbows. Also, each joint of conduit shall have the following information stamped plainly on it: (1) UL Label; (2) NEMA TC-2; (3) Max 90°-C; (4) Manufacturer; and (5) Size. All conduits shall be manufactured in the United States and shall adhere to the following dimensions.

Size	OD, Inches	ID, Inches Min
2"	2.369 – 2.381	2.021
3"	2.369 – 2.381	3.006
4"	4.491 – 4.509	3.961
6"	6.614 – 6.636	5.986

#### **IV-1.3. HANDLING AND LAYING GALVANIZED STANDARD AND LONG RADIUS STEEL 90 DEGREE ELBOWS:**

All galvanized standard and long radius steel 90-degree elbows shall have threaded connections. Threads shall be full and leanly cut with sharp dies. All ends of the elbows shall be

reamed, after threading and before assembly, to remove all burrs and rough inner edges. The compound used shall provide the maximum protections against corrosion in the joint and shall be applied to all male threads in such manner and quantity that all threads are coated but so that no compound will be forced into the interior of the conduit.

If the 90-degree elbows do not extend above grade, then a piece of SCH 40 PVC conduit shall be connected to the elbow to provide a 1-foot above grade riser.

Galvanized standard and long radius steel 90-degree elbows will be measured by the number of elbows used for each size, i.e. 2”, 3”, 4” and 6”.

The proper size elbows and their turn up locations shall be shown on the plans or as directed by the Engineer. All 2”, 3”, 4” and 6” elbows shall be plugged with a Carlon P258JT, P258LT, P258NT and P258RT pull tab plugs, respectively.

**IV-1.3.1. GALVANIZED STANDARD AND LONG RADIUS STEEL 90-DEGREE ELBOWS**

Galvanized standard and long radius steel 90-degree elbows shall conform to Federal Specification WW-C-581 and Underwriters Laboratories 1242. The elbows also shall conform to ANSI C80.3. All elbows shall be American made; none of Foreign Manufacture will be accepted. Each galvanized elbow shall be furnished with two PVC SCH 40 gray female adapters. Galvanized 90-degree elbows shall adhere to the following dimensions.

<u>Size</u>	<u>Radius “R”</u>	<u>Tangent “T”</u>	<u>Offset “H”</u>
2”	Standard	4.5”	14”
2”	24”	11”	35”
3”	Standard	6.125”	19.125”
4”	Standard	7.125”	23.125”
6”	36”	11”	47”

**IV-1.3.2. HANDLING AND INSTALLING GALVANIZED RIGID STEEL CONDUIT**

All galvanized conduit shall have threaded connections. Threads shall be full and leanly cut with sharp dies and then galvanized. All ends of the elbows shall be reamed, after threading and before assembly, to remove all burrs and rough inner edges. The compound used shall provide the maximum protections against corrosion in the joint and shall be applied to all male threads in such manner and quantity that all threads are coated but so that no compound will be forced into the interior of the conduit.

Each riser pole shall have one (1) 10-foot galvanized steel conduit turned up the pole. The conduit shall be attached to the galvanized steel 90-degree elbow and properly strapped to the pole with straps provided by Conway Corporation.

The cost of work under this section shall be included in the List of Variable Quantities with the Rigid Riser Pipe unit price. The unit price shall include the fittings, steel conduit, labor and equipment connected with installing the Rigid Riser Pipe

**IV-1.3.3. GALVANIZED RIGID STEEL CONDUIT**

Galvanized steel conduit shall conform to Federal Specification WW-C-581 and Underwriters Laboratories 6. The elbows also shall conform to ANSI C80.1. All steel conduit shall be American made; none of Foreign Manufacture will be accepted. Each galvanized steel conduit shall be furnished with one (1) galvanized steel coupling. Galvanized steel conduit shall adhere to the following dimensions.

<u>Size</u>	<u>Nominal OD</u>	<u>Nominal Wall</u>	<u>Length of Conduit</u>
2"	2.375"	.146"	9'11"
3"	3.5	.205"	9'10.5"
4"	4.5	.225	9'10.25"
6"	6.625"	.266"	9'10"

**IV-2. CONCRETE PADS FOR CAPACITORS, METERS, RECLOSERS, SWITCHGEAR AND TRANSFORMERS**

Each pad shall be constructed of ready-mix type concrete giving a minimum compressive strength of 3,500 psi at 28 days. The pad thickness shall be 12-inches minimum with 6-inches extending above adjacent surfacing. Pad length and width shall be determined from the detailed Conway Corporation drawings.

Each pad shall have reinforcing steel No. 4 bars (1/2"), grade 40, 12-inches center-to center, extending both ways, on horizontal line 3-inches up from the bottom of pad.

Each pad shall be grounded with a ground ring composed of a No. 2/0 AWG minimum bare copper grid loop located 12-inches outside the pad edges and 30-inches deep and four ground rods 5/8-inch by 8-foot long (**Eritech 615880 copperbonded ground rods or Engineer approved equal**), one driven in each corner per the latest NEC Sec 250.53-250.56. The ground ring shall be constructed by connecting the grid wire to the rods by exothermically welded connections. i.e. **CADWELD Electrical Connection**, etc. A No. 2/0 AWG minimum bare copper tail wire shall be attached to the grid wire per a "T-Shot" and installed to each of the conduit pad blockouts. A minimum of a five (5) foot tail shall be curled up at each blockout.

Blockout materials shall be provided by the Contractor. Conduits shall be cut 6" below the top of the pad. The top of the pad shall be troweled and smooth.

The concrete, ground ring, ground rods, rebar, forming and blockout materials, labor and equipment shall be included in the List of Variable Quantities for the associated equipment concrete pads. i.e. recloser, transformer, switchgear, capacitor, secondary enclosures, and meter pads.

### **IV-3. NORDIC FIBERGLASS ND-130, ND-330, AND ND-360 (600 Amp) SECTIONALIZING CABINETS**

Each ND-130, ND-330, and ND-360 (600 Amp) sectionalizing cabinet, supplied by Conway Corporation, shall be buried to manufactures recommended cabinet burry depth. . Gravel shall be installed, tamped leveled and brought to grade to the correct buried depth for each cabinet.

The cabinets shall be grounded with one 5/8-inch by 8-foot ground rod (**Eritech 615880 copperbonded ground rods or Engineer approved equal**), installed 6-inches off the conduits extending 3-inches above grade and per the latest NEC Sec 250.53-250.56.

The tamping, the installation of Contractor furnished ground rod, the transporting from Conway Corporation Service Center (#800 S. Harkrider) to the job site, and the installation shall be included in the List of Variable Quantities for the associated sectionalizing cabinet. The gravel used for grade shall be included in the List of Variable Quantities for gravel CLASS 7.

### **IV-4. PENCELL SECONDARY PEDESTALS**

Each PenCell pedestal, supplied by Conway Corporation, shall be buried a minimum of 10-inches in depth.

Gravel and sand shall be installed, tamped, leveled and brought to grade to the correct buried depth for the pedestal as directed by the Engineer. The pedestal shall be centered over the conduits. Each conduit shall extend 4-inches above the gravel grade. The size of the pedestal shall be determined from the attached Conway Corporation drawings.

The tamping, the transporting from Conway Corporation Service Center to the job site and the installation shall be included in the List of Variable Quantities for the PenCell secondary pedestal. The gravel and sand used for grade shall be included in the List of Variable Quantities for gravel CLASS 7 and sand, respectively.

### **IV-5. HANDLING AND INSTALLING STREET LIGHT RISERS**

Each 2-inch (2") standard galvanized street light elbow shall be tuned up 6-feet off the back of curb or as directed by the Engineer. A 6-inch (6") PVC sleeve, 4-foot in length, shall be placed over each buried galvanized street light elbow and 2-inch riser. The sleeve shall extend between 6-inches and 1-foot above dirt grade at the street light location.

Street light sleeves placed within Entergy's Transmission R-O-W shall be grounded with one 5/8-inch by 8-foot ground rod (**Eritech 615880 copperbonded ground rods or Engineer approved equal**), installed 1-inch off the conduit extending 3-inches above grade and per the latest NEC Sec 250.53-250.56.

The 6-inch sleeve and ground rod if required, along with its installation shall be included in the List of Variable Quantities.

#### **IV-6. FIBERCRETE JUNCTION BOXES**

Each fibercrete junction box, supplied by Conway Corporation, shall be buried to a depth where the box top will be flush with the final ground grade.

Gravel and sand shall be installed, tamped, leveled and brought to grade to the correct buried depth for the junction box as directed by the Engineer. The junction box shall be centered over the conduits. Each conduit shall extend 2-inches above the gravel grade. The size of the junction box shall be determined from the detailed Conway Corporation drawings.

All fibercrete junction boxes shall be grounded with one 5/8-inch by 8-foot ground rod (**Eritech 615880 copperbonded ground rods or Engineer approved equal**), installed 1-inch off the conduit extending 3-inches above the gravel grade and per the latest NEC Sec 250.53-250.56.

The tamping, the installation of Contractor furnished ground rod, the transporting from Conway Corporation Service Center to the job site and the installation shall be included in the List of Variable Quantities for the Fibercrete Junction Boxes. The gravel used for grade shall be included in the List of Variable Quantities for gravel CLASS 7.

#### **IV-7. CONCRETE/PVC STREET LIGHT POLE SLEEVES**

A 12-inch (12") SCH 40 PVC sleeve, 5-foot in length, shall be installed 2.5-feet off the back of curb or as directed by the Engineer. A 1-inch (2") SCH 40 PVC conduit shall be installed from the junction box, 2-foot (2') below grade to the side of the 12" sleeve. Connect the 2" pipe with a 2" PVC male adapter and a 2" lock ring to the side of the sleeve. The sleeve shall extend 1-inch above dirt grade at the street light location. For further detail, refer to the Conway Corporation Sleeve detail drawing.

The 12-inch sleeve, 1" conduit and adapters, along with its installation shall be included in the List of Variable Quantities for the Concrete Street Light Pole Sleeves.



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## DOUBLE E-LOC® COUPLING



The ETCO Double E-Loc is a locking compression coupling used to join smooth, ribbed, corrugated or Figure 8 High Density Polyethylene (HDPE) conduit. The locking, pressure-tight design makes the Double E-Loc an ideal coupling for pneumatic cable placing applications when air and watertight integrity of the system is imperative. Unmatched pressure ratings, pull-out resistance, no metal parts, and no special tools make the ETCO Double E-Loc the preferred coupling. Lock rings specially designed to grip rigid PVC and steel pipe are also available.

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**DOUBLE E-LOC®**

½" TO 2" IPS



2½" TO 4" IPS

Part No.	Standard Duct Size	Length	Pieces Per Ctn.	Weight Per Ctn.
DEL-084	.084" O.D. DUCT (½" IPS)	6.25"	50	10
DEL-105	1.05" O.D. DUCT (¾" IPS)	6.25"	50	17
DEL-131	1.315" O.D. DUCT (1" IPS)	6.25"	50	26
DEL-135	1.350" O.D. DUCT	6.25"	50	63
DEL-142	1.420" O.D. DUCT / 1.460" O.D. RIBBED	6.25"	50	61
DEL-150	1.500" O.D. DUCT (1-1/2" TRUE SIDR 9)	6.25"	50	56
DEL-150UV	1.500" O.D. AERIAL	6.25"	50	56
DEL-154	1.540" O.D. DUCT / 1.575" RIBBED	6.25"	50	58
DEL-154UV	1.540" O.D. AERIAL (1-1/4" TRUE)	6.25"	50	58
DEL-157	1.570" O.D. DUCT (40MM)	6.25"	50	56
DEL-160	1.600" O.D. DUCT	6.25"	50	56
DEL-160UV	1.600" O.D. AERIAL	6.25"	50	56
DEL-166	1.660" O.D. DUCT (1-1/4" IPS)	6.25"	50	48
DEL-166G	1.660" O.D. RIBBED	6.25"	50	48
DEL-166UV	1.660" O.D. AERIAL (1-1/4" IPS)	6.25"	50	53
DEL-171	1.710" O.D. DUCT (1-1/4" SIDR 9)	6.25"	50	54
DEL-178	1.780" O.D. DUCT / 1.830" RIBBED	8.25"	25	47
DEL-178UV	1.780" O.D. AERIAL	8.25"	25	47
DEL-183	1.830" O.D. DUCT (1-1/2" SIDR 9)	8.25"	25	46
DEL-190	1.900" O.D. DUCT (1-1/2" IPS)	8.25"	25	32
DEL-190UV	1.900" O.D. AERIAL (1-1/2" IPS)	8.25"	25	32
DEL-237	2.375" O.D. DUCT (2" IPS)	8.5"	25	51
DEL-237UV	2.375" O.D. AERIAL (2" IPS)	8.5"	25	51
DEL-287	2.875" O.D. DUCT (2½" IPS)	8.5"	20	49
DEL-350	3.500" O.D. DUCT 3" IPS)	8.5"	15	43
DEL-450	4.500" O.D. DUCT (4" IPS)	8.5"	10	44

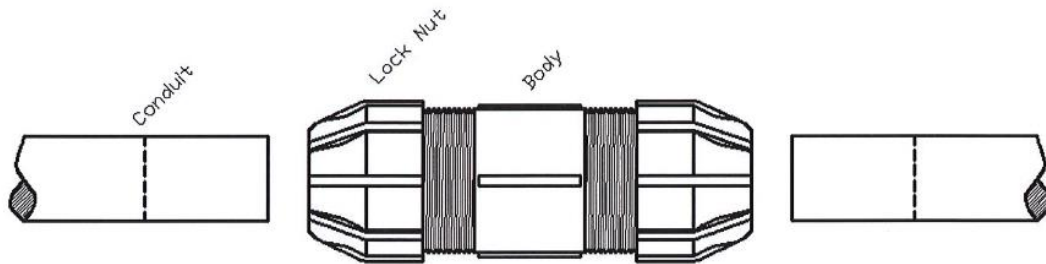
Parts labeled UV are designed for above ground applications and are UV resistant.  
 METRIC sizes are also available.



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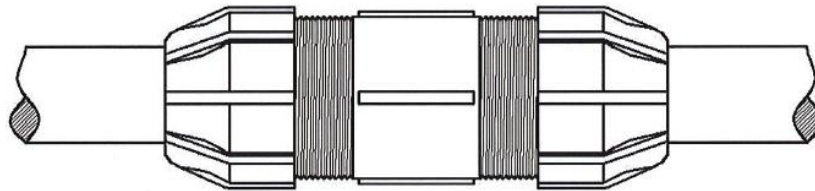
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## INSTALLATION INSTRUCTIONS DOUBLE E-LOC® COUPLINGS METHOD 1

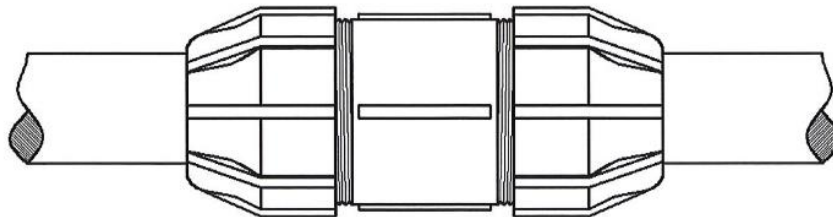


3 1/8" Mark (for 1" to 1 1/4" Double E-Loc)  
3 3/8" Mark (for 1 1/2" Double E-Loc)  
3 7/8" Mark (for 2" Double E-Loc)  
(Typical)

Loosen Lock Nuts until 1" of thread is visible on each side of body. Mark each conduit 3 1/8" from the end (for 1" to 1 1/4" sizes), 3 3/8" from the end (for 1 1/2" sizes) or 3 7/8" from the end (for 2" sizes)



Push conduit into each end of Double E-Loc coupling body making sure the conduit is tight against the center stop.



Tighten lock nut on each end of body hand tight.

03/06



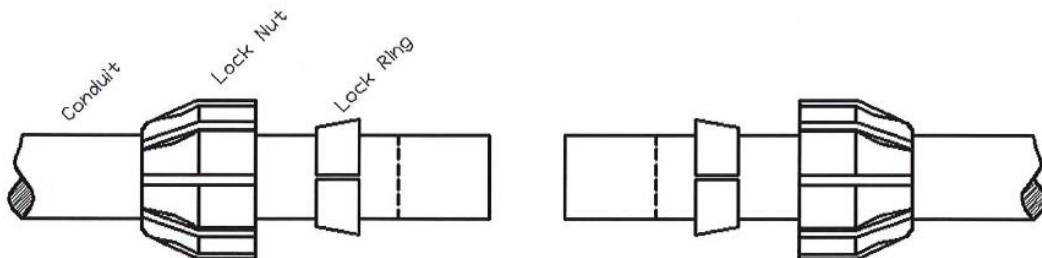


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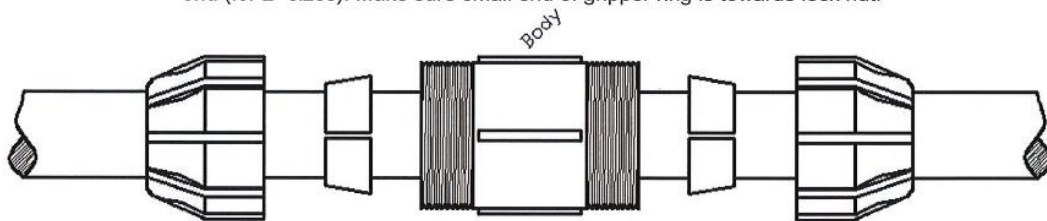
## INSTALLATION INSTRUCTIONS DOUBLE E-LOC® COUPLINGS

### METHOD 2

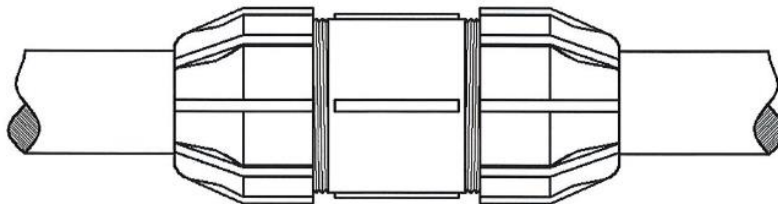


1 $\frac{1}{8}$ " Mark (for 1" to 1 $\frac{1}{4}$ " Double E-Loc)  
2 $\frac{1}{8}$ " Mark (for 1 $\frac{1}{2}$ " Double E-Loc)  
2 $\frac{1}{2}$ " Mark (for 2" Double E-Loc)  
(Typical)

Slip lock nut and split gripper ring on each side of conduit to be coupled.  
Mark each conduit 1 $\frac{1}{8}$ " from the end (for 1" to 1 $\frac{1}{4}$ " sizes) or 2 $\frac{1}{8}$ " from the end (for 1 $\frac{1}{2}$ " sizes) and 2 $\frac{1}{2}$ " from the end (for 2" sizes). Make sure small end of gripper ring is towards lock nut.



Push conduit into each end of Double E-Loc coupling body making sure the conduit is tight against the center stop.



Tighten lock nut on each end of body hand tight.

03/06

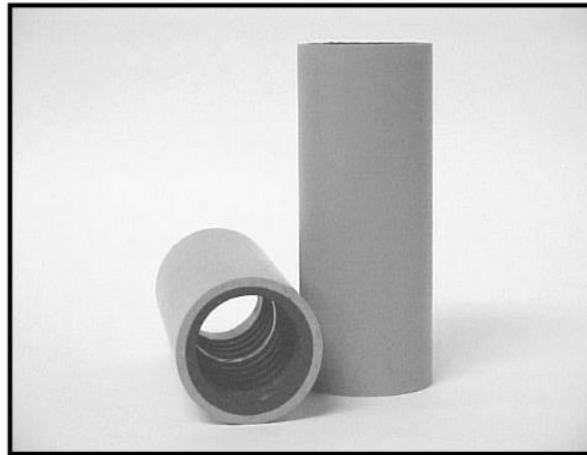


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## **E-LOC® COUPLING**



The E-Loc Coupling is a compression coupling that provides a watertight/airtight connection in buried or restrained applications. The ability to join dissimilar materials, such as, PVC, HDPE, fiberglass, or metal makes the E-Loc a versatile coupling for the telephone, electrical, and cable industries. Patented.

E-Loc Couplings are available to fit conduit sizes from ½" through 8", including several special diameters. Watertight to 200 psi restrained on smooth wall, ribbed, and corrugated duct. Custom lengths and transitions for different diameters are also available.



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**E-LOC® COUPLING**

Nom Size	Part No.	Standard Duct Size	Coupling Body O.D. (IN.)	Length (IN.)	Pcs. Per Ctn.	Wt. Ctn.
1/2"	EL-084	0.840" 1/2" IPS & SCH 40	1.315	4.5	100	18
	EL-086	0.860" 1/2" DROP	1.315	4.5	100	33
	EL-086R	0.860" 1/2" DROP 50A	1.315	6	50	20
5/8"	EL-062	0.625" 13MM	1.315	6	50	16
3/4"	EL-105	1.050" 3/4" IPS	1.315	4.5	100	28
1"	EL-123	1.231" OD DUCT	1.315	6	50	48
	EL-128C	1.280" CORR	1.315	6	50	
	EL-131	1.315" 1" IPS & SCH 40	2.000	5.25	50	23
	EL-135	1.350" OD DUCT	2.375	6	50	45
	EL-137	1.375" OD DUCT	2.375	6	50	45
	EL-140C	1.400" CORR (1")	2.375	6	50	42
1-1/8"	EL-142	1.420" OD DUCT	2.375	6	50	44
1-1/4"	EL-150	1.500" OD DUCT	2.375	6	50	41
	EL-154	1.540" OD DUCT	2.375	6	50	38
	EL-157 (40mm)	1.575" OD DUCT	2.375	6	50	39
	EL-157C	1.570" CORR 1-1/4	2.375	6	50	39
	EL-160	1.600" OD DUCT	2.375	6	50	36
	EL-166	1.660" 1-1/4" IPS	2.400	5.25	50	28
1-1/2"	EL-175	1.750" OD DUCT	2.375	6	50	30
	EL-178	1.780" OD DUCT	2.375	6	50	
	EL-183	1.830" OD DUCT	2.375	6	50	42
	EL-190	1.900" 1-1/2" IPS	2.650	6	25	19
	EL-190-12	1.900" 1-1/2" IPS X 12" LG	2.875	12	12	29
	EL-2197	2.197" OD DUCT (2"EMT)	2.875	6	25	
2"	EL-232C	2.325" CORR (2" PNA)	2.875	6	25	42
	EL-235	2.350" OD DUCT	2.875	6	25	
	EL-237	2.375" 2" IPS	3.170	6	25	25
2"	EL-237-8	2.375" 2" IPS X 8" LG	2.875	8	16	36
	EL-237-12	2.375" 2" IPS X 12" LG	3.500	12	16	52
	EL-243	2.430" 2" SIDR 11	2.875	6	25	40

Standard coupling length is 6" unless noted otherwise. METRIC sizes are also available.

