CITY OF CONWAY, ARKANSAS

SPECIFICATIONS
AND
CONTRACT DOCUMENTS

FOR

CONSTRUCTION OF
SALEM & IRBY ROUNDABOUT

PREPARED BY
CONWAY TRANSPORTATION DEPARTMENT
100 EAST ROBINS STREET
CONWAY, ARKANSAS 72032
501-450-6165

MARCH 2020

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SECTION 00 11 16

INVITATION TO BID

Sealed bids addressed to the **City of Conway, Arkansas,** will be received at the City of Conway Transportation Department, 100 E Robins St, Conway, Arkansas 72032, until 10:00 am, Thursday, April 23, 2020, for the construction of a roundabout located at the intersection of Salem Road and Irby Drive in Conway, Arkansas. The sealed bids will then be opened and publicly read aloud. The work includes all labor, material, and equipment required to perform the work as described in the project plans and specifications.

Proposals shall be accompanied by a cashier's or certified check upon a national or state bank in an amount not less than five per cent (5%) of the total maximum bid price payable without recourse to **City of Conway, Arkansas**, 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. The notice of award of Contract shall be given by the Owner within thirty (30) days following the opening of bids.

The successful Bidder must furnish a performance bond and a separate payment bond upon the forms provided herein in the amount of one hundred percent (100%) of the contract price from an approved surety company holding a permit from the State of Arkansas to act as surety, or other surety or sureties acceptable to the Owner.

The attention of bidders is called to the fact that Act 150 of 1965 (as amended), Arkansas Statutes, states that a Contractor must be licensed by the State Licensing Board for Contractors before he may undertake work when the cost thereof in Arkansas is Twenty Thousand Dollars ($20,000.00) or more.

Plans, specifications, proposal forms, and other contract documents may be obtained from the Mayor's Office, Conway City Hall, 1201 Oak Street, Conway, Arkansas. Electronic files can be obtained via email request to Jamie.brice@cityofconway.org. There will be a $35 charge for a hard copy set of plans and specifications; cash, check, or credit card will be accepted. Please visit our website at www.cityofconway.org for all updated project information.

City of Conway, Arkansas
Bart Castleberry, Mayor

SECTION 00 21 13

INSTRUCTION TO BIDDERS

PART 1 – GENERAL

1.01 PREPARATION OF BID

A. Each bid must be submitted on the prescribed Proposal form (SECTION 00 42 43) of these specifications. The blank space must be filled in legibly with ink. In case of discrepancy between written words and figures, the written words shall govern. Erasures or other corrections on the Proposal form 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 interlineation, excisions or special conditions shall be made or included in the Proposal by the bidder.

B. No bid will be considered which covers only a part of the work. A conditional bid will not be considered.

C. The Unit Price Schedule (bid form) shall not be detached, but shall be submitted in the original binding as furnished by the Engineer. Submission must be at the place, and at or prior to the time specified in the Advertisement for Bids.

D. Each bid must be submitted in a sealed envelope clearly marked on the outside that it contains a bid for the **SALEM AND IRBY ROUNDABOUT** and with the hour and date of bid opening shown thereon. The name, address, and Arkansas 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 properly addressed as noted in SECTION 00 11 16 - INVITATION TO BID, of these specifications.

1.02 INTERPRETATIONS AND ADDENDA

A. 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 City Engineer, 100 East Robins Street Conway, Arkansas 72032. Any inquiry received 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 posted on the city of Conway's website at www.cityofconway.org at least twenty-four (24) hours before bids are opened. 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.

1.03 INSPECTION OF SITE

A. 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 the facilities involved, and the difficulties and restrictions attending the performance of the Contract. The Bidder shall thoroughly examine and familiarize himself with the Plans, Technical Specifications, and other Contract Documents. 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.

1.04 BID GUARANTY

A. 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 substantially in the form attached. 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, Arkansas**. 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.

B. Certified check, or bid bonds, of unsuccessful Bidders, will be returned upon request as soon as feasible after the opening of the bids.

1.05 COLLUSION; SUBCONTRACTS

A. 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.

B. Before executing any subcontract, the successful Bidder shall submit the name of any proposed Subcontractor for prior approval of the Owner.

1.06 STATEMENT OF BIDDER'S QUALIFICATIONS

A. Each Bidder shall upon request of the Owner 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.

1.07 TIME FOR RECEIVING BIDS

A. 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.

1.08 OPENING OF BIDS

A. At the time and place fixed for the opening of bids, the Owner first will cause the bid guarantees to be checked as stipulated above. The Owner then will cause the qualified 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.

1.09 WITHDRAWAL OF BIDS

A. Bids may be withdrawn on written request if the request is received prior to the time fixed for the opening of bids.

1.10 AWARD OF CONTRACT; REJECT OF BIDS

A. The Contract will be awarded to the responsible Bidder submitting the lowest total bid complying with the conditions of the Notice to Contractors and other parts of these Contract Documents. The Bidder to whom the award is made will be notified at the earliest possible date. 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.

B. The Owner 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 it is involved in construction of these improvements.

1.11 EXECUTION OF AGREEMENT; PERFORMANCE AND PAYMENT BOND

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

B. 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 who 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.

C. The failure of the successful Bidder to execute such Agreement 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 readvertise for bids.

1.12 BONDS AND INSURANCE

A. Attention of Bidders is called to Act 82 of the 1935 Acts of the Arkansas General Assembly, which requires that all bid bonds, performance bonds, labor bonds, employer's liability insurance, public liability insurance, workmen's collective insurance, and property damage insurance must be secured through resident agents of Arkansas.

B. All companies furnishing bid bonds and performance bonds shall appear 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.

1.13 LEGAL QUALIFICATIONS

A. All Bidders, in order to submit a bonafide Proposal, must be licensed under the terms of Act 150 of the 1965 Acts of the Arkansas General Assembly, as amended, when the amount of the Contract is Twenty Thousand Dollars ($20,000.00) or more.

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

1.14 MODIFICATION OF BID

A. No modification of any bid already submitted will be considered unless such modification is received prior to the hour set for opening for bids.

END OF SECTION

UNIT PRICE SCHEDULE

SALEM AND IRBY ROUNDABOUT

ITEM #	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE BID (DOLLARS)	AMOUNT BID (DOLLARS)
1	SITE PREPARATION	1	LS	_____	_____
2	REMOVAL AND DISPOSAL OF STORM DRAINAGE STRUCTURES	1	LS	_____	_____
3	B-STONE	800	TN	_____	_____
4	UNDERCUT AND SELECT BACKFILL	3000	CY	_____	_____
5	UNCLASSIFIED EXCAVATION (PLAN QUANTITY)	1000	CY	_____	_____
6	COMPACTED EMBANKMENT (PLAN QUANTITY)	2000	CY	_____	_____
7	AGG. BASE COURSE (CLASS 7)	1500	TN	_____	_____
8	ASPHALT CONCRETE HOT MIX BINDER COURSE	500	TN	_____	_____
9	ASPHALT CONCRETE HOT MIX SURFACE COURSE	400	TN	_____	_____
10	TEMPORARY ASPHALT PAVEMENT FOR DETOUR	100	TN	_____	_____
11	REMOVAL OF TEMPORARY ASPHALT PAVEMENT FOR DETOUR	100	TN	_____	_____
12	MOBILIZATION	1	LS	_____	_____
13	MAINTENANCE OF TRAFFIC	1	LS	_____	_____
14	TRAFFIC DRUMS	100	EA	_____	_____
15	CONSTRUCTION PAVEMENT MARKINGS	500	LF	_____	_____
16	CONSTRUCTION SIGNS	170	SF	_____	_____

UNIT PRICE SCHEDULE

SALEM AND IRBY ROUNDABOUT

ITEM #	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE BID (DOLLARS)	AMOUNT BID (DOLLARS)
17	CONSTRUCTION BARRICADES	96	LF	_____	_____
18	12" R.C. PIPE CULVERT (CLASS III)	57	LF	_____	_____
19	18" R.C. PIPE CULVERT (CLASS III)	282	LF	_____	_____
20	DROP INLETS (4' X 4')	3	EA	_____	_____
21	AREA INLETS (4' X 4')	1	EA	_____	_____
22	SEEDING	1	AC	_____	_____
23	WATER	200	MG	_____	_____
24	MULCH COVER	1	AC	_____	_____
25	SILT FENCE	750	LF	_____	_____
26	DROP INLET SILT FENCE	100	LF	_____	_____
27	STABILIZED CONSTRUCTION ENTRANCE	1	EA	_____	_____
28	CONCRETE WASHOUT	1	EA	_____	_____
29	SOLID SODDING (AS DIRECTED BY THE ENGINEER)	800	SY	_____	_____
30	TOPSOIL FURNISHED AND PLACED	150	CY	_____	_____
31	CONCRETE TRUCK APRON / DRIVE	700	SY	_____	_____
32	BRICK PAVERS	290	SY	_____	_____

UNIT PRICE SCHEDULE

SALEM AND IRBY ROUNDABOUT

ITEM #	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE BID (DOLLARS)	AMOUNT BID (DOLLARS)
33	MODULAR BLOCK RETAINING WALL	620	SF	_____	_____
34	HANDRAIL	280	LF	_____	_____
35	CONCRETE WALKS	750	SY	_____	_____
36	CONCRETE CURB & GUTTER (6" X 1.5')	1750	LF	_____	_____
37	CONCRETE CURB & GUTTER (4" X 2')	240	LF	_____	_____
38	CONSTRUCTION LAYOUT	1	LS	_____	_____
39	WHEELCHAIR RAMPS	90	SY	_____	_____
40	THERM PVMT MARK - YELLOW (4")	300	LF	_____	_____
41	THERM PVMT MARK - WHITE (4")	300	LF	_____	_____
42	THERM PVMT MARK - WHITE (12")	200	LF	_____	_____
43	THERM PVMT MARK - YIELD LINES	20	EA	_____	_____
44	STANDARD SIGN	170	SF	_____	_____
45	CHANNEL POST SIGN SUPPORT	27	EA	_____	_____
46	2" CONDUIT	230	LF	_____	_____
47	JUNCTION BOX	3	EA	_____	_____
48	LANDSCAPE IRRIGATION	1	LS	_____	_____

UNIT PRICE SCHEDULE

SALEM AND IRBY ROUNDABOUT

ITEM #	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE BID (DOLLARS)	AMOUNT BID (DOLLARS)
49	LANDSCAPE SEGMENTAL BLOCK WALL	1	LS	_____	_____
50	EASTERN REDBUD (3" CAL.)	4	EA	_____	_____
51	BLUE RUG JUNIPER (3 GAL.)	41	EA	_____	_____
52	DWARF YAUPON HOLLY (3 GAL.)	28	EA	_____	_____
53	EARLY SUNRISE TICKSEED (1 GAL.)	68	EA	_____	_____
54	LANDSCAPE SOD (ROUNDABOUT INTERIOR)	1515	SF	_____	_____
55	TRENCH EXCAVATION SAFETY	1	LS	_____	_____

TOTAL UNIT PRICE BID:

_____
(words)

_____
(figures)

SECTION 00 42 43

PROPOSAL FORM

Place _____

Date _____

Proposal of _____,

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

or

Proposal of _____,

a partnership consisting of_____

(Strike out the term not applicable)

To: CITY OF CONWAY, ARKANSAS

This bid results from your invitation for bids for the **SALEM AND IRBY ROUNDABOUT**.

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 specified for incorporation into the project and 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 prices stated herein.

The undersigned Bidder agrees to begin work within ten (10) calendar days after the issuance by the Owner of a "Work Order" or "Notice to Proceed" and to complete the work within ONE hundred fifty (150) calendar days thereafter (except as modified in SECTION 00 72 00 - 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 SECTION 00 74 00 - SPECIAL 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 the GENERAL CONDITIONS of these Contract Documents.

Bidder acknowledges receipt of the following addendum (addenda):

_____ Dated _____

_____ Dated _____

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 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. The projects may be awarded to the lowest responsive bid to the lowest responsive bid or as deemed in the best interest of the city.

Accompanying this Proposal as bid security is certified check/bid bond (Strike One)

in the amount of _____Dollars

($_____), being not less than five percent (5%) of the total 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.

_____ _____

(Witness) (Name of Bidder)

_____ By_____

_____ _____

(Address) (Print Name and Title)

SEAL (If Bidder is a corporation) _____

_____

(Office Address of Bidder)

NOTES: Sign in ink. Do not detach.

SECTION 00 43 13

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT we the undersigned, _____, as PRINCIPAL, and

_____, as SURETY, are held

and firmly bound unto **City of Conway**, Arkansas, hereinafter called the OWNER in the penal

sum of _____ ($ _____),

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

THE CONDITION OF THIS OBLIGATION IS SUCH THAT WHEREAS, the Principal has submitted the

accompanying Proposal, dated _____ _____, for

SALEM AND IRBY ROUNDABOUT
CONWAY, ARKANSAS

NOW, THEREFORE, if the Principal shall not withdraw said Proposal within sixty (60) days after the opening of same, and shall within ten (10) days after the prescribed forms are presented to him for signature, enter into a written Contract with the Owner in accordance with the Proposal as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument, under their

several seals this _____ day of _____, 2020 , the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

SEAL

_____

_____

(Principal)

By_____

_____ _____

(Witness) (Title)

_____ _____

_____ _____

(Address)

SEAL

_____

_____ _____

(Corporate Surety)

By_____

_____

_____

(Address)

NOTE: Power-of-attorney for person signing for surety company must be attached to bond.

SECTION 00 52 00

AGREEMENT FORM

THIS AGREEMENT made this _____ day of _____, 2020 by and between

_____

a Corporation organized and existing under the laws of the State of_____;

a partnership consisting of _____;

an individual trading as _____;
(Strike out the two terms not applicable)

hereinafter called the "Contractor" and City of Conway, Arkansas, 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 **SALEM AND IRBY ROUNDABOUT**, in strict accordance

with the Contract Documents, including all Addenda thereto numbered _____ and dated

_____ and_____dated _____ as prepared by the Engineer.

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 unit price or lump sum price stipulated in the Unit Price Schedule, subject to additions, and deductions as provided in SECTION 00 72 00 - GENERAL CONDITIONS, PARAGRAPH 1.13 - CHANGES IN THE WORK.

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 One hundred fifty (150) calendar days thereafter (except as modified in 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 SECTION 00 74 00 - SPECIAL 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. This Agreement
b. Addenda
c. Notice to Contractors
d. Instructions to Bidders
e. Proposal
f. General Conditions
g. Supplementary Conditions
h. Special Conditions
i. Technical Specifications
j. Drawings

This Agreement, together with other Documents enumerated in this Article 4, which said other Documents are as fully a part of the Contract 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-Payment Bond shall be a surety company of financial resources satisfactory to the Owner and authorized to do business in the State of Arkansas.

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

ATTEST:

_____
(Company Name)

_____ _____
(Contractor witness signature) (Official signature)

_____ _____
(Printed name) (Printed name, title)

_____
(Street address)

_____
(City, State, Zip)

City of Conway, Arkansas
(Owner)

_____ _____
(Owner witness signature) (Official signature)

_____ Bart Castleberry, Mayor
(Printed name) (Printed name, title)

SECTION 00 61 13

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT WE, _____ as Principal,

hereinafter called Principal, and _____ of

_____ State of _____, as Surety, hereinafter called

the Surety, are held and firmly bound unto **City of 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, severally, and 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 _____, 2020, a copy of which is attached hereto and made a part hereof, hereinafter referred to as the Contract, for Faulkner County, **SALEM AND IRBY ROUNDABOUT** in the city of Conway, Arkansas.

NOW THEREFORE, if the Principal shall well and truly perform and complete in good, sufficient, and workmanlike manner all of the work required by said Contract and within the time called for thereby to the satisfaction of the Owner, and shall pay all persons for labor, materials, equipment, and supplies furnished by said Principal in accordance with said Contract (failing which such persons shall have a direct right to action against the Principal and Surety under this obligation, but subject to the Owner's priority) and shall hold and save harmless the Owner from any and all claims, loss, and expense of every kind and nature arising because of or resulting from the Principal's operation under said Contract, except payments to the Principal rightly due the Principal for work under said Contract, then this obligation shall be null and 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 Principal to the other shall not release in any way the Principal and Surety, or either of them, 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 herein.