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**E-LOC® COUPLING CON'T**

Nom Size	Part No.	Standard Duct Size	Coupling Body O.D. (IN.)	Length (IN.)	Pcs. Per Ctn.	Wt. Ctn.
2-1/2"	EL-251	2.510" 2-1/2" TRUE	2.875	6	25	36
	EL-251-8	2.510" 2-1/2" X 8" LG TRUE	2.875	8		
	EL-287	2.875" 2-1/2" IPS	3.500	6	24	46
3"	EL-350	3.500" 3" IPS	4.500	6	18	38
	EL-350-8	3.500" 3" IPS X 8" LG	4.500	8	12	33
	EL-350-12	3.500" 3" IPS X 12" LG	4.500	12	9	36
	ELR-350	3.500" REPAIR SLEEVE	4.500	6	18	38
4"	EL-400	4.500" 4" IPS	4.500	6	12	34
	EL-400-8	4.500" 4" IPS X 8" LG	5.563	8	10	34
	EL-400-12	4.500" 4" IPS X 12" LG	5.563	12	6	34
	EL-400-14	4.500" 4" IPS X 14" LG	5.563	14	10	50
	ELR-400	4.500" REPAIR SLEEVE	5.563	6	12	34
	ELR-400-8	4.500" REPAIR SLEEVE X 8" LG	5.563	8	10	37
	EL-435	4.350" 4" C DUCT	5.563	6	12	35
	EL-471	4.710" OD DUCT	5.563	6	12	27
	EL-471-12	4.710" OD DUCT X 12" LG	5.563	12	10	54
	EL-476	4.760" OD DUCT	5.563	6	12	26
	EL-476-8	4.760" OD DUCT X 8" LG	5.563	8	10	29
EL-476-14	4.760" OD DUCT X 14" LG	5.563	14	10	50	
5"	EL-500	5.563" 5" IPS	6.662	6	16	54
	EL-500-8	5.563" 5" IPS X 8" LG	6.662	8	10	41
	EL-500-12	5.563" 5" IPS X 12" LG	6.662	12	5	34
6"	EL-600	6.625" 6" IPS	7.702	6	12	43
	EL-600-8	6.625" 6" IPS X 8" LG	7.702	8	6	30
	EL-600-12	6.625" 6" IPS X 12" LG	7.702	12	6	40
	ELR-600	6.625" REPAIR SLEEVE	7.702	6	12	40
	ELR-600-8	6.625" REPAIR SLEEVE X 8" LG	7.702	8	6	28
8"	EL-800-8	8.625" 8" IPS X 8" LG	10.500	8	2	20

Standard coupling length is 6" unless noted otherwise. METRIC sizes are also available.

Section 250.53(E) correlates with 250.52(A)(5) or (A)(7) and with 250.66(A). For example, if a metal underground water pipe or the metal frame of the building or structure is used as the grounding electrode or as part of the grounding electrode system, Table 250.66 must be used for sizing the grounding electrode conductor. The size of the grounding electrode conductor or bonding jumper that is the sole connection to the supplemental electrode is not required to be larger than 6 AWG copper or 4 AWG aluminum.

**(F) Ground Ring.** The ground ring shall be buried at a depth below the earth's surface of not less than 750 mm (30 in.).

**(G) Rod and Pipe Electrodes.** The electrode shall be installed such that at least 2.44 m (8 ft) of length is in contact with the soil. It shall be driven to a depth of not less than 2.44 m (8 ft) except that, where rock bottom is encountered, the electrode shall be driven at an oblique angle not to exceed 45 degrees from the vertical or, where rock bottom is encountered at an angle up to 45 degrees, the electrode shall be permitted to be buried in a trench that is at least 750 mm (30 in.) deep. The upper end of the electrode shall be flush with or below ground level unless the aboveground end and the grounding electrode conductor attachment are protected against physical damage as specified in 250.10.

Where rock bottom is encountered, the electrodes must be either driven at not more than a 45-degree angle or buried in a 2½-foot-deep trench. Driving the rod at an angle is permitted only if it is not possible to drive the rod vertically to obtain at least 8 feet of earth contact. Burying the ground rod is permitted only if driving the rod vertically or at an angle is not possible. Exhibit 250.26 illustrates these requirements.

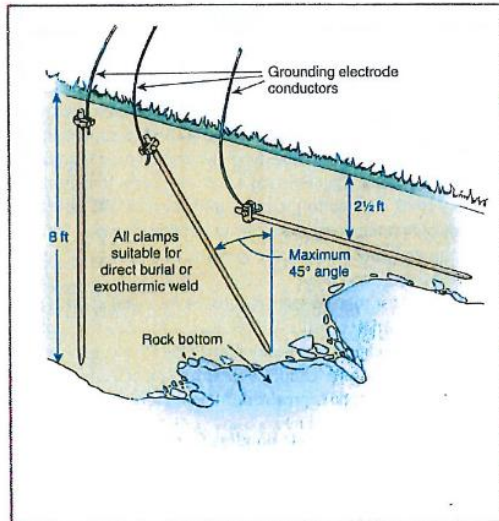


EXHIBIT 250.26 Installation requirements for rod and pipe electrodes.

Section 250.70 requires ground clamps used on buried electrodes to be listed for direct earth burial. Ground clamps installed above ground must be protected where subject to physical damage per 250.53(C).

**(H) Plate Electrode.** Plate electrodes shall be installed not less than 750 mm (30 in.) below the surface of the earth.

#### 250.54 Auxiliary Grounding Electrodes

One or more grounding electrodes shall be permitted to be connected to the equipment grounding conductors specified in 250.118 and shall not be required to comply with the electrode bonding requirements of 250.50 or 250.53(C) or the resistance requirements of 250.53(A)(2) Exception, but the earth shall not be used as an effective ground-fault current path as specified in 250.4(A)(5) and 250.4(B)(4).

Grounding electrodes, such as ground rods, that are connected to equipment are not permitted to be used in lieu of the EGC, but they may be used to provide a local earth reference connection at electrical equipment locations. For example, grounding electrodes may be used for lightning protection or to establish a reference to ground in the area of electrically operated equipment. The earth may not be used as the sole EGC or effective (ground) fault current path. Auxiliary grounding electrodes are not required to be incorporated into the grounding electrode system for the service or other source of electrical supply.

#### 250.58 Common Grounding Electrode

Where an ac system is connected to a grounding electrode in or at a building or structure, the same electrode shall be used to ground conductor enclosures and equipment in or on that building or structure. Where separate services, feeders, or branch circuits supply a building and are required to be connected to a grounding electrode(s), the same grounding electrode(s) shall be used.

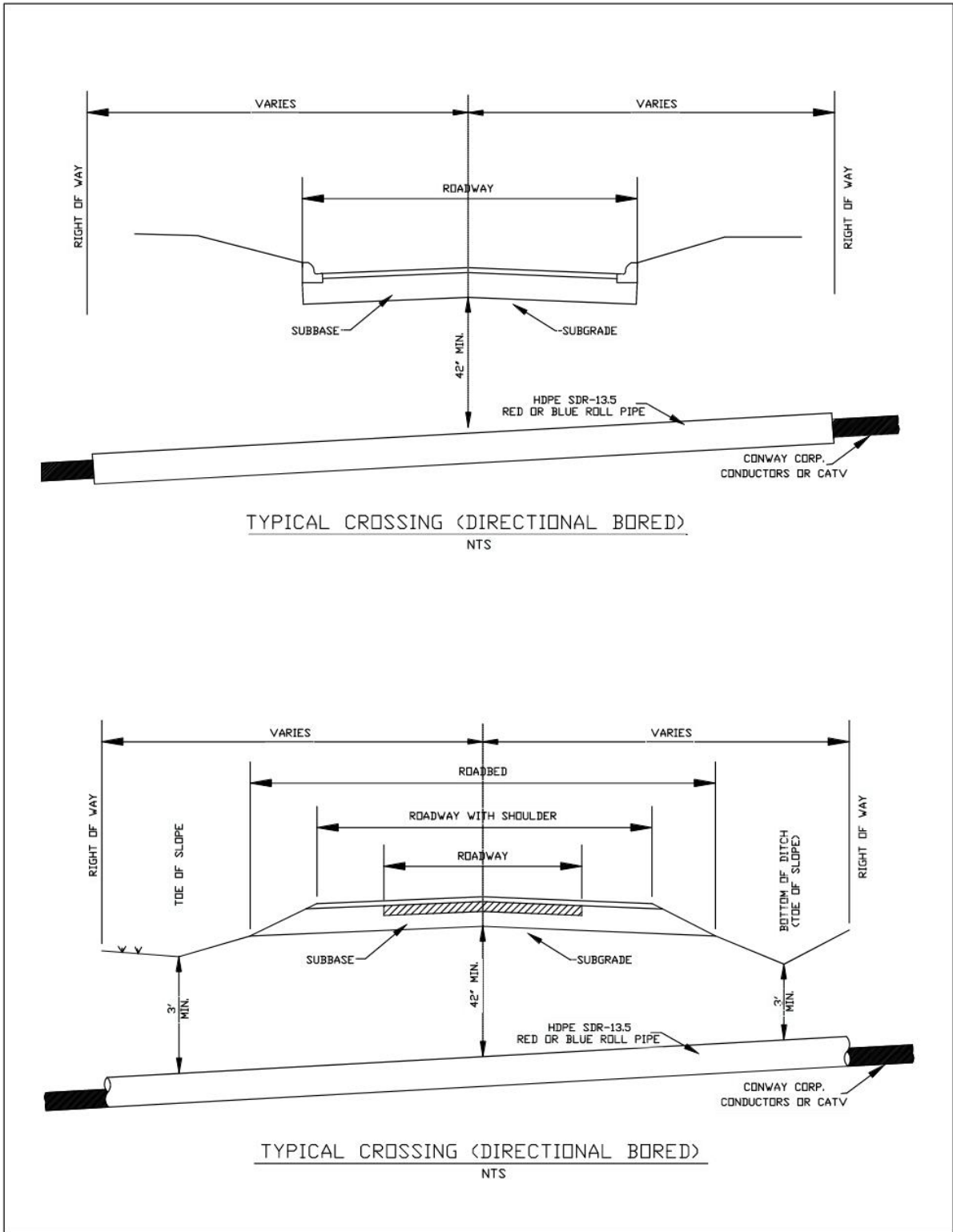
Two or more grounding electrodes that are bonded together shall be considered as a single grounding electrode system in this sense.

#### 250.60 Use of Strike Termination Devices

Conductors and driven pipes, rods, or plate electrodes used for grounding strike termination devices shall not be used in lieu of the grounding electrodes required by 250.50 for grounding wiring systems and equipment. This provision shall not prohibit the required bonding together of grounding electrodes of different systems.

Informational Note No. 1: See 250.106 for spacing from strike termination devices. See 800.100(D), 810.21(J), and 820.100(D) for bonding of electrodes.

Informational Note No. 2: Bonding together of all separate grounding electrodes will limit potential differences between them and between their associated wiring systems.



END OF SECTION SP-19

## ITEM SP-20 – UTILITY ADJUSTMENTS

### GENERAL

SP20-1.1 Utility facilities at the locations noted below will be removed, relocated and/or adjusted in accordance with separate agreements between the Owner and the respective utility owners.

SP20-1.2 In accordance with Subsection 105.07, Cooperation with Utilities, of the Standard Specifications, the Contractor is forewarned that such work may be underway concurrently with the work under this contract.

SP20-1.3 The following utility forces may be working within the construction limits covered by the contract:

1. Owner – CenterPoint Energy  
Facilities – Natural Gas line  
Location – Underground gas line parallels Donaghey Ave. within the right of way on the on the east and west sides.  
Status – West side relocations within Stage 1 construction zone are scheduled to be complete by July 2020. East side relocations within Stage 2 construction zone are scheduled to be complete by October 2020.

*Contact Ben Thomson, 501-377-4738, ben.thomson@centerpointenergy.com*

2. Owner – AT&T  
Facilities – Underground telephone (fiber)  
Location – Underground telephone lines parallel Donaghey Ave. within the right of way on the on the west side with services across Donaghey Ave.  
Status – Relocations complete. An AT&T duct run remains existing within Donaghey Ave. north of Salem Rd.

*Contact Lanny Page, 501-218-6842, LP1318@att.com*

3. Owner – Conway Corporation  
Facilities –Power lines  
Location – Overhead electric lines parallel Doanghey Ave. within the right of way on the east side.  
Status – Underground relocations complete from Dave Ward Dr. to College Avenue. Overhead relocation along College Ave. is complete. Overhead relocation north of College Ave. on the west Side of Donaghey Ave. is scheduled to be complete by October 2020.

*Contact Dale Gottsponer, 501-450-6050, dale.gottsponer@conwaycorp.com*

4. Owner – Conway Corporation  
Facilities – Water/Wastewater  
Location – Water/Wastewater utilities parallel Donaghey Ave. within the right of way on the east and west sides.  
Status – Relocations complete

*Contact Mark Ferguson, 501.548.3020, Mark.Ferguson@conwaycorp.com*

5. Owner – Conway Corporation  
Facilities – CATV  
Location – Overhead CATV lines parallel Markham St. within the right of way on the west side.  
Status - Underground relocations complete.

*Contact Jeff Crownover, 501-548-3001, Jeffery.Crownover@conwaycorp.com*

6. Owner – Enable Midstream Partners  
Facilities – 12” High Pressure Gas Transmission  
Location – Crossing Donaghey Ave. near Sta. 39+00  
Status – Utility to remain in place. Contractor shall notify Enable Midstream Partners for any excavation within 25 feet of the utility. See attached requirements for working within utility easement.

*Contact Jeffery Cates, 501-940-3608, jeffery.cates@EnableMidstream.com*

7. Owner – Ritter Communications  
Facilities – Underground communication (fiber)  
Location – Underground fiber parallels Donaghey Ave. within right of way near College Ave.  
Status – Relocations scheduled to be complete by August 2020.

*Contact Scott Johnson, 870-227-9367, scott.johnson@rittercommunications.com*

8. Owner – Windstream  
Facilities – Underground communication (fiber)  
Location – Underground fiber parallels Donaghey Ave. within right of way on the east and west sides.  
Status – Relocations scheduled to be complete by July 2020.

*Contact Bruce Sims, 501-679-1691, Bruce.Sims@windstream.com*

The completion dates were based on information received from the utility companies and the most current information available at this time; therefore, the dates are subject to change.

The utility relocations will be taking place during construction. It shall be the responsibility of the Contractor to verify the work has been done. It may be necessary for the contractor to coordinate work with and around utility adjustments.

In case there is a delay beyond the estimated completion dates as set forth above, and should such delay necessarily cause a delay in the Contractor’s prosecution of the work, an equitable extension of contract time will be granted to the Contractor. No claim for extra compensation will be allowed, however, because of such delay.



**The Contractor should make every effort to locate buried utilities including, but not limited to, calling Arkansas One Call Center (800) 482-8998.**

ENABLE MIDSTREAM REQUIREMENTS

**EXCAVATION SAFETY GUIDELINES**

Each excavation near Enable Midstream Partners (Company) facilities or rights-of-way is unique and require evaluation and assessment of the work area prior to work being performed. The following information is communicated to keep you safe.

- **Company personnel must be present and supervise the excavation when within 25 feet of the pipeline.**
- Hand digging is required when the mechanical excavation has reached a distance of 18 inches from the pipeline, or the state's tolerance zone if greater.
- All excavation equipment is required to have barred teeth, unless otherwise approved by the Company.
- No trenching permitted within 15 feet of active pipelines.
- All ground disturbances will be repaired and vegetation reestablished by Contractor.
- Under no circumstances shall the Contractor "reach over" an active pipeline with power equipment, unless approved by the Company.
- All pipeline crossings shall maintain a minimum 24 inches clearance.
- At no time during parallel construction shall Company ROW (easement area) be used as work space or as a road/access road.
- No equipment shall work on top of existing Company pipelines. For equipment crossings, Company personnel must be present.
- Whenever blasting is employed for rock excavation within 660 feet of Company facilities, Company personnel must be present.
- Seismographic work within 660 feet of Company facilities must be evaluated by the Company prior to initiating seismographic activities to ensure that such activity does not adversely affect the integrity of Company's facilities.
- Any buried pipeline that has been exposed is required to be inspected by the Company prior to backfilling.
- If Company markings are destroyed or need to be refreshed in the planned work area, call the One Call center or the Company directly.
- If the scope of work changes, contact the One Call center and submit a new locate request.

**If you are unable to reach the representative below, or in case of an emergency, call 1-800-474-1954 or 1-800-522-8048.**

STATE OF _____	TOLERANCE ZONE: _____
ONE CALL TICKET NUMBER: _____	
COMPANY CONTACT NAME: _____	
COMPANY CONTACT PHONE: _____	
DATE: _____	

END OF ITEM SP-20



## ITEM SP-21 – COORDINATION OF WORK

**DESCRIPTION:** This item shall consist of specifications relative to the coordination of work during construction operations at the beginning, and/or intermediate points, and/or end of contracts or jobs and shall be supplementary to Section 105, Control of Work, of the Standard Specifications, Edition of 2014.

Coordination of work will be necessary with the Contractor for utility relocations and with any other contractors that may have active jobs adjacent to this project during the construction period.

**CONSTRUCTION:** The Contractor shall schedule and perform the several operations of construction at the beginning and/or end, or any intermediate point of the project in such a sequence that work on the facility will progress in an expeditious manner.

The Contractor shall furnish the Engineer for approval a plan or schedule of his proposed work at the termini of the project as well as any intermediate points where coordination with another contractor will be necessary. He shall keep the Engineer informed or advised of any action or cause that might affect the successful coordination of work with other contractors.

END OF ITEM SP-21



## **ITEM SP-22 – SHORING FOR CULVERTS**

**DESCRIPTION:** Work under this item shall consist of the design, construction, and removal of a shoring or bracing system that may be required to retain the existing, temporary, or new roadway embankment and to maintain traffic during construction of culverts. The shoring system shall provide sufficient clearance for excavation and construction work and shall ensure the safety of the traveling public and workmen at all times.

**WORK TO BE PERFORMED:** Prior to construction of the shoring system, the Contractor shall submit the design and details of the system to the Engineer for informational and record purposes. Such submission shall include the design calculations, the kind and condition of materials to be used, working drawings showing all dimensions, and the procedure for installation of the system. The design and details submitted shall be prepared and/or approved by a Professional Engineer registered in Arkansas.

The Contractor shall be responsible for the adequacy of the temporary shoring during the entire period of construction. The Contractor shall be responsible for any and all damages and/or claims, including injury or death, arising out of the construction and use of temporary shoring.

The Contractor shall construct the shoring in accordance with the details submitted to the Engineer for informational purposes. Unless otherwise permitted by the Engineer, all components of the shoring system shall be removed upon completion of their use and shall remain the property of the Contractor.

**PAYMENT:** No direct payment will be made for work described in this special provision (which includes preparation of necessary design details and drawings, construction and removal of shoring, and for all materials, labor, tools, equipment, and incidentals necessary to complete the work) but shall be considered subsidiary to other pay items in the contract.

END OF ITEM SP-22



### SP-23 – SALVAGING SIDEWALK CASTING

**Description.** Work under this item shall consist of the salvaging, maintaining, and reinstallation of a historic sidewalk casting as shown below. The casting is embedded in the existing sidewalk near Sta. 49+40 RT.



**Work to be Performed.** The Contractor shall carefully salvage, maintain, and reinstall the casting within the new sidewalk at the same location.

**Payment.** Salvaging sidewalk casting will not be paid for directly, but will be considered subsidiary to other items of work.

END OF SECTION SP-23





# **TECHNICAL SPECIFICATIONS**



## SECTION E-1 – SITE PREPARATION

### DESCRIPTION

E1-1.1 This item covers the preparation of the site for construction of the proposed improvements. The attention of the bidder is directed to the necessity for careful examination of the entire project site to determine, at the time of bid preparation, the full extent of work to be done under the item "SITE PREPARATION."

E1-1.2 The item "SITE PREPARATION" shall include:

1. Mobilization
2. Contractor's Staging Areas
3. Contractor's Access/Haul Roads
4. Clearing and Grubbing
5. Removal and Disposal of Structures
6. Clean Up

### CONSTRUCTION METHODS

E1-2.1 MOBILIZATION: The Contractor shall consider and include his cost for providing personnel, equipment, materials, bonds, etc. required for prosecution of the work under this item.

E1-2.2 CONTRACTOR'S STAGING AREAS: The area designated in the Plans as the Contractor's staging area shall be used by the Contractor to locate the field office, to store materials, for employee parking, and for other purposes necessary to perform the work on this project. All areas used or otherwise occupied by the Contractor for his operations shall be cleaned and restored to their original condition prior to the final acceptance of the project by the Owner. All work involved in the preparation and restoration of areas used or occupied by the Contractor will not be measured for separate payment, but will be considered subsidiary to the bid item "SITE PREPARATION."

E1-2.3 CONTRACTOR'S ACCESS/HAUL ROADS: The Contractor shall layout, construct, maintain, remove and/or reshape all access/haul roads needed to construct the work. Work, including all materials and labor, involved in the layout, construction, maintenance, repair, and removal (including re-seeding of the area occupied by the road), and/or re-shaping of the Contractor's access/haul roads will not be measured for separate payment, but will be considered subsidiary to the bid item "SITE PREPARATION."

Before final acceptance of the project, any damage to the existing roads caused by the Contractor shall be repaired as directed by the Engineer. The repair of the existing roads will not be measured for separate payment but will be considered subsidiary to the item "SITE PREPARATION."

E1-2.4 CLEARING AND GRUBBING: This work shall consist of cutting, removing from the ground, and properly disposing of trees, stumps, hedge, brush, roots, weeds, rubbish, and other materials within the limits of the project or other designated areas that interfere with the work or are considered objectionable.

The project site shall be cleared except those objects designated to remain shall be carefully protected from abuse, marring, or damage during construction operations.

Holes remaining after removal of trees, stumps, etc., shall be backfilled with material approved by the Engineer and compacted as directed except in areas to be excavated. The Contractor shall complete the operation by blading, bulldozing, or other approved methods, so that the project site shall be free of holes, ditches, or other abrupt changes in elevations that resulted from the clearing and grubbing operations.

The project site shall be cleared of stumps, brush, rubbish, trees, and shrubs, with the exception of such trees, shrubs, and areas designated on the Plans or by the Engineer for preservation. Grubbing will not be required in areas that will have a fill height of 3 feet or more above undisturbed stumps cut within 6 inches of the natural ground.

Debris shall be removed from the project site and disposed of at an off-site location. The entire job site shall be cleared of all debris, of whatever nature, and made ready in all respects for the construction of the proposed improvements.

The Contractor shall make all necessary arrangements with the property owner for obtaining suitable disposal locations. The costs involved in clearing and grubbing, obtaining disposal sites, hauling, and final cleanup will not be paid for directly but will be considered subsidiary to "SITE PREPARATION."

E1-2.5 REMOVAL AND DISPOSAL OF STRUCTURES: This work shall consist of the removal and satisfactory disposal of utility poles; signs, sign supports, sign foundations; traffic rail; fence; curb and curb and gutter; portland cement concrete or asphalt concrete pavement, parking areas, sidewalks, and steps; driveways; retaining walls; manholes; drainage structures; concrete or masonry foundations (including foundations of poles or signs to be removed) or slabs; and culverts, all of which are not designated or permitted to remain. The Contractor shall make his own estimate of the work required for the removal of structures which conflict with the proposed construction. All structures required to be removed may not be designated as such in the plans.

The provisions of this section shall not apply to underground petroleum storage tanks.

The attention of the bidder is directed to the necessity for careful examination of the entire site to determine, at the time of bid preparation, the full extent of work to be accomplished. The entire site shall be cleared of all man-made obstructions and debris, of whatever nature, and prepared in all respects for the construction.

The Contractor shall not unnecessarily interfere with the use of any adjacent sidewalks, streets, or roads.

Materials removed will become the property of the Contractor and shall be removed from the job site, unless specifically designated otherwise.

All surface items such as curb, curb and gutter, driveways, parking areas, walks, steps, asphalt and PCC pavement, and walls shall be separated or broken away from the adjacent part of any structure designated to remain in place by a vertical saw cut along the line designated by the Engineer. The edge of the structure left in place shall be approximately vertical with no abrupt changes in alignment. Any damage to or removal of the structure designated to remain in place shall be repaired or replaced at no cost to the Owner.

Holes, ditches, or other abrupt changes in elevation caused by the removal operations that could obstruct drainage or be considered hazardous or unsightly shall be backfilled, compacted, and left in a workmanlike condition.

Existing culverts or parts thereof that interfere with the new construction shall be removed.

Where existing pipe culverts are to be extended or otherwise incorporated into the new work, only such part of the existing structure shall be removed as to provide a proper connection to the new work.