No suit, action, or proceeding shall be brought on this bond outside the State of Arkansas. No suit, action, or proceeding shall be brought on this bond, except by the Owner, after six (6) months from the date on which final payment to the Contractor falls due. No suit, action, or proceeding shall be brought by the Owner after two (2) years from the date on which final payment to the Contractor falls due.

This bond is executed pursuant to the terms of Arkansas Statute 51-637.

Executed on this _____ day of _____, 20____.

SEAL

_____
(Principal)

By_____

Title_____

SEAL

_____
(Surety)

By_____
(Attorney-in-Fact)

NOTES:

1. **This bond form is mandatory. No other forms will be acceptable.**
2. **The date of the Bond must not be prior to the date of the Contract.**
3. **Any surety executing this Bond must appear 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.**
4. **Attach Power of Attorney.**

SECTION 00 72 00

GENERAL CONDITIONS

PART 1 – GENERAL

1.01 DEFINITIONS

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

1. The term "Contract" means the Contract executed by the Local Public Agency and the Contractor of which these GENERAL CONDITIONS form a part.
2. The term "Local Public Agency" or "Owner" means **City of Conway, Arkansas**, which is authorized to undertake this Contract.
3. The term "Contractor" means the person, firm or corporation entering into the Contract with the Local Public Agency to construct and install the improvements embraced in this project.
4. The term "Engineer" means Conway City Engineer or other designated professional consultant or individual providing the local public agency with engineering services, its successor, or any other person or persons employed by said Local Public Agency to furnish engineering services in connection with the construction embraced in the Contract.
5. The term "Local Government" means the **City of Conway, Arkansas**, within which the Project is situated.
6. The term "Contract Documents" means and shall include the following: Executed Agreement, Addenda (if any), Invitation to Bid, Instructions to Bidders, Proposal, General Conditions, Supplementary Conditions, Special Conditions, Technical Specifications, and Drawings.
7. The term "Drawings" or "Plans" means the construction drawings prepared for this project.
8. The term "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.
9. The term "Addendum" means any change, revision or clarification of the Contract Documents which has been duly issued by the Local Public Agency to prospective Bidders prior to the time of receiving bids.
10. The term "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.
11. The term "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.

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

1.02 SUPERINTENDENCE BY CONTRACTORS

A. 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 Local Public Agency 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.

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

1.03 CONTRACTOR'S EMPLOYEES

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

B. 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.

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

1.04 SAFETY OF CONTRACTOR'S EMPLOYEES

A. The Contractor shall be responsible for the safety of his employees during the progress of the work as well as the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

1.05 SUBCONTRACTS

A. 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 that nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Owner.

1.06 OTHER CONTRACTS

A. The Local Public Agency 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 Local Public Agency. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor as scheduled.

1.07 CONTRACTOR'S INSURANCE

A. Before any work is commenced, the Contractor shall furnish an approved certificate of insurance addressed to the Owner, showing that he carries the following insurance which shall be maintained throughout the term of the Contract.

1. Workmen's Compensation -- Statutory Limit
2. Employer's Liability for Hazardous Work -- If Needed
3. Public Liability (Bodily Injury) -- $1,000,000/occurrence
4. Property Damage -- $1,000,000/occurrence
5. Builder's Risk -- Insurable Portion

B. The Contractor shall carry or require that there be carried the insurance listed in (1) through (4) above for the protection of all his employees and those of his Subcontractors engaged in work under this Contract, and for the protection of the public.

C. If the work includes pipelines or other underground structures, the Property Damage Liability shall include explosion, collapse and underground coverage.

D. The premiums for all insurance and the bond required herein shall be paid by the Contractor.

E. It shall be the obligation of the Contractor to complete and deliver to the Owner the structure required by these Contract Documents regardless of any loss, damage to, or destruction of the structure prior to delivery.

1.08 OWNER'S AND ENGINEER'S PROTECTIVE LIABILITY INSURANCE

A. The Contractor shall obtain Owner's Protective Liability insurance, which shall be in force for the entire project period, naming as the insured therein, **City of Conway, Arkansas**. Such insurance shall be provided as a separate policy from the Contractor's insurance as listed above. Limits of liability shall be the following:

1. Bodily Injury Liability (Including Death) -- $1,000,000 each occurrence

2. Physical Damage Liability (Damage to or Destruction of Property) -- $1,000,000 each occurrence

B. A copy of the insurance policy shall be delivered to the Owner and Engineer.

1.09 FITTING AND COORDINATION OF THE WORK

A. The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, Subcontractors, or material men 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.

1.10 MUTUAL RESPONSIBILITY OF CONTRACTORS

A. 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 Local Public Agency on account of any damage alleged to have been so sustained, the Local Public Agency 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 Local Public Agency shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith.

1.11 PAYMENT

A. PAYMENT TO CONTRACTOR

1. The Engineer shall prepare (with the required assistance from the Contractor) the requisition for partial payment. If the bid is a lump sum price or 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 requisition 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 ten percent (10%) for retainage, adding the value of submitted paid invoices covering construction materials, properly stored on the site and deducting the amount of all previous payments. After the project is fifty percent (50%) complete, no additional retainage beyond ten percent (10%) of the first fifty percent (50%) of the project cost will be withheld provided that the Contractor is making satisfactory progress and there is no specific cause for greater withholding until completion of the project at which time the retainage will be released with the final payment. The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit prices and lump sum prices

contained in the Proposal. The value of materials properly stored on the site 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.

2. 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.

B. WITHOLDING PAYMENTS

1. The Local Public Agency may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Local Public Agency 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 Local Public Agency and will not require the Local Public Agency 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 Local Public Agency elects to do so. The failure or refusal of the Local Public Agency 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.

C. FINAL PAYMENT

1. After final inspection and acceptance by the Local Public Agency of all work under the Contract, the requisition for final payment shall be prepared which shall be based upon the carefully measured or computed quantity of each item of work at the applicable unit prices and lump sum prices stipulated in the Proposal. 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 subject to his

furnishing the Local Public Agency with a release in satisfactory form of all claims against the Local Public Agency 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.

2. The Local Public Agency, 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 Local Public Agency deems the same necessary in order to protect its interest. The Local Public Agency, 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 in nowise impair the obligations of any Surety or Sureties furnished under this Contract.

3. Withholding of any amount due the Local Public Agency under the section entitled LIQUIDATED DAMAGES FOR DELAY under SPECIAL CONDITIONS, shall be deducted from the payments due the Contractor.

4. All equipment warranties and general guarantee and maintenance bond provisions shall become effective for one year upon date of final acceptance of the complete project by the Local Public Agency.

D. PAYMENTS SUBJECT TO SUBMISSION OF CERTIFICATES

1. Each payment to the Contractor by the Local Public Agency shall be made subject to submission by the Contractor of all written certifications required.

1.12 USE OF COMPLETED PORTIONS

A. 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.

1.13 CHANGES IN THE WORK

A. The Local Public Agency 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.

B. 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 Local Public Agency authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract price will be valid unless so ordered.

C. After the work is complete, a final change order will 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.

D. If the applicable unit prices are contained in the Agreement (established as a result of either a unit price or a Supplemental Schedule of Unit Prices) the Local Public Agency 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.

E. If applicable unit prices are not contained in the Agreement as described above or if the total net change increases or decreases the total Contract price more than twenty-five (25) percent, the Local Public Agency 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 Local Public Agency 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 Local Public Agency 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.

F. 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.

G. 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 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.

1.14 CLAIMS FOR EXTRA COST

A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost or extension of time, he shall, within ten (10) days after the receipt of such instructions, and in any event before proceeding to execute the work, submit his protest thereto in writing to the Local Public Agency, stating clearly and in detail the basis of his objections. No such claim will be considered unless so made.

B. 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 material, or performing more work, than would be reasonable estimated from the Drawings and maps issued.

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

D. If, on the basis of the available evidence, the Local Public Agency 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.

1.15 OWNER'S RIGHT TO TERMINATE CONTRACT

A. If the Contractor shall be adjudged a 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 solvency, 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 Local Public Agency 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.

B. At the expiration of the said ten (10) days, the Owner may immediately serve notice upon the Surety to complete the work.

C. 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, including labor, materials, tools, implements, machinery or apparatus to said Contractor and the expense so charged shall be deducted and paid by the Owner out of such monies as may be due, or that may thereafter at any time become due to the Contractor under and by virtue of this agreement. And in case such expense is less than the sum which would have been payable under this Contract if the same had been completed by the Contractor, then said Contractor shall be entitled to receive the difference. And in case such expense is greater than the sum which would have been payable under this Contract if the same had been completed by said Contractor, then the Contractor and his Surety shall pay the amount of such excess to the Owner, on demand from said Owner or Engineer of the amount so due.

1.16 SUSPENSION OF WORK

A. 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 sixty (60) days by giving the Contractor notice in writing three (3) days prior to the suspension.

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

C. 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 sixty (60) days, the Contractor may abandon that portion of the work so suspended and the Contractor shall be paid for all work performed on the portion so suspended at unit prices quoted in the bid for completed work involved, at agreed prices on any extra work involved and at a fair and equitable price for partially completed work involved.

D. 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 in his discretion.

1.17 DELAYS - EXTENSION OF TIME - LIQUIDATED DAMAGES

A. If the Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner, the Owner's Engineer or employees, or by any separate contractor employed by the Owner, or by changes ordered in the work or by strikes, lock-outs, fire, unusual delay in transportation, unavoidable casualty or any other cause beyond the Contractor's control, then the time of completion shall be extended for such reasonable time as the Owner may decide; provided, however, said time of completion shall be extended upon the following conditions and no other.

(1) Requests for extension of time shall be in writing. No extension of time shall be granted automatically.

(2) The Contractor claiming an extension of time because of any of the contingencies hereinabove mentioned, shall, within ten (10) days of the occurrence of the contingency which justifies the delay, notify the Owner in writing of his claim and the reasons therefor.

(3) In event of a continuing cause of delay only one claim is necessary.

B. Excusable Delays: The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the work due:

(1) 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;

(2) To any acts of the Owner;

(3) To causes not reasonable 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.

(4) To any delay of any subcontractor occasioned by any of the causes specified in subparagraphs (1), (2), and (3) of this paragraph.

C. It is acknowledged between the parties to this Contract that the work to be performed by the Contractor will result in a benefit to all customers of the Owner and that a delay in completion of the work will be detrimental to many customers of the Owner. It is further acknowledged that, while work is in progress, the Owner

shall incur an indeterminable amount of expense as a result of necessary supervision of the work and other overhead and administrative expenses. It is further acknowledged that the work to be performed will permit the Owner to furnish larger amounts of water to its customers for which the Owner shall receive income and that a delay in the work will cause a loss of the income, the exact amount of which is impossible of ascertainment.

It is, therefore, agreed that is there is a delay in 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 Special Conditions, bound herewith, as liquidated damages.

1.18 DISPUTES

A. 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 ten (10) days of commencement of the dispute be presented by the Contractor to the Local Public Agency for decision. All papers pertaining to claims shall be filed in quadruplicate. Such notice need not detail the amount of the claim, but shall state the facts surrounding the claim in sufficient detail to identify the claim, together with its character and scope. In the meantime, the Contractor shall proceed with the work as directed. Any claim not presented within the time limit specified within this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten (10) days of its commencement, the claim will be considered only for a period commencing ten (10) days prior to the receipt by the Local Public Agency of notice thereof.

B. The Contractor shall submit in detail his claim and his proof thereof. Each decision by the governing body of the Local Public Agency will be in writing and will be mailed to the Contractor by registered mail, return receipt requested.

C. If the Contractor does not agree with any decision of the Local Public Agency, he shall in no case allow the dispute to delay the work, but shall notify the Local Public Agency promptly that he is proceeding with the work under protest and he may then except the matter in question from the final release.

1.19 ASSIGNMENT OR NOVATION

A. 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 local Public Agency; provided, however, that assignments to banks, trust companies, or other financial institutions may be made without the consent of the Local Public Agency. 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.

1.20 TECHNICAL SPECIFICATIONS AND DRAWINGS

A. 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, according to their scale, but in all cases of discrepancy in figures or details, the decision of the Engineer shall be obtained before proceeding with the Work. If 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.

1.21 SHOP DRAWINGS

A. 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 in four (4) copies for review (unless otherwise specified) 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 no claim, by the Contractor, for extension of the Contract time will be granted by reason of his failure in this respect.

B. 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.

C. 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 accord with the Plans and Specifications, and approved changes.

D. If the Shop Drawing is in accord with the Contract or involves only a minor adjustment in the interest of the Local Public Agency 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 drawings and specifications. This check is only for review of general conformance with design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner".

1.22 REQUESTS FOR SUPPLEMENTARY INFORMATION

A. It shall be the responsibility of the Contractor to make timely requests of the Local Public Agency for any additional information not already in his possession which should be furnished by the Local Public Agency 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 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.

1.23 REFERENCE TO MANUFACTURER OR TRADE NAME - "OR EQUAL CLAUSE"

A. 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, and be suited to the same use and capable of performing the same functions as that specified, the use of such substitute will not require revisions of related work, and identifying all variations of the proposed substitute from specified and indicating available maintenance service. 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 about 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.

B. 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 City. 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.

1.24 SAMPLES, CERTIFICATES AND TESTS

A. 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.

B. 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.

C. Approval of any materials shall be general only and shall not constitute a waiver of the Local Public Agency'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.

D. 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 Local Public Agency will pay all other expenses.

1.25 PERMITS AND CODES

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

B. 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 Local Public Agency.

C. 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.

D. 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.

1.26 CARE OF WORK

A. 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 Local Public Agency and the Engineer and their employees and agents, against any judgement with costs, which may be obtained as a result of such injury or property damage, because of the alleged liability of the Local Public Agency or of the Engineer.

B. 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 Local Public Agency.

C. 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.

D. In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without special instructions or authorization from the Local Public Agency, 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 Local Public Agency. Any compensation claimed by the Contractor on account of such emergency work will be determined by the Local Public Agency as provided in the Section entitled CHANGES IN THE WORK under GENERAL CONDITIONS.

E. 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, etc., and he shall at his own expense completely repair any damage thereto caused by his operations.

F. 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 Local Public Agency, 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 Local Public Agency, or the Engineer, is liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

1.27 QUALITY OF WORK AND PROPERTY

A. 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.

B. 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 is 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, its 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 Arkansas Law, but if any greater obligations than imposed in this Contract is specified in any such warranty or by Arkansas Law, those greater obligations shall be deemed a part of this Contract and enforceable by the Owner.

1.28 ACCIDENT PREVENTION

A. 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 Safety Code No. 9, Arkansas Department of Labor, 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.

B. 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 Local Public Agency with reports concerning these matters.

C. The Contractor shall indemnify and save harmless the Local Public Agency, 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.

1.29 SANITARY FACILITIES

A. The Contractor shall furnish, install, and maintain ample sanitary facilities for the workmen. 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 Local Government. 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.

1.30 USE OF PREMISES

A. 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 Local Public Agency, or as may be directed otherwise by the Local Public Agency, 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 Local Public Agency are not sufficient to accommodate the Contractor's operations, he shall arrange with the Local Government, or with the owner or owners of private property for additional area or areas, and without involving the Local Public Agency in any manner whatsoever.

B. The Contractor shall comply with all reasonable instructions of the Local Public Agency and the ordinances and codes of the Local Government, regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

1.31 REMOVAL OF DEBRIS, CLEANING, ETC.

A. 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, and put the whole site of the work and public Rights-of-Way in a neat and clean condition. Trash burning on the site of the work will be subject to prior approval of the Local Public Agency and existing State and local regulations.

1.32 RETURN OF OWNER'S MATERIALS, EQUIPMENT OR PROPERTY

A. 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 is specified in the Plans and Specifications. If the Contractor fails to deliver the materials, equipment or other property, its value as determined by the Engineer shall be deducted from amounts due the Contractor.

1.33 OBSERVATION OF WORK

A. 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.

B. 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.

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

D. 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.

E. 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.

F. 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 therefor made by the Owner.

G. 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.

H. 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.

I. 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.

J. 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.

1.34 REVIEW BY LOCAL PUBLIC AGENCY OR OWNER

A. The Local Public Agency, 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, 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 Local Public Agency through its authorized representatives or agents. Representatives of Federal, State, and local government agencies also have the right of physical inspection of the work during work hours.