The connecting edges or joints shall be cut, chipped, and trimmed to the required lines and grades without weakening or damaging the part of the structure to be retained.

For a pipe culvert extension, the headwall and the attached end joint of concrete pipe or the flared end section on all types of pipe shall be removed to accommodate the extension. This work will not be paid for directly but will be considered included in the items involved in the culvert extension.

Trenches or voids resulting from the removal or demolition of existing culverts or other structures shall be filled with approved material placed in layers in accordance with SECTION E-2.

Masonry and reinforced concrete foundations shall be obliterated, or if in fill sections, may be left in place if covered by not less than 2 feet of embankment.

Concrete foundations for poles to be removed shall be obliterated to a depth of 2 feet below finished grade or as required to accommodate new construction.

The removal and disposal of the various items covered by this specification will not be measured for separate payment, but will be subsidiary to the bid item "SITE PREPARATION."

E1-2.6 CLEAN UP: From time to time, the Contractor shall clean up the site in order that the site presents a neat appearance and that the progress of work will not be impeded. One such clean up shall immediately precede final inspection.

Immediately following acceptance of the work by the Owner, the Contractor shall remove all temporary equipment, surplus materials, and debris resulting from his operations, and leave the site in a condition fully acceptable to the Owner.

#### METHOD OF MEASUREMENT

E1-3.1 Site Preparation will be measured as a lump sum complete item.

#### BASIS OF PAYMENT

E1-4.1 Work completed and accepted under this item will be paid for at the contract lump sum price bid for "SITE PREPARATION," which price shall be full compensation for furnishing all labor, tools, equipment and incidentals necessary to complete the work.

Periodic payments will be made under this item in proportion to the amount of work accomplished, as determined by the Engineer.

Payment will be made under:

Item E1-4.1 Site Preparation - per Lump Sum

END OF SECTION E-1



## SECTION E-2 – EXCAVATION AND EMBANKMENT

### DESCRIPTION

E2-1.1 This section addresses the requirements of all earthwork necessary for the construction of streets, driveways, parking areas, sidewalks, trails, curb and gutter, ditches, and sitework within the project area in accordance with the Plans. The work shall be in conformity with the lines, grades, thicknesses, and typical sections as shown in the Plans or established by the Engineer.

E2-1.2 This section does not include the excavation and backfill of structures and pipe. Excavation and backfill of structures and pipe is included under SECTION E-3 – EXCAVATION FOR STRUCTURES of these specifications.

### STANDARDS

E2-2.1 All materials and work (including testing) shall be in accordance with the lines and grades shown on the Plans, or as directed by the Engineer, and with applicable portions of SECTION 210 – EXCAVATION AND EMBANKMENT and SECTION 212 – SUBGRADE of the Standard Specifications, except as modified or augmented herein.

### MATERIALS

E2-3.1 Excavation performed under this Section, regardless of the material encountered, shall be classified as unclassified excavation.

Unless otherwise noted in the Plans or directed by the Engineer all excavated material shall become the property of the Contractor and shall be disposed of at an off-site location.

E2-3.2 BORROW MATERIAL: Additional requirements for borrow material utilized under pavements are described in paragraph E2-4.4.

The Contractor shall maintain the haul route free from spillage by his vehicles. He shall clean the haul route surface as often as necessary to avoid the creation of a public nuisance. He shall repair and restore the surface of all haul roads which have been damaged by his operations.

### CONSTRUCTION METHODS

E2-4.1 STRIPPING AND TOPSOIL: Before beginning any excavation or embankment, the areas where the excavation and/or the embankment are to be made shall be stripped to a minimum depth of 6 inches. Stripping will not be measured for separate payment, but will be considered subsidiary to the item “UNCLASSIFIED EXCAVATION.”

Topsoil obtained from the stripping operation shall be salvaged and stockpiled for later use. Topsoil salvaged from the stripping operation, and then later rehandled, will not be measured for separate payment, but will be considered subsidiary to the item “UNCLASSIFIED EXCAVATION.”

E2-4.2 USE OF SUITABLE EXCAVATION: Suitable excavation shall be used for embankment construction, and where needed, for backfilling. The suitability of material to be placed in embankments shall be subject to approval by the Engineer. Suitable excavation not needed for the work shall be disposed of by the Contractor off-site. Excavation unsuitable for use shall be disposed of by the Contractor off-site.

The Contractor is expected to construct embankment from suitable excavated material, and it may be necessary to stockpile a portion or all of this material for later use. The stockpiling and rehandling will not be paid for separately but will be subsidiary to “UNCLASSIFIED EXCAVATION.” The Contractor will be

required to replace with suitable borrow material, at no additional compensation, any suitable excavated material needed for the work which was wasted by the Contractor.

#### E2-4.3    COMPACTION OF EARTHWORK:

All compaction shall be to a density not less than ninety-five percent (95%) of maximum density, at optimum moisture, obtained in the laboratory. The moisture-density relationship of the material shall be determined in the laboratory in accordance with AASHTO Designation T 99.

#### E2-4.4    SUBGRADE:

Subgrade for paved areas shall be compacted to a density not less than ninety-five percent (95%) of maximum density, at optimum moisture, obtained in the laboratory. The moisture-density relationship of the material shall be determined in the laboratory in accordance with AASHTO Designation T 99.

The Contractor shall keep the subgrade properly drained at all times by the use of temporary ditches and/or pumps as required. Improperly drained subgrade will not be justification for undercut. The Engineer may require the exposed surface to dry before any judgment is rendered to the quality or workmanship of the exposed soils. The Contractor may be required to scarify/disk (to promote drying) and recompact the subgrade prior to determining whether undercut will be permitted. Regraded, recompacted, or reworked subgrade will not be considered for additional payment. Alternatively, the Contractor may elect to undercut saturated subgrade material at his own expense.

No contract time extensions will be granted to the Contractor for reworking wet subgrades retaining water due to improper grading or negligence by the Contractor. If proper drainage is not maintained during earthwork operations, the potential for undercut may be increased. Additional undercut required due to Contractor negligence will not be considered for payment.

Subgrade for concrete sidewalks and steps shall be in accordance with requirements specified in SECTION I-16 – CONCRETE SIDEWALKS AND STEPS.

Preparation of subgrade will not be measured for separate payment, but shall be considered subsidiary to “UNCLASSIFIED EXCAVATION.”

Site grading shall comply with AHTD Standard Specifications Section 210. Subgrade preparation should comply with AHTD Standard Specifications Section 212.

Soils Classifying as A-7-5 or A-7-6 and all soils with a plasticity index (PI) in excess of 18 shall not be utilized within 12 in. of the plan subgrade elevation.

Imported material for fill or backfill under pavements should consist of an approved silty clay/shale fragment blend fill, or approved clayey sand (SC), sandy clay (CL), or clayey gravel (GC) low-plasticity clayey gravel (GC). All fill and backfill should be placed in horizontal, nominal 6- to 8-in.-thick loose lifts. The in-place density and water content should be determined for each lift and should be tested to verify compliance with the specified density and water content prior to placement of subsequent lifts. All fill should be free of organic matter, debris, and durable rock fragments in excess of approximately a 3 inch dimension.

Unsuitable subgrade soils shall be undercut to a depth determined by the Engineer and removed from the street section or improved by a designed method to stabilization accepted by the City Engineer. Other soils which the Engineer determines cannot be properly compacted shall also be undercut to a specified depth. This excavated unsuitable material shall be disposed of off-site.

Backfill for undercut areas shall meet the requirements described above. Other materials exceeding these requirements may be used as backfill, subject to the approval of the Engineer. Backfill shall be



placed and compacted in 8-inch maximum lifts in accordance with the density requirements in this specification.

E2-4.5 The ditch excavation for channel changes or to bring ditches to minimum required section shall be in accordance with applicable portions of the Standard Specifications referred to above. All ditch excavation shall be completed to the required grade shown on the Plans or as directed by the Engineer.

E2-4.6 OVER-EXCAVATION: Where excavation is carried below or beyond that required, the space shall be filled to grade with suitable material and thoroughly compacted as directed by the Engineer. The Contractor will not be entitled to additional compensation for such over-excavation or the necessary refilling, unless the Owner or its representative is responsible for the error.

E2-4.7 Those areas outside of the pavement areas in which the top layer of soil material has become compacted, by hauling or other activities of the Contractor, shall be scarified and disked to a depth of 4 inches, in order to loosen and pulverize the soil.

E2-4.8 If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor shall, at his/her own expense, satisfactorily repair or pay the cost of all damage to such facilities or structures which may result from any of the Contractor's operations during the period of the contract.

#### METHOD OF MEASUREMENT

E2-5.1 Measurement of Unclassified Excavation and Embankment Construction shall be based on plan quantities. Quantities were calculated by measuring the amount of cut or fill between the original cross section and the neat lines of the cut or fill on the proposed cross section, and using the average end area method. Existing ground cross sections were generated from field surveyed cross sections translated to computer generated contours and cross sections. These cross sections are included in the Plans. The plan quantity of Unclassified Excavation is the amount of cut calculated, measured as stated above. The Contractor shall make his own determination as to the amount of unsuitable excavated material which may be encountered, and the resulting additional borrow material required for the construction of the embankment.

In cut sections, the additional cut required to construct the topsoil layer to the plan grade has not been measured and will not be measured for separate payment, but will be subsidiary to Unclassified Excavation. In fill sections, the additional fill required to replace the stripped material has not been measured and will not be measured for payment, but will be subsidiary to Unclassified Excavation.

Measurements of earthwork will be changed to reflect changes in grade or section directed by the Engineer.

No allowance has been made for shrinkage in the measurement of embankment construction. The Contractor shall make his own determination as to the amount of shrinkage involved in the construction of the embankment.

Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

E2-5.2 Undercut Excavation and Backfill shall be measured from the surface of the ground, after stripping has been accomplished, or from the bottom of the planned excavation, to the depth of the undercut as directed by the Engineer. Measurements will be taken by the Engineer, and the volume

of undercut will be calculated by the average end area method. The necessary refilling of undercut areas will not be measured for separate payment, but will be subsidiary to Undercut Excavation and Backfill. Only that amount of undercut directed by the Engineer will be measured for payment.

E2-5.3 Trench excavation for drainage pipe or excavation for drainage structures will not be measured for separate payment, but will be subsidiary to the drainage pipe or structure installation pay item.

#### BASIS OF PAYMENT

E2-6.1 Unclassified excavation shall be paid for at the contract unit price bid per cubic yard for "UNCLASSIFIED EXCAVATION," which price shall be full compensation for all excavation, including drainage ditch excavation; for the formation of embankment (including topsoil) using this excavated material, including hauling, spreading, and compaction; for removal and disposal of structures; for disposal of unsuitable material; and for all equipment, tools, labor and incidentals necessary to complete the work.

E2-6.2 Embankment construction shall be paid for at the contract unit price bid per cubic yard for "EMBANKMENT CONSTRUCTION," which price shall be full compensation for the formation of embankment, including loading, hauling, spreading, and compaction; for compaction and preparation of subgrade; for the refilling, rolling, and compaction of all undercut areas; and for all equipment, tools, labor, and incidentals necessary to complete the work.

E2-6.3 Undercut Excavation and Backfill shall be paid for at the contract unit price bid per cubic yard for "UNDERCUT EXCAVATION AND BACKFILL," which price shall be full compensation for all excavation; for disposal or placement of unsuitable material including loading, hauling, spreading, and compaction; for compaction and preparation of subgrade; for the refilling, rolling, and compaction of all undercut areas; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Periodic payments will be made under the following items in proportion to amount of work accomplished as determined by the Engineer.

Payment will be made under:

Item E2-6.1	Unclassified Excavation -- per cubic yard
Item E2-6.2	Embankment Construction -- per cubic yard
Item E2-6.3	Undercut Excavation and Backfill -- per cubic yard

END OF SECTION E-2

## SECTION E-3 – EXCAVATION FOR STRUCTURES

### DESCRIPTION

E3-1.1 This section covers the removal of all materials of whatever nature necessary for the construction of retaining walls, wingwalls, headwalls, pipe culverts, storm drainage piping, inlets, box culverts, and other structures. All work shall be in accordance with details shown on the Plans, or as directed by the Engineer, and with these specifications.

E3-1.2 The work involved in unclassified excavation for structures shall be in accordance with SECTION E-2 – EXCAVATION AND EMBANKMENT, except as modified or augmented herein.

### MATERIALS

E3-2.1 Backfill materials shall meet the applicable requirements of SECTION E-2 of these specifications. Such material shall be free from frozen material, trash, lumber, broken pieces of concrete having any dimension greater than two (2) inches, broken concrete in nests regardless of dimensions, or other debris. Such material shall be susceptible to proper compaction.

### CONSTRUCTION METHODS

#### E3-3.1 EXCAVATION FOR STORM DRAINAGE PIPE AND OTHER STRUCTURES:

Trench width at the horizontal centerline of a pipe shall not exceed outside diameter of the pipe plus two (2) feet where earth backfill is used.

Areas of excavation for inlets and junction boxes shall be selected by the Contractor, except that areas shall be large enough to permit proper construction of the structures, and except that they shall not extend more than eighteen (18) inches outside the structures, unless authorized by the Engineer.

E3-3.2 BACKFILL: Backfill shall be made from suitable available structural excavation materials, and from suitable available roadway excavation materials if and as needed.

Backfill shall be compacted to a density not less than ninety-five (95) percent of the maximum density, at optimum moisture, obtained in the laboratory in accordance with AASHTO Designation T99. Samples for laboratory tests and field determinations will be taken by the Contractor.

Backfill shall not be placed against concrete structures until the expiration of the curing periods specified in SECTION S-1 – STRUCTURAL CONCRETE of these specifications.

Compacting shall be obtained by the use of pneumatic or mechanically actuated tampers. Gravity hand tampers will not be acceptable. Backfill material shall be sprinkled or aerated as necessary to assure the required density.

Backfill of structures, other than pipe, shall be made with reasonable uniformity around and along the structure. It shall be placed in 6 inch layers, loose measurement and each layer compacted.

Backfill of storm drainage pipe shall be in accordance with SECTION I-3 - PIPE CULVERTS of these specifications and SECTION 606 – PIPE CULVERTS of the Standard Specifications.

Backfill will not be measured for separate payment. Placing and compacting of backfill shall be considered subsidiary work pertaining to structural excavation.

E3-3.3 DISPOSAL OF EXCAVATED MATERIAL: Excavated material unsuitable for use, or in excess of needs, shall be disposed of by the Contractor off-site.

### MEASUREMENT AND PAYMENT

E3-4.1 Excavation for structures, including but not limited to storm drainage pipe, flared end sections, inlets, junction boxes, box culverts, retaining walls, etc. will not be measured for separate payment, but will be considered subsidiary work pertaining to the construction of the items.

END OF SECTION E-3

## SECTION E-4 – TRENCH AND EXCAVATION SAFETY SYSTEMS

### DESCRIPTION

E4-1.1 This item covers the compliance with Act 291 of 1993 which requires the inclusion, in the bid, of a separate pay item for "TRENCH AND EXCAVATION SAFETY SYSTEMS."

### STANDARDS

E4-2.1 All work under this item shall conform to the current edition of Occupational Safety and Health Administration Standard for Excavation and Trenches Safety System, 29 CFR 1926, Subpart P (copy attached).

"Competent Person" as defined in the Standard Specifications shall be the General Contractor's General Superintendent.

### CONSTRUCTION METHODS

E4-3.1 NOTIFICATIONS REQUIRED: The Contractor, prior to beginning any excavation, shall notify the State Department of Labor (Safety Division) that work is commencing on a project with excavations greater than five feet.

The Contractor shall notify all Utility Companies and Owners in accordance with OSHA Administration 29 CFR 1926.651(b)(2) for the purpose of locating utilities and underground installations.

E4-3.2 EXISTING STRUCTURES AND UTILITIES: Where the trench or excavation endangers the stability of a building, wall, street, highway, utilities, or other installation, the Contractor shall provide support systems such as shoring, bracing, or underpinning to ensure the stability of such structure or utility.

The Contractor may elect to remove and replace or relocate such structures or utilities with the written approval of the owner of the structure or utility and the Project Owner.

### METHOD OF MEASUREMENT

E4-4.1 Trench or excavation safety systems shall be measured as a complete unit.

### BASIS OF PAYMENT

E4-5.1 Trench and excavation safety systems shall be paid for at the lump sum price bid for "TRENCH AND EXCAVATION SAFETY SYSTEM," which price shall be full compensation for benching, sloping, sheeting, shoring, shielding, or any other protective system that provides the necessary protection to comply with Act 291 of 1993.

Payment will be made under:

Item E4-5.1 Trench and Excavation Safety System - per lump sum

END OF SECTION E-4



## SECTION I-1 – MAINTENANCE OF TRAFFIC

### DESCRIPTION

11-1.1 This item shall include the erection of signs, barricades, temporary markings, removal of temporary and permanent markings, and the maintenance of, or noninterference with, traffic in accordance with details shown on the Plans and with these Specifications, or as directed by the Engineer.

11-1.2 This item shall also include the temporary relocation of traffic and street signs, the maintenance of the temporarily relocated signs through the construction of the project, and the permanent relocation of any sign relocated due to construction signage after the construction is complete.

### STANDARDS

11-2.1 Maintenance of traffic as described above shall be accomplished in accordance with the applicable portions of SECTION 603 – MAINTENANCE OF TRAFFIC AND TEMPORARY STRUCTURES of the Standard Specifications, except as modified or augmented herein.

11-2.2 Traffic control devices shall be in accordance with SECTION 604 – TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

11-3.1 The Contractor shall implement and maintain all maintenance of traffic devices as shown on the Plans or submit his own Plan to the Owner and Engineer for review and approval. Upon approval by the Owner in writing, the Contractor shall supply the Fire Chief and the Police Chief one (1) copy each for their files. Two (2) copies shall be supplied to the Engineer. The Contractor shall initiate and maintain all necessary labor and materials necessary to construct the project in a manner which will guarantee public safety with a minimum of inconvenience. Additional work shall be performed by the Contractor during construction as directed by the Owner or Engineer if necessary to insure the above standards.

11-3.2 CONTRACTOR PERSONNEL: The Contractor shall designate a traffic control supervisor to furnish continuous surveillance over traffic control operations. This supervisor shall be available at night and weekends to respond to calls involving traffic control. The name of the traffic control supervisor shall be provided at the preconstruction conference and to local police.

The Contractor's personnel who are used to maintain traffic flow, such as flagmen or any other person who verbally communicates with or gives directions to the motorized public, shall speak English fluently.

11-3.3 DRIVEWAYS: Maintenance of driveways shall be as approved by the Engineer. It shall be the Contractor's responsibility to maintain adequate access to private and commercial property at all times, except as required for construction across the driveway as approved by the Engineer. During the construction of driveways or at any time that a property owner cannot use his driveway, the Contractor shall notify the property owner (one week in advance, minimum) when the driveway will be closed and the approximate length of time that it will be closed. The intent of this section of the Specifications is to cause as little inconvenience as possible to private property owners.

11-3.4 RELOCATION AND REPLACEMENT OF TRAFFIC SIGNS AND PAVEMENT STRIPING: During the construction of the project, the temporary relocation of street signs and traffic control signs will be performed by the Contractor. The Contractor shall maintain the signs at highly visible locations as near as practicable to the original locations. The latest edition of the Manual of Uniform Traffic Control Devices published by the Federal Highway Administration shall be used as a guide to the placement of signs during construction.

Immediately after the construction of any part of the project reaches a stage of completion such that the relocation of the street signs and traffic control signs is no longer necessary, the Contractor shall permanently relocate the street signs and traffic control signs. Removing any construction signage must be approved by the Engineer.

Street signs and traffic control signs shall be removed from such area of work as necessary to permit work on the project. Each sign shall be temporarily relocated in a secure manner by driving the sign into the ground with equipment approved by the Engineer, or otherwise installed as approved to prevent damage to underground utilities. Street signs no longer necessary shall be salvaged in good condition and restored to their original use or returned to the Owner if no longer needed.

Existing striping shall be removed and new temporary stripes and other pavement markings shall be provided by the Contractor. Work shall be performed in accordance with SECTION 720 (for Type 4) – PERMANENT PAVEMENT MARKING TAPE of the Standard Specifications. Pavement markings not necessary to the phased construction patterns shall be removed or obliterated with black paint, as approved by the Engineer. Striping shall be maintained and restored as necessary during construction.

11-3.5 SUSPENSION OF WORK: If the Owner or the Engineer determines that provisions for safe traffic control are not being provided or maintained, the work will be suspended. In cases of serious or willful disregard for safety of the public or construction workers, the Owner will place the traffic control devices in proper condition and deduct the costs from monies due the Contractor.

11-3.6 CONSTRUCTION SEQUENCE: The Plans show the Construction Stages. Stage 1 is shown to be executed first. However, the Owner may require the Contractor to construct the stages in an alternate order.

#### METHOD OF MEASUREMENT

11-4.1 Maintenance of Traffic will be measured as a complete item.

#### BASIS OF PAYMENT

11-5.1 Work performed under this section, acceptably completed as provided above, will be paid for at the control lump sum bid price for "MAINTENANCE OF TRAFFIC," which price shall be full compensation for this item. Periodic payments will be made under this item in proportion to the amount of work accomplished, as determined by the Engineer.

Payment will be made under:

Item 11-5.1 Maintenance of Traffic – per lump sum

END OF SECTION I-1



## SECTION I-2 – CONCRETE DITCH PAVING

### DESCRIPTION

I2-1.1 This item shall consist of the construction of concrete ditch paving, according to these Specifications and in conformity with the locations, lines, and grades shown on the Plans, or as directed by the Engineer.

### STANDARDS

I2-2.1 Material and work for this section shall be in accordance with SECTION 605 – CONCRETE DITCH PAVING of the Standard Specifications, unless modified or augmented herein.

### METHOD OF MEASUREMENT

I2-3.1 Concrete Ditch Paving constructed within the limits shown on the Plans or as directed will be measured by the square yard of exposed surface.

### BASIS OF PAYMENT

I2-4.1 Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per square yard for “CONCRETE DITCH PAVING” of the type specified, which price shall be full compensation for furnishing materials, including joint filler; for constructing the concrete ditch paving; for excavation and backfilling; and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

Item I2-4.1 Concrete Ditch Paving – per square yard

END OF SECTION I-2



## SECTION I-3 – PIPE CULVERTS

### DESCRIPTION

I3-1.1 This section covers reinforced concrete pipe and flared end sections constructed at the locations shown on the Plans or as directed by the Engineer.

### STANDARDS

I3-2.1 Materials and work shall be in accordance with SECTION 606 – PIPE CULVERTS of the Standard Specifications, except as modified or augmented herein.

### MATERIALS

I3-3.1 Concrete pipes shall be of the bell and spigot or tongue and groove type, as approved by the Engineer, and shall conform to the specifications of ASTM Designation C 76 (for circular pipe) and C 506 (for arch pipe), latest editions, for the sizes and classes of pipes shown on the Plans and listed in the Unit Price Schedule. The class of pipe and date of manufacture shall be marked on each joint of pipe. Pipe shall be at least ten (10) days old before it is delivered to the project.

I3-3.2 Flared end sections shall be reinforced concrete conforming to the requirements of ASTM C 76.

I3-3.3 Jointing material for reinforced concrete pipe shall be rubber gaskets conforming to the requirements of ASTM C 443.

### CONSTRUCTION METHODS

I3-4.1 TRENCHING AND BACKFILL: Trenching and backfill shall be in accordance with applicable requirements of SECTION 606 – PIPE CULVERTS of the Standard Specifications and SECTION E-3 – EXCAVATION FOR STRUCTURES, SECTION I-8 - PAVEMENT REPAIRS, and SECTION E-4 – TRENCH AND EXCAVATION SAFETY SYSTEMS of these specifications, except as modified or augmented herein.

Where unsuitable material is encountered, excavation shall continue until a firm material is reached and the over-excavation filled to grade with a special bedding material in accordance with the provisions of SECTION M-5 – PIPE EMBEDMENT.

I3-4.2 INSTALLATION OF PIPE: The installation of pipe shall be in accordance with SECTION 606 – PIPE CULVERTS of the Standard Specifications, except as modified or augmented herein.

The pipe ends where jointing occurs shall be cleaned and maintained clean. The joint shall be constructed as recommended by the manufacturer of the pipe. Each section of pipe shall be examined carefully before being laid, and the defective or damaged sections shall not be used. Pipelines shall be laid to the grades and alignment indicated, or as directed by the Engineer. Pipe laying shall proceed upgrade. The "bell" ends of concrete pipe shall point upgrade.

Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting holes in pipe will not be allowed. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Full responsibility for the diversion of drainage and for dewatering of trenches during construction shall be borne by the Contractor.

All pipe in place shall be approved by the Engineer before being backfilled. In all backfilling operations, the Contractor shall be responsible for preventing damage to or misalignment of the pipe.

Pipe embedment if required shall be furnished, placed, and shaped as described in SECTION M-5 – PIPE EMBEDMENT.

#### METHOD OF MEASUREMENT

I3-5.1 Pipe culverts will be measured by the linear foot in place, completed and accepted. Length shall not be measured through inlets, junction boxes, or other drainage structures. Separate measurements will be made by the sizes and classes shown on the Plans and listed in the Unit Price Schedule. Measurements will be taken to the nearest linear foot.

I3-5.2 Flared end sections will be measured by the unit (each) and will include the curtain wall, complete in place.

I3-5.3 Excavation and backfill will not be measured separately, but will be considered subsidiary to constructing the pipe.

I3-5.4 Special bedding material, used at the direction of the Engineer, will be measured and paid for as specified in SECTION M-5 – PIPE EMBEDMENT.

#### BASIS OF PAYMENT

I3-6.1 Pipe culverts acceptably completed and measured as provided above will be paid for at the contract unit price per linear foot bid respectively for "REINFORCED CONCRETE PIPE," of the sizes and classes shown on the Plans and listed in the Unit Price Schedule; which prices, in each case, shall be full compensation for furnishing all materials, except special bedding material; for all trenching, backfilling, and compacting; and for all equipment, tools, labor, and incidentals necessary to complete the work.

I3-6.2 Flared end sections acceptably completed and measured as provided above will be paid for at the contract unit price per each bid respectively for "FLARED END SECTION," of the sizes shown on the Plans and listed in the Unit Price Schedule; which prices, in each case, shall be full compensation for furnishing all materials, except special bedding material; for all excavation, backfilling, and compacting; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

Item I3-6.1a	18" Reinforced Concrete Pipe, Class III - per linear foot
Item I3-6.1b	24" Reinforced Concrete Pipe, Class III - per linear foot
Item I3-6.1c	30" Reinforced Concrete Pipe, Class III - per linear foot
Item I3-6.1d	36" Reinforced Concrete Pipe, Class III - per linear foot
Item I3-6.1e	22" x 14" Reinforced Concrete Arch Pipe, Class III - per linear foot
Item I3-6.1f	29" x 18" Reinforced Concrete Arch Pipe, Class III - per linear foot
Item I3-6.1g	29" x 18" Reinforced Concrete Arch Pipe, Class IV - per linear foot
Item I3-6.1h	36" x 23" Reinforced Concrete Arch Pipe, Class III - per linear foot
Item I3-6.1i	44" x 27" Reinforced Concrete Arch Pipe, Class III - per linear foot
Item I3-6.1j	59" x 36" Reinforced Concrete Arch Pipe, Class III - per linear foot
Item I3-6.2a	22" x 14" Reinforced Concrete Arch Flared End Section - per each
Item I3-6.2b	29" x 18" Reinforced Concrete Arch Flared End Section - per each

END OF SECTION I-3

## I-4 – REINFORCED CONCRETE BOX CULVERTS

### DESCRIPTION

I4-1.1 This item covers the furnishing and installation of reinforced concrete box culverts (RCBCs) in accordance with the lines and grades and for the sizes and locations as shown in the Plans.

### STANDARDS

I4-2.1 For cast in place RCBCs, materials and work shall be in accordance with SECTION 801 – EXCAVATION AND BACKFILLING of the Standard Specifications and SECTION S-1 – STRUCTURAL CONCRETE of these Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

I4-3.1 Box culvert construction and typical section shall conform to the details and dimensions as shown in the Plans. Deviations from these details and dimensions shall be approved in writing by the Engineer.

I4-3.4 All joints shall be filled with an approved non-shrink grout.

I4-3.5 Cutting, grouting, and connection of existing pipe culverts shall not be measured for separate payment, but shall be considered subsidiary work pertaining to “REINFORCED CONCRETE BOX CULVERT.”

I4-3.6 Constructing pipe sleeve and concrete stub out connections for future pipe inlets shall not be measured for separate payment, but shall be considered subsidiary work pertaining to “REINFORCED CONCRETE BOX CULVERT.”

### METHOD OF MEASUREMENT

I4-4.1 Reinforced concrete box culverts will be measured by the cubic yard in place, based upon the actual volume within the neat lines of the structure as shown on the plans or revised by the authority of the engineer.

### BASIS OF PAYMENT

I4-5.1 Work completed and accepted and measured as provided above will be paid for at the contract unit price bid per cubic yard as listed in this specification and the Unit Price Schedule, which price shall be full compensation for all materials furnished and placed, including reinforcing steel; and includes all barrels, headwalls, wing walls and footings; and for all labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Item I4-5.1      12' x 5' Reinforced Concrete Box Culvert - per cubic yard

END OF SECTION I-4



## **SECTION I-5 – DROP INLETS AND JUNCTION BOXES**

### DESCRIPTION

I5-1.1 This section covers all work in connection with the construction of the various types and sizes of inlets and junction boxes in accordance with the locations and details shown on the Plans and with these Specifications.

### STANDARDS

I5-2.1 All work under this section shall be done in accordance with SECTION 609 – DROP INLETS AND JUNCTION BOXES of the Standard Specifications, except as modified or augmented herein.

### MATERIALS

I5-3.1 Cement, aggregate, water, additives, and reinforcing steel shall conform to the requirements for materials as provided in SECTION S-1 – STRUCTURAL CONCRETE of these specifications.

I5-3.2 Materials other than those described above shall be in conformity with paragraph 609.02 – Materials of the Standard Specifications.

### CONSTRUCTION METHODS

I5-4.1 Forms, concrete, and reinforcing steel shall be in accordance with applicable requirements of SECTION S-1 – STRUCTURAL CONCRETE and with additional stipulations as follows:

1. Inside wall forms shall be removed prior to the erection of forms for top slabs. The supports for top slab forms shall be positioned in such a manner that will result in a minimum of interference with the free flow of water.
2. Manhole rings and covers shall conform to the details in the Plans and to applicable portions of SECTION 609 – DROP INLETS AND JUNCTION BOXES of the Standard Specifications.

### METHOD OF MEASUREMENT

I5-5.1 Completed and accepted inlets and junction boxes will be measured by the completed structure.

### BASIS OF PAYMENT

I5-6.1 Work completed and accepted under this section and measured as provided above will be paid for at the Contract Unit Price bid for each for the items listed below, which price shall be full compensation for constructing the item; for all excavation and backfill; and for all materials, equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

- Item I5-6.1a Drop Inlet (Type MO) - per Each
- Item I5-6.1b Drop Inlet (Type C) - per Each
- Item I5-6.1c Drop Inlet (Reverse Throat) - per Each
- Item I5-6.1d 4' Extension - per Each
- Item I5-6.1e Junction Box (Type ST) - per Each

END OF SECTION I-5



## SECTION I-7 – PIPE UNDERDRAINS

### DESCRIPTION

17-1.1 This item shall consist of pipe underdrains of the type, size, and dimensions required on the plans, furnished and installed at the locations, lines, grades, and details in the Plans, or by the Engineer.

17-1.2 The item shall include the cost of excavation, the cost of furnishing and installing all trenching and bracing, all fittings required to complete the underdrain as shown on the Plans, and the material for the making of all joints including all connections to existing drainage pipes and structures.

### STANDARDS

17-2.1 All work under this section shall be in accordance with SECTION 611 – PIPE UNDERDRAINS, OUTLET PROTECTORS, AND COVERS of the Standard Specifications, except as modified or augmented herein.

### MATERIALS

17-3.1 Materials shall conform to the applicable requirements of SECTION 611 – PIPE UNDERDRAINS, OUTLET PROTECTORS, AND COVERS of the Standard Specifications, except as modified or augmented herein.

17-3.2 OUTLET AND CONNECTOR PIPE: Outlet and connector pipe shall be the same material as the underdrain pipe and shall have a diameter equal to the diameter of the underdrain pipe, or as directed by the Engineer. Outlet and connector pipe shall not be perforated.

### CONSTRUCTION METHODS

17-4.1 EXCAVATION: The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but shall not be less than the external diameter of the pipe plus 6 inches on each side. The trench walls shall be approximately vertical.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 4 inches. The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The engineer shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

Excavated material not required or acceptable for backfill shall be disposed of by the Contractor as directed by the Engineer. The excavation shall not be carried below the required depth; when this is done, the trench shall be backfilled at the Contractor's expense with material approved by the Engineer and compacted to the density of the surrounding earth material.

The bed for the pipe shall be so shaped the pipe shall be in continuous contact with the bottom of the trench. Spaces for the pipe bell shall be excavated accurately to size to clear the bell so that the barrel supports the entire weight of the pipe.

The Contractor shall do such trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to governing laws. Unless otherwise provided,

the bracing, sheathing, or shoring shall be removed by the Contractor after the completion of the backfill to at least 12 inches (300 mm) over the top of the pipe. The sheathing or shoring shall be pulled as the granular backfill is placed and compacted to avoid any unfilled spaces between the trench wall and the backfill material. The cost of trenching, bracing, sheathing, or shoring, and the removal of same, shall be included in the unit price bid per foot for the pipe.

17-4.2 INSTALLING FILTER FABRIC: After excavation has been accomplished, the filter fabric shall be installed. The material shall be un-rolled over the trench and then walked into the trench in such a manner so as to avoid any damage to the fabric. Any damage to the fabric shall be repaired by placing a piece of fabric large enough to cover the damaged area and lapping beyond the damaged area by a minimum of 2 feet.

The end of a new roll of fabric shall be lapped at least three feet onto the old roll.

After installation of the porous backfill, the filter fabric shall be lapped at least 1.5 feet over the porous backfill to form a fabric encasement around the pipe and backfill.

17-4.3 LAYING AND INSTALLING PIPE: Unless otherwise shown on the plans, a 4-inch (100 mm) bed of granular backfill material shall be spread in the bottom of the trench throughout the entire length under all perforated pipe underdrains.

Pipe outlets for the underdrains shall be constructed when required or shown on the Plans. The pipe shall be laid with tight-fitting joints. Porous backfill is not required around or over pipe outlets for underdrains. All connections to other drainage pipes or structures shall be made as required and in a satisfactory manner. If connections are not made to other pipes or structures, the outlets shall be protected and constructed as shown on the Plans.

17-4.4 MORTAR: The mortar shall be of the desired consistency for caulking and filling the joints of the pipe and for making connections to other pipes or to structures. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted.

17-4.5 BACKFILLING:

17-4.5.1 OUTLET AND CONNECTOR PIPE (EARTH): All trenches and excavations shall be backfilled within a reasonable time after the pipes are installed, unless other protection of the pipe is directed. The backfill material shall be selected material from excavation or borrow; material which is placed within a nominal pipe diameter distance at the sides of the pipe and 1 foot over the top shall be material which can be readily compacted. It shall not contain stones retained on a 3-inch sieve, frozen lumps, chunks of highly plastic clay, or any other material which is objectionable to the Engineer. The material shall be moistened or dried, if necessary to be compacted by the method in use. Backfill material shall be approved by the Engineer. Special care shall be taken in placing the backfill. Great care shall be used to obtain thorough compaction under the haunches and along the sides to the top of the pipe.

The backfill shall be placed in loose layers not exceeding 6 inches in depth under and around the pipe, and not exceeding 8 inches over the pipe. Successive layers shall be added and thoroughly compacted by hand and pneumatic tampers, approved by the Engineer, until the trench is completely filled and brought to the proper elevation. Backfilling shall be done in a manner to avoid injurious top or side pressures on the pipe.

In embankments and for other areas outside of pavements, the backfill shall be compacted to the density required for embankments in unpaved areas under SECTION E-2 – EXCAVATION AND EMBANKMENT. Under paved areas, the subgrade and any backfill shall be compacted to the density required for embankments for paved areas under SECTION E-2.

17-4.5.2 UNDERDRAIN (PERFORATED) PIPE (GRANULAR MATERIAL): Granular backfill placement in the trench and about the pipe shall be as shown on the Plans. Special care shall be taken in placing the backfill. The granular backfill shall not contain a damaging amount of foreign matter, nor shall earth from the sides of the trench or from the windrow be allowed to filter into the backfill. The backfill shall be placed in loose layers not exceeding 6 inches (150 mm) in depth and compacted by hand and pneumatic tampers to the requirements as given for earth backfill. Backfilling shall be done in a manner to avoid injurious top or side pressure on the pipe. The granular backfill shall be made to the elevation of the trench, as shown on the Plans.

When porous backfill is to be placed in paved or adjacent areas prior to the completion of grading or subgrade operations, the backfill material shall be placed immediately after laying the pipe. The depth of this granular backfill shall be not less than 12 inches, measured from the top of the underdrain. During subsequent construction operations, this minimum backfill of 12 inches of depth shall not be disturbed until such time as the underdrains are to be completed. When the underdrains are to be completed, the unsuitable material shall be removed until the porous backfill is exposed. That part of the porous backfill which contains objectionable material shall be removed and replaced with suitable material. The cost of removing and replacing any such unsuitable material shall be borne by the Contractor.

Whenever a granular subbase blanket course is to be used under pavements which extends several feet beyond the edge of paving to the outside edge of the underdrain trench, the granular backfill material over the underdrains shall be placed in the trench up to an elevation of at least 2 inches above the bottom surface of the granular subbase blanket course. Immediately prior to the placing of the granular subbase blanket course, the Contractor shall blade this excess trench backfill from the top of the trench onto the adjacent subgrade where it can be incorporated into the granular subbase blanket course. Any unsuitable material which remains over the underdrain trench shall be removed and replaced. The subbase material shall be placed to provide clean contact between the subbase material and the underdrain granular backfill material for the full width of the underdrain trench.

17-4.6 CONNECTIONS: When the Plans call for connections to existing or proposed pipe or structures, these connections shall be watertight and made so that a smooth uniform flow line will be obtained throughout the drainage system.

17-4.7 CLEANING AND RESTORATION OF SITE: After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as ordered by the Engineer. Except for paved areas, the Contractor shall restore all disturbed areas to their original condition.

#### METHOD OF MEASUREMENT

17-5.1 Pipe underdrains shall be measured by the linear foot of pipe underdrains completed, in place, and accepted, for each size. All fittings shall be included in the footage as typical pipe sections in the pipeline being measured.

17-5.2 Porous backfill shall be measured by the cubic yard of porous backfill, completed, in place, and accepted, and shall be determined from the dimensions given on the Plans by typical trench sections indicating the placement of porous backfill or dimensions ordered by the Engineer.

17-5.3 Filter fabric shall be measured by the linear foot of filter fabric, completed, in place, and accepted, measured along the centerline of the completed underdrain pipe, with no additional allowance for lapping of the filter fabric.

17-5.4 6" Outlet Pipe shall be measured by the linear foot of outlet pipe completed, in place, and accepted. All fittings shall be included in the footage as typical pipe sections in the pipeline being measured. Outfall connections to existing structures shall not be measured for separate payment, but will be considered subsidiary to the outlet pipe.

BASIS OF PAYMENT

I7-6.1 Work performed and accepted under this item and measured as provided above will be paid for at the contract unit price bid per the items listed below. These prices shall be full compensation for furnishing all materials and for all preparation, excavation, backfill, hauling, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item I7-6.1      4" Pipe Underdrain - per linear foot

END OF SECTION I-7

## SECTION I-8 – PAVEMENT REPAIRS

### DESCRIPTION

I8-1.1 This section covers the repairs of streets for storm drainage culverts, drainage structures, or other excavations within existing pavements which are to remain. All work shall be in accordance with these specifications and the details in the Plans at the locations shown in the Plans or as directed by the Engineer. Quantity includes 250 square yards to be used if and when directed by the engineer for existing pavement repairs prior to mill and inlay operations.

### STANDARDS

I8-2.1 All work under this section shall be in accordance with SECTION 615 – PAVEMENT REPAIR OVER CULVERTS of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

I8-3.1 Pavement removal limits shall be smoothly sawcut and shall have a neat appearance. Asphalt and/or concrete materials removed from the excavation or cut shall not be used as backfill material.

I8-3.2 Permanent asphalt and concrete pavement repairs shall conform to the details in the Plans and the requirements of SECTION 615 – PAVEMENT REPAIR OVER CULVERTS of the Standard Specifications, except as modified or augmented herein. In the event of a conflict, the details in the Plans and this specification shall govern over the requirements of SECTION 615. For concrete pavement repairs, joints shall be sawcut and sealed as directed by the Engineer in accordance with details in the Plans and SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT of the Standard Specifications.

I8-3.3 Temporary pavement repairs shall be in accordance with the details in the Plans and shall be maintained and removed as required.

I8-3.4 RESTORATION OF STREET CUT: The Contractor is required to restore the excavation, or cut, immediately upon completion of the work which required the cut. The Contractor shall notify the Engineer when the restoration is completed.

### METHOD OF MEASUREMENT

I8-4.1 Permanent pavement repairs will be measured by the square yard acceptably completed, less any overcut as determined by the Engineer, for each type of repair as detailed in the Plans. In no case shall the measurement extend beyond the pay limits shown on the details for each type of pavement repair. Pavement repairs of insufficient depth shall not be measured for payment.

I8-4.2 Temporary pavement repair shall be measured by the square yard maintained and utilized by traffic as directed by the Engineer. In no case shall the measurement of repair extend beyond the pay limits shown on the details in the Plans. Pavement repairs of insufficient depth shall not be measured for pavement.

I8-4.3 Temporary or permanent restoration of private drives and parking surfaces, where directed by the Engineer, will be included in the measurement and payment of the unit prices indicated above.

I8-4.4 Repair of the street required because of damage from the Contractor's equipment or negligence will not be measured for payment.

I8-4.5 Pavement cutting and removal will not be measured for separate payment, but shall be considered subsidiary to the installation of the involved item.

BASIS OF PAYMENT

18-5.1 Payment for pavement repairs will be made at the contract unit price bid per square yard for PERMANENT PAVEMENT REPAIR and TEMPORARY PAVEMENT REPAIR, which price shall be full compensation for the complete restoration of the pavement in accordance with the Plans and this specification including sawcutting, removal, and disposal of materials; placement and compaction of backfill; placement of asphalt, concrete or other materials; placement, maintenance, and removal of temporary surface materials; and all labor, materials, equipment, and incidental items required to complete the repair.

Payment will be made under:

- Item 18-5.1a Permanent Pavement Repair - per square yard
- Item 18-5.1b Temporary Pavement Repair - per square yard

END OF SECTION I-8

## SECTION I-10 – FENCES

### DESCRIPTION

I10-1.1 This item covers furnishing and constructing new barbed wire, chain-link, and wood privacy fence and gates in accordance with the types, locations, and details in the Plans, or as directed by the Engineer.

### STANDARDS

I10-2.1 Materials and work shall be in accordance with SECTION 619 – FENCES of the Standard Specifications, except as modified or augmented herein.

### METHOD OF MEASUREMENT

I10-3.1 Fencing will be measured by the linear foot outside to outside of end post, for the type specified as directed by the Engineer. Only fencing directed by the Engineer will be measured for payment.

### BASIS OF PAYMENT

I10-4.1 Work performed and accepted under this item and measured as provided above will be paid for at the contract unit price bid per linear foot for fencing and gates as listed below and in the unit price schedule, which prices shall be full compensation for all clearing and grading; for setting posts, erecting fence, and installing gates; for all excavation and backfill; for furnishing all material; and for all labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Item I10-4.1	Wood Privacy Fence – per linear foot
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END OF SECTION I-10





## SECTION I-12 – TEMPORARY EROSION CONTROL AND STORMWATER POLLUTION PREVENTION PLAN

### DESCRIPTION

I12-1.1 This section covers the application of Temporary Erosion Control items at locations shown on the Plans, as directed by the Engineer, and as required for permit compliance. The Contractor will also be required to request and obtain all necessary federal, state, and local permits. The temporary erosion control measures shown in the Plans does **not** represent the extent of work and coordination required by the Contractor under this item.

I12-1.2 In coordination with the Arkansas Department of Environmental Quality (ADEQ), the owner has submitted an application for the Stormwater Construction General Permit ARR150000 and has also filed the Notice of Intent (NOI). The contractor will be required to satisfy all requirements of the permit.

I12-1.3 In coordination with the Arkansas Department of Environmental Quality (ADEQ), the owner has requested a Short Term Activity Authorization (STAA). The contractor will be required to satisfy all requirements of the permit.

### STANDARDS

I12-2.1 Items and materials for this section shall be in accordance with SECTION 621 – TEMPORARY EROSION CONTROL ITEMS AND DEVICES of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

I12-3.1 Providing the temporary erosion control items and devices shown on the Plans is intended to minimize the erosion of soils during construction. However, the items and devices shown are not intended to represent all of the necessary items or procedures required to be implemented by the Contractor. The plans and specifications show the Engineer's estimate of a minimum effort needed to maintain proper erosion control during construction. Additional effort and materials may be required by the Contractor to minimize the erosion of soils during construction. It shall be the Contractor's responsibility to install and maintain all the items shown in the Plans and to coordinate, submit, obtain, and comply with all necessary Federal, State, and local permits. The coordination with governing agencies shall include, but not limited to the following:

- Coordinating and obtaining all local permits regarding grading operations for the proposed improvements, Contractor's staging area, spoil placement and any other grading operations related to the project as directed by the local governing agency.

I12-3.2 Heavy Duty silt fencing (with welded wire in the fabric) may be required on steep slopes if the Engineer determines that the silt fence used by the Contractor is not performing satisfactory.

### METHOD OF MEASUREMENT

I12-4.1 Temporary erosion control will be measured as a complete item.

### BASIS OF PAYMENT

I12-5.1 Temporary erosion control acceptably completed will be paid for at the contract lump sum price bid for "TEMPORARY EROSION CONTROL," which prices shall be full compensation for furnishing all materials, tools, equipment, labor, and incidentals necessary to complete the work. Periodic payments will be made under this item in proportion to the amount of work accomplished, as determined by the Engineer. Payment for "TEMPORARY EROSION CONTROL" will also include compliance with the Stormwater

Pollution Prevention Plan, which shall include compensation for drainage-way inspections, report preparation, housekeeping practices, cleaning and maintenance, and other actions outlined in the Stormwater Pollution Prevention Plan necessary to execute the Plan.

Payment will be made under:

Item I12-5.1      Temporary Erosion Control – per lump sum

END OF SECTION I-12

## **SECTION I-13 – SOLID SODDING**

### DESCRIPTION

I13-1.1 This section covers the furnishing and placing of approved Bermuda sod, fertilizer, and water to form solid mats on areas shown on the Plans or as directed by the Engineer.

### STANDARDS

I13-2.1 Materials and work shall be in accordance with SECTION 624 – SOLID SODDING of the Standard Specifications, except as herein modified or augmented.

### CONSTRUCTION METHODS

I13-3.1 Areas to be sodded shall be shaped and graded to an elevation in such manner that they will, after placement of sod, conform to the typical sections.