1.35 PROHIBITED INTERESTS

A. No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or

material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part 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.

1.36 FINAL INSPECTION

A. When the Improvements embraced in this Contract are substantially completed, the Contractor shall notify the Local Public Agency 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 Local Public Agency having charge of observation. If the Local Public Agency 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 each Department of the Local Government and any other involved government agencies when such improvements are later to be accepted by the Local Government and/or other government agencies.

1.37 PATENTS

A. The Contractor shall hold and save harmless the Local Public Agency, its officers, and employees, 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 Local Public Agency, unless otherwise specifically stipulated in the Technical Specifications.

1.38 WARRANTY OF TITLE

A. 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 Local Public Agency 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 Local Public Agency. 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 work when no formal Contract is entered into for such materials.

1.39 GENERAL GUARANTY

A. 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 Local Public Agency 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 of the work. The Local Public Agency will give notice of defective materials and work with reasonable promptness.

END OF SECTION

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

PART 1 – GENERAL

1.01 PROGRESS SCHEDULE

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

(1) Actual date construction is scheduled to start if different from the date of notice to proceed.

(2) Planned contract completion date.

(3) Beginning and completion dates for each phase of work.

(4) Respective dates for submission of shop drawings 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-day condition and shall be available for inspection at the construction site at all times.

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

1.02 DRAWINGS

A. Five (5) sets of Plans and Specifications shall be furnished to the Contractor, at no charge, for construction purposes. If Plans have been reduced to one-half size, three (3) sets of those together with two (2) sets reproduced on the original scale shall constitute the five (5) sets of Plans furnished to the Contractor. Additional copies may be obtained at cost of reproduction upon request.

B. 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.

1.03 RECORD DRAWINGS

A. Before any work is started, the Contractor shall obtain one set of Plans to be used for Record Drawings. 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.

B. 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.

1.04 TRENCH AND EXCAVATION SAFETY SYSTEM

A. The OSHA Standard for Excavation and Trenches Safety System found in 29 CFR 1926, Subpart P requires trench and excavation safety measures for excavations greater than 5 feet. These Standards shall conform to the following requirements.

B. Trench Excavation and Safety System: All work under this item shall be in accordance with the current edition of the OSHA Standard for Excavation and Trench Safety Systems, 29 CFR 1926 Subpart P.

C. The Contractor shall notify all utility companies and Owners in accordance with the OSHA requirements given in 29 CFR 1926.651(b)(2) for the purpose of locating utilities and underground installations.

D. 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.

E. The Contractor may elect to remove and replace or relocate such structures or utilities with the written approval of the Utility Owner, the Engineer, and the Owner.

F. Payment for the work required by this item shall be included in the lump sum price bid for Trench and Excavation Safety listed in the Unit Price Schedule herein. After award of the contract, the Contractor shall submit to the Engineer a breakdown of cost for the trench excavation and safety work involved in the lump sum price bid

and shall, with each periodic payment request, submit a certification by the "competent person" as defined in 29 CFR 1926.650(b) that the Contractor has complied with the provisions of the OSHA Standard for Excavation and Trench Safety Systems, 29 CFR 1926 Subpart P, for work for which payment is requested.

1.05 STORM WATER POLLUTION PREVENTION PLAN

A. The Arkansas Department of Environmental Quality has issued NPDES Permit No. ARR150000 to cover projects disturbing more than one acre. The City has prepared a Storm Water Pollution Prevention Plan to identify the specific and general best management practices to be incorporated in the permit to conform to the ADEQ Permit.

B. The Contractor and his subcontractors will be required to sign the appropriate certification in the Storm Water Pollution Prevention Plan. The provisions of this Plan and revisions thereof shall be strictly adhered to by the contractor and his subcontractors.

C. No additional payments will be made to the contractor for conformance to this Plan other than payment for the specific items of work listed in the Unit Price Schedule. All general compliance cost associated with adhering to the Plan will be considered subsidiary to the general items of the contract.

D. Fines or penalties imposed on the City of Conway by the Arkansas Department of Environmental Quality due to noncompliance with the Permit or Plan will be deducted from payments due the contractor.

END OF SECTION

SECTION 00 74 00

SPECIAL CONDITIONS

PART 1 – GENERAL

1.01 GENERAL

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

1.02 LOCATION OF PROJECT

A. This project is located in the City of Conway, Faulkner County, Arkansas. The work for this project involves construction of a roundabout and associated drainage and other features at the intersection of Irby Ave. and Salem Rd.

1.03 SCOPE OF WORK

A. The work to be performed under this Contract consists of furnishing all materials, labor, supervision, tools and equipment necessary for the construction of the street and drainage improvements as shown on the plans. The work includes the earthwork, removal of unsuitable subgrade material (undercut), crushed stone base course, asphalt paving, concrete curb and gutters, storm drainage pipe, curb inlets and related work for these project.

1.04 TIME ALLOTTED FOR COMPLETION

A. The time allotted for completion of the work shall be one hundred fifty (150) consecutive calendar days, which time shall begin with ten (10) days of the work order or notice to proceed, or upon the date the Contractor moves on the side 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, notifying the Contractor to proceed with the construction of the project, subject to the provisions of this paragraph.

1.05 FORMS, PLANS AND SPECIFICATIONS

A. Forms of Proposal, Contract and Bonds, and Plans and Specifications may be examined and obtained Mayor's Office at the Conway City Hall, 1201 Oak Street in Conway, Arkansas, at the cost of fifty dollars per set ($35.00), no refund will be made. Electronic copies of these documents can also be obtained from the Mayor's office at no charge.

1.06 LIQUIDATED DAMAGES FOR DELAY

A. The Contractor agrees that time is the essence of this Contract, and 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 Five Hundred Dollars ($500.00) as stipulated damages for each day of such delay.

1.07 KNOWLEDGE OF CONDITIONS

A. 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.

A. Any records of surface and subsurface conditions, water conditions, or other observations that have been made by the Engineer or the Owner have been done with reasonable care and accuracy and will be made available to the Contractor for his information. The Contractor acknowledges that there is no expressed or implied guarantee as to the accuracy or interpretation of the records, conditions and hazards involved and that he has not relied upon any representation of the Owner or Engineer.

1.08 COORDINATION OF WORK WITH OTHERS

A. The Contractor shall coordinate his work with the various utility companies serving this area. Utilities are located in close proximity to the work or within the work area and adjustments to utility line and service lines are anticipated. Prior to commencement of work the contractor shall contact Arkansas One Call for field location of all utilities. Anticipated utility conflicts and adjustment of utilities shall be coordinated with the appropriate utility company prior to commencement of construction.

1.09 REFERENCE SPECIFICATIONS

A. Where reference is made in these Specifications to specifications complied 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.

1.10 LAYOUT OF THE WORK

A. The owner will establish and reference the centerline of the construction prior to commencement of work. The contractor will be provided a copy of the pertinent survey data. The contractor shall provide all the necessary construction layout work for proper control of the work. The work shall be performed by a competent surveyor experienced in construction layout work and being a Arkansas Registered Land Surveyor. Initially the contractor shall provide the City Engineer with notes showing surveyed cross sections taken at 100 foot intervals along the street. The surveyed cross section shall show the elevation of the existing street pavement centerline and edges along with ground elevations to the limits of construction. Field set hub or stake elevations set by the contractor shall also be provided to the city.

B. The City Engineer will review the survey data and establish the finished grades for the project or may elect to proceed with the street grades as shown on the plans.

1.11 USED MATERIALS

A. No material which has been used by the Contractor for any temporary purpose whatever is to be incorporated in the permanent structure without written consent of the Engineer.

1.12 MAINTENANCE OF TRAFFIC AND ACCESS TO PRIVATE DRIVES

A. Ingress and egress to residences shall be maintained at all times. With appropriate notification and approval by the engineer, the roadway may be temporarily closed for short periods of time. Temporary driveways and access roads shall be provided as necessary. Appropriate barricades, road closed signage and detour signs shall be provided by the contractor to route traffic thru the construction area.

1.13 NOT USED

1.14 BARRICADES, LIGHTS AND WATCHMEN

A. 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.

B. 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.

C. 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.

1.15 FENCES AND DRAINAGE CHANNELS

A. 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 or better than that in which they were found except as indicated on the Drawings.

B. Where surface drainage channels are disturbed or blocked during construction, they shall be restored to a grade that will provide for positive drainage after the work of construction is completed and prevent any ponding of water.

1.16 NOT USED

1.17 MATERIAL STORAGE

A. 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.

1.18 EXISTING UTILITIES AND SERVICE LINES

A. The Contractor shall be responsible for the protection of all existing utilities or improvements crossed by or adjacent to his operations. The contractor shall be responsible for coordination of the adjustment of utility lines or service lines. The contractor shall meet with Conway Corporation, Center Point Energy, AT&T, and Windstream after initial field marking of the utilities and layout of the construction work to identify required adjustments. The utility companies are responsible for adjustment of their utilities to avoid conflicts with construction. The contractor is responsible for repair of damage to utilities or service lines existing prior to the job or after the required utility adjustment has been completed by the utility company. Where existing utilities or service lines are cut, broken or damaged, the Contractor shall be responsible for payment to the utility company for the utility companies replace or repair of utility lines damaged by the contractors work. The Arkansas One Call service and the Conway Corporation shall be called prior to excavation in an area.

1.19 TESTING, INSPECTION AND CONTROL

A. Testing and control of all materials used in the work shall be done by an approved commercial laboratory employed and paid directly by the Owner, unless otherwise specified in the Technical Specifications. The Contractor shall furnish, at his own

expense, all necessary specimens for testing of the materials, as required by the Engineer.

1.20 BOND

A. 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 bids 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.

B. 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, all payments or money due the Contractor withheld.

1.21 LIGHT AND POWER

A. The Contractor shall provide, at his own expense, temporary lighting and facilities required for the proper prosecution and inspection of the work.

1.22 NOT USED

1.23 LEGAL HOLIDAYS

A. January 1, Memorial Day, July 4, Labor Day, Thanksgiving and December 25 will be considered as being holidays; no other days will be so considered. No engineering observation will be furnished on legal holidays or Sundays, except in an emergency. The Contractor shall observe the legal holidays and Sundays, and no work shall be performed on these days except in an emergency. However, these days shall not be excluded from Contract time.

1.24 PAY ITEM DESCRIPTION

A. The method of measurement and payment of the various pay items listed in the unit price schedule are described in the technical specifications. All items of work not specifically listed in the unit price schedule shall be considered subsidiary to the

items of work listed in the unit price schedule. The contractor shall be responsible for including the cost of items not specifically listed in the various other items of the contract.

B. Included in the items considered subsidiary to the other items of the contract are compaction, maintenance of traffic, temporary driveways, fence relocation, fence remove and replace, removal of existing drainage pipes and removal of concrete driveways and concrete paving.

1.25 SEQUENCE OF CONSTRUCTION

A. Sequence of all phases of work shall be such as to provide for the least possible inconvenience to the Owner and to the operation of this facility. Scheduling of work which would interfere with 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.

B. The successful Contractor shall furnish a proposed work schedule to the Engineer for review and approval as soon as possible after award of the Contract. This schedule shall show anticipated equipment delivery schedules and times of beginning and completing of the several work tasks.

END OF SECTION

SECTION 01 42 19

REFERENCE STANDARDS

PART 1 – GENERAL

1.01 DESCRIPTION

A. The Standard Specifications for Highway Construction, Arkansas State Highway Commission, Current Edition, are referred to herein as Standard Specifications.

B. A copy of the Standard Specifications may be obtained from the Arkansas State Highway Department, Little Rock, Arkansas.

1.02 STANDARD SPECIFICATIONS

A. 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 article number. Each such referenced part shall be considered to be a part of these Contract Documents as though copied herein in full.

B. Certain referenced parts of the Standard Specifications are modified in these specifications that follow. In case of conflict between the Standard Specifications, and the specifications that follow, the specifications that follow shall govern.

1.03 MEASUREMENT AND PAYMENT -- NOT USED

PART 2 – PRODUCTS -- NOT USED

PART 3 – EXECUTION -- NOT USED

END OF SECTION

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers the work required to implement storm water pollution prevention measures, maintain storm water pollution prevention measures and modify storm water pollution prevention measures. The storm water pollution prevention work shall conform to the enclosed storm water pollution prevention plan and other measures as required to prevent sediments and other contaminants from leaving the construction area. The work shall be in accordance with the details shown on the plans, with these specifications and in accordance with the storm water pollution prevention plan.

B. The goal of the storm water pollution prevention work is to minimize the impact the work has on the water quality of the waterways and stream receiving the storm water runoff from this site. The contractor shall take every precaution to conform to the goal.

1.02 STANDARD SPECIFICATIONS

A. The work covered by this section shall be in accordance with SECTION 621 - TEMPORARY EROSION CONTROL ITEMS AND DEVICES, Standard Specifications except as augmented herein.

1.03 STORM WATER POLLUTION PREVENTION PLAN

A. The City has developed a Storm Water Pollution Prevention Plan and Storm Water Permit for this project. The contractor shall perform the construction and maintenance work outlined in the storm water pollution prevention plan.

B. Prior to the City's approval of this contract the contractor and his subcontractors will be required to be signatory parties to the storm water pollution prevention plan. By signing this document the contractor and his subcontractors agree to incorporate the various pollution prevention measures required therein in his project work activities and practices.

C. All fines and penalties imposed on the City by state or federal agencies due to the lack of diligence and conformance to the plan will be deducted from and withheld from payments due the contractor.

D. City personnel will provide the routine inspection and reporting required in the Storm Water Pollution Prevention Plan.

E. Modifications to the plan and maintenance of the storm water pollution prevention measures as required in the regular inspection reports prepared by the City shall be promptly addressed by the contractor. If the corrective measures and maintenance are not made the City will secure assistance from other contractors or companies to perform the needed work and the cost thereof deducted from payments due the contractor.

F. All temporary erosion control items and devices shall be removed and properly disposed of after the appropriate stabilization of the disturbed area as described in the Storm Water Pollution Prevention Plan.

PART 2 – PRODUCTS -- NOT USED

PART 3 – EXECUTION

3.01 CONSTRUCTION METHODS

A. The material and construction methods for installation of the erosion control devices and items required in the storm water pollution prevention plan shall be in accordance with SECTION 621 - TEMPORARY EROSION CONTROL ITEMS AND DEVICES, standard specifications, and in accordance with the details contained in the plans.

3.02 MEASUREMENT AND PAYMENT

A. Temporary Erosion Control Measures and Devices acceptably completed and maintained throughout the project will be measured as follows:
   1. Silt Fence will be measured by the linear foot acceptably installed and maintained and paid for at the contract unit price per linear foot for “Silt Fence,” which price shall be full compensation for all material, labor, equipment, tools and incidentals required to install and maintain the silt fence.
   2. Rock Check Dams will be measured by the ton of rock material acceptably installed and maintained and paid for at the contract unit price per ton for “Rock Ditch Check,” which price shall be full compensation for all material, labor, equipment, tools and incidentals required to install and maintain the rock check dam.
   3. Baled Straw will be measured by the bale acceptably installed and maintained and paid for at the contract unit price per bale for “Baled Straw,” which price shall be full compensation for all material, labor, equipment, tools and incidentals required to install and maintain the straw bales.

END OF SECTION

SECTION 01 89 13

SITE PREPARATION PERFORMANCE REQUIREMENTS

PART 1 – GENERAL

1.01 Description

A. Site preparation includes the removal and disposal of all trees, structures, fences, pavements, and other items that are in the area which is to be excavated, filled, or within the area in which construction equipment must operate to properly perform the work. All work shall be in accordance with the details and information shown on the Plans or as directed by the Engineer and in accordance with these Specifications.

B. The items of work included in this section and considered subsidiary to this item of contract payment are summarized as follows:

1. Clearing and disposal of trees, brush, stumps, logs, and other vegetation in the construction area.

2. Removal and disposal of existing pipe and drainage structures.

3. Stripping of vegetation and topsoil from the work area.

4. Removal and disposal of concrete paving and concrete driveways.

5. Coordination of work with utility companies and property owners.

6. Removal and disposal of existing asphalt pavement.

7. Layout of the work.

8. Removal and replacement of fences.

9. Clean up

10. Cleaning and Grading of Outfall Drainage Ditch

C. Related items of work, including maintenance of traffic, utility protection measures and other items relating to site preparation and clearing are included in these Technical Specifications and in the Special Conditions of these Specifications.

1.02 STANDARD SPECIFICATIONS - Not Used

1.03 MEASUREMENT AND PAYMENT

A. Except as otherwise specified below, Site Preparation, along with other items of work described in this section, will be measured as a lump sum item. Periodic measurement will be made in proportion to the estimated work completed.

B. Site preparation, acceptably completed and measured as provided, will be paid for at the contract unit price per lump sum for "Site Preparation," which price shall be full compensation for all labor, equipment, materials, tools, and incidentals required to complete the work as described herein.

C. Maintenance of traffic; clearing and cleaning of outfall drainage ditch; maintenance, relocation or reconstruction of mail boxes, will not be measured for separate payment but shall be considered subsidiary to the other items of the contract.

D. Construction layout will be measured as a lump sum item with an estimated percentage complete included on the monthly estimate as work progresses. Construction layout acceptably completed will be paid at the contract unit price per complete item for "Construction Layout", which price shall be full compensation for all materials, equipment, labor, tools and incidentals required to complete the work.

E. Crushed stone placed as approved by the engineer for temporary maintenance of traffic and access will be measured by the ton. Measurement will be based on truck weight tickets from the plant or quarry. Crushed stone and asphalt for temporary maintenance of traffic acceptably completed and measured as provided above will be paid for at the contract unit price per ton for "Crushed Stone Base Course", which price shall be full compensation for all materials, labor, equipment, tools and incidentals required to complete the work.

F. If prompt and regular cleanup of the work area is not performed and if proper maintenance of cuts across or in the street are not maintained, the owner will hire others to perform this work as needed and deduct the cost of this work from the amount due the contractor.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.01 Clearing and Cleaning Work Area

A. All trees, brush, rubble, structures and other items within the limits of the construction shall be removed and properly disposed of off the project area and in an area suitable for disposal of waste materials.

B. All excess excavation shall be hauled from the site and properly disposed of.

3.02 Interim and Final Clean-UP

A. The Contractor shall promptly remove and properly dispose of all trees, brush and other items removed during construction. All debris, trash and other objectionable material created by the construction activities shall be promptly removed and disposed of. Piles of dirt, debris, concrete, concrete block, asphalt or gravel shall be cleaned from the yard areas and adjoining right of way weekly.

B. The entire project site shall be cleared of all construction debris prior to final payment to the contractor.

3.03 Disposal

A. If conditions allow and proper permission is received from the city fire chief, the burning of perishable material will be allowed. The material burned shall be under the constant care of a competent watchman until the fire is extinguished. The burning, if allowed, shall be performed in a manner and under conditions that will not be harmful to surrounding vegetation or structures. The Contractor will be held responsible for any damage caused by the burning.

B. All non-combustible material, debris, remains of burning of material or combustible material, if burning is not used or allowed, shall be disposed of at the area designated at the landfill suitable for this type material.

3.04 Drainage Maintenance

A. The Contractor shall perform the work such that drainage ways are not blocked or the flow of storm water from or thru the project area is not restricted.

B. The Contractor shall construct drainage swales as required to prevent ponding of water in the work area.

3.05 Maintenance of Traffic

A. The contractor shall erect the necessary barricades and provide the signage as needed to keep traffic out of the construction area, and provide for uninterrupted flow of traffic around the work area. Open excavations, dropoffs along the edge of roadway shall be properly barricaded to minimize the potential for vehicles or pedestrians from harm.

B. The street shall be maintained open when practical for local residents and service vehicles to access the private residences within the work area.

3.06 Coordination With Utility Companies

A. The contractor shall coordinate the adjustment, protection and relocation of utilities with the Utility Companies serving the area. The Conway Corporation provides water, sanitary sewer, cable T.V., and electrical service to the area. Center Point Energy provides natural gas service. AT&T and Windstream provide telephone service. Adjustments to manholes, water valves, water and sewer service lines, fire hydrants, power poles and other water, sewer, electrical and cable T.V. facilities will be field adjusted by the Conway Corporation. Natural gas services and mains will be adjusted by Center Point Energy. Telephone service lines and cables will be adjusted by AT&T and Windstream.

B. After contacting Arkansas One Call to provide initial utility locations as described herein and completing construction layout of the proposed improvements, the contractor shall determine potential utility conflicts. The contractor shall request field meetings with the various utilities to determine the schedule and location for various utility adjustments. The contractor shall advise the utilities as to the depth and location of the various items of construction including estimated depth of undercut.

C. The contractor will be responsible for protection of the utilities until the relocation is completed. The contractor shall pay the utility for cost incurred to repair a utility service line if the line is properly field located and the damage to the utility is due to his neglect or carelessness.

3.07 Maintenance of Cuts in Street

A. Cuts across or in the street made in conjunction with storm drainage installation of other construction activity shall be maintained at all times to provide a smooth driving surface. A two inch thickness of asphalt shall be placed in the compacted cut to match the surface of the adjacent pavement.

3.08 Maintenance And Construction of Fences

A. Fences along the construction area shall be maintained during construction. Temporary fences may be required in some instances to maintain the security of the industry's facilities. New fences as shown on the plans or designated in the field shall generally be constructed before the fence it is replacing is disturbed.

3.09 Layout of the Work

A. From centerline and baseline set by the owner prior to the commencement of work the contractor shall provide all construction staking and layout. The requirements for the work are generally covered in paragraph SC.10 of the Special Conditions and shall conform to paragraph 635.03 (b) of the Standard Specification for Highway Construction.

B. The contractor shall submit field surveyed cross section data to the City Engineer prior to the setting of grades for the project. The Engineer may elect to revise the profile grade after review of the field data.

END OF SECTION

SECTION 03 00 00

CONCRETE

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers concrete and reinforcing steel for the construction of concrete structures, inlets, curb and gutter, concrete driveways, concrete paving, headwalls and box culvert widening, and other miscellaneous concrete structures shown on the Plans or called for in the Specifications.

B. Additional requirements are as specified in the section of the Specifications covering the several items involved with concrete and with reinforcing steel.

C. All work shall be in accordance with details shown on the Plans and with these Specifications.

1.02 STANDARD SPECIFICATIONS

A. Concrete and reinforcing steel construction as described above shall be accomplished in accordance with the applicable portions of SECTION 802 - CONCRETE FOR STRUCTURES, SECTION 804 - REINFORCING STEEL FOR STRUCTURES, Standard Specifications except as modified or augmented herein.

1.03 MEASUREMENT AND PAYMENT

A. Concrete and reinforcing steel will not be measured for separate payment but shall be considered subsidiary to the other items of the Contract.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Cement

1. Cement shall be Portland cement conforming to AASHO Designation M 85, Type I. If approved by the Engineer, Type III, high-early strength Portland cement, of that designation may be used.

2. If concrete is mixed on the site, cement shall be delivered in plainly marked paper sacks of not less than 94 pounds net weight.

B. Fine Aggregate

1. Fine aggregate shall be clean sand, coarse grained, sharp, and free from clay, loam, vegetable matter or other foreign substances. It shall be washed and screened for reasonably uniform gradation within limits as follows:

Size Square Opening Sieve	Percentage by Weight Passing
3/8"	100
No. 4	95-100
No. 8	70-95
No. 16	45-80
No. 30	20-60
No. 50	5-30
No. 100	0- 5

C. Coarse Aggregate

1. Coarse aggregate shall consist of crushed stone. It shall consist of clean, hard, tough, durable particles free from shale, dirt, lignite or other impurities. It shall be washed and screened for reasonably uniform gradation within limits as follows:

Size Square Opening Screen	Percentage by Weight Passing
1-1/2"	100
3/4"	35-75
3/8"	10-30
No. 4	0- 5

2. When tested in accordance with AASHO Designation T 96, coarse aggregate shall have a percentage of wear not more than 40.

D. Water

1. Water used in mixing concrete and mortar shall be free from injurious amounts of acids, alkalis, oil, sewage and vegetable matter. It shall be fit for drinking.

E. Reinforcing Steel

1. Bar reinforcement shall conform to ASTM Designation A 615 up to and including No. 18 sizes. All bars shall be of deformed type conforming to current specifications of AASHO Designation M 137. All reinforcing steel shall be Grade 60.

2. Mesh reinforcement for concrete shall be cold-drawn steel wire for concrete reinforcement conforming to ASTM Designation A 82.

F. Joint Materials

1. Premolded expansion joint filler strips shall be one-half (1/2) inch in thickness, of the size and shape shown on the plans or as required, and shall conform to the requirements of AASHO Designation M 33.

2. Joint compound, pouring type, shall be delivered to the project in the manufacturer's sealed containers. It shall conform to the requirements of AASHO Designation M 173.

3. Roofing felt shall conform to subparagraph 802.2 (d) Roofing, SECTION 802, CONCRETE FOR STRUCTURES, Standard Specifications.

2.02 COMPOSITION AND STRENGTH OF CONCRETE

A. Concrete shall be composed of Portland cement, fine and coarse aggregates, and water proportioned in keeping with the following:

1. Minimum sacks of cement per cubic yard -- 6
2. Consistency range in slump, inches -- 2-4

B. Proportioning of concrete shall be by weight except that water may be measured by volume.

1. A 1-cubic foot sack of Portland cement will be considered 94 pounds in weight.
2. A gallon of water will be considered as weighing 8.33 pounds.

C. Concrete made with ordinary Portland cement shall have a minimum compressive strength at 28 days of 3,000 pounds per square inch; if made with high-early-strength cement, that strength shall be attained at the age of 7 days.

2.03 REINFORCING STEEL

A. Steel reinforcement shall be free from rust, scale, and from mortar, dirt or other objectionable coatings. It shall be placed accurately in accordance with details shown on the plans and properly secured in position.

B. Bar reinforcement shall be bent cold.

1. Where bars are used in concrete which will remain in contact with earth surfaces, the bars shall be supported in position by framing, and by wire as needed, in such manner that the supports shall not remain as protrusions through the surface of the concrete; wires shall be cut off and pushed down into the concrete before the concrete has had initial set.

2. Where concrete is poured on horizontal forms, bars shall be supported by metal chairs.

C. Splices

1. Bar reinforcement shall be spliced where shown on the plans. Unless otherwise shown on the plans, the lap at each splice shall be 32 times the bar diameter.

PART 3 - EXECUTION

3.03 MIXING

A. Ready-mixed Concrete

1. Ready-mixed concrete may be used at the option of the Contractor if acceptable concrete is delivered. Ready-mixed concrete shall conform to ASTM Designation C 94 and to applicable portions of these specifications for on-site mixing. The concrete shall be delivered and placed within one (1) hour after all materials, including mixing water, shall have been placed in the mixing drum.

2. The Contractor shall obtain from the supplier of the ready-mixed concrete the supplier's agreement to inspection by the Engineer, to the full extent deemed necessary by the Engineer.

3. Water may be added at the job site only with specific approval of the Engineer.

B. Critical Temperatures

1. Concrete shall not be mixed and placed when the descending temperature is less than 40°F., or a rising temperature is less than 35°F. Temperatures shall be taken in the forms or other points of concrete placement. Concrete shall not be placed when there is frost or ice on forms. In the mixing of concrete, particles of frozen aggregate shall not be used.

2. If the Contractor desires to overcome the restrictions of subparagraph (1) next above, with respect to the stated temperatures, he shall provide heating equipment adequate to maintain a temperature surrounding the concrete of not less than 40°F for a 7 day period. The Contractor shall be responsible for any defective work, and shall replace such work at his own expense.

3.04 FORMS

A. Forms shall be constructed to the shape, form, lines and grade required, and shall be maintained sufficiently rigid to prevent deformation or displacement under load.

B. Forms may be constructed of any material having sufficient strength which will permit a surface of satisfactory finish. They must be sufficiently tight to prevent the

escape of mortar in appreciable quantity. Forms shall be clean, and oiled with form oil before concrete is placed. Care shall be exercised to avoid any coating of the reinforcing steel with form oil.

C. Forms shall be set true to the required grade and alignment, and shall be supported rigidly during the entire operation of placing and finishing of concrete. The alignment and grade of all forms set shall be approved before and immediately prior to the placing of any concrete against them.

D. Forms for the tops of inlets and junction boxes shall be placed after the inside wall form are removed, or the wall form shall be cut so as to permit the flow of water while the top form is in place. The top form shall be supported in such manner as not to impede the flow of water while forms are still in place.

E. All form removal shall be accomplished in such manner as to avoid injury to the concrete. Except as otherwise specifically authorized by the Engineer, forms for the concrete items listed below shall not be removed prior to the expiration of periods of time as follows:

1. Sidewalks, Curbs, Curb and Gutter, Headwalls -- 24 hours
2. Inside Walls for Inlets and Junction Boxes -- 24 hours
3. Outside Walls for Inlets and Junction Boxes -- 36 hours
4. Any Load-bearing Form -- 14 days

F. The Contractor shall be responsible for damage caused by premature removal of forms.

3.05 JOINTS

A. Joints shall be formed in the positions, and according to the details shown on the plans. Concrete shall be monolithic from neat lines to joints and from joint to joint.

B. Construction joints not specifically shown on the plans are to be avoided, but if made shall be as approved by the Engineer, and shall be made and located so as to minimize impairment of the strength of the structure. Where any construction joint is to be made, the surface of the concrete in place shall be roughened and cleaned thoroughly and all laitance, loose aggregate, and foreign matter removed. Forms shall be tightened as needed. Joints shall be wetted thoroughly immediately before placing the new concrete. Excess water shall be drained from the surface of the joint before the new concrete is placed.

3.06 PREPARATION FOR PLACING CONCRETE

A. Excavations for foundations shall be prepared in accordance with the applicable portions of SECTION 31 23 16 - UNCLASSIFIED EXCAVATION. Water shall be removed from excavations before concrete is deposited, and all loose particles and debris

removed therefrom. The bottom of excavations shall be moistened, but not made muddy, before the concrete is deposited.

B. The interior of forms shall be cleaned of all sawdust, chips, other construction debris, and all foreign matter.

C. Steel reinforcement will be inspected and shall be approved prior to the placement of concrete. Runways for buggies or wheelbarrows shall not be supported on the reinforcement.

3.07 PLACING CONCRETE

A. General
1. Concrete shall be placed only upon firm surfaces that are free from frost, ice, mud, and other detrimental substances.

2. Concrete shall be placed in such a manner as to avoid segregation, and to avoid displacement of reinforcement. Concrete shall be deposited as closely as feasible to its final position. Concrete shall not be dropped freely for distances greater than those specified as follows:
   a. Sidewalks, Curb, Curb and Gutter -- 2 feet
   b. Retaining Wall Footings -- 3 feet
   c. Retaining Walls, Inlets/Junction Box bottoms/walls -- 5 feet
   d. Tops of Inlets and Junction Boxes -- 5 feet
   e. Headwalls -- 5 feet

3. Concrete shall be placed to the lines, grade and sections shown on the plans or as directed by the Engineer. Care shall be exercised in the placing of concrete that the forms are not displaced. Honeycomb shall be prevented by proper manipulation and compaction of the concrete.

B. Curb, and Curb and Gutter
1. Vibrating of the concrete will not be required if other methods of manipulation obtain acceptable results.
2. Curb and gutter shall be shaped without the use of mortar or additional cement. When the concrete has hardened sufficiently, the exposed edges of the curb and gutter shall be edged with an edging tool having a radius of approximately one-eight (1/8) inch.

C. Sidewalks
1. Concrete shall be spaded carefully, particularly along the edges to avoid the occurrence of honeycomb and in such manner as to avoid the introduction of dirt into the concrete. A vibrator shall not be used.
2. Sidewalk shall be one-course construction with mortar topping. The exposed edges of the sidewalk shall be edged with an edging tool having a radius of

approximately one eighth (1/8) inch.

3. The sidewalk shall be stuck off with a screed or straight edge to true grade. All scum, debris, and excess water shall be worked off the surface.