I13-3.2 Immediately following the sodding operations, all gutters, sidewalks, driveways, street pavement, yards, or other areas shall be cleaned of all debris, excess sod, topsoil, or other objectionable matter. All such clean-up operations shall be completed before sodded areas are measured for payment as described below.

### METHOD OF MEASUREMENT

I13-4.1 Areas covered by living sod completed and accepted will be measured by the square yard to the nearest square yard.

### BASIS OF PAYMENT

I13-5.1 Solid sodding acceptably completed, and measured as provided above, will be paid for at the contract unit price per square yard bid for "SODDING," which price shall be full compensation for furnishing and placing all materials, including sod, fertilizer, and water; for clean-up work; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

Item I13-5.1 Sodding - per square yard

END OF SECTION I-13



## **SECTION I-14 – TOPSOIL**

### DESCRIPTION

I14-1.1 This section covers the furnishing and placing topsoil on completed slopes and ditches as shown in the typical sections and other areas shown on the Plans or as described by the Engineer.

### STANDARDS

I14-2.1 Materials and work shall be in accordance with SECTION 628 – TOPSOIL FURNISHED AND PLACED of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

I14-3.1 Immediately following the topsoiling operations, all gutters, sidewalks, driveways, street pavement, yards or other areas shall be cleaned of all excess topsoil.

### MEASUREMENT AND PAYMENT

I14-4.1 Topsoil will not be measured for separate payment, but will be subsidiary to the item or items under SECTION E-2 – EXCAVATION AND EMBANKMENT.

END OF SECTION I-14



## SECTION I-15 – CONCRETE ISLAND

### DESCRIPTION

I15-1.1 This item shall consist of constructing concrete islands in accordance with the lines, grades, thicknesses and locations shown on the Plans or directed by the Engineer.

### STANDARDS

I15-2.1 All work and materials under this item shall be in accordance with SECTION 632 – CONCRETE ISLAND of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

I15-3.1 Joints shall be sawcut and sealed in accordance with the details in the Plans. In the absence of details in the Plans specifically for concrete islands, joints shall be constructed in accordance with the requirements for joints in concrete sidewalk.

### METHOD OF MEASUREMENT

I15-4.1 Concrete island shall be measured by the square yard, completed and accepted.

### BASIS OF PAYMENT

I15-5.1 Concrete islands will be paid for at the contract unit price bid per square yard at the specified thickness. This price shall be full compensation for furnishing and installing the concrete, formwork, curing materials; for sawing and sealing joints; and for all equipment, labor, and incidentals required to complete the work.

Payment will be made under:

Item I15-5.1a	Concrete Island (8") - per square yard
Item I15-5.1b	Concrete Truck Apron (12") - per square yard

END OF SECTION I-15





## SECTION I-16 – CONCRETE SIDEWALKS AND STEPS

### DESCRIPTION

I16-1.1 This item shall consist of the construction of reinforced and unreinforced Portland Cement concrete sidewalks (including handicap ramps) and steps in accordance with the lines, grades, and construction details shown on the Plans or as directed by the Engineer. All materials and work shall be in accordance with details shown on the Plans and with these Specifications.

### STANDARDS

I16-2.1 Materials and work for sidewalks and steps shall be in accordance with SECTION 633 - CONCRETE WALKS, CONCRETE STEPS, AND HANDRAILING and SECTION 641 – WHEELCHAIR RAMPS of the Standard Specifications, except as modified by SECTION S-1 – STRUCTURAL CONCRETE of these specifications, and except as modified or augmented herein.

### CONSTRUCTION METHODS

I16-3.1 Final finishing of the surface shall be by steel trowel finish followed by light brushing or brooming to attain a slightly roughened texture. Transverse (contraction) joints in the walks shall be sawcut (to a depth of T/4) at intervals not greater than the width of the walk, or as directed, in accordance with details in the Plans.

I16-3.2 Transverse expansion joints in sidewalks and islands shall be constructed opposite expansion joints in curb and gutter, where sidewalk abuts other concrete structures, and as otherwise directed by the Engineer, except that no space shall be left between the sidewalk and adjacent curb. All joints shall be sealed with material meeting the requirements of SECTION 501 – PORTLAND CEMENT CONCRETE PAVEMENT, Paragraph 501.03(g), Standard Specifications.

I16-3.3 Curing compound meeting SECTION 802 – CONCRETE FOR STRUCTURES of the Standard Specifications shall be used on all sidewalks.

### METHOD OF MEASUREMENT

I16-4.1 Concrete for sidewalks (including handicap ramps) and steps will be measured by the horizontal square yard. The area for steps will be the treads only.

### BASIS OF PAYMENT

I16-5.1 Work acceptably completed and measured as provided above, will be paid for at the contract unit price bid per square yard for “SIDEWALK”, “RAMPS”, and “CONCRETE STEPS,” at the specified thickness, which price shall be full compensation for subgrade preparation; for formwork; for furnishing and placing all materials, including expansion joint material; for truncated dome pavers, and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

Item I16-5.1a	Sidewalk - per square yard
Item I16-5.1b	Ramps (Type 3) - per square yard
Item I16-5.1c	Ramps (Type 5) - per square yard
Item I16-5.1d	Ramps (ARDOT - Type 3) - per square yard
Item I16-5.1e	Ramps (Island) - per square yard
Item I16-5.1f	Concrete Steps - per square yard

END OF SECTION I-16



## SECTION I-17 – CURB AND GUTTER

### DESCRIPTION

I17-1.1 This section shall consist of the construction of curb and curb and gutter at the locations shown on the Plans or as directed by the Engineer.

### STANDARDS

I17-2.1 Materials and work (including testing) for Concrete Curb and Concrete Curb and Gutter shall be in accordance with SECTION 634 - CURBING of the Standard Specifications, except as modified by SECTION S-1 - STRUCTURAL CONCRETE of these Specifications, and except as modified or augmented in this section of the Specifications.

### CONSTRUCTION METHODS

I17-3.1 FORMS: Article 634.03(b) of Standard Specifications shall be augmented as follows:

1. Form for curb and gutter on tangent shall be steel forms, taking into consideration standard lengths of such forms.
2. Forms in curved sections may be substantially built wood forms.
3. The Engineer shall approve all forms before they are used on the job and shall inspect them periodically. When forms appear to be unsatisfactory in any way, either before forms are used, during forming operations, or during the placing of concrete, the Engineer shall order the work stopped until the defects have been corrected or the defective forms are replaced by satisfactory ones.

I17-3.2 PLACING AND FURNISHING: That part of Article 634.03(c)(1) of the Standard Specifications which relates to placing and finishing shall be replaced by the following requirements:

1. Concrete shall be dry enough to permit early removal of face forms, if used, for the curb section; 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. At the Contractor's option, shaping may be done by a steel screen, shaped to exact curb and gutter section, riding upon the tops of front metal template. The Contractor shall be responsible for construction within the tolerances allowed by this section. The shaping operation shall be repeated as often as necessary to attain the required results.
4. If templates are used to control shape, they shall be of metal and securely fastened in position at intervals not exceeding ten (10) feet. Templates shall be normal to the grade of the gutter and to the centerline of roadway.

I17-3.3 JOINTS: Article 634.03(d), Joints, 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 sixty (60) feet or as otherwise controlled by details on the Plans. 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" (width) x 1-1/2" (depth) and shall be placed at fifteen (15) foot intervals between expansion joints or as otherwise controlled by details on the Plans. Contraction joints shall be formed by sawing, unless otherwise specified, and sealed with a non-sag sealant meeting the requirements of the Standard Specifications.
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, and at sidewalks, 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 Standard Specifications.

I17-3.4 PLACEMENT: Concrete curb and concrete curb and gutter shall be one-course, monolithic, between expansion joints.

#### METHOD OF MEASUREMENT

I17-4.1 Work required by this Section shall be measured by the linear foot. Each continuous section of the curb and/or curb and gutter of the type constructed, will be measured along the back edge of the curb; measurements shall include the space occupied by all joints. Measurements shall not include the distance across inlet structures. The quantity on the estimate will be the sum of the several measurements, to the nearest linear foot.

#### BASIS OF PAYMENT

I-17-5.1 Work performed and accepted under this item and measured as provided above will be paid for at the contract unit price bid per the items listed below. These prices shall be full compensation for furnishing all materials, including joint material; for all reinforcing steel; for all excavating, fine grading, and backfilling; for placing, finishing, sawing, and curing; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

Item I17-5.1a	Concrete Combination Curb and Gutter (Type A) (2'-0") - per linear foot
Item I17-5.1b	Concrete Combination Curb and Gutter (Type A) (6'-0") - per linear foot
Item I17-5.1c	Concrete Combination Curb and Gutter (Type E-1) (2'-0") - per linear foot

END OF SECTION I-17

## SECTION I-18 – ROADWAY CONSTRUCTION CONTROL

### DESCRIPTION

I18-1.1 This item shall consist of furnishing and maintaining all lines, grades, survey points, and measurements necessary for the proper execution of the work under the Contract, all in accordance with the Plans and Specifications.

### STANDARDS

I18-2.1 All work for this section will conform to SECTION 635 – ROADWAY CONSTRUCTION CONTROL, of the Standard Specifications, except as modified or augmented herein.

### METHOD OF MEASUREMENT

I18-3.1 Roadway Construction Control will be measured as a complete unit.

### BASIS OF PAYMENT

I18-4.1 Work completed and accepted and measured as provided above will be paid for at the contract lump sum price bid for Roadway Construction Control, which price shall be full compensation for furnishing and maintaining all necessary lines, grades, survey points, and measurements; and for furnishing all engineering personnel, equipment, materials, tools, and incidentals necessary to complete the work.

No adjustments in the lump sum price bid will be made for Roadway Construction Control required due to normal increases or decreases in contract quantities. However, if the amount of Roadway Construction Control required is increased or decreased in connection with a change order, compensation will be adjusted accordingly.

Partial payments for ROADWAY CONSTRUCTION CONTROL will be made in proportion to the amount of work accomplished on this item.

No additional payment will be made for restaking needed to maintain the control.

Payment will be made under:

Item I18-4.1 Roadway Construction Control - per lump sum.

END OF SECTION I-18



## SECTION I-19 – MAILBOXES

### DESCRIPTION

I19-1.1 This section covers the removal, the temporary relocation, and the permanent relocation of mailboxes that conflict with construction. When required, it shall also include furnishing and installing new mailboxes and appurtenances. All work under this section shall be in accordance with details shown on the Plans and these specifications.

### STANDARDS

I19-2.1 All work and materials under this section shall conform to the requirements of SECTION 637 – MAILBOXES of the Standard Specifications, except as modified or augmented herein.

### MATERIALS

I19-3.1 Whenever possible, mailboxes and mailbox supports shall be removed and reinstalled in a concrete base as directed by the Engineer at the time of construction.

I19-3.2 Mailbox supports shall consist of 3" to 4" penta-treated posts, or equal, with a 1" x 6" x 16" No. 2 pine wolmanized pine board on top or alternate support approved by the Engineer.

I19-3.3 A 1/8" x 1-1/2" steel (painted with black enamel) or 1/4" x 1" aluminum brace shall be mounted on the street side. The brace shall be mounted at 45 degrees with the post with 2" bends at connections. The brace shall be mounted with #8 round-head brass galvanized wood screws.

I19-3.4 The relocation shall be mounted with base support and dimensions relative to the new pavement as shown on the Plans.

### CONSTRUCTION METHODS

I19-4.1 Mailbox access shall be maintained at all times so that postal service will not be interrupted. It is intended that mailboxes be immediately restored after removal.

I19-4.2 All mailboxes and supports that are in satisfactory condition in the opinion of the Engineer shall be relocated. Replacement with new materials is only necessary when the existing materials are not satisfactory due to age, deterioration, or damage during removal or storage by the Contractor.

I19-4.3 Mailboxes shall be permanently relocated in the same street station as before and where requested by the property owner, unless directed otherwise by the Engineer.

I19-4.4 Temporary Service: If it becomes necessary to cut off vehicle access to individual properties temporarily, then mailboxes may have to be located in a temporary stand at the end of each block. The temporary mailbox support for boxes closely spaced shall consist of a sturdy wood frame of two upright members and 2" x 6" pine horizontal support. Prior to this temporary relocation, each owner shall be contacted by the Contractor. After each owner has been informed, the U.S. Post Office shall be notified by the Contractor by telephone and in writing indicating the location and probable time of beginning and ending of the proposed temporary group mailbox relocation.

### METHOD OF MEASUREMENT

I19-5.1 Mailboxes relocated in accordance with this specification shall be measured as a complete item. The Contractor shall make his own determination of the work required under this item.

## BASIS OF PAYMENT

I19-6.1 All work associated with mailbox relocation shall be paid for at the lump sum price bid for "MAILBOX RELOCATION," which price shall include mailbox removal, temporary relocation, permanent relocation, new materials where required, coordination with property owners and postal service, and all tools, equipment, labor, and incidentals necessary to complete the work.

Periodic payments will be made proportional to the amount of work accomplished as determined by the Engineer.

Payment will be made under:

Item I19-6.1 Mailbox Relocation – per lump sum

END OF SECTION I-19



## **ITEM I-20 – DELINEATOR**

### DESCRIPTION

I20-1.1 This item shall consist of the construction of delineators in accordance with these specifications and Standard Drawings at the locations shown on the plans or as directed by the Engineer.

I20-1.2 The Manufacturer's installation procedures and Shop Drawings showing the installation details shall be submitted to the Engineer for review.

### MATERIALS

I20-2.1 The delineators shall be Impact Recovery Systems, MP2-36GS-DW-F – MP Flex Post, 36", Green, Short Squeeze, White DG, Fixed Two Bands White Diamond Grade, or approved equal.

I20-2.2 The bases shall be Impact Recovery Systems, BS-SMFB – Surface Mount Base, Quick Release, Black, or approved equal.

### CONSTRUCTION METHODS

I20-3.1 The delineators shall be installed per the manufacturer's specifications for asphalt pavement.

### METHOD OF MEASUREMENT

I20-4.1 Work completed and accepted will be paid for at the contract unit price bid per each for Delineator.

### BASIS OF PAYMENT

I20-5.1 The bid price and payment shall be full compensation for furnishing materials, anchors, adhesives, surface preparation, fabrication, installation, and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

Item I20-5.1 Delineator - per each

END OF SECTION I-20



## ITEM I-21 – BRICK PAVERS

### DESCRIPTION

I21-1.1 This item shall consist of the construction of brick pavers in accordance with the lines, grades, and construction details shown on the Plans or as directed by the Engineer. All materials and work shall be in accordance with details shown on the Plans and with these Specifications.

### MATERIALS

I21-2.1 Concrete Base Materials for concrete base shall be in accordance with Section 633 – Concrete Walks, Concrete Steps, and Hand Railing of the Standard Specifications.

I21-2.2 Geotextile Filter fabric shall be a woven geotextile complying with Section 625, Type 1.

I21-2.3 Bedding Sand Bedding sand shall be clean, non-plastic, and free from deleterious or foreign matter. The sand shall be natural or manufactured from crushed rock. Grading of samples shall be done according to ASTM C136. The particles shall be sharp and conform to the grading requirements of ASTM C33 as shown below:

<u>Sieve</u>	<u>Percent Passing</u>
3/8"	100
# 4	95 - 100
# 8	80 - 100
# 16	50 - 85
# 30	25 - 60
# 50	10 - 30
# 100	2 - 10

I21-2.4 Pavers The brick pavers shall be Pine Hall Brick Co., Inc. English Edge Flash (Full Range) (4"x8"x2-1/4") or approved equal. Chamfers on both bed surfaces for reversibility; spacer nibs to control joint size and chippage, natural through the body color.

Unit clay paver shall conform to the requirements of ASTM C902, Class SX, Type 1, Application PX and C67 for Freeze and Thaw. The units shall be standard 4"x8" size having dimensions of 2 1/4" x 4" x 8" (including spacer nibs on the side), chamfered edges on both bed surfaces, 8,000 psi minimum compressive strength and below 8% cold water absorption.

I21-2.5 Joint Sand Joint sand shall be polymeric.

### CONSTRUCTION METHODS

I21-3.1 Geotextile Lay Filter Geotextile (if applicable) along edges where indicated in the drawings. Geotextile shall be installed in such a manner that all splice joints are provided with a 12" minimum lap. Care shall be taken during the placement and installation of the material to prevent damage to the fabric. Damages to the geotextile shall be repaired by placing a geotextile patch over the damaged area, extending 12" beyond the perimeter of the damaged area.

I21-3.2 Bedding Sand Spread the sand evenly over the rigid base and screed to 1 inch maximum to 1/2 inch minimum thickness. The screeded sand should not be disturbed. Sufficient sand shall be placed to ensure that no delay occurs in laying pavers. The screeded bedding sand shall not be subjected to any traffic by either mechanical or pedestrian use.

### I21-3.3 Pavers

1. Ensure that pavers are free of foreign material before installation. The installer shall take the pavers from the pallet by row consisting of 18 pavers. Each row shall be installed together to ensure proper color mix.
2. Lay the pavers in the pattern(s) as shown on the drawings. Full pavers are to be laid first. The pavers should be laid hand tight. Maintain straight pattern lines and adjust as necessary.
3. Joints between the pavers shall be maintained by spacer nibs manufactured on the paver sides.
4. Fill gaps at the edges of the paved area with cut pavers. Cut pavers to be placed along the edge using a masonry saw and in such a manner that no segment is smaller than one quarter of a full paver.
5. Use a low amplitude, high frequency plate vibrator capable of 3000 to 5000 lbs. centrifugal compaction force to vibrate the pavers into the sand. Vibrate the pavers, sweeping polymeric sand into the joints and vibrating until they are full.
6. The final surface elevations shall not deviate more than 3/8 inch under a 10 foot long straightedge.

### I21-3.4 Joint Sand

1. Ensure pavers are completely dry and follow manufacturer's installation instructions.
2. The treated area shall be protected from rain or moisture and shall not be trafficked for 24 hours after the completion of the stabilizer application
3. All work to within three feet of the laying face must be left fully compacted with polymeric sand-filled joints at the completion of each day.

### METHOD OF MEASUREMENT

I21-4.1 Work completed and accepted will be paid for at the contract unit price bid per square yard for Brick Pavers.

### BASIS OF PAYMENT

I21-5.1 The bid price and payment shall be full compensation for furnishing materials, concrete base, installation, and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

Item I21-5.1 Brick Pavers – per square yard

END OF SECTION I-21

## **SECTION I-22 – FLOWABLE FILL**

### DESCRIPTION

I22-1.1 This item shall consist of placing flowable fill if and where directed by the Engineer.

### STANDARDS

I22-2.1 Materials and work under this item shall be in accordance with SECTION 206 – FLOWABLE SELECT MATERIAL of the Standard Specifications, except as modified or augmented herein.

### METHOD OF MEASUREMENT

I22-4.1 Flowable Fill shall be measured in place by the cubic yard. Only the amount of flowable fill directed by the Engineer will be measured for payment.

### BASIS OF PAYMENT

I22-5.1 Flowable Fill will be paid for at the contract unit price bid per cubic yard. This price shall be full compensation for designing the mix; furnishing, mixing, and placing the material; and for all equipment, incidentals, and labor required to complete the work.

Payment will be made under:

Item I22-5.1 Flowable Fill - per cubic yard

END OF SECTION I-22



## SECTION I-23 – CONCRETE ISLAND BEHIND WALK

### DESCRIPTION

I23-1.1 This item shall consist of constructing concrete island behind walk in accordance with the lines, grades, thicknesses and locations shown on the Plans or directed by the Engineer.

### STANDARDS

I23-2.1 All work and materials under this item shall be in accordance with SECTION 632 – CONCRETE ISLAND of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

I23-3.1 Joints shall be saw cut and sealed in accordance with the details in the Plans. In the absence of details in the Plans specifically for concrete islands, joints shall be constructed in accordance with the requirements for joints in concrete sidewalk.

### METHOD OF MEASUREMENT

I23-4.1 Concrete island behind walk shall be measured by the square yard, completed and accepted.

### BASIS OF PAYMENT

I23-5.1 Concrete island behind walk will be paid for at the contract unit price bid per square yard for each thickness indicated. This price shall be full compensation for furnishing and installing the concrete, formwork, curing materials; for sawing and sealing joints; and for all equipment, labor, and incidentals required to complete the work.

Payment will be made under:

Item I23-5.1      Concrete Island Behind Walk (8") - per square yard

END OF SECTION I-23





## SECTION L-1 – PLANT MATERIALS

### DESCRIPTION

L1-1.1 This section covers the furnishing and installation of plant materials and incidental materials in accordance with the types, locations, and details in the Plans, or as directed by the engineer.

L1-1.2 The item “PLANT MATERIALS” shall include:

1. Groundcovers
2. Trees and Shrubs
3. Soil Amendment
4. Fertilizer
5. Mulch
6. Steel Edging
7. Maintenance
8. Clean-up

L1-1.3 Section I-13 is applicable for all “SOLID SODDING”.

L1-1.4 Section I-14 is applicable for all “TOPSOIL”.

### STANDARDS

L1-2.1 Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

### MATERIALS

L1-3.1 GROUNDCOVERS: Healthy, disease-free plants of species and variety indicated, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery

L1-3.2 TREES AND SHRUBS: Nursery grown, with healthy root systems, well-shaped, and fully branched; healthy, vigorous stock, free of insects, eggs, and larvae; and free of defects and disfigurement.

L1-3.3 SOIL AMENDMENT: Commercially available organic soil amendment such as Cotton Burr Mulch or Supersoil.

L1-3.4 FERTILIZER: Commercially available synthetic, granular controlled release starter fertilizer containing the following minimum percentages, by weight, of plant food nutrients.

- 10 percent available nitrogen
- 10 percent available phosphorus
- 10 percent available potassium

L1-3.5 MULCH: Organic pine straw mulch, free from noxious weeds, mold, pesticides or other deleterious materials.

L1-3.6 STEEL EDGING: Metal edging to be hot rolled steel, soft enough to bend flat on itself in any direction without cracking. Surface shall be normal mill oxide with smooth deoxidized matte finish. Edging

shall confirm with ASTM A36 with carbon content a maximum of 0.10. Paint shall be applied electrostatically and formulated to withstand outdoor exposure.

### CONSTRUCTION METHODS

L1-4.1 PLANT MATERIAL OBSERVATION: Engineer may observe plant material at site before planting. Remove rejected plants immediately from Project site. Notify Engineer of sources of planting materials seven (7) days in advance of delivery to site.

L1-4.2 PLANTING RESTRICTIONS: Plant during one of the following periods:

1. Spring Planting: April 1 to May 15
2. Fall/ Winter Planting: September 15 to March 31

L1-4.3 SUBMITTALS: Product data and product certificates.

L1-4.4 GROUNDCOVERS: Plant ground cover as indicated. Dig holes large enough to allow spreading roots. Work soil around roots and leave a slight saucer around plants to hold water. Water after planting. Do not cover plant crowns with wet soil.

L1-4.5 TREES AND SHRUBS: Excavate pits with sides sloped inward at a 45-degree angle. Trim perimeter of bottom, leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Excavate approximately two to three times as wide as ball or container diameter. Scarify sides of plant pit smeared or smoothed during excavation.

1. Backfill: Planting soil
2. Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
3. Remove burlap and wire baskets from tops and sides of balls. For containers, remove root balls without damaging root ball or plant. For bare-root stock, spread roots without tangling, plumb before backfilling, and maintain plumb while working.
4. Backfill around ball in layers, tamping to settle soil and eliminate voids and air pockets. When one-half backfilled, water thoroughly before placing remainder of backfill. Water again after placing and tamping final layer of soil.
5. Remove only dead, dying, or broken branches. Do not prune for shape.

L1-4.6 SOIL AMENDMENT: Place 6-inch layer of soil amendment over top of exposed subgrade and till into the top 12-inches of the planting bed.

L1-4.7 FERTILIZER: Apply starter fertilizer at rates recommended on manufacturer's labelling.