4. Concrete shall be placed to the thickness of the structural element being poured, but in no case in layers over 18 inches deep. Each layer shall be compacted by mechanical internal-vibrating equipment, supplemented by such hand spading, rodding and tamping as the Engineer may direct. Vibrators shall not be used to transport concrete inside forms over distances so great as to cause segregation.

5. The use of form vibrators is not acceptable. Internal vibrators shall be capable of transmitting vibration to the concrete at frequencies not less than 4,500 impulses per minute. Duration of vibration shall be limited to the time necessary to produce satisfactory consolidation without causing objectionable segregation. The vibrator shall not be inserted into lower courses previously vibrated. Vibrators shall be applied in a substantially vertical position, and at uniformly spaced points nor further apart than the visible effectiveness of the vibrator.

6. For the last lift of any structural element, the concrete shall be struck off with a screed or straight edge to true grade. All scum, debris, and excess water shall be worked off the surface and the surface shall be finished in accordance with paragraphs 3.06 and 3.07.

3.08 FINISHING

A. Curb, and Curb and Gutter
   1. Gutters to remain exposed in the completed work and top of curb shall be given a steel trowel finish, followed by a light brushing.

   2. If face form is used, the battered face of curbs shall be given a carborundum stone finish as specified below for exposed surfaces. If a face form is not used, finish shall be as specified in (1) next above.

B. Sidewalk shall be given a steel trowel finish and shall be lightly broomed or brushed to produce a uniform surface of slightly roughened texture.

C. All other surfaces which will remain exposed in the completed work shall be wetted thoroughly and rubbed with a medium-grit carborundum stone, followed by a second rubbing with a fine-grit carborundum stone, to obtain an entire surface of smooth texture and uniformity in color. A cement wash to plaster coat shall not be used.

D. All concrete shall be finished in accordance with stipulations as follows:

1. General
    a. Defective concrete, whether exposed or unexposed, shall be repaired or replaced as directed by the Engineer.

2. Formed surfaces
    a. All form tie rods shall be removed, and all tie wires shall be cut back 1/4 inch. The resulting holes and depressions shall be pointed with mortar.

3. Unformed surfaces
    a. Surfaces not to remain exposed in the completed work need have no further finish if carefully struck off as required in paragraph 3.05.

3.09 CURING

A. Immediately after placing or finishing, concrete surfaces shall be protected against moisture loss. Where formed surfaces are cured in the forms, the forms shall be kept wet. If the forms are removed before the end of the curing period, curing shall be continued for the remainder of the period using suitable means.

B. All concrete, other than retaining wall, headwall footings, and bottom slabs of inlets and junction boxes shall be cured for a period of at least five (5) days.

C. Curing shall be accomplished by one of the methods, or combination of methods, described as follows:
    1. The surface shall be covered with burlap, cotton mats or other suitable fabric kept in intimate contact with the surface, or with sand which shall be kept continuously wet.

    2. The entire surface shall be covered with a white pigmented curing compound, applied in a two-coat, continuous operation. Application shall be not less than 1 gallon for 150 square feet of surface for each coat. The compound shall conform to the requirements of AASHO Designation M 148.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 – GENERAL

3.01 DESCRIPTION

A. This section covers all earthwork necessary for the construction of streets, sidewalks, curb and gutter, drainage ditches, embankments, site work, and disposal of excavated materials unsuitable for use in fills or backfills.

B. This section covers the preparation and compaction of subgrade upon which base, curb and gutter, and sidewalks are to be constructed, the compaction of the ground surface upon which embankment is to be constructed, and the compaction of the embankment.

C. All work shall be in accordance with lines and grades shown on the plans, or as established by the Engineer, and with these specifications.

3.02 STANDARD SPECIFICATIONS

A. Structural excavation and backfill are covered in SECTION 31 23 16 - UNCLASSIFIED EXCAVATION, of these specifications.

3.03 MEASUREMENT AND PAYMENT

A. Excavation to plan street grades shown on the plan, unclassified excavation, and embankment material or fill required to achieve the subgrade elevation shown on the plans has been estimated from original cross sections. This will be the quantity used for final payment subject to any adjustments made in the elevation or typical section during the construction of the project.

B. Earthwork, as specified in this section, will be paid for at the contract unit price bid per cubic yard for "Unclassified Excavation" or “Compacted Embankment”, as the case may be, which price shall be full compensation for all excavation, including blasting and or ripping if required; for stripping; for compaction and preparation of embankment; excavation of material, loading, hauling and for all equipment, tools, labor and incidentals necessary to complete the work.

C. Undercut or removal of unsuitable subgrade material will be field

measured by taking cross sections of the area that is designated for undercut. Measurement will be made from the subgrade elevation or existing ground, whichever is the lower, to the lower limits of the undercut. Excavation above the subgrade elevation will be measured as unclassified excavation.

D. Payment for undercut and backfill acceptably completed and measured as provided above will be made at the contract unit price for "Undercut and Select Backfill" which price shall be full compensation for all labor, equipment, material (including hauled in select backfill material), tools and incidentals required to complete the work.

E. Crushed stone backfill, used as backfill for excavation of unsuitable material as directed the Engineer, acceptably completed will be measured by the ton and paid for at the contract unit price per ton for “Aggregate Base Course” which price shall be full compensation for all material, labor, equipment, tools and incidentals required to complete the work.

F. Compaction of earthwork will not be measured for separate payment, but will be considered subsidiary to the several items of the contract.

G. Stripping and stockpiling topsoil, placement of topsoil over earthen area behind curb, shaping and grading area behind curb will not be measured for separate payment, but will be considered subsidiary to the several items of the contract.

PART 2 – PRODUCTS -- NOT USED

PART 3 – EXECUTION

3.01 EXCAVATION

A. All excavation shall be classed as Unclassified Excavation and shall include all excavation performed under this item regardless of the material encountered. Removal of existing pavement, and other existing improvements, is covered in SECTION 01 89 13 - SITE PREPARATION, of these specifications.

B. Excavation shall include the removal and satisfactory disposal of all material within the normal or widened limits of the typical section in excavation. It shall include such shaping and sloping as is necessary for the construction,

preparation and completion of all embankments and subgrades to the required alignment, grade and typical cross sections shown on the plans, or as directed by the Engineer.

C. To the extent suitable and needed, excavated material shall be used in backfill or fills. Such material shall be free from frozen material, trash, lumber, broken pieces of concrete having any dimension greater than 2 inches, or broken concrete in nests regardless of dimensions, or other debris. Such material shall be susceptible to proper compaction.

D. Excavated material unsuitable for use or in excess of needs shall be disposed of by the Contractor off-site.

3.02 OVER-EXCAVATION

A. Where excavation is carried below or beyond that required, the space shall be filled to grade with suitable material and thoroughly compacted to the subgrade density in lifts not exceeding 8 inches in thickness.

3.03 USE

A. Suitable excavation shall be used for the forming of embankment and, where needed, for backfilling.

B. Embankment and backfills will not be measured for separate payment, but shall be considered subsidiary work pertaining to the several items of the Contract.

C. Excavation unsuitable for use shall be disposed of by the Contractor off-site.

3.04 EMBANKMENT

A. Embankment shall be constructed in accordance with applicable parts of SECTION 210.11 - EMBANKMENT CONSTRUCTION, Standard Specifications.

B. Compaction shall be in accordance with the provisions of the following subsection 3.05.

C. Embankment material may be suitable material as described in the following subsection 3.06.

3.05 COMPACTION OF EARTHWORK

A. Compaction shall be in accordance with applicable parts of SECTION 210.10 - COMPACTION REQUIREMENTS, Standard Specifications and Supplemental Specifications, except as herein modified.

B. All compaction, except for sidewalk, shall be to a density not less than ninety five (95) percent of the maximum density, at optimum obtained in the laboratory. Samples of laboratory tests and field determination will be taken by the Engineer and at the expense of the Owner, except that the Contractor shall assist the Engineer in the making of field determinations.

C. The moisture-density relation of the material shall be determined in the laboratory in accordance with AASHTO Designation T-99, using material passing a three-fourth (3/4) inch sieve. The field determination of material in place shall be in accordance with AASHTO Designation T-191.

D. The Contractor will not be required to furnish a field laboratory.

E. Compaction for sidewalks shall be to a density of not less than ninety (90) percent of the maximum density.

F. Attention is called to the fact that Special Compaction of Earthwork is not included in the Proposal Schedule and will not be paid for directly.

3.06 EMBANKMENT MATERIAL

A. Embankment material and/or borrow material required to replace undercut areas shall consist of a satisfactory soil, or a mixture of soil and stone or gravel, or other acceptable material, free from sod, stumps, logs, roots or other perishable or deleterious matter, and shall be capable of forming a stable embankment when compacted. The material shall have a maximum PI of 10 and generally be consider a sandy clay with maximum side of large rocks of 6". The embankment material shall be approved by the engineer prior to be utilized on this project.

B. Embankment material shall be used in the filling of areas undercut to remove unsuitable subgrade, holes created by the removal of structure, trees or pipes, the forming of embankments and the making of backfills, when a sufficient amount of suitable material, from excavation and structural excavation is not available. In general, embankment material is not to be used until suitable materials from excavation and structural excavation have been exhausted. In any event, the Contractor shall be responsible for the premature introduction of embankment material. In case such introduction causes a waste in excavation or structural excavation,

the volume of such waste shall be deducted from the measurement of embankment materials. Embankment material shall be placed in maximum uncompacted lift thicknesses of 8" and each lift compacted in accordance with paragraph 3.05 above.

3.07 SUBGRADE PREPARATION

A. The subgrade for the base course shall consist of shaping and compacting and otherwise preparing the roadbed. The subgrade shall be prepared in accordance with SECTION 212 - SUBGRADE of the Standard Specifications. Scarifying to a depth of 8" and compaction at optimum moisture content to 95% maximum density as described in paragraph 3.06 above. Equipment specifically designed for earthwork compaction shall be utilized (sheep foot roller or other equipment as approved by the engineer).

3.08 REMOVAL OF UNSUITABLE SUBGRADE MATERIAL

A. The Contractor shall remove material deemed as unsatisfactory for subgrade at the locations and within the limits defined by the Engineer. The unsuitable material shall be properly disposed of by the Contractor.

B. Select subgrade material as described in paragraph 3.07 above shall be obtained for replacing the unsuitable material. The material must be approved by the Engineer before it can be used as select subgrade material.

3.09 FINISHED SURFACE PREPARATION BEHIND CURB

A. The earthen area disturbed by construction behind the curb shall be filled to final grade with 4 to 6 inches of topsoil material stripped from the site at the beginning of the project. The final 4” to 6” surface layer shall be free of concrete, crushed stone, asphalt, gravel, rocks, tree roots or limbs or items other than soil material or decaying vegetation.

B. The area shall be graded and shaped to provide a smooth mowable surface free of humps, ruts or depressions, suitable for mowing with a hand pushed lawn mower. The area shall be shaped and graded to transition the surface to match the adjacent top of curb, driveway, walks, drainage structures. The surface shall be seeded or sodded as directed by the engineer. The area shall be shaped and graded to drain properly with no ponding of water on the area or adjacent to the finished seeded or sodded area. Drainage swales shall be constructed as required to route

surface water for the yard area or adjacent Right of way into openings in storm drainage structures or other outlet areas for the water.

C. The proper finishing of the final surface along the limits of the project is considered, by the owner, as a very important part of this project. Funds will be retained until the finished area along the streets has been properly completed.

3.10 STONE BACKFILL

A. At locations designated by the engineer stone backfill may be used to fill small undercut areas. The stone backfill shall conform to SECTION 207 - STONE BACKFILL, Standard Specifications.

END OF SECTION

SECTION 31 23 16

UNCLASSIFIED EXCAVATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers the removal of all materials of whatever nature necessary for the construction of pipe culverts, storm drainage piping, headwalls, box culverts and other concrete drainage structures. Excavation described herein will not be measured for separate payment but shall be considered subsidiary work pertaining to the involved items of the contract.

B. All work shall be in accordance with details shown on the plans, or as directed by the Engineer, and with these specifications.

1.02 STANDARD SPECIFICATIONS

A. The work involved in unclassified excavation for structures shall be in accordance with SECTION 801 - EXCAVATION AND BACKFILLING, Standard Specifications, for the structures involved and except as modified or augmented herein.

B. Other requirements for pipe culverts are specified in SECTION 33 42 13 - PIPE CULVERTS, of these specifications.

C. Any material used in backfills, or fills under the pavement, shall conform to the requirements of SECTION 31 00 00 – EARTHWORK, of these specifications.

1.03 MEASUREMENT AND PAYMENT

A. Structural excavation for all structures, including pipe and box culverts, inlets and junction boxes and head walls will not be measured for separate payment but will be considered subsidiary work pertaining to the construction of the items.

PART 2 – PRODUCTS -- NOT USED

PART 3 – EXECUTION

3.01 EXCAVATION FOR PIPE CULVERTS AND OTHER STRUCTURES

A. Trench width at the horizontal centerline of a pipe culvert shall not exceed nominal inside diameter of the culvert plus 2 feet.

B. Areas of excavation for headwalls, inlets, and junction boxes shall be elected 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 18 inches outside the structures.

3.02 DISPOSAL OF EXCAVATED MATERIAL

A. To the extent suitable and needed, excavated material shall be used in backfill or fills. Such material shall be free from frozen material, trash, lumber, broken pieces of concrete having any dimension greater than 2 inches, or broken concrete in nests regardless of dimensions, or other debris. Such material shall be susceptible to proper compaction.

B. Excavated material unsuitable for use or in excess of needs shall be disposed of by the Contractor off-site.

3.03 BACKFILL

A. Backfill shall be made from suitable structural excavation materials and from suitable roadway excavation materials if and as needed. Such materials shall conform to the requirements of paragraph 1.02 above.

B. Backfill shall be compacted to a density not less than ninety percent (90%) of the maximum density, at optimum moisture, obtained in the laboratory, in accordance with AASHO Designation T 191. Samples for laboratory tests and field determinations will be taken by the Engineer at the expense of the Owner; the Contractor shall give assistance when requested.

C. Backfill shall not be placed against concrete structures until the expiration of the curing periods specified in paragraph SECTION 03 00 00 - CONCRETE.

D. 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.

E. Backfill of structure, 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.

F. Backfill of pipe culverts shall be in accordance with the following:

1. Backfill material shall be deposited simultaneously on both sides of the pipe in layers not exceeding 6 inches in thickness, loose measurement. It shall be compacted thoroughly under haunches of pipe on both sides for the full width of trench. This operation shall be continued to the elevation 12 inches

above the top of pipe.

2. Backfilling shall proceed uniformly along the entire section of pipe being backfilled. The Contractor shall be responsible for any damage to or displacement of pipe.

3. Backfill above the elevation 12 inches higher than the top of pipe may be compacted by any method which will obtain the required density and which will cause no damage to displacement. Flooding of trenches will not be acceptable.

4. Backfill of pipe shall be carried to the elevations of the adjoining subgrade or as specified in Part 3.01 of SECTION 33 42 13 – PIPE CULVERTS.

5. Backfill will not be measured for separate payment. Placing and compacting of backfill shall be considered subsidiary work pertaining to structural excavation.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSE

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers all work in connection with the construction of crushed stone base course.

1.02 Standard Specifications

A. Materials and work for crushed stone base course shall be Class 7 Aggregate Base Course in accordance with SECTION 303 - AGGREGATE BASE COURSE, Standard Specifications unless modified or augmented herein.

B. Subject to approval of the Engineer, material will be acceptable from crushing plants which currently are, or recently have been supplying crushed stone material meeting the specifications of the Arkansas State Highway Commission for aggregate base material, Class 7.

1.03 Measurement and Payment

A. 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 Paragraph 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 shall 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.

B. 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", 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.

PART 2 PRODUCTS - NOT USED

PART EXECUTION

3.01 MAINTENANCE

A. The Contractor shall maintain the base course until, and during the construction of the asphaltic concrete wearing course. He shall repair at his own expense any defects which may develop.

END OF SECTION

SECTION 32 12 13

PREPARTORY COATS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Prime coat shall consist of a single application of bituminous material, applied on the completed and approved crushed stone base course, at the rate shown on the plans or approved by the Engineer.

B. Tack coat shall consist of a single application of bituminous material, applied on existing asphalt or concrete pavement and on new asphalt binder, at the rate shown on the plans or as approved by the Engineer.