L1-4.8 MULCH: Apply organic mulch, 3 inches thick and finish level with adjacent finish grades. Do not place mulch within 3 inches of tree trunks or stems.

L1-4.9 STEEL EDGING: Install edgings and anchor with stakes per details in the Plans.

L1-4.10 MAINTENANCE:

1. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, adjusting and repairing tree-stabilization devices, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease. Maintain trees and shrubs until established, but not less than 12 months.

2. Groundcover Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings. Maintain ground covers and plants until established, but not less than six months.

L1-4.11 CLEAN-UP: Turf areas, pavements and facilities that have been damaged from the planting operation must be restored to original condition at the Contractor's expense. Excess and waste material must be removed from the installed area and must be disposed off-site at an approved landfill, recycling center, or composting center. Adjacent paved areas must be cleared.

#### METHOD OF MEASUREMENT

L1-5.1 Plant materials installed in accordance with this specification shall be measured as a lump sum of the complete item, including all work completed in place.

#### BASIS OF PAYMENT

L1-6.1 Payment will be made at the contract unit price for plant materials, complete and in place, as measured above and accepted by the Engineer. The price shall be full compensation for furnishing all new plant materials and for all preparation, installation, and maintenance of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item to the satisfaction of the Engineer.

Payment will be made under:

Item L1-6.1 Plant Materials – per lump sum

END OF SECTION L-1



## SECTION L-2 – IRRIGATION

### DESCRIPTION

L2-1.1 This item covers furnishing and installing materials necessary to construct a new irrigation system in accordance with the types, locations, and details in the Plans, or as directed by the Engineer.

L2-1.2 The item "IRRIGATION" shall include:

1. PVC Piping.
2. Manual valves.
3. Automatic control valves.
4. Sprinklers.
5. Drip irrigation specialties.
6. Controllers.
7. Boxes for automatic control valves.

### STANDARDS

L2-2.1 Materials, equipment, and construction methods for IRRIGATION shall be in accordance with the specifications herein.

L2-2.2 Irrigation zone control shall be automatic operation with controller and automatic control valves. Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.

### MATERIALS

L2-3.1 PVC PIPING: ASTM D1785, PVC 1120 compound, Schedules 40 and 80.

1. PVC Socket Fittings: ASTM D2466, Schedule 40.
2. PVC Threaded Fittings: ASTM D2464, Schedule 80.
3. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

L2-3.2 AUTOMATIC CONTROL VALVES: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

L2-3.3 SPRINKLERS: Designed for uniform coverage over entire spray area indicated at available water pressure.

1. Body Material: ABS.
2. Nozzle: ABS.
3. Retraction Spring: Stainless steel.
4. Internal Parts: Corrosion resistant.
5. Pattern: Fixed, with flow adjustment.

L2-3.4 DRIP IRRIGATION SPECIALTIES: Drip Tubes with Direct-Attached Emitters:

1. Tubing: Flexible PE or PVC with plugged end.
2. Emitters: Devices to deliver water at approximately 20 psig.

- a. Body Material: PE or vinyl, with flow control.
- b. Mounting: Inserted into tubing at set intervals.

L2-3.6 **CONTROLLERS:** Each station is variable from approximately 5 to 60 minutes. Include switch for manual or automatic operation of each station.

1. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and two matching keys; include provision for grounding.
  - a. Body Material: Stainless-steel sheet metal.
  - b. Mounting: Surface type for wall.
2. Control Transformer: 24-V secondary, with primary fuse.
3. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two or more times daily.
  - a. Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.
  - b. Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.
  - c. Surge Protection: Metal-oxide-varistor type on each station and primary power.
4. Moisture Sensor: Adjustable from one to seven days, to shut off water flow during rain.
5. Smart Controllers: Use ET, tested in accordance with IA SWAT Climatological Based Controllers 8th Draft Testing Protocol and compliant with ASHRAE Standard 189.1.
6. Wiring: UL 493, Type UF multiconductor, with solid-copper conductors; insulated cable; suitable for direct burial.
  - a. Feeder-Circuit Cables: No. 12 AWG minimum, between building and controllers.
  - b. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves; color-coded different from feeder-circuit-cable jacket color; with jackets of different colors for multiple-cable installation in same trench.
  - c. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.
7. Concrete Base: Reinforced precast concrete not less than 36 by 24 by 4 inches thick, and 6 inches greater in each direction than overall dimensions of controller. Include opening for wiring.

L2-3.7 **BOXES FOR AUTOMATIC CONTROL VALVES:** Box and cover, with open bottom and openings for piping; designed for installing flush with grade. Place drainage backfill, consisting of cleaned gravel or crushed stone graded from 3/4-inch minimum to 3-inches maximum under box.

1. Size: As required for valves and service.
2. Shape: Rectangular
3. Sidewalk material: PE
4. Cover material: PE, with lettering "VALVE BOX"

#### CONSTRUCTION METHODS

L2-4.1 GENERAL: Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of 36 inches below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
2. Circuit Piping: 12 inches.
3. Drain Piping: 12 inches.
4. Sleeves: 24 inches.

Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

L2-4.2 PIPING: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

1. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.
2. Install piping free of sags and bends.
3. Install groups of pipes parallel to each other, spaced to permit valve servicing.
4. Install fittings for changes in direction and branch connections.
5. Install expansion loops in control-valve boxes for plastic piping.
6. Lay piping on solid subbase, uniformly sloped without humps or depressions.
7. Install piping in sleeves under roadways and sidewalks. Sleeves shall be made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.

L2-4.3 AUTOMATIC CONTROL VALVES: Install in boxes per details in the Plans.

L2-4.4 SPRINKLERS: Install sprinklers after hydrostatic test is completed. Install at manufacturer's recommended heights and a minimum of 4-inches from walls and 2-inches from other boundaries unless otherwise indicated.

L2-4.5 DRIP IRRIGATION SPECIALTIES: Install drip tubing with emitters directly on finish grade where indicated on the Plans. Fasten or stake to ground per manufacturer's recommendations.

L2-4.6 CONTROLLER: Install in metal pedestal cabinet on poured-in-place concrete base per details in the Plans. Install control cable in same trench as irrigation piping and at least two inches below or beside piping. Provide conductors of a size not less than that recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

L2-4.7 TESTING: After installation, charge system and check for leaks. Repair leaks and retest until no leaks exist. After electrical circuitry had been energized, operate controllers and automatic control valves to conform proper system operation. Test and adjust controls and safeties. Replace Damaged and malfunctioning controls and equipment. Any irrigation product will be considered defective if it does not pass tests and inspections.

L2-4.8 CLEANING: Flush dirt and debris from piping before installing sprinklers and other devices. Remove waste and other debris from job site and dispose of at an approved location.

L2-4.9 DEMONSTRATION AND AS-BUILTS: Train owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers. Upon final acceptance by Owner, provide Owner with all product manuals; a copy of the run-time schedule; and three 11x17 copies and a digital PDF of system as-builts.

#### METHOD OF MEASUREMENT

L2-5.1 Measurement for the installation of the irrigation system shall be measured as a lump sum of the complete item, including all work completed in place and ready for operation, and including installation of the point of connection, meter, shut off valve, backflow device, remote control valves, controller, drip irrigation tubing and spray heads in accordance with the types, locations, and details in the Plans, or as directed by the engineer.

#### PAYMENT

L2-6.1 Payment will be made at the contact lump sum price for each complete item, as measured above, accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item to the satisfaction of the Engineer.

Payment will be made under:

Item L2-6.1      Irrigation – per lump sum

END OF SECTION L-2



## SECTION L-3 – SEGMENTAL CONCRETE UNIT MASONRY RETAINING WALLS

### DESCRIPTION

L3-1.1 This section covers the furnishing and installation of modular block wall masonry retaining walls in accordance with the types, locations, and details in the Plans, or as directed by the engineer.

### STANDARDS

#### L3-2.1 SEGMENTAL RETAINING WALL UNITS:

1. ASTM C 1372 - Standard Specification for Segmental Retaining Wall Units
2. ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units

#### L3-2.2 GEOSYNTHETIC REINFORCEMENT:

1. ASTM D 4595 - Tensile Properties of Geotextiles by the Wide-Width Strip Method
2. ASTM D 5262 - Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics
3. GRI:GG1 - Single Rib Geogrid Tensile Strength
4. GRI:GG5 - Geogrid Pullout

L3-2.3 LEVELING PAD: Material for leveling pad shall consist of compacted aggregate base course as specified in SECTION P1 AGGREGATE BASE COURSE of these specifications.

L3-2.4 GRANULAR BACKFILL MATERIAL: Granular Backfill material for the wall shall be crushed aggregate course, Class 7 as described in SECTION P1 AGGREGATE BASE COURSE of these specifications.

### MATERIALS

L3-3.1 SEGMENTAL RETAINING WALL (SRW) UNITS: SRW units shall be Rockwood Classic 8 Beveled Retaining Wall Units as manufactured by ABC Block & Brick or approved equal. Units shall be machine formed, Portland Cement concrete blocks specifically designed for retaining wall applications. SRW units currently approved for this project are:

1. Color of SRW units shall be "Autumn Blend," or as specified by the Engineer.
2. Finish of SRW units shall be split face.
3. SRW unit faces shall be of straight geometry.
4. SRW unit height shall be eight inches.
5. SRW units (not including aggregate fill in unit voids) shall provide a minimum weight of 105 psf wall face area.
6. SRW units shall be capable of being erected with the horizontal gap between adjacent units not exceeding 1/8 inches.

7. SRW units shall be capable of providing overlap of units on each successive course so that walls meeting at corner are interlocked and continuous. SRW units that require corners to be mitered shall not be allowed.
8. SRW units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the structure. Cracking or excessive chipping may be grounds for rejection. Units showing cracks longer than 1/2" shall not be used within the wall. Units showing chips visible at a distance of 30 feet from the wall shall not be used within the wall.
9. Concrete used to manufacture SRW units shall have a minimum 28 days compressive strength of 3,000 psi and a maximum moisture absorption rate, by weight, of 8% as determined in accordance with ASTM C1372. Compressive strength test specimens shall conform to the saw-cut coupon provisions of ASTM C140.
10. SRW units' molded dimensions shall not differ more than + 1/8 inch from that specified, in accordance with ASTM C1372.

L3-3.2 GEOSYNTHETIC REINFORCEMENT: Geosynthetic reinforcement shall consist of geogrids or geotextiles manufactured as a soil reinforcement element. The manufacturers/suppliers of the geosynthetic reinforcement shall have demonstrated construction of similar size and types of segmental retaining walls on previous projects.

The geosynthetic type must be approved one week prior to bid opening.

#### CONSTRUCTION METHODS

L3-4.1 INSPECTION: Prior to commencing work, the retaining wall contractor shall examine the areas and conditions under which the retaining wall system is to be erected and notify the Engineer in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

Promptly notify the wall design engineer of site conditions which may affect wall performance, soil conditions observed other than those assumed, or other conditions that may require a reevaluation of the wall design.

Verify the location of existing structures and utilities prior to excavation.

L3-4.2 PREPARATION: Contractor shall excavate to the lines and grades shown on the project grading plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Engineer at the Contractor's expense.

1. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support, if required, is the responsibility of the Contractor.

L3-4.3 EXCAVATION: Excavate to the lines and grades shown on the Drawings. Over-excavation not approved by the Engineer will not be paid for by the Owner. Replacement of these soils with compacted fill and/or wall system components will be required at the Contractor's expense. Use care in excavating to prevent disturbance of the base beyond the lines shown.

L3-4.4 FOUNDATION PREPARATION: Following the excavation, the foundation soil shall be examined by the Owner's Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with infill soils, as directed by the Owner's Engineer.

Foundation soil shall be proof-rolled and compacted to 95% standard Proctor density and inspected by the Owner's Engineer prior to placement of leveling pad materials.

L3-4.5 LEVELING PAD PREPARATION: Leveling pad shall be placed as shown on the plans with a minimum thickness of 6 inches. The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lower most SRW unit.

Granular leveling pad material shall be compacted to provide a firm, level bearing surface on which to place the first course of units. The aggregate base shall be compacted to achieve 95% of maximum standard Proctor density (ASTM D 698).

L3-4.6 SRW UNIT INSTALLATION: All SRW units shall be installed at the proper elevation and orientation as shown on the plans and details or as directed by the Wall Design Engineer. The SRW units shall be installed in general accordance with the manufacturer's recommendations. The specifications and drawings shall govern in any conflict between the two requirements.

First course of SRW units shall be placed on the leveling pad. The units shall be leveled side-to-side, front-to-rear and with adjacent units, and aligned to ensure intimate contact with the leveling pad. The first course is the most important to ensure accurate and acceptable results. No gaps shall be left between the front of adjacent units. Alignment may be done by means of a string line or offset from base line to the back of the units.

All excess debris shall be cleaned from top of units and the next course of units installed on top of the units below.

Prior to placement of next course, the level and alignment of the units shall be checked and corrected, where needed.

Layout of curves and corners shall be installed in accordance with the wall plan details or in general accordance with SRW manufacturer's installation guidelines. Walls meeting at corners shall be interlocked by overlapping successive courses.

Procedures stated in the three prior paragraphs shall be repeated until reaching top of wall units, just below the height of the cap units. Geosynthetic reinforcement, drainage materials, and reinforced backfill shall be placed in sequence with unit installation as described in Paragraphs L3-4.6, L3-4.7, and L3-4.8.

All geosynthetic reinforcement shall be installed at the proper elevation and orientation as shown on the plan profiles and details, or as directed by the Engineer.

1. At the elevations shown on the final plans, (after the units, drainage material, and backfill have been placed to this elevation) the geosynthetic reinforcement shall be laid horizontally on compacted infill and on top of the concrete SRW units, to within one inch of the front face of the unit below. Embedment of the geosynthetic in the SRW units shall be consistent with SRW manufacturer's recommendations. Correct orientation of the geosynthetic reinforcement shall be verified by the Contractor to be in accordance with the geosynthetic manufacturer's recommendations. The highest strength direction of the geosynthetic must be perpendicular to the wall face.
2. Geosynthetic reinforcement layers shall be one continuous piece for their entire embedment length. Splicing of the geosynthetic in the design strength direction (perpendicular to the wall face) shall not be permitted. Along the length of the wall, horizontally adjacent sections of geosynthetic reinforcement shall be butted in a manner to assure 100 percent coverage parallel to the wall face.

3. Tracked construction equipment shall not be operated directly on the geosynthetic reinforcement. A minimum of 6 inches of backfill is required prior to operation of tracked vehicles over the geosynthetic. Turning should be kept to a minimum. Rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds (less than 5 mph).
4. The geosynthetic reinforcement shall be free of wrinkles prior to placement of soil fill. The nominal tension shall be applied to the reinforcement and secured in place with staples, stakes or by hand tensioning until reinforcement is covered by six inches of fill.

L3-4.7 BACKFILL PLACEMENT: The reinforced backfill shall be placed as shown in the final wall plans in the maximum compacted lift thickness of 10 inches and shall be compacted to a minimum of 95% of standard Proctor density (ASTM D 698) at a moisture content within 2% of optimum. The backfill shall be placed and spread in such a manner as to eliminate wrinkles or movement of the geosynthetic reinforcement and the SRW units.

Only hand-operated compaction equipment shall be allowed within 3 feet of the back of the wall units. Compaction within the 3 feet behind the wall units shall be achieved by at least three (3) passes of a lightweight mechanical tamper, plate, or roller.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing and reinforced backfill to direct water runoff away from the wall face.

At completion of wall construction, backfill shall be placed level with final top of wall elevation. If final grading, paving, landscaping, and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading and drainage shall be provided to ensure water runoff is not directed at the wall nor allowed to collect or pond behind the wall until final construction adjacent to the wall is completed.

L3-4.8 CAP UNIT INSTALLATION: SRW caps shall be properly aligned and glued to underlying units with a flexible, high-strength concrete adhesive. Rigid adhesive or mortar are not acceptable.

Caps shall overhang the top course of units by 3/4 to 1 inch. Slight variation in overhang is allowed to correct alignment at the top of the wall.

L3-4.9 SITE CONSTRUCTION TOLERANCES:

1. Vertical Alignment: Plus or minus 1-1/2 inches over any 10-foot distance, with a maximum differential of 3 inches over the length of the wall.
2. Horizontal Location Control from Grading Plan
3. Straight Lines: Plus or minus 1-1/2 inches over any 10-foot distance.
4. Corner and Radius Locations: Plus or minus 12 inches.
5. Curves and Serpentine Radii: Plus or minus 2 feet.
6. Immediate Post Construction Wall Batter: Within 2 degrees of the design batter of the concrete retaining wall units.
7. Bulging: Plus or minus 1-1/4 inches over any 10-foot distance.

The Owner or Owner's Representative is responsible for ensuring that construction by others adjacent to the wall does not disturb the wall or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading. Heavy paving or grading equipment shall be kept a minimum of three feet behind the back of the wall face. Equipment

with wheel loads in excess of 150 psf live load shall not be operated within 10 feet of the face of the retaining wall during construction adjacent to the wall. Care should be taken by the General Contractor to ensure water runoff is directed away from the wall structure until final grading and surface drainage collection systems are completed.

L3-4.10 FIELD QUALITY CONTROL: Installer is responsible for quality control of installation of system components.

The Owner or General Contractor, at their expense, will retain a qualified professional to perform quality assurance checks of the installer's work.

Correct work which does not meet these specifications or the requirements shown on the Drawings at the installer's expense.

Perform compaction testing of the reinforced backfill placed and compacted in the reinforced backfill zone.

1. Testing Frequency:

- a. One test for every 2 feet (vertical) of fill placed and compacted, for every 50 lineal feet of retaining wall.
- b. Vary compaction test locations to cover the entire area of the reinforced soil zone, including the area compacted by the hand-operated compaction equipment.

L3-4.11 ADJUSTING AND CLEANING: Replace damaged SRW units with new units as the work progresses.

Remove debris caused by wall construction and leave adjacent paved areas broom clean.

METHOD OF MEASUREMENT

L3-5.1 Modular block wall installed in accordance with this specification shall be measured by the square foot of vertical surface, including all work completed in place.

BASIS OF PAYMENT

L3-6.1 Payment will be made at the contract unit price for "Modular Block Wall", complete and in place, as measured above and accepted by the Engineer. The price shall be full compensation for furnishing all materials, including geosynthetic grid, modular block, cap blocks, pins and all additional equipment, and for all labor, equipment, tools, and all incidentals necessary to complete this item to the satisfaction of the Engineer.

Granular Backfill, crushed stone footing or leveling pad and drainage backfill will not be measured for separate payment but shall be considered subsidiary to the Modular Block Wall.

Excavation for the modular block wall and backfill material will not be measured for separate payment but shall be considered subsidiary to the modular block wall.

Payment will be made under:

Item L3-6.1	Modular Block Wall – per square foot
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END OF SECTION L-3



## SECTION M-3 - COLD MILLING

### DESCRIPTION

M3-1.1 This item covers cold milling of existing asphalt pavement in accordance with these specifications and in conformity to the dimensions and details shown on the plans. This item includes the cold milling, removal, and disposal of the paving materials designated to be removed. Areas of cold milling have been estimated on the plans. The actual limits of cold milling will be as directed by the Engineer. All pavement material removed shall be disposed of in designated on-site disposal areas, or off-site, as directed by the Engineer.

### CONSTRUCTION METHODS

M3-2.1 GENERAL: No pavement removal shall be started until the work has been laid out by the Contractor and approved by the Engineer. All hauling will be considered a necessary and incidental part of the work. Its cost shall be considered by the Contractor and included in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

M3-2.2 COLD MILLING ASPHALT PAVEMENT: The Contractor shall provide self-propelled equipment with sufficient power, traction and stability to maintain an accurate depth of cut and slope. The equipment shall be capable of accurately and automatically establishing profile grades along each edge of the machine by referencing from the existing pavement by means of a ski or matching shoe, or from an independent grade control, and shall have an automatic system for controlling cross-slope at a given rate. The milling machine shall have an effective means for preventing dust resulting from the operation from escaping into the air. Provision shall be made, either integrally with the milling machine or by the use of additional equipment, to remove the material being cut from the surface of the roadway. The number of passes and the depth of each pass required to obtain the total depth to be removed shall be determined by the Contractor.

Sawcutting (1.5-inch minimum depth) will be required at the edge of the removal areas.

### METHOD OF MEASUREMENT

M3-3.1 Cold milling areas will be measured by the length and width of the cold milled area in square yards, to the specified depth, at the locations directed by the Engineer. Measurement shall not include areas milled beyond approved limits.

### BASIS OF PAYMENT

M3-4.1 Cold milling will be paid for at the contract unit price bid for "COLD MILLING ASPHALT PAVEMENT," which price shall be full compensation for all cold milling, removal, and disposal of asphalt surface materials; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

Item M3-4.1 Cold Milling Asphalt Pavement -- per square yard

END OF SECTION M-3





## SECTION M-5 - PIPE EMBEDMENT

### DESCRIPTION

M5-1.1 This section covers the furnishing of all labor, equipment, and materials necessary for placing pipe foundations as required on the Plans or as deemed necessary by the Engineer.

### MATERIALS

M5-2.1 Materials for pipe bedding or embedment shall be as follows:

M5-2.1.1 Corrugated Metal Pipe, Aluminized Steel Pipe, and High Density Polyethylene Pipe shall be bedded in limestone abrasive, commonly known as "grit", or an approved equal meeting the following gradation:

<u>Sieve</u> <u>(Square Opening)</u>	<u>Percent Passing</u>
3/8 inch	100
No. 200	0 - 10

M5-2.1.2 Bedding for Reinforced Concrete Pipe may be Class 5 or Class 7 Aggregate Base in accordance with SECTION 303 – AGGREGATE BASE COURSE of the Standard Specifications, or limestone abrasive as described in this specification.

M5-2.1.3 All bedding material shall adhere to the following requirements:

(1) Deleterious substances shall not be present in the prepared crushed stone in excess of the following amounts:

Soft and friable pieces - 5%  
Material finer than No. 200 - 1%  
Clay lumps - 0.5%

(2) The percentage of wear of the crushed stone, tested in the Los Angeles Abrasion Tests, shall not be greater than 45 percent.

(3) Crushed stone shall be stockpiled and placed in such a manner that foreign material will not be included in the complete embedment section.

### CONSTRUCTION METHODS

M5-3.1 Pipe embedment will be required for the storm drainage pipe in areas deemed necessary by the Engineer. The excavated trench shall be inspected by the Engineer and may be deemed acceptable for pipe placement. In such cases no compensation will be made to the Contractor for bedding material. If the Engineer determines that bedding is required, then the minimum bedding under storm drainage pipe will be a 6-inch thickness of bedding material in the trench bottom. The width of the pipe embedment shall extend the full width of the trench bottom, but not beyond the maximum trench width. The Contractor will not be paid for extra bedding placed in trenches that are excessive in width and/or exceed the limits shown in the Plans.

M5-3.2 Excavation for pipe embedment shall be carried to a specified depth below the pipe flow line to allow adequate bedding materials to be placed in accordance with details shown on the Plans and as required by the Engineer.

M5-3.3 Additional excavation will be required in soft, mucky areas where the specified bedding will not adequately support the pipe. Where such areas as determined by the Engineer are excavated, the additional depth of trench shall be backfilled with Class 7 Base or Class "C" Ballast Stone. The Contractor will not be paid for any additional excavation required, but will be paid for the additional backfill required. No additional compensation will be given to the Contractor unless the Engineer has measured and verified the additional excavation prior to the placement of the bedding.

#### METHOD OF MEASUREMENT

M5-4.1 Pipe Embedment will be measured by the cubic yard as calculated by the Engineer. Excavation for embedment will not be measured for separate payment, but will be subsidiary to Pipe Embedment.