C. All work under this section shall be in accordance with details shown on the plans and with these specifications.

1.02 STANDARD SPECIFICATIONS

A. Materials and work for this section shall be in accordance with SECTION 401 - PRIME AND TACK COATS, and SECTION 403 MATERIALS AND EQUIPMENT FOR PRIME, TACK, AND ASPHALT SURFACE TREATMENT, Standard Specifications, that concerns prime coats and tack coats, unless modified or augmented herein.

1.03 MEASUREMENT AND PAYMENT

A. Prime coat and tack coat will not be measured for separate payment but shall be considered subsidiary to asphalt pavement.

PART 2 – PRODUCTS

2.01 MATERIAL

A. The type of bituminous material to be used is not designated on the plans or in these specifications, except that, in general, prime coat be a medium curing cut back asphalt and tack coat shall be an emulsified asphalt. The Engineer will elect the particular grade of asphalt, depending on the season of the year and texture of the base material.

PART 3 – EXECUTION -- NOT USED

END OF SECTION

SECTION 23 12 16

ASPHALT PAVING

1.01 DESCRIPTION

A. This section covers the asphaltic concrete hot mix surface course constructed upon the binder course or the crushed stone base course and prime coat. All work shall be in accordance with details shown on the plans and with these specifications.

1.02 STANDARD SPECIFICATIONS

A. The work shall be in accordance with the following sections of the Standard Specifications, except as modified or augmented herein;

1. SECTION 405 - ASPHALTIC CONCRETE HOT MIX BASE COURSE
2. SECTION 406 - ASPHALTIC CONCRETE HOT MIX BINDER COURSE
3. SECTION 407 - ASPHALTIC CONCRETE HOT MIX SURFACE COURSE

B. Materials and equipment shall be as specified in SECTION 409 - MATERIAL AND EQUIPMENT FOR HOT MIX BITUMINOUS BINDER AND SURFACE COURSES, Standard Specifications, except as modified or augmented herein.

C. Construction methods shall be in accordance with SECTION 410 - CONSTRUCTION METHODS FOR HOT MIX BITUMINOUS BINDER AND SURFACE COURSES, Standard Specifications, except as modified or augmented herein.

1.03 MEASUREMENT AND PAYMENT

A. Asphaltic concrete hot mix surface courses will be measured by the ton of two thousand (2,000) pounds, as determined by plant weights. Measurements shall include only the actual amounts placed within the lines shown on the plans, or as directed by the Engineer.

B. Asphaltic concrete hot mix surface courses acceptably completed and measured as provided above, will be paid for at the Contract unit prices per ton bid for "Asphalt" which prices shall be full compensation for furnishing all materials; and for all equipment, tools, labor and incidentals necessary to complete the work.

PART 2 – PRODUCTS

2.01 BITUMINOUS MATERIALS

A. Penetration grade shall be 85-100. The Asphalt Surface Course shall conform to the mix design for Type 3 surface course.

PART 3 - EXECUTION

3.01 TEMPERATURE LIMITATIONS

A. The placing and mixing of Asphaltic Concrete Hot Mix Surface Course shall comply with the requirements of paragraph 410.12, SECTION 410 - CONSTRUCTION METHODS FOR HOT MIX BITUMINOUS BINDER AND SURFACE COURSE, Standard Specifications, except that asphaltic materials shall not be placed during rainy weather without approval by the Engineer.

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING AND DRIVEWAYS

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers the construction of concrete paving as shown on the plans or as directed by the engineer.

B. This section covers the reconstruction of driveways disturbed by construction. The driveways shall be replaced with the same surfacing and materials as exist prior to construction unless otherwise shown on the plans or approved by the engineer.

1.02 STANDARD SPECIFICATIONS

A. Materials for concrete sidewalks and handicap ramps shall conform to the requirements of SECTION 03 00 00 - CONCRETE of these specifications and SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Standard Specifications.

1.03 MEASUREMENT AND PAYMENT

A. Concrete driveways will be measured by the square yard.

B. Concrete driveways 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 reinforcing steel that might be required, for preparation of the subgrade; and for all equipment, tools, labor and incidentals necessary to complete the work.

C. Asphalt driveway extensions shall be measured and paid for as set forth in SECTION 32 11 23 - AGGREGATE BASE COURSE, SECTION 32 12 13 – PREPARATORY COATS, and SECTION 32 12 16 - ASPHALT PAVING.

D. Gravel driveway extensions shall be measured and paid for in accordance with SECTION 32 11 23 - AGGREGATE BASE COURSE.

E. Concrete driveway extensions will be measured by the square yard. They will be paid for as specified in paragraph (B) above, except that concrete driveway extensions shall be substituted for concrete driveways.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The construction material of the extensions shall generally conform to the material of the existing driveways.

B. Materials for concrete paving, concrete driveways and extensions shall conform to the requirements of SECTION 03 00 00 - CONCRETE and construction shall be in accordance with SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Standard Specifications.

C. Materials for asphalt driveway extensions shall be in accordance with applicable portions of SECTION 32 11 23 – AGGREGATE BASE COURSE, SECTION 32 12 13 – PREPARATORY COATS and SECTION 32 12 16 - ASPHALT PAVING of these specifications.

D. Materials for gravel driveways shall be in accordance with SECTION 32 11 23 – AGGREGATE BASE COURSE.

PART 3 – EXECUTION

3.01 CONTRUCTION METHODS

A. The construction of driveways shall be done in accordance with applicable sections of these specifications for the type of construction material specified. Sections considered applicable are as follows:

1. SECTION 31 00 00 – EARTHWORK
2. SECTION 32 11 23 – AGGREGATE BASE COURSE
3. SECTION 32 12 13 – PREPERATORY COATS
4. SECTION 32 12 16 - ASPHALT PAVING

3.02 PLANE OF DEMARCATION

A. The plane defining the street edge of a driveway is that vertical plane which passes through two (2) points described as follows:

1. One (1) point is on the back of curb, on one (1) side of driveway center line, at the point of curvature of the arc running toward the right-of-way line.

2. The other point is the corresponding point on the back of curb on the other side

of driveway center line.

B. Measurements of curb and gutter will include the distance between the two (2) points of curvature described above.

END OF SECTION

SECTION 32 16 13

CONCRETE CURB AND GUTTER

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section shall consist of the construction of concrete curb and gutter at the locations shown on the plans or as directed by the Engineer.

1.02 STANDARD SPECIFICATIONS

A. Materials and work for concrete curb and concrete gutter shall be in accordance with SECTION 634 - CURBING, Standard Specifications, except as modified by SECTION 03 00 00 - CONCRETE of these specifications and except as modified or augmented in this section of the specifications.

B. Tests shall be in accordance with SECTION 00 72 00 - GENERAL CONDITIONS paragraph 1.24, SAMPLES, CERTIFICATES AND TESTS, and SECTION 03 00 00 – CONCRETE, of these specifications.

1.03 MEASUREMENT AND PAYMENT

A. Work required by this section shall be measured by the linear foot. Each continuous section of the concrete curb and concrete curb and gutter constructed, will be measured along the back edge of the curb; measurements shall include the space occupied by all joints. Measurements shall include distances across driveways. The quantity on the estimate will be the sum of the several measurements, to the nearest 0.1 linear foot.

B. Work acceptably completed and measured as provided above will be paid for at the Contract unit prices per linear foot bid for "Concrete Curb" or for "Concrete Curb and Gutter," as the case may be, which prices shall be full compensation for furnishing all materials, including joint material, and for all reinforcing steel; for all excavation, fine grading, and backfilling; for placing, finishing and curing; and for all equipment, tools, labor and incidentals necessary to complete the work.

PART 2 – PRODUCTS

2.01 FORMS

A. Paragraph 634.03(b) shall be augmented as follows:

1. Forms 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.

PART 3 - EXECUTION

3.01 PLACING AND FINISHING

A. That part of Paragraph 634.03(b)(2) 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 insure 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 one-eighth (1/8) inch.

3. As the Contractor may elect, shaping may be done by a steel screed, shaped to exact curb and gutter section, riding upon the tops of front metal templets. 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 templets are used to control shape, they shall be of metal securely fastened in position at intervals not exceeding ten (10) feet. Templets shall be normal to

the grade of the gutter and to the center line of roadway.

3.02 JOINTS

A. Paragraph 634.03(d), Joints, for concrete curb and gutter shall be deleted in its entirety, and substituted therefor shall be the following:

1. Premolded expansion joint material shall be placed between curb and any concrete construction that otherwise would abut upon it. Joint material shall be one-half (1/2) inch thick, with a width sufficient to obtain complete separation.

2. Expansion joints of one-half (1/2) inch premolded material shall be constructed at the ends of curb and gutter, at the points of curvature of returns to streets and driveways. Intermediate joints shall be constructed so that the maximum distance between joints is sixty (60) feet. The joint material shall extend entirely through the curb and gutter, and, before the joint can be considered completed, must be trimmed to curb and gutter section. Joints shall be normal to the grade of gutter and the center line of the roadway. Contraction joints shall be placed at ten (10) foot intervals between expansion joints, and otherwise shall conform to paragraph 501.05(j)(3) dealing with contraction joints in SECTION 501 – PORTLAND CEMENT CONCRETE PAVEMENT, Standard Specifications.

3. Premolded joint material shall be of the non-extruding type, and shall conform to AASHO Designation M 33.

4. All joints shall be sealed with material meeting the requirements of SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Paragraph 501.02(h), Standard Specifications.

3.03 PLACEMENT

A. Concrete curb and concrete curb and gutter shall be one-course, monolithic, between expansion joints.

END OF SECTION

SECTION 32 20 00

CONCRETE SIDEWALK AND ACCESS RAMP

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers the construction of Sidewalk and Access Ramp as shown on the plans.

1.02 STANDARD SPECIFICATIONS

A. Materials for concrete sidewalks and handicap ramps shall conform to the requirements of SECTION 03 00 00 - CONCRETE of these specifications and SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Standard Specifications.

1.03 MEASUREMENT AND PAYMENT

A. Concrete Sidewalk and Access Ramps acceptably completed will be measured by the square yard.

B. Concrete sidewalk acceptably completed, and measured as provided above, will be paid for at the Contract unit price per square yard bid for “Concrete Sidewalk,” which price shall be full compensation for furnishing all materials, including reinforcing steel that might be required, for preparation of the subgrade; and for all equipment, tools, labor and incidentals necessary to complete the work.

C. Access Ramps acceptably completed, and measured as provided above, will be paid for at the Contract unit price per square yard bid for “Access Ramp,” which price shall be full compensation for furnishing all materials, including truncated dome detectible warning device, for preparation of the subgrade; and for all equipment, tools, labor and incidentals necessary to complete the work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The detectible warning device placed in the handicap ramp near the street curb line shall be constructed in accordance with City of Conway Standard Detail AR-7.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. The handicap ramp shall be constructed in accordance with City of Conway Standard Detail AR-7.

B. The construction of Concrete Sidewalk and Access Ramps shall be performed in accordance with applicable paragraphs of SECTION 03 00 00 - CONCRETE of these specifications.

END OF SECTION

SECTION 32 32 23.13

SEGMENTAL CONCRETE UNIT MASONRY RETAINING WALLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work includes furnishing and installing segmental retaining wall (SRW) units to the lines and grades designated on the project's final construction drawings or as directed by the Engineer. Also included is furnishing and installing appurtenant materials required for construction of the retaining wall as shown on the construction drawings.

1.02 STANDARD SPECIFICATIONS

A. 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

B. 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

C. Where specifications and reference documents conflict, the Architect/Engineer shall make the final determination of applicable document.

1.03 MEASUREMENT AND PAYMENT

A. Modular Block Wall will be measured by the square foot of vertical surface.

B. Modular Block Wall acceptably completed, and measured as provided above, will

be paid for at the Contract unit price per square foot bid for “Modular Block Wall”, which price shall be full compensation for all excavation, furnishing all materials, including geosynthetic grid, modular block, cap block, pins, and all additional equipment, tools, labor and incidentals necessary to complete the work.

C. 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.

D. 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.

1.04 SUBMITTALS / CERTIFICATION

A. Material Submittals: The Contractor shall submit manufacturers' certifications two weeks prior to start of work stating that the SRW units and geosynthetic reinforcement meet the requirements of Section 2 of this specification.

1.05 DELIVERY, STORAGE AND HANDLING

A. Contractor shall check materials upon delivery to assure that Specified type and grade of materials have been received and proper color and texture of SRW units have been received.

B. Contractor shall prevent excessive mud, wet concrete, epoxies, and like materials that may affix themselves, from coming in contact with materials.

C. Contractor shall store and handle materials in accordance with manufacturer's recommendations.

D. Contractor shall protect materials from damage. Damaged materials shall not be incorporated into the retaining wall.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Segmental Retaining Wall (SRW) Units

1. SRW units shall be Rockwood Classic 8 Beveled Retaining Wall Units as manufactured by Conway Block Company 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:

a. Color of SRW units shall be “Autumn Blend,” or as specified by the Engineer

b. Finish of SRW units shall be split face.

c. SRW unit faces shall be of straight geometry.

d. SRW unit height shall be eight inches.

e. SRW units (not including aggregate fill in unit voids) shall provide a minimum weight of 105 psf wall face area.

f. SRW units shall be capable of being erected with the horizontal gap between adjacent units not exceeding 1/8 inches.

g. 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.

h. 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.

i. 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.

j. SRW units' molded dimensions shall not differ more than $\pm$ 1/8 inch from that specified, in accordance with ASTM C1372.

B. Geosynthetic Reinforcement

1. 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.

2. The geosynthetic type must be approved one week prior to bid opening. Geosynthetic types currently approved for this project are:

D. Leveling Pad

1. Material for leveling pad shall consist of compacted aggregate base course as specified in SECTION 32 11 23 AGGREGATE BASE COURSE of these specifications.

E. Granular Backfill Material

1. Granular Backfill material for the wall shall be crushed aggregate course, Class 7 as described in SECTION 32 11 23 AGGREGATE BASE COURSE of these specifications.

PART 3: CONSTRUCTION

3.01 INSPECTION

A. 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.

B. 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.

C. Verify the location of existing structures and utilities prior to excavation.

3.02 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.

A. 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

3.03 EXCAVATION

A. Excavate to the lines and grades shown on the Drawings. Over-excavation not approved by the [Architect] [Engineer] [Owner (or Owner's representative)] 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.

3.04 FOUNDATION PREPARATION

A. 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.

B. 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.

3.05 LEVELING PAD PREPARATION

A. 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.

B. 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).

3.06 SRW UNIT INSTALLATION

A. 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.

B. 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.

C. All excess debris shall be cleaned from top of units and the next course of units installed on top of the units below.

D. Prior to placement of next course, the level and alignment of the units shall be checked and corrected, where needed.

E. 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.

F. Procedures C through E 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 Section 4.06, 4.07, and 4.08.

G. 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.

3.07 BACKFILL PLACEMENT

A. 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.

B. 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.

C. 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.

D. 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.

3.08 CAP UNIT INSTALLATION

A. SRW caps shall be properly aligned and glued to underlying units with
B. a flexible, high-strength concrete adhesive. Rigid adhesive or mortar are not acceptable.

C. 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.

3.09 SITE CONSTRUCTION TOLERANCES

A. 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.

B. 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.

6.10 FIELD QUALITY CONTROL

A. Installer is responsible for quality control of installation of system components.

B. The Owner or General Contractor, at their expense, will retain a qualified professional to perform quality assurance checks of the installer's work.

C. Correct work which does not meet these specifications or the requirements shown on the Drawings at the installer's expense.

D. 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.

6.11 ADJUSTING AND CLEANING

A. Replace damaged SRW units with new units as the work progresses.

B. Remove debris caused by wall construction and leave adjacent paved areas broom clean.

END OF SECTION

SECTION 32 92 23

SODDING

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers all work in connection with the placement of solid sodding and at locations shown on the plans or designated by the engineer. The work includes the placement of topsoil and sod along the roadway and adjacent work area. The work shall be in accordance with the details shown on the plans and with these specifications.

1.02 STANDARD SPECIFICATIONS

A. The sodding and work covered by this section shall be in accordance with SECTION 624 – SOLID SODDING, standard specifications except as augmented herein.

1.03 MEASUREMENT AND PAYMENT

A. The sodding Solid Sodding installed at the locations designated by the engineer and acceptably completed will be measured by the square yard of thriving vegetation established by the sodding.

B. Solid Sodding acceptably completed and measured as provided above will be paid for at the contract unit price per square yard for "Solid Sodding."

C. Topsoil shall be obtained from the stripings within the project limits will be measured and paid for at the contract unit price per square yard for "Topsoil," which price shall be full compensation for all material including seed, fertilizer, mulch, and water; all labor, equipment, tools and incidentals required to complete the work.

D. Separate payment will not be made for water, mulch cover fertilizer or lime but shall be considered subsidiary to the other items of the contract.

PART 2 – PRODUCTS -- NOT USED

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. Solid Sodding shall be placed at locations designated by the engineer, generally between the sidewalk and curb in area of developed and maintained lawns. The material and installation requirements for the solid sodding shall conform to Section 624 - SOLID SODDING, standard specifications for highway construction.

B. Prior to placement of solid sod a layer of top soil shall be spread uniformly over the area having a minimum thickness of 4”. The top soil shall be obtained from the site stripping shall utilized to fill the top soil requirement.

C. If the engineer determines that conditions are not appropriate for permanent seeding application, the contractor will place temporary seeding and mulch cover at locations designated by the engineer. The Temporary seeding and mulching shall conform to the requirements of SECTION 621 - TEMPORARY EROSION CONTROL ITEMS AND DEVICES standard specifications for highway construction.

END OF SECTION

SECTION 33 42 13

PIPE CULVERTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers the construction of reinforced concrete and corrugated metal culverts at the locations shown on the plans or as directed by the Engineer. All work shall be in accordance with details shown on the plans and with these specifications.

1.02 STANDARD SPECIFICATIONS

A. Materials and work shall be in accordance with SECTION 606 - PIPE CULVERTS, Standard Specifications, except as herein modified or augmented.

1.03 MEASUREMENT AND PAYMENT

A. Excavation and backfill will not be paid for separately but will be considered subsidiary to laying the pipe.

B. All pipe will be measured by the linear foot. Measurements will be taken along the pipe from centerline of drop inlet or junction box to centerline of inlet of junction box or to the end of pipe at the ditch, measured along the flow line. Separate measurements will be made of the sizes and classes shown on the plans and listed in the Proposal. Measurements will be taken to the nearest 0.1 linear foot.

C. Pipe culverts acceptably completed and measured as provided above will be paid for at the contract unit price per linear foot bid respectively for "Storm Drainage Pipe" of the size and class or gauge shown on the plans and listed in the Proposal, 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.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All storm drainage pipe shall be Reinforced Concrete Pipe, Class III unless otherwise specified or called out on the Plans.

B. Reinforced Concrete Pipe
   1. Concrete pipe shall conform to the specifications of ASTM Designations C 76 and C 506, latest editions, for the sizes and classes of pipes shown on the plans

and listed in the Proposal. 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.

C. Corrugated Metal Pipe

1. Where specifically shown as corrugated metal pipe or CMP on the plans, polymer coated corrugated steel pipe shall be used. The pipe shall conform to the requirements of paragraph 606.02 (6) of the Standard Specifications for Highway Construction. Corrugations shall be 2 2/3" x 1/2". Minimum thickness of the metal shall be 14 gauge.

D. Alternative Jointing

1. Jointing material for reinforced concrete pipe, at the Contractor's option, shall be bituminous plastic cement or compression-type rubber conforming to the requirements that follow:

a) Bituminous plastic cement shall be made for use without heating.

1) It shall be composed either of a steam refined petroleum asphalt or of a refined coal tar dissolved in a suitable solvent and stiffened with a mineral filler consisting essentially of short fiber asbestos.

2) The cement shall be a smooth, non-thickened, uniform mixture and shall show no separation which cannot be overcome easily by stirring. The material shall be of such consistency and properties that it can be applied readily with a trowel, a putty knife, or with a caulking gun without pulling or drawing. The cement, when applied to concrete surfaces, shall exhibit good adhesive and cohesive properties, and shall have only slight shrinkage after curing. The cement shall be capable of being exposed to temperature below freezing without sustaining any damage or losing its characteristics.

3) When applied in a layer 1/16-inch to 1/8-inch thick on a tinned metal panel and cured at room temperature for twenty-four (24) hours, the cement shall set to a tough plastic coating, free from blisters. The cement shall conform to specifications tabulated as follows:

	Minimum	Maximum
Grease Cone Penetration (unworked) 150 grams 25°C., 5 Sec., ASTM D 217, Min/10	175	250
Weight, pounds per gallon	9.75	xxx
Non-volatile, 19 grams, 105°C. - 110°C., 24 hours, %	75	xxx
Ash, by ignition, %	25	45

Backfill shall not be undertaken until the cement joint is at least twenty-four (24) hours old.

b) With pipe manufactured for such joints, an approved rubber compression-type joint may be used. In case of such use, backfilling may proceed immediately after the pipe is laid and inspected.

2.02 JOINTING OF PIPE

A. Jointing of concrete pipe shall be in accordance with one of the two methods specified as follows:

1. Bituminous Cement Joint: The tongue and groove shall be wiped clean and dry. The plastic compound shall be applied to the entire surface of both the tongue and groove. The joints shall be forced together with excess compound extruding both inside and outside the joint. Excess compound shall be removed from the interior surface and the exterior shall be leveled reasonably flush with the surface of the pipe.

2. Rubber Compression-Type Joint: The tongue and groove shall be cleaned and maintained clean. The joint shall be constructed as recommended by the manufacturer of the pipe.

3. Corrugated metal pipe couplings shall conform to paragraph 606.02 (e) of Standard Specifications for Highway Construction.

PART 3 – EXECUTION

3.01 TRENCHING AND BACKFILL

A. Trenching and backfill shall be in accordance with applicable requirements of SECTION 31 23 16 - UNCLASSIFIED EXCAVATION, except as augmented herein.

B. Where unsuitable material is encountered, excavation shall continue until a firm material is reached and the overexcavation filled to grade with a special bedding material conforming to Aggregate Base Course, Class 7.

3.02 INSTALLATION OF PIPE

A. 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 groove ends of concrete pipe shall point upgrade.

B. Proper facilities shall be provided for lowering sections of pipe into trenches.

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.

C. All pipe in place shall have been approved before being backfilled. In all backfilling operations, the Contractor shall be responsible for preventing damage to or misalignment of the pipe.

END OF SECTION

SECTION 33 49 00

STORM DRAINAGE STRUCTURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section covers all work in connection with the construction of various types of curb inlets, drop inlets or junction boxes, walled ditches and box culverts included in this project. The work shall be in accordance with the details shown on the plans and with these specifications.

1.02 STANDARD SPECIFICATIONS

A. The work covered by this section shall be in accordance with SECTION 609 - DROP INLETS AND JUNCTION BOXES, standard specifications except as augmented herein.

1.03 MEASUREMENT AND PAYMENT

A. Inlets or junction boxes acceptably completed will be measured by the whole unit.

B. Work completed and measured as provided above will be paid for at the contract unit price per each for "Drop Inlets" Single or Double Extension which price shall be full compensation for all materials, labor, equipment, tools and incidentals required to complete the work including excavation and backfill (except stone ballast).

C. Stone ballast backfill which may be used along the subgrade edge of the inlet will be measured by the Ton.

D. Payment for Stone ballast backfill will be made at the contract unit price per Ton.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Concrete and reinforcing steel shall be in accordance with SECTION 03 00 00 - CONCRETE of these specifications.

B. All other materials and hardware shall be in accordance with subsection 609.02, Materials of the standard specifications.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. Forms, formwork, concrete and reinforcing steel shall be in accordance with SECTION 03 00 00 - CONCRETE, and with the following conditions:

1. Inside wall forms shall be removed prior to the erection of forms for the top slab. The supports for the top slab forms shall be positioned in such a manner that will result in a minimum of interference with the free flow of water thru the structure.

B. Alternate masonry and block work shall be in accordance with the following:

1. Concrete masonry unit work shall be completed in a workmanlike manner, true to dimensions shown on the plans. All masonry shall be clean; the area of foundation to receive the first course of mortar shall be washed clean before laying the first course of blocks. Blocks shall be laid to form a neat smooth interior wall section. Where partial blocks are needed that shall be neatly cut and no broken or random placement of block parts utilized to fill voids.

2. Masonry shall be laid in a full mortar bed, with the vertical joints entirely filled with mortar. Horizontal joints and interior joints shall be not less than 1/4 inch or more than 1/2 inch in thickness. The masonry units shall be laid in alternate courses of headers and stretchers, with consecutive courses breaking joints. When bats are necessary in forming the closure around pipes, a full unit shall be used next to the pipes and the bats used in the interior of the course.

3. The interior surface of the masonry units shall be pargeted with mortar of a thickness sufficient to obtain a uniform finished interior surface.

4. The voids in the blocks shall be completely filled with concrete with number 4 reinforcing bars doweled from the footing thru voids in the block into the top slab at 16 inches on centers. The reinforcing steel shall be embedded a minimum of 5" in the bottom slab and top slab.

5. Alternate masonry block construction may be used only for structures 5 feet or less in width and 5 feet or less in depth. All other structures shall be poured reinforced concrete walls.

C. Alternate poured in place round inlet structures may be used in non traffic bearing locations. The inlets shall conform to City of Conway Standard Detail D-1, Typical Curb

Inlet.

3.02 BACKFILL OF CURB INLET

A. The side of the inlet along the street subgrade shall be backfilled with ballast stone.

B. Backfill of all other sides shall be with native material placed in 8” lifts and each lift mechanically tamped to minimize settlement.

3.03 WEEP HOLES

A. Weep holes shall be provided in each curb inlet to provide drainage from the base course along the street. Weep holes shall be a 3" PVC pipe extending thru the street side of the inlet walls with the top of the 3" pipe matching the street subgrade elevation. The drain pipe shall be beneath the base of the curb and gutter section and shall not extend thru the concrete of the curb and gutter section or inlet throat.

B. Weep holes shall be placed along box culverts and walled ditches near bottom of the wall at 16’ maximum spacing. Weep holes shall be 2” minimum diameter and shall be covered with a small 1’ square of non-woven construction fabric. Ballast stone backfill shall be placed a minimum of 1 foot around the weep hole

3.04 OPENINGS IN BACK OF INLET

A. Where called out on the plans or required to provide drainage behind the curb a opening 8" high by 2 foot wide shall be provided in the back of the inlet. The bottom elevation of the opening shall be placed so that positive drainage is provided out of the yard area or out of the ditch the opening is placed to intercept.

3.05 CURB INLET TOP ON EXISTING BOX

A. Where shown on the plans the contractor shall remove the existing box top and construct a curb inlet top on the existing box. The top shall be constructed in accordance with the top portion of the curb inlet detail and shall completely cover and incorporate the existing box.

END OF SECTION

SECTION 02315

TRENCH EXCAVATION, BACKFILL, AND COMPACTING

PART 1. GENERAL

1.1 SUMMARY

A. Work of this Section also includes:
   1. Replacing topsoil that contains regenerative material.
   2. Disposal of trees, stumps, brush, roots, limbs, and other waste materials from clearing operations.
   3. Imported topsoil.
   4. Crush rock backfill required by over-excavation.
   5. Imported pipe zone material.
   6. Trench settlement repair, including replacing roadway surfacing, sidewalk, or other structures.
   7. Replacing damaged culverts.

B. Trench excavation is classified as common excavation and includes removal of material of whatever types encountered including rock to depths shown or as directed by Engineer.

C. Pipe zone includes full width of excavated trench from bottom of pipe to a point 6 inches above top outside surface of pipe barrel.

D. Conform to federal, state, and local codes governing safe loading of trenches with excavated material.

E. The right is reserved to modify the use, location, and quantities of the various types of backfill during construction as Engineer considers to be in the best interest of Owner.

F. There shall be no extra compensation for dewatering and rock excavation.

G. Pipe shall be installed according to the latest version of AWWA C605.

1.2 RELATED SECTIONS

A. Section 02080 - Manhole Construction.

B. Section 02515 - Polyvinyl Chloride (PVC) Pipe and Fittings.

C. Section 02530 - Sewage Collection System.

1.3 REFERENCES

A. Arkansas Department of Transportation, P.O. Box 2261, Little Rock, Arkansas 72203, latest edition.
   1. ArDOT 303 - Aggregate Base Course.

B. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959.
   1. ASTM D448 - Classifications for Standard Sizes of Aggregate and Bridge Construction.
   2. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb. (2.49-kg.) Rammer and 12-inch (304.8-mm) Drop.
   3. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10-lb. (4.54-kg.) Rammer and 18-inch (457-mm) Drop.
   4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes.
   5. ASTM D2922 - Test Methods for Density of Soils and Soil-Aggregates in Place by Nuclear Method.

C. Occupational Safety and Health Administration (OSHA) Standard for Excavation and Trenches Safety System, 29 CFR 1926, Subpart P: Excavations.

D. The Contractor shall be solely responsible for trench and excavation safety systems in accordance with Act 291 of 1993.

PART 2. PRODUCTS

2.1 FOUNDATION STABILIZATION

A. Crushed gravel or crushed rock, free from dirt, clay balls, or organic material, well graded from coarse to fine, containing sufficient finer material for proper compaction, and meeting ASTM D448 Size No. 67 (Concrete Aggregate).

2.2 PIPE ZONE MATERIAL

A. Select material shall consist of fine loose earth or sand free from clods or rocks larger than 3/4 inches in dimension and of proper moisture content for maximum consolidation.

B. Crushed granular material conforming to ASTM D448, Size No. 67.

C. Washed stone bedding size 1/4-inch to 3/4-inch.

2.3 COMMON FILL MATERIALS

A. Material shall not contain pieces larger than 3 inches, and shall be free of roots, debris, or organic matter.

2.4 SELECT FILL MATERIALS

A. Class 7, Class 3, and Class 4 as established by Section 303 of Arkansas Department of Transportation Standard Specifications for Highway Construction.

B. ASTM Soil Classification GC as set forth in ASTM Designation D2487-92. On site material may be used, provided it is in accordance with ASTM D2487-92.

2.5 BEDDING MATERIAL

A. Pea gravel, sand, or other locally available bedding material, as approved.

2.6 TRENCH BACKFILL

A. Granular Backfill:
   1. Natural or artificial mixture of gravel and soil mortar uniformly well graded from coarse to fine.
   2. ArDOT Section 303 Class 3, Class 4, or Class 7 as specified in this Section.

2.7 PVC WATER AND SEWER PIPE TRENCH

A. See Drawings for trench details.

2.8 COMPACTION EQUIPMENT

A. Suitable type and adequate to obtain the amount of compaction specified.

B. Operate in strict accordance with manufacturer's instructions and recommendations and maintain in such condition so that it will deliver manufacturer's rated compactive effort.

2.9 IMPORTED TOPSOIL

A. Suitable sandy loam from an approved source.

B. Must possess friability and a high degree of fertility.

C. Free of clods, roots, gravel, and other inert material.

D. Free of quackgrass, horsetail, and other noxious vegetation and seed.

PART 3. EXECUTION

3.1 PREPARATION

A. Where clearing or partial clearing of right-of-way is necessary, complete prior to start of trenching.

B. Cut trees and brush as near to surface of ground as practicable, remove stumps, and pile for disposal.

C. Do not permit excavated materials to cover brush or trees prior to disposal.

3.2 PREVENT TRENCH WATER AND ANIMALS FROM ENTERING PIPE

A. When pipe laying is not in progress, including noon hours, open ends of pipe shall be closed; and no trench water, animals, or foreign material shall be permitted to enter the pipe.

3.3 DISPOSAL OF CLEARED MATERIAL

A. Dispose of material in such a manner to meet requirements of state, county, and local regulations regarding health, safety, and public welfare.

B. Dispose of nonflammable and flammable material off the construction site in an approved location.

C. Do not leave material on the Project site, shove onto abutting private properties, or bury in embankments or trenches.

3.4 REMOVAL OF OBSTRUCTIONS

A. Remove obstructions within trench area or adjacent thereto such as tree roots, stumps, abandoned piling, logs, and debris.

B. Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the easement or right-of-way without adversely affecting the intended function of the facility.