#### BASIS OF PAYMENT

M5-5.1 Pipe Embedment acceptably completed and measured as provide above, will be paid for at the contract unit price bid per cubic yard for "PIPE EMBEDMENT," which price shall be full compensation for furnishing the material; for hauling, excavating, placing, spreading, and compacting; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

Item M5-5.1 Pipe Embedment - per cubic yard

END OF SECTION M-5

## **SECTION M-7 – WATER FOR DUST CONTROL**

### DESCRIPTION

M7-1.1 This item shall consist of the furnishing and placing of water for the purpose of dust control during periods of dry weather.

### CONSTRUCTION METHODS

M7-2.1 Control of dust is of extreme importance to the health and welfare of the project residents and it is the intent of this specification that the Contractor will, upon 24-hour notice by the Engineer, furnish a water truck and adequate personnel to control dust on the project as directed by the Engineer and to maintain the availability of the equipment on the job during periods of dry weather.

The Contractor may be required to spray trees and other shrubs as required by the City.

### METHOD OF MEASUREMENT

M7-3.1 Water will be measured by the gallon in the truck and will be computed by cross sectional area times the length of the tank.

### BASIS OF PAYMENT

M7-4.1 Water will not be measured for separate payment, but will be considered subsidiary work pertaining to the construction of the items.

END OF SECTION M-7



## SECTION P-1 – AGGREGATE BASE COURSE

### DESCRIPTION

P1-1.1 This section covers all work in connection with the construction of aggregate base course in accordance with the lines, grades, thicknesses, and typical sections as shown in the Plans or directed by the Engineer. Material shall be Class 7 unless otherwise specified in the Plans.

### STANDARDS

P1-2.1 Material and work (including testing) for aggregate base course shall be in accordance with SECTION 303 – AGGREGATE BASE COURSE of the Standard Specifications for Class 7, except as modified or augmented herein.

### CONSTRUCTION METHODS

P1-3.1 TESTS: Material will be acceptable from quarries or crushing plants which currently are, or recently have been, supplying material meeting the Standard Specifications for Aggregate Base Course. In-place density shall be determined by AASHTO T 310, Direct Transmission of not less than 98% of maximum density determined in the laboratory by AASHTO T 180, Method D.

P1-3.2 MAINTENANCE: The Contractor shall maintain the base course until and during the construction of the subsequent base or surface course. Defects that develop in the base course shall be repaired by the Contractor at the Contractor's expense.

### METHOD OF MEASUREMENT

P1-4.1 Aggregate Base Course will be measured by the ton of two thousand (2,000) pounds, as determined by weighing on accurate, approved scales as described in Article 109.01(f), Standard Specifications. Each truck shall bear a plainly legible identification number and, upon being weighed, shall be given two (2) copies of a delivery ticket which will have on it the number of the truck, time of departure, truck weight, combined weight, and project name. The Engineer shall receive a copy of each delivery ticket for the computation of pay quantities. Aggregate base course used in the construction of other items which are measured separately shall not be measured in this item.

### BASIS OF PAYMENT

P1-5.1 Aggregate Base Course, acceptably completed and measured as provided above, will be paid for at the contract unit price per ton for "AGGREGATE BASE COURSE" for the class specified, which price shall be full compensation for furnishing the material; for hauling, placing, spreading, and compacting; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment for "AGGREGATE BASE COURSE" will be made in proportion to amount of work completed to date in accordance with the following payment schedule:

### PAYMENT SCHEDULE

	<u>Partial Estimates</u>
(1) Aggregate Base Course Dumped and Spread	Tons of Base Course Dumped and Spread to date x 50%

(2) Aggregate Base  
Course Compacted

Tons of Base  
Course Compacted  
to date x 50%

Payment will be made under:

Item P1-5.1 Aggregate Base Course (Class 7) - per ton

END OF SECTION P-1

## SECTION P-2 – PRIME AND TACK COATS

### DESCRIPTION

P2-1.1 This item shall consist of a single application of bituminous material and blotter material if required, applied on the completed and approved base course, on the subgrade, and/or on the existing bituminous or concrete surface in accordance with these specifications and in reasonably close conformity with the lines shown on the Plans or as directed by the Engineer.

### STANDARDS

P2-2.1 Work under this section shall be in accordance with the portions of SECTION 401 – PRIME AND TACK COATS AND EMULSIFIED ASPHALT IN BASE COURSE of the Standard Specifications that concern prime coats and tack coats, except as modified or augmented herein.

### MATERIALS

P2-3.1 Materials shall conform to the requirements provided under Section 403 of the Standard Specifications. Unless approved otherwise by the Engineer, a medium curing cutback asphalt or an asphalt penetrating prime will be used for prime coat and a rapid curing cut back or emulsified asphalt will be used for tack coat. Dependent upon the texture of the base and the season of the year the work is being performed, the Engineer will select the particular grade of the type of bituminous material that will be used.

### MEASUREMENT AND PAYMENT

P2-4.1 Prime and tack coats will not be measured for separate payment but will be considered subsidiary to the ACHM Surface, Binder, or Stabilized Base Courses, as applicable.

END OF SECTION P-2





## SECTION P-3 – ASPHALT SURFACE AND BINDER COURSE

### DESCRIPTION

P3-1.1 This section covers construction of the Asphalt Concrete Hot Mix Surface Course and Asphalt Concrete Hot Mix Binder Course in accordance with the lines, grades, thicknesses, and typical sections shown in the Plans, or as directed by the Engineer.

### STANDARDS

P3-2.2 BINDER COURSE: Materials, equipment, and construction methods for ASPHALT CONCRETE HOT MIX BINDER COURSE shall be in accordance with SECTIONS 406, 409, and 410 of the Standard Specifications, except as modified or augmented herein. The asphalt binder shall be PG 64-22.

P3-2.3 SURFACE COURSE: Materials, equipment, and construction methods for ASPHALT CONCRETE HOT MIX SURFACE COURSE shall be in accordance with SECTIONS 407, 409, AND 410 of the Standard Specifications, except as modified or augmented herein. The asphalt binder shall be PG 70-22.

### CONSTRUCTION METHODS

P3-3.1 The Design and Quality Control of Asphalt Mixtures shall be in accordance with SECTION 404 of the Standard Specifications, except as modified herein.

P3-3.2 Standard Specification Modifications and Augmentations:

1. SECTION 404.01(b) Design Requirements: The number of design gyrations ( $N_{MAX}$ ) shall be 115 for PG 64-22 and 160 for PG 70-22.
2. SECTION 410.09(a) General: Samples for all properties except density, thickness, and the investigation of segregation shall be obtained from trucks at the plant. The testing agency shall clearly mark the load ticket of each sampled truck to indicate that the load has been sampled.
3. SECTION 410.09(b)(2) Pavement Smoothness: The Contractor shall provide the straight-edge.
4. TABLE 410-1: Table 410-1 is amended to add thickness tolerances as shown at the end of this section. When lots and subplot divisions for initial and final courses do not coincide, the Contractor may be required to take additional samples (full-depth) at his expense at locations agreed upon by the Engineer to potentially avoid penalties or rejection of his work.
5. SECTION 410.09(d) Adjustments: (5) For thickness of each course layer, the contract price shall be reduced by 10% if the thickness is outside the Compliance Limits but within the Price Reduction Limits. For overall thickness, the contract price shall be reduced by an additional 10% if the thickness is outside the Compliance Limits but within the Price Reduction Limits.

For thickness of each course layer and/or total pavement thickness in excess of the amount specified and beyond the Compliance Limits, the payment shall be reduced by the amount of excess quantity of material placed, as determined by the Engineer. The intent of this section is to prevent the Owner from paying for excess and unauthorized quantities of material placed. However, if the elevations, cross slopes, or other characteristics are unacceptable to the Owner based on the requirements in the Contract Documents, the Contractor may be required to remove and replace pavement as determined by the Engineer.

6. SECTION 410.10 Incentives: Delete entirely.

METHOD OF MEASUREMENT

3-4.1 Asphalt Concrete Hot Mix Surface, Binder, and Base Courses will be measured by the ton (2,000 pounds) of each mixture used in the accepted work. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage. Load tickets shall be provided as directed by the Engineer. Measurements shall include only the actual amounts placed within the lines shown on the Plans, or as directed by the Engineer.

BASIS OF PAYMENT

3-5.1 Asphalt Concrete Hot Mix Surface and Binder Courses, acceptably completed, and measured as provided above, will be paid for at the contract unit prices per ton bid for "ACHM SURFACE COURSE" and "ACHM BINDER COURSE", which prices shall be full compensation for furnishing, placing and compacting all materials; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

- Item P3-5.1a      ACHM Surface Course – per ton
- Item P3-5.1b      ACHM Binder Course – per ton

**Addition to Table 410-1 in Standard Specifications**

Property	Compliance Limits	Price Reduction Limits	Lot Rejection Limits	Sublot Rejection Limits
Thickness (variation from specified)				
Base	+/- 1/2 inch	1/2 inch to 3/4 inch deficient in thickness	more than 3/4 inch deficient in thickness	more than 3/4 inch deficient in thickness
Binder	+/- 3/8 inch	3/8 inch to 1/2 inch deficient in thickness	more than 1/2 inch deficient in thickness	more than 1/2 inch deficient in thickness
Surface	+/- 1/4 inch	1/4 inch to 3/8 inch deficient in thickness	more than 3/8 inch deficient in thickness	more than 3/8 inch deficient in thickness
Total Pavement	+/- 1/4 inch	1/4 inch to 3/8 inch deficient in thickness	more than 3/8 inch deficient in thickness	more than 3/8 inch deficient in thickness

END OF SECTION P-3

## SECTION P-5 – DRIVEWAYS AND APRONS

### DESCRIPTION

P5-1.1 This section covers the construction of driveways, driveway extensions, and aprons to the lines and grades shown on the Plans or as directed by the Engineer.

### MATERIALS

P5-2.1 The construction material of driveways shall be Portland Cement Concrete Pavement as shown in the Plans.

P5-2.2 Materials for concrete driveways and aprons shall be in accordance with SECTION 505 – PORTLAND CEMENT CONCRETE DRIVEWAY of the Standard Specifications.

### CONSTRUCTION METHODS

P5-3.1 The construction of driveways shall be in accordance with the details in the Plans and the applicable sections of these Specifications for the type of construction material specified. Sections of these specifications considered applicable are as follows:

SECTION E-2 – EXCAVATION AND EMBANKMENT  
SECTION P-1 – AGGREGATE BASE COURSE

### METHOD OF MEASUREMENT

P5-4.1 Concrete driveways and aprons will be measured by the square yard. Curb and gutter extending across the front of the driveway will not to be included.

### BASIS OF PAYMENT

P5-5.1 Concrete driveways, driveway extensions, and aprons acceptably completed and measured as provided above will be paid for at the contract unit price per square yard bid for Concrete Driveways, which price shall be full compensation for furnishing all materials, including the base materials as detailed in the Plans and including reinforcing steel that might be required; for preparation of the subgrade and base materials; for joints required by the Plans; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

Item P5-5.1a	Commercial Driveway - per square yard
Item P5-5.1b	Residential Driveway - per square yard
Item P5-5.1c	ARDOT Driveway - per square yard

END OF SECTION P-5



## SECTION P-6 – PORTLAND CEMENT CONCRETE BASE

### DESCRIPTION

P6-1.1 This item shall consist of constructing Portland Cement Concrete Base, with or without reinforcement, in accordance with the lines, grades, thicknesses, typical sections, and details shown on the Plans or directed by the Engineer.

### STANDARDS

P6-2.1 All work, materials and testing under this item shall be in accordance with SECTION 309 – PORTLAND CEMENT CONCRETE BASE of the Standard Specifications, except as modified or augmented herein.

### METHOD OF MEASUREMENT

P6-3.1 Portland Cement Concrete Base shall be measured by the square yard, completed and accepted.

### BASIS OF PAYMENT

P6-4.1 Portland Cement Concrete Base will be paid for at the contract unit price bid per square yard for each thickness indicated. This price shall be full compensation for preparing the subgrade and shaping the shoulders, unless otherwise specified; for furnishing, transporting, and placing materials; for preparing and processing materials; for mixing, spreading, vibrating, finishing, and curing; for performing mix designs and quality control and acceptance sampling and testing; and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

Item P6-4.1a	Portland Cement Concrete Base (6") - per square yard
Item P6-4.1b	Portland Cement Concrete Base (8") - per square yard

END OF SECTION P-6



## **SECTION S-1 – STRUCTURAL CONCRETE**

### DESCRIPTION

S1-1.1 This section covers concrete and reinforcing steel for the construction of drainage structures, sidewalks, islands, curb and gutter, foundations, footings, retaining walls, and other miscellaneous concrete structures conforming to the lines, grades, dimensions, and details shown on the Plans or as directed by the Engineer.

S1-1.2 Additional requirements are as specified in the sections of the specifications covering the several items involved with concrete and reinforcing steel.

### STANDARD SPECIFICATIONS

S1-2.1 Concrete and reinforcing steel construction shall be accomplished in accordance with the applicable portions of SECTION 802 – CONCRETE FOR STRUCTURES and SECTION 804 – REINFORCING STEEL FOR STRUCTURES of the Standard Specifications, except as modified or augmented herein.

### MEASUREMENT AND PAYMENT

S1-3.1 Concrete and reinforcing steel will not be measured for separate payment but will be considered subsidiary to the items involved except for reinforced concrete box culverts, which will be measured in accordance with Section I-4 – REINFORCED CONCRETE BOX CULVERTS.

END OF SECTION S-1





## SECTION T-1 - THERMOPLASTIC PAVEMENT MARKING

### DESCRIPTION

T1-1.1 This item shall consist of furnishing and placing thermoplastic pavement markings (TPM) of the color and type specified. Pavement markings shall be in accordance with these Specifications and in conformity with the dimensions and at the locations shown on the Plans or as directed by the Engineer. In general, the work shall meet the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways.

### STANDARDS

T1-2.1 The materials and construction methods for this item will conform to SECTION 719 - THERMOPLASTIC PAVEMENT MARKING and SECTION 721 – RAISED PAVEMENT MARKER of the Standard Specifications, except as modified or augmented herein.

T1-2.2 Green Thermoplastic Pavement Marking shall be Ennis Flint, PreMark, Bike Lane Green, or approved equal.

T1-2.3 Bicycle symbol and directional arrows on green background shall be Ennis Flint, PreMark, or approved equal.

### CONSTRUCTION METHODS

T1-3.1 Crosswalk stripes applied to the roadway surface shall be preformed (one piece) hot-applied. Crosswalk stripes can not be applied in sections.

T1-3.2 Arrows applied to the roadway surface shall be preformed (one piece) hot-applied. Arrows can not be applied in sections

### METHOD OF MEASUREMENT

T1-4.1 Thermoplastic pavement markings will be measured by the linear foot of material actually placed or per each symbol or marker, as applicable. Sand or water blasting as surface preparation will not be measured and paid for directly but will be considered a part of the item Thermoplastic Pavement Marking.

### BASIS OF PAYMENT

T1-5.1 Thermoplastic Pavement Marking (TPM) completed and accepted and measured as provided above will be paid for at the contract unit price per linear foot in place, of the width and color specified, or at the contract unit price per each for symbols for each type as specified, or at the contract unit price per square foot for bike lane green; which price shall be full compensation for furnishing and installing markings; and for all labor, tools, equipment, and incidentals necessary to complete the work. Sand or water blasting as surface preparation will not be measured and paid for directly but will be considered a part of the item Pavement Markings. Where double stripes are placed, each pavement marking will be measured separately.

Payment will be made under:

Item T1-5.1a	Thermoplastic Pavement Marking - 4" White - per linear foot
Item T1-5.1b	Thermoplastic Pavement Marking - 4" Yellow - per linear foot
Item T1-5.1c	Thermoplastic Pavement Marking - 6" White - per linear foot
Item T1-5.1d	Thermoplastic Pavement Marking - 12" White - per linear foot
Item T1-5.1e	Thermoplastic Pavement Marking - 24" White - per linear foot

Item T1-5.1f	Thermoplastic Pavement Marking - Green - per square foot
Item T1-5.1g	Thermoplastic Pavement Marking (Bicycle & Arrow) - per each
Item T1-5.1h	Thermoplastic Pavement Marking (Arrows) - per each
Item T1-5.1i	Thermoplastic Pavement Marking (Words) - per each
Item T1-5.1j	Thermoplastic Pavement Marking (Yield Line) - per linear foot

END OF SECTION T1

## SECTION T-2 – SIGNS AND SUPPORTS

### DESCRIPTION

T2-1.1 This item shall consist of furnishing and installing new signs, complete with posts, supports, and concrete bases, where required, in accordance with the dimensions and details shown in the Plans and at the locations shown in the Plans, or as directed by the Engineer.

T2-1.2 Relocation of all existing signs is not included under this section, but is included under SECTION I-1 – MAINTENANCE OF TRAFFIC of these specifications.

### STANDARDS

T2-2.1 Work and materials under this section shall conform to the requirements of SECTION 723 – GENERAL REQUIREMENTS FOR SIGNS, SECTION 725 – GUIDE SIGN, SECTION 726 – STANDARD SIGN, SECTION 729 – CHANNEL SIGN POST SUPPORT, and SECTION 730 - BREAKAWAY SIGN SUPPORT of the Standard Specifications, as applicable, except as modified or augmented herein.

T2-2.2 Signs not conforming to or regulated by the Standard Specifications shall meet all local, County or City guidelines and submittals may be required for approval.

### METHOD OF MEASUREMENT

T2-3.1 New signs installed at the locations show on the Plans or as directed by the Engineer will be measured by the square foot and shall include the post, supports, and concrete bases, where applicable. Measurements will consist only of the face of the sign to the nearest 0.10 square foot of area. No deduction in area will be made for corner radii or mounting holes. The area of octagonal signs, pentagonal signs, U.S. Shields, and Interstate Shields will be computed as the area of the circumscribing square. The area of triangular signs will be computed as the area of the triangle. The area of circular signs will be computed as the area of the circle.

### BASIS OF PAYMENT

T2-4.1 Work completed and accepted under this item and measured as provided above shall be paid for at the contract unit price bid per square foot for each type of sign as listed below and in the Unit Price Schedule, which price shall be full compensation for furnishing and installing signs, posts, supports, street sign brackets, and footing; and for all tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Item T2-4.1a	Standard Roadside Sign – per square foot
Item T2-4.1b	Guide Sign – per square foot
Item T2-4.1c	Street Name Sign – per square foot

END OF SECTION T-2



## **SECTION W-2 – VALVE, METER, AND PULL BOXES ADJUSTED TO GRADE**

### DESCRIPTION

W2-1.1 The Contractor shall adjust valve, meter, and pull boxes of gas, water, and/or telecommunication utilities as shown in the Plans or as directed by the Engineer.

### STANDARDS

W2-2.1 This work shall be accomplished in accordance with SECTION 610 – MANHOLES, DROP INLETS, AND JUNCTION BOXES ADJUSTED TO GRADE of the Standard Specifications, except as modified or augmented herein.

### CONSTRUCTION METHODS

W2-3.1 If any new material is required in making adjustments, it shall be similar and equal to the existing material, and shall be furnished by the Contractor at his own expense. In no case shall the Contractor allow pavement or embankment to be placed over valve, meter, or pull boxes nor fail to adjust the top of the box flush with the finished grade, whether or not the adjustment is called for on the Plans. Relocation of water lines or valves is not included in this work except to correct damages done to existing utilities caused by the Contractor.

### METHOD OF MEASUREMENT

W2-4.1 Valve, meter, or pull boxes adjusted to grade and accepted will be measured per each.

### BASIS OF PAYMENT

W2-5.1 Payment will be made at the contract unit price bid per each as "VALVE, METER, OR PULL BOX ADJUSTED TO GRADE," which prices shall be full compensation for furnishing all materials, and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

Item W2-5.1 Valve, Meter, or Pull Box Adjusted to Grade - per each



# **APPENDIX A**







ARKANSAS  
Department of Environmental Quality

Permit Tracking Number: **ARR156590**  
AFIN: **23-01295**

**NOTICE OF COVERAGE (NOC)**

**FOR NPDES STORMWATER CONSTRUCTION GENERAL PERMIT NUMBER ARR150000**

City of Conway  
Attn: Bart Castleberry  
1201 Oak St  
Conway, AR 72032

The Notice of Intent (NOI) and Stormwater Pollution Prevention Plan (SWPPP) for coverage under the ARR150000 Stormwater Construction General Permit were received on April 02, 2020 and have been reviewed. The facility has been assigned Permit Tracking Number **ARR156590** and AFIN **23-01295**. Any permit-related correspondence must include this Permit Tracking Number and AFIN. This NOC is issued to **City of Conway** in reliance upon the statements and representations made in the submittal for the following project located in Faulkner County:

Donaghey Ave. Improvements  
702-526 Donaghey Ave.  
Conway, AR 72032

This coverage is for the disturbance of 8.00 acres for the construction of **bridge and roadway construction** only. In accordance with the NOI there will be 8.00 acres disturbed out of 8.00 total acres. The Project Contact Person for this construction site is Dustin Tackett, 501-604-1790.

The permittee is responsible for compliance with all applicable terms and conditions of this NOC and the enclosed General Permit ARR150000. Receipt of this NOC does not relieve any permittee of the responsibility to comply with any other applicable federal, state, and local statute, ordinance, policy, or regulation which includes but is not limited to Short Term Activity Authorizations (STAA) or 404 permits.

The SWPPP will be located in the SWPPP box at the construction entrance.

This authorization must be **posted** at the construction site in a prominent place per the general permit.

Expiration Date: 10/31/2021

\_\_\_\_\_  
Bryan Leamons, P.E.  
Senior Operations Manager, Office of Water Quality

\_\_\_\_\_  
4/15/2020  
Coverage Date



Stormwater Pollution Prevention Plan (SWPPP) for Construction Activity  
for Large Construction Sites

National Pollutant Discharge Elimination System (NPDES)  
General Permit # ARR150000

Prepared for:  
City of Conway

Date:  
February 21, 2020

Prepared by:  
Garver

Project Name and Location: Donaghey Ave. Improvements (Prince to Dave Ward)

Property Parcel Number (Optional): \_\_\_\_\_

Operator Name and Address: City of Conway, 1201 Oak Street, Conway, AR 72032

A. Site Description

a. Project description, intended use after NOI is filed: This project will include construction activities consistent with full depth pavement replacement, mill & inlay, construction of new sidewalk, bike path, and storm sewer.

b. Sequence of major activities which disturb soils:

General Sequence of activities:

1. Obtain all necessary permits (if required).

2. Know and maintain an Arkansas Department of Environmental Quality (ADEQ) approved Storm Water Pollution Prevention Plan implemented for construction sites.

3. Inform all personnel and subcontractors of SWPPP and relate where to post the Construction Site Notice and house SWPPP.

4. Have all existing utilities located.

5. Install erosion and sediment control devices in accordance with the Plans and this SWPPP.

6. Construct Improvements (see Plan Set). Maintain erosion and sediment control devices as needed.

7. Grade all areas to final grade.

8. Stabilize all areas, place topsoil, landscaping, and sod.

9. When all construction is completed, the site is 100% stabilized at 80% density, and approved by the Engineer, remove all temporary erosion and sediment control features. Stabilize with sodding or seeding any areas disturbed by their removal

c. Total Area: 7.88 acres                      Disturbed Area<sup>2</sup>: 7.88 acres

d. Soils Information:

i. Runoff Coefficient Pre-Construction (See Appendix A) : .63

ii. Runoff Coefficient Post-Construction (See Appendix A) : .80

iii. Describe the soil or the quality of any discharge from the site:

<b>Map Unit Symbol</b>	<b>Map Unit Name</b>	<b>Percent in AOI</b>	<b>HSG Classification</b>
8	Leadvale Silt Loam, 1 to 3 % slopes	59%	C/D
32	Taft silt loam, 0 to 2 % slopes	41%	C/D

B. Responsible Parties

*Be sure to assign all SWPPP related activities to an individual or position; even if the specific individual is not yet known (i.e. contractor has not been chosen).*

Individual/Company	Phone Number	Service Provided for SWPPP (i.e., Inspector, SWPPP revisions, Stabilization Activities, BMP Maintenance, etc.)
City of Conway	501-450-6165	SWPPP Revision
Contractor	TBD	Stabilization Activities, BMP Maintenance, etc.
Garver, LLC	501-604-1790	Engineer, SWPPP Preparer

C. Receiving Waters

a. The following waterbody (or waterbodies) receives stormwater from this construction site: Unnamed tributary to Stone Dam Creek, thence to Lake Conway, thence to Palarm Creek, thence to Arkansas River.

b. Is the project located within the jurisdiction of an MS4?  Yes  No

i. If yes, Name of MS4: City of Conway

c. Ultimate Receiving Water:

Red River

White River

Ouachita River

St. Francis River

Arkansas River

Mississippi River

<sup>1</sup>Increases in total acreage require an additional acreage request, an updated SWPPP and a \$200 modification fee to be submitted to ADEQ.