C. Dispose of obstructions in accordance with this Section.

3.5 REMOVAL AND REPLACEMENT OF TOPSOIL

A. Where trenches cross lawns, garden areas, pasturelands, cultivated fields, or other areas on which reasonable topsoil conditions exist, remove topsoil for a depth of 6 inches for full width of trench to be excavated.

B. Use equipment capable of removing a uniform depth of material.

C. Stockpile removed topsoil at regular intervals, and do not mix with other excavated material.

D. Locate stockpiles so that material of one ownership is not transported and stockpiled on property of another ownership.

E. Minimum finished depth of topsoil over trenches: 5 inches.

F. Imported topsoil may be substituted for stockpiling and replacing topsoil.

G. Maintain finished grade of topsoil level with area adjacent to trench until final acceptance by Engineer.

H. Repair damage to adjacent topsoil caused by work operations.
   1. Remove rock, gravel, clay, and other foreign materials from the surface.
   2. Regrade.
   3. Add topsoil as required.

3.6 TRENCH WIDTH

A. Minimum width of unsheeted trenches where pipe is to be laid shall be 18 inches greater than the outside diameter of the pipe, or as approved.

B. Maximum width at top of trench will not be limited, except where excess width of excavation would cause damage to adjacent structures or property or cause undue stresses on the pipe.

C. Confine trench widths to dedicated rights-of-way or construction easements, unless special written agreements have been made with affected property owner.

3.7 EXCAVATION

A. Excavate trench to lines and grades shown or as established by Engineer with proper allowance for pipe thickness and for pipe base or special bedding when required.

B. If trench is excavated below required grade, correct with foundation stabilization material.

C. Place material over full width of trench in compacted layers not exceeding 6 inches deep to established grade with allowance for pipe base or special bedding.

3.8 PREPARATION OF TRENCH - LINE AND GRADE

A. Do not deviate more than ½ inch from line or ½ inch from grade. Measure for grade at the pipe invert, not at the top of the pipe, because of permissible variation in pipe wall thickness.

B. Grade the bottom of the trench by hand to the line and grade where the pipe is to be laid, with proper allowance for pipe thickness and for pipe base when specified or indicated.

C. Remove hard spots that would prevent a uniform thickness of bedding.

D. Check the grade with a straightedge and correct irregularities found.

E. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between bell holes, except that the grade may be disturbed for the removal of lifting tackle.

3.9 SHORING, SHEETING, AND BRACING OF TRENCHES

A. Sheet and brace trench when necessary to prevent caving during excavation in unstable material or to protect adjacent structures, property, workers, and the public.

B. Increase trench widths accordingly by the thickness of the sheeting.

C. Maintain sheeting in place until pipe has been placed and backfilled at pipe zone.

D. Remove shoring and sheeting as backfilling is done in a manner that will not damage pipe or permit voids in backfill.

E. Conform to safety requirements of federal, state, or local public agency having jurisdiction for sheeting, shoring, and bracing of trenches; the most stringent of these requirements shall apply.

3.10 LOCATION OF EXCAVATED MATERIALS

A. Place excavated material only within construction easement, right-of-way, or approved working area.

B. Do not obstruct private or public traveled roadways or streets.

3.11 REMOVAL OF WATER

A. Provide and maintain ample means and devices to promptly remove and dispose of water entering trench during time trench is being prepared for pipe laying, during laying of pipe, and until backfill at pipe zone is completed.
   1. These provisions apply during the noon hour as well as overnight.
   2. Provide necessary means and devices, as approved, to positively prevent under water from entering the construction area of another contractor.

B. Dispose of water in a manner to prevent damage to adjacent property.

C. Drainage of trench water through the pipeline under construction is prohibited.

3.12 FOUNDATION STABILIZATION

A. When existing material in bottom of trench is unsuitable for supporting pipe, excavate unsuitable material.

B. Backfill trench to subgrade of pipe base with foundation stabilization material specified.

C. Place foundation stabilization material over the full width of trench and compact in layers not exceeding 6 inches deep to required grade by making passes with a vibratory compactor (or equivalent).

D. Material shall be considered unsuitable when it contains more than 5 percent organic material by volumetric sampling or when it will not support a reading of 1.5 on a hand penetrometer.

3.13 ROCK IN PIPE TRENCH

A. Where rock is encountered in bottom of trench, support pipe on bedding material.

B. Minimum Bedding Thickness: Minimum of 4 inches or one eighth of the outside diameter of pipe, whichever is greater.

C. Extend bedding up pipe sides one sixth of outside diameter of the pipe, minimum.

D. Backfill over pipe according to pipe zone type.

3.14 PIPE ZONE BACKFILL

A. Depth of the pipe zone above pipe barrel varies with pipe material.

B. Particular attention must be given to area of pipe zone from flow line to centerline of pipe to ensure firm support is obtained to prevent lateral movement of pipe during final backfilling of pipe zone.

C. Backfill area of pipe zone from bottom of pipe to horizontal centerline of pipe by hand-placing material around pipe in 4-inch layers.

D. Achieve continuous support beneath pipe haunches by "walking in" and slicing with shovel.

E. Backfill area of pipe zone from horizontal centerline to top of pipe zone with pipe zone material as determined by class of backfill.

F. In lieu of selected material for pipe zone in upper portion of pipe zone, imported pipe zone material approved by Engineer for trench backfill may be substituted.

G. If the Engineer determines that the existing material is insufficient or unsuitable at trench side for selected material for pipe zone in upper portion of pipe zone, provide suitable material from other trench excavation along pipeline or imported pipe zone material.

3.15 TRENCH BACKFILL ABOVE PIPE ZONE

A. When backfill is placed mechanically, push backfill material onto slope of backfill previously placed and allow to slide down into trench.

B. Do not push backfill into trench in such a way as to permit free fall of material until at least 2 feet of cover is provided over top of pipe.

C. Under no circumstances allow sharp, heavy pieces of material to drop directly onto pipe or tamped material around pipe.

D. Do not use backfill material of consolidated masses larger than ½ cubic foot.

3.16 EXCESS EXCAVATED MATERIAL

A. Dispose of excess excavated material off project site in an approved area.

3.17 DRAINAGE CULVERTS

A. Replace drainage culverts which are removed on near right angles to pipe centerline.

B. If pipe cannot be reused or is damaged during removal, dispose of it and provide new pipe.

C. Protect culverts from damage or restore to equivalent condition.

D. Replace culverts to existing lines and grades.

E. Do not replace culverts until proposed pipeline is installed and backfill of trench has been completed to subgrade of culvert.

3.18 PIPE COVER

A. Place select material from excavation over pipe to provide minimum coverage, as shown on Drawings or as directed by Engineer.

3.19 DRAINAGE DITCH RESTORATION

A. Undercrossings of minor drainage ditches not covered in another Specification Section shall be backfilled so that upper 1 foot of material in ditch between ditch banks is clay.

B. Compact material for full ditch width by 6 passes of vibratory compactor (or equivalent).

C. Where indicated on Drawings, provide concrete arch, and/or riprap on ditch banks.

3.20 SETTLEMENT

A. Correct settlement noted in backfill, fill, or in structures built over backfill or fill within warranty period.

3.21 IMPORTED TOPSOIL

A. Should regenerative material be present in soil, remove both surface and root which appears in within 1 year following acceptance of Project in a manner satisfactory to Owner.

END OF SECTION

SECTION 02810

IRRIGATION SYSTEM

PART 1. GENERAL

1.1 SUMMARY

A. Provide irrigation system where shown on the Drawings, and as specified herein, complete in place, tested and approved, including but not necessarily limited to, pipe, automatic controller and remote control valves.

1.2 RELATED SECTIONS

A. Section 01001 - Basic Requirements.

B. Section 02315 - Trench Excavation, Backfilling, and Compacting.

C. Section 02900 - Landscaping.

D. Section 02924 - Sodding.

E. Division 16 - Electrical.

1.3 SUBMITTALS

A. Submit Shop Drawing, manufacturer's data, and other requested data to the Engineer in accordance with Section 01001.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary trades and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Materials delivered to job site shall be packaged in a manner that damage will not occur during deliver and stored in original package and labeled in a locked area to prevent theft or possible damage.

PART 2. PRODUCTS

2.1 PIPE

A. Install 1-1/2 inch Schedule 40 PVC for the following lines: Main line to individual circuit valves.

B. Lateral lines to tree well areas must be Class 200 PVC.

2.2 REDUCED PRESSURE ZONE BACKFLOW PREVENTER

A. Manufacturer:
   1. Watts In-Line.
   2. Or approved equal.

B. Vault:
   1. Manufacturer: Dyer Fiberglass, Inc.
   2. Model No. D103.
   3. Exterior finish shall be white leophthallo gel-coating .02 to .04 inches.

2.3 VALVES

A. Automatic Drain Valves: King Automatic Drain Valves.

B. Circuit Valves: Toro Flow-Pro Series electric remote control valves.

C. Pressure Regulators: Toro Techline PRV075LP35

D. Valve Boxes: Ametek, Plymouth Products Division, Sheboygan, Michigan, Box Model Number 170101 and cover shall be Number 173134. Cover shall have snap locks.

2.4 AUTOMATIC CONTROLLER

A. Manufacturer: Toro 170 Series Monitor II No. 176-56-01, pedestal mount.

2.5 DRIPPERS

A. Provide 3 WPC20 drippers per tree well. Drippers shall be installed on .160" x 220" micro-tubing (EDTUBE).

PART 3. EXECUTION

3.1 INSTALLATION

A. PVC Piping:
   1. Exercise care in handling, loading, unloading and storing plastic pipe and fittings.
   2. Use protective cover until ready to install.
   3. In jointing, use only the specified solvent and make joints in accordance with the manufacturer's recommendations as approved by the Engineer.
      a. Give solvent welds at least 15 minutes set-up time before moving or handling and 24 hours curing time before filling with water.
   4. Centerload plastic pipe with a small amount of backfill to prevent arching and whipping under pressure.

B. Install irrigation main lines and stub out lateral lines.

C. Reduced Pressure Zone Preventer: Install between meter and master valve at least 12 inches above grade and locations as shown on Drawings.

D. Automatic Drain Valves:
   1. Install at low points of each circuit.
   2. Minimum of 2 per circuit.

E. Valve Boxes: Locate valve boxes at locations as shown on Drawings.

F. Irrigation Dripper Heads: Finished top elevations of irrigation dripper heads shall be beneath river gravel. Do not place drippers in backfill.

G. Costs for installation of required 1 inch irrigation meter will be the responsibility of the Contractor.

H. Place main line in sleeves when located under driveways and crossing roadways.

I. Follow piping diagrams exactly in tree wells. Piping is designed to go around proposed trees. Do not disturb root ball of trees when installing irrigation system.

J. Utilize common trenches when possible.

3.2 TESTING AND INSPECTING

A. Do not allow or cause any of the work in this Section to be covered up or enclosed until testing has been observed, tested, and approved by the Engineer. Irrigation system shall be fully operational within 48 hours of setting first tree into tree well.

B. Before backfilling the main line and with control valves in place but before lateral lines are connected, completely flush and test the main line.
   1. Repair leaks.
   2. Flush out each section of lateral lines before bubbler heads are attached.

C. Testing:
   1. Make necessary provisions for thoroughly bleeding the lines of air and debris.
   2. Before testing, fill the lines with water for a period of at least 24 hours.
   3. After valves have been installed, test live water lines for leaks at a pressure of 150 psi for a period of two hours, with couplings exposed and with pipe sections centerloaded.
   4. Provide required tested equipment and personnel.
   5. Repair leaks and retest until acceptance by the Engineer.

D. Final Inspection:
   1. Clean, adjust and balance irrigation system:
      a. Remote control valves are properly balanced.
      b. Heads are properly adjusted for radius and arc of coverage.
      c. The installed system is workable, clean, and efficient.

3.3 INSTRUCTIONS

A. Attach a typewritten legend inside each controller door stating the areas covered by each remote control valve.

B. After system has been completed, inspected, and approved, instruct the Owner's maintenance personnel in the operation and maintenance of the system. Contractor to provide typewritten instructions for winterizing shut down and spring start up procedures.

END OF SECTION

SECTION 02930

EXTERIOR PLANTS

PART 1. GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Trees.
   2. Shrubs.
   3. Ornamental Grasses and Sedges.
   4. Steel header.
   5. Topsoil's, Fertilizers, Soil Amendments and Mulches

1.3 DEFINITIONS

A. Backfill Mix: Soil excavated from plant pits and mixed with amendments and placed in plant pit backfill. 12" deep minimum at planting area/shrub beds.

B. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of exterior plant required.

C. Finish Grade: Elevation of finished surface of planting soil and exterior pavements.

D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

E. Planting Soil: Native, imported or manufactured topsoil, or site soil modified to become topsoil; mixed with soil amendments.

F. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

H. Top Soil: Organic material and amendments mixed with site soil that is stockpiled and is spread on the site for a general planting medium.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for each of the following:
   1. 20 lb (8.8 kg) of stone mulch and rock mulch including each color and texture of stone required, in labeled plastic bags.
   2. Steel header materials and accessories, of manufacturer's standard size, to verify color selected.

C. Tree Staking Mock-Up:
   1. Preparation on one tree.
   2. Use specified materials for mock-up.
   3. Accepted mock-up shall be project standard for all tree staking on the project.

D. Qualification Data: For qualified landscape Installer.

E. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
   1. Manufacturer's certified analysis for standard products.
   2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

F. Material Test Reports: Soil fertility tests for existing surface soil and soil fertility tests for imported topsoil to determine final backfill mixes. Send plant list to soils lab with soil samples.

G. Landscape Schedule: Indicating anticipated planting dates for exterior plants.

H. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year. Submit before expiration of required maintenance periods.

I. Warranty: See 1.8 below.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants.
   1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed. Cooperative Extension Service is an acceptable soil testing lab.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange

capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for plant growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
2. The Landscape Architect will determine the final planting soil mix, backfill and topsoil based on the soil test report(s) which may differ from the test report recommendations.

D. Obtain the Soils Report comments on the Plant List and review with the Landscape Architect before finalizing Plant List.

E. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

1. Selection of exterior plants purchased under allowances will be made by Landscape Architect, who will tag plants at their place of growth before they are prepared for transplanting.

F. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches (150 mm) above the ground for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

G. Observation: Landscape Architect may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials 10 working days in advance of delivery to site.

H. Pre-installation Conference: Coordinate with Landscape Architect for conference location, time and date.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees and shrubs before delivery except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.

B. Handle planting stock by root ball.

C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition throughout root mass.

1.7 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
   1. Spring Planting: February to end of March
   2. Fall Planting: October and November

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed according to manufacturer's written instructions and warranty requirements.

C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns unless otherwise acceptable to Landscape Architect.
   1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.8 WARRANTY

A. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner.
      b. Structural failures including plantings falling or blowing over.
      c. Faulty operation of other activities and trades on site.
      d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

   2. Warranty Periods from Date of Substantial Completion:
      a. Trees and Shrubs: One year.
      b. Ground Cover and Plants: One year.
   3. Include the following remedial actions as a minimum:
      a. Remove dead exterior plants immediately. Replace immediately with specified species, and size unless required to plant in the succeeding planting season.
      b. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
      c. A limit of one replacement of each exterior plant will be required except for losses or replacements due to failure to comply with requirements.

d. Provide extended warranty for replaced plant materials; warranty period equal to original warranty period.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
   1. Maintenance Period: One year from date of planting completion.

B. Initial Maintenance Service for Ground Cover and Plants: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
   1. Maintenance Period: One year from date of planting completion.

PART 2. PRODUCTS

2.1 TREE AND SHRUB MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, circling roots and disfigurement.

B. Provide trees and shrubs of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

E. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.2 SHADE AND FLOWERING TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
   1. Provide container-grown trees.
   2. Branching Height: One-third to one-half of tree height.

B. Small Spreading Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
   1. Stem Form: Single trunk.
   2. Provide balled and burlapped or container-grown trees.

2.3 BROADLEAF EVERGREENS

A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

B. Form and Size: Specimen quality as symmetrically shaped broadleaf evergreens.
   1. Shearing Designation: Natural, never sheared.
   2. Provide container-grown trees.

2.4 ORNAMENTAL GRASSES AND