<sup>2</sup>Increases in only disturbed acreage require an additional acreage request and an updated SWPPP to be submitted to ADEQ.

D. Documentation of Permit Eligibility Related to the 303(d) list and Total Maximum Daily Loads (TMDL) (<https://www.adeg.state.ar.us/water/planning/>)

a. Does the stormwater enter a waterbody on the 303(d) list or with an approved TMDL?  Yes  No

b. If yes:

i. Waterbody identified on 303(d) list: Stone Dam Creek

ii. Pollutant addressed on 303(d) list or TMDL: Ammonia, Nitrogen

iii. This specific project, or generally construction activity i.e. surface erosion, is identified on 303(d) list or associated assumptions and allocations identified in the TMDL for the discharge:  Yes  No

iv. Additional controls implemented: \_\_\_\_\_  
\_\_\_\_\_

E. Attainment of Water Quality Standards After Authorization

- a. The permittee must select, install, implement, and maintain BMPs at the 1construction site that minimize pollutants in the discharge as necessary to meet applicable water quality standards. In general, except in situations explained below, the SWPPP developed, implemented, and updated to be considered as stringent as necessary to ensure that the discharges do not cause or contribute to an excursion above any applicable water quality standard.
- b. At any time after authorization, the Department may determine that the stormwater discharges may cause, have reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. If such a determination is made, the Department will require the permittee to:
  - i. Develop a supplemental BMP action plan describing SWPPP modifications to address adequately the identified water quality concerns and submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or
  - ii. Cease discharges of pollutants from construction activity and submit an individual permit application.

I understand and agree to follow the above text regarding the attainment of water quality standards after authorization. Yes No

F. Site Map Requirements (Attach Site Map):

- a. Pre-construction topographic view;
- b. Direction of stormwater flow (i.e., use arrows to show which direction stormwater will flow) and approximate slopes anticipated after grading activities;
- c. Delineate on the site map areas of soil disturbance and areas that will not be disturbed under the coverage of this permit;
- d. Location of major structural and nonstructural controls identified in the plan;
- e. Location of main construction entrance and exit;
- f. Location where stabilization practices are expected to occur;
- g. Locations of off-site materials, waste, borrow area, or equipment storage area;
- h. Location of areas used for concrete wash-out;
- i. Location of all surface water bodies (including wetlands) with associated natural buffer boundary lines. Identify floodplain and floodway boundaries, if available;
- j. Locations where stormwater is discharged to a surface water and/or municipal separate storm sewer system if applicable,
- k. Locations where stormwater is discharged off-site (should be continuously updated);

- l. Areas where final stabilization has been accomplished and no further construction phase permit requirements apply;
- m. A legend that identifies any erosion and sediment control measure symbols/labels used in the site map and/or detail sheet; and
- n. Locations of any storm drain inlets on the site and in the immediate vicinity of the site.

G. Stormwater Controls

a. Initial Site Stabilization, Erosion and Sediment Controls, and Best Management Practices:

- i. Initial Site Stabilization: Construction will progress as indicated in the sequence of major activities noted in the Plan Set. Erosion and sediment control measures shall be installed prior to beginning any construction activities as noted on the Erosion Control Sheets. Erosion control devices will be maintained throughout construction activities.
- ii. Erosion and Sediment Controls: Stabilized construction entrances, concrete washout areas, silt fences, and drop inlet silt fences.
- iii. If periodic inspections or other information indicates a control has been used inappropriately or incorrectly, the operator will replace or modify the control for site situations: Yes No  
If No, explain: \_\_\_\_\_  
\_\_\_\_\_
- iv. Off-site accumulations of sediment will be removed at a frequency sufficient to minimize off-site impacts: Yes No  
If No, explain: \_\_\_\_\_  
\_\_\_\_\_
- v. Sediment will be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%: Yes No  
If No, explain: \_\_\_\_\_  
\_\_\_\_\_
- vi. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges: Yes No  
If No, explain: \_\_\_\_\_  
\_\_\_\_\_
- vii. Off-site material storage areas used solely by the permitted project are being covered by this SWPPP: Yes No

If Yes, explain additional BMPs implemented at off-site material storage area: \_\_\_\_\_  
\_\_\_\_\_

b. Stabilization Practices

i. Description and Schedule: All disturbed areas containing exposed soil shall receive temporary erosion and sediment control applications. Exposed bare earth sections should be protected by evenly distributed hay, straw, or wood mulch before a rain event. Contractor may choose to utilize alternative erosion control products such as straw wattles, only as approved by the engineer. Dust shall be controlled by sufficiently wetting dusty areas, as needed. To all extents possible, construction activities shall be isolated as to limit areas of disturbance. After site work, all disturbed areas shall be seeded or replaced with sod.

ii. Are buffer areas required? Yes No

If Yes, are buffer areas being used? Yes No

If Yes, describe natural buffer areas: \_\_\_\_\_  
\_\_\_\_\_

If No, explain why not: Water crossings do not require natural buffer areas and the stream is culverted throughout the proposed disturbed area without natural buffer .

iii. A record of the dates when grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be included with the plan.

Yes No

If No, explain: \_\_\_\_\_  
\_\_\_\_\_

iv. Deadlines for stabilization:

1. Stabilization procedures will be initiated 14 days after construction activity temporarily ceases on a portion of the site.
2. Stabilization procedures will be initiated immediately in portions of the site where construction activities have permanently ceased.

c. Structural Practices

i. Describe any structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site: Stabilized construction entrances, silt fences, curb inlet protection, and drop inlet silt fences.

ii. Describe Velocity Dissipation Devices: Silt Fences

iii. Sediment Basins:

Are 10 or more acres draining to a common point? Yes No



Is a sediment basin included in the project?  Yes  No

If Yes, what is the designed capacity for the storage?

3600 cubic feet per acre = : \_\_\_\_\_

or

10 year, 24 hour storm = : \_\_\_\_\_

Other criteria were used to design basin: \_\_\_\_\_

\_\_\_\_\_

If No, explain why no sedimentation basin was included and describe required natural buffer areas and other controls implemented instead: Stormwater from the site discharges at two separate points. Drain Inlets to the discharge points have inlet protection.

#### H. Other Controls

a. Solid materials, including building materials, shall be prevented from being discharged to Waters of the State:  Yes  No

b. Off-site vehicle tracking of sediments and the generation of dust shall be minimized through the use of:

A stabilized construction entrance and exit

Vehicle tire washing

Other controls, describe: \_\_\_\_\_

c. Temporary Sanitary Facilities: Portable sanitary waste systems will be required at all times during construction. All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor.

d. Concrete Waste Area Provided:

Yes

No. Concrete is used on the site, but no concrete washout is provided.

Explain why: \_\_\_\_\_

\_\_\_\_\_

N/A, no concrete will be used with this project

e. Fuel Storage Areas, Hazardous Waste Storage, and Truck Wash Areas: At a minimum, any products in the following categories shall be considered hazardous: paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, chemical additives for soil stabilization, or concrete curing compounds and additives. In the event of a spill which may be hazardous, the spill coordinator designated by the Contractor should be contacted immediately. The City of Conway shall also be notified immediately following notification of the spill coordinator. All hazardous waste materials will be disposed of as specified by local or state regulations or by the product

manufacturer. Fuel storage will be at least 300 feet from known wetlands or other waterbodies and shall have secondary containment as required by state and federal law. Products will be kept in original containers in covered areas unless they are not resealable. Original labels and material safety data will be retained; they contain important product information. If surplus products must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

I. Non-Stormwater Discharges

- a. The following allowable non-stormwater discharges comingled with stormwater are present or anticipated at the site:

- Fire-fighting activities;
- Fire hydrant flushings;
- Water used to wash vehicles (where detergents or other chemicals are not used) or control dust in accordance with Part II.A.4.H.2;
- Potable water sources including uncontaminated waterline flushings;
- Landscape Irrigation;
- Routine external building wash down which does not use detergents or other chemicals;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled materials have been removed) and where detergents or other chemicals are not used;
- Uncontaminated air conditioning, compressor condensate (See Part I.B.13.C of the permit);
- Uncontaminated springs, excavation dewatering and groundwater (See Part I.B.13.C of the permit);
- Foundation or footing drains where flows are not contaminated with process materials such as solvents (See Part I.B.13.C of the permit);

- b. Describe any controls associated with non-stormwater discharges present at the site: To all extents possible, non-stormwater discharges shall be minimized. Present discharges at the site will be controlled using proposed erosion control BMPs (silt fence and drop inlet protection including drop inlet silt fence).

J. Permanent Controls for Post-Construction Stormwater Management:

Describe measures installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed: All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be done at the earliest date possible, but no later than three (3) calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainage ways shall have priority followed by devices protecting any drainage ditches.

K. Applicable State or Local Programs: The SWPPP will be updated as necessary to reflect any revisions to applicable federal, state, or local requirements that affect the stormwater controls implemented at the site. Yes No

L. Inspections

a. Inspection frequency:

Every 7 calendar days

or

At least once every 14 calendar days and within 24 hours of the end of a storm even 0.25 inches or greater (a rain gauge must be maintained on-site)

b. Inspections:

Completed inspection forms will be kept with the SWPPP.

ADEQ's inspection form will be used (See Appendix B)

or

A form other than ADEQ's inspection form will be used and is attached (See inspection form requirements Part II.A.4.L.2)

c. Inspection records will be retained as part of the SWPPP for at least 3 years from the date of termination.

d. It is understood that the following sections describe waivers of site inspection requirements. All applicable documentation requirements will be followed in accordance with the referenced sections.

i. Winter Conditions (Part II.A.4.L.4)

ii. Adverse Weather Conditions (Part II.A.4.L.5)

M. Maintenance:

The following procedures to maintain vegetation, erosion and sediment control measures and other protective measures in good, effective operating condition will be followed: All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be done at the earliest date possible, but no later than three (3) calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainage ways shall have priority followed by devices protecting any drainage ditches.

Any necessary repairs will be completed, when practicable, before the next storm event, but not to exceed a period of 3 business days of discovery, or as otherwise directed by state or local officials.

N. Employee Training:

The following is a description of the training plan for personnel (including contractors and subcontractors) on this project: Training shall be given by a

knowledgeable and qualified trainer to all project related personnel prior to them working at the project site. The Contractor shall be required to have a qualified individual as defined in the permit.

\*\*Note, Formal training classes given by Universities or other third-party organizations are not required, but recommended for qualified trainers; the permittee is responsible for the content of the training being adequate for personnel to implement the requirements of the permit.

Certification

"I certify under penalty of law that this document and all attachments such as Inspection Form were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Responsible or Cognizant Official: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

# Computation Sheet for Determining Runoff Coefficients

Appendix A

Total Site Area =	7.88	Acres	[A]
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### Existing Site Conditions

Impervious Site Area <sup>1</sup> =	2.80	Acres	[B]
-------------------------------------	------	-------	-----

Impervious Site Area Runoff Coefficient <sup>2, 4</sup> =	.95		[C]
---	-----	--	-----

Pervious Site Area <sup>3</sup> =	5.08	Acres	[D]
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Pervious Site Area Runoff Coefficient <sup>4</sup> =	.45		[E]
--	-----	--	-----

### Pre-Construction Runoff Coefficient

$$\frac{[B \times C] + [D \times E]}{[A]} = 0.63$$

### Proposed Site Conditions (after construction)

Impervious Site Area <sup>1</sup> =	5.53	Acres	[F]
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Impervious Site Area Runoff Coefficient <sup>2, 4</sup> =	0.95		[G]
---	------	--	-----

Pervious Site Area <sup>3</sup> =	2.35	Acres	[H]
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Pervious Site Area Runoff Coefficient <sup>4</sup> =	0.45		[I]
--	------	--	-----

### Post-Construction Runoff Coefficient

$$\frac{[F \times G] + [H \times I]}{[A]} = 0.80$$

1. Includes paved areas, areas covered by buildings, and other impervious surfaces.
2. Use 0.95 unless lower or higher runoff coefficient can be verified.
3. Includes areas of vegetation, most unpaved or uncovered soil surfaces, and other pervious areas.
4. Refer to local Hydrology Manual for typical C values.

Note: The impervious and pervious surfaces should equal the total area.

**ARR150000 Inspection Form**

Appendix B

Inspector Name: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Inspector Title: \_\_\_\_\_

Date of Rainfall: \_\_\_\_\_

Duration of Rainfall: \_\_\_\_\_

Days Since Last Rain Event: \_\_\_\_\_ days

Rainfall Since Last Rain Event: \_\_\_\_\_ inches

Description of any Discharges During Inspection: \_\_\_\_\_

Location of Discharges of Sediment/Other Pollutant (specify pollutant & location): \_\_\_\_\_

Locations in Need of Additional BMPs: \_\_\_\_\_

**Information on Location of Construction Activities**

Location	Activity Begin Date	Activity Occuring Now (y/n)?	Activity Ceased Date	Stabilization Initiated Date	Stabilization Complete Date

**Information on BMPs in Need of Maintenance**

Location	In Working Order?	Maintenance Scheduled Date	Maintenance Completed Date	Maintenance to be Performed By

Changes required to the SWPPP: \_\_\_\_\_

Reasons for changes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SWPPP changes completed (date): \_\_\_\_\_

"I certify under penalty of law that this document and all attachments such as Inspection Form were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Responsible or Cognizant Official: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

# BMP Consideration Checklist

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP should be checked as “Not Used” with a brief statement describing why it is not being used.

**Note: Appendix C and D do not have to be submitted with the SWPPP. These attachments are for use during the development of the SWPPP.**

EROSION CONTROL BMPs				
BMP	BMP Considered for project	BMP Used	BMP Not Used	If not used, state reason
EC-1 Scheduling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
EC-2 Preservation of Existing Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
EC-3 Hydraulic Mulch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
EC-4 Hydroseeding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
EC-5 Soil Binders	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
EC-6 Straw Mulch	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
EC-7 Geotextiles & Mats	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
EC-8 Wood Mulching	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
EC-9 Earth Dikes & Drainage Swales	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
EC-10 Velocity Dissipation Devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
EC-11 Slope Drains	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
EC-12 Stream bank Stabilization	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
SEDIMENT CONTROL BMPs				
BMP	BMP Considered for project	BMP Used	BMP Not Used	If not used, state reason
SE-1 Silt Fence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SE-2 Sediment Basin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-3 Sediment Trap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-4 Check Dam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-5 Fiber Rolls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-6 Gravel Bag Berm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-7 Street Sweeping and Vacuuming	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SE-8 Sand Bag Barrier	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-9 Straw Bale Barrier	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SE-10 Storm Drain Inlet Protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SE-11 Chemical Treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
WIND EROSION CONTROL BMPs				
BMP	BMP Considered for project	BMP Used	BMP Not Used	If not used, state reason
WE-1 Wind Erosion Control	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



# BMP Consideration Checklist

TRACKING CONTROL BMPs				
BMP	BMP Considered for project	BMP Used	BMP Not Used	If not used, state reason
TR-1 Stabilized Construction Entrance/Exit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
TR-2 Stabilized Construction Roadway	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TR-3 Entrance/Outlet Tire Wash	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NON-STORM WATER MANAGEMENT BMPs				
BMP	BMP Considered for project	BMP Used	BMP Not Used	If not used, state reason
NS-1 Water Conservation Practices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-2 Dewatering Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-3 Paving and Grinding Operations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-4 Temporary Stream Crossing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-5 Clear Water Diversion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-6 Illicit Connection/ Discharge	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-7 Potable Water/Irrigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NS-8 Vehicle and Equipment Cleaning	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-9 Vehicle and Equipment Fueling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-10 Vehicle and Equipment Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NS-11 Pile Driving Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-12 Concrete Curing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-13 Concrete Finishing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
NS-14 Material and Equipment Use Over Water	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-15 Demolition Adjacent to Water	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
NS-16 Temporary Batch Plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs				
BMP	BMP Considered for project	BMP Used	BMP Not Used	If not used, state reason
WM-1 Material Delivery and Storage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-2 Material Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-3 Stockpile Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-4 Spill Prevention and Control	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-5 Solid Waste Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-6 Hazardous Waste Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-7 Contaminated Soil Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-8 Concrete Waste Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-9 Sanitary/Septic Waste Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
WM-10 Liquid Waste Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

# SWPPP Completion Checklist

Yes = Complete

No = Incomplete/Deficient

N/A = Not applicable to project

Yes	No	N/A		Permit Section Citation
			<b>A. A site description, including:</b>	
			1. Project description, intended use after NOT	<u>Part II.A.4.A.1</u>
			2. Sequence of major activities	<u>Part II.A.4.A.2</u>
			3. Total & disturbed acreage	<u>Part II.A.4.A.3</u>
			4. Pre- and post-construction runoff coefficient OR soil/discharge data	<u>Part II.A.4.A.4</u>
			<b>B. Responsible Parties: All parties dealing with the SWPPP and the areas they are responsible for on-site.</b>	<u>Part II.A.4.B</u>
			<b>C. Receiving Water.</b>	<u>Part II.A.4.C</u>
			-MS4 Name	<u>Part II.A.4.C</u>
			-Ultimate Receiving Water	<u>Part II.A.4.C</u>
			<b>D. Documentation of permit eligibility related to Impaired Water Bodies and Total Maximum Daily Loads (TMDLs)</b>	
			1. Identify pollutant on 303(d) list or TMDL	<u>Part II.A.4.D.1</u>
			2. Is construction activity or the specific site listed as cause?	<u>Part II.A.4.D.2</u>
			3. Measures taken to reduce pollutants from the site.	<u>Part II.A.4.D.3</u>
			<b>E. Attainment of Water Quality Standards After Authorization.</b>	<u>Part II.A.4.E</u>
			<b>F. Site Map --- See End of Evaluation Form</b>	<u>Part II.A.4.F</u>
			<b>G. Description of Controls:</b>	
			1. Erosion and sediment controls, including:	
			a. Initial site stabilization	<u>Part II.A.4.G.1.a</u>
			b. Erosion and sediment controls	<u>Part II.A.4.G.1.b</u>
			c. Replacement of inadequate controls	<u>Part II.A.4.G.1.c</u>
			d. Removal of off-site accumulations	<u>Part II.A.4.G.1.d</u>
			e. Maintenance of sediment traps/basins @ 50% capacity	<u>Part II.A.4.G.1.e</u>
			f. Litter, construction debris and chemicals properly handled	<u>Part II.A.4.G.1.f</u>
			g. Off-site storage areas and controls	<u>Part II.A.4.G.1.g</u>
			2. Stabilization practices:	
			a. Description and schedule for stabilization	<u>Part II.A.4.G.2.a</u>
			b. Description of buffer areas	<u>Part II.A.4.G.2.b</u>
			c. Records of stabilization	<u>Part II.A.4.G.2.c</u>
			d. Deadlines for stabilization	<u>Part II.A.4.G.2.d</u>
			3. Structural Practices:	
			-Describe structural practices to divert flows, store flows, or otherwise limit runoff	<u>Part II.A.4.G.3</u>
			a. Sediment basins	<u>Part II.A.4.G.3.a.1</u>
			-Are more than 10 acres draining to a common point? If so, are sediment basins included?	<u>Part II.A.4.G.3.a.1</u>
			-Sediment basin dimensions and capacity description and calculations	<u>Part II.A.4.G.3.a.1</u>
			-If a basin wasn't practicable, are other controls sufficient?	<u>Part II.A.4.G.3.a.1</u>
			b. Velocity dissipation devices concentrated flow from 2 or more acres	<u>Part II.A.4.G.3.b</u>
			<b>H. Other controls including:</b>	
			1. Solid waste control measures	<u>Part II.A.4.H.1</u>
			2. Vehicle off-site tracking controls	<u>Part II.A.4.H.2</u>
			3. Compliance with sanitary waste disposal	<u>Part II.A.4.H.4</u>
			4. Does the site have a concrete washout area controls?	<u>Part II.A.4.H.5</u>
			5. Does the site have fuel storage areas, hazardous waste storage and/or truck wash areas controls?	<u>Part II.A.4.H.6</u>

# SWPPP Completion Checklist

Yes	No	N/A		Permit Section Citation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>I. Identification of allowable non-storm water discharges</b>	Part II.A.4.I
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-Appropriate controls for dewatering, if present	Part I.B.12.C
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>J. Post construction stormwater management.</b>	Part II.A.4.J
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>K. State or local requirements incorporated into the plan.</b>	Part II.A.4.K
			<b>L. Inspections</b>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Inspection frequency listed?	Part II.A.4.L.1
			2. Inspection form	Part II.A.4.L.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ours.	
			If not ours, does it contain the following items:	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	a. Inspector name and title	Part II.A.4.L.2.a
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	b. Date of inspection.	Part II.A.4.L.2.b
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	c. Amount of rainfall and days since last rain event (14 day only)	Part II.A.4.L.2.c
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	d. Approx beginning and duration of storm event	Part II.A.4.L.2.d
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	e. Description of any discharges during inspection	Part II.A.4.L.2.e
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	f. Locations of discharges of sediment/other pollutants	Part II.A.4.L.2.f
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	g. BMPs in need of maintenance	Part II.A.4.L.2.g
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	h. BMPs in working order, if maintenance needed (scheduled and completed)	Part II.A.4.L.2.h
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	i. Locations that are in need of additional controls	Part II.A.4.L.2.i
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	j. Location and dates when major construction activities begin, occur or cease	Part II.A.4.L.2.j
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	k. Signature of responsible/cognizant official	Part II.A.4.L.2.k
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Inspection Records	Part II.A.4.L.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Winter Conditions	Part II.A.4.L.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Adverse Weather Conditions	Part II.A.4.L.5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>M. Maintenance Procedures</b>	Part II.A.4.M
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>N. Employee Training</b>	Part II.A.4.N
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Signed Plan Certification</b>	Part II.A.5. and Part II.B.10
			<b>F. Site Map showing:</b>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Pre-construction topographic view	Part II.A.4.F.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Drainage flow	Part II.A.4.F.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Approximate slopes after grading activities	Part II.A.4.F.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Areas of soil disturbance and areas not disturbed	Part II.A.4.F.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Location of major structural and non-structural controls.	Part II.A.4.F.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Location of main construction entrance and exit.	Part II.A.4.F.5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Areas where stabilization practices are expected to occur.	Part II.A.4.F.6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Locations of off-site materials, waste, borrow area or storage area.	Part II.A.4.F.7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Locations of areas used for concrete wash-out.	Part II.A.4.F.8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Locations of surface waters on site.	Part II.A.4.F.9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Locations where water is discharged to a surface water or MS4.	Part II.A.4.F.10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Storm water discharge locations.	Part II.A.4.F.11
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. Areas where final stabilization has been accomplished.	Part II.A.4.F.12
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. Legend for symbols/labels used	Part II.A.4.F.13
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15. Location of storm drain inlets on site or in immediate vicinity	Part II.A.4.F.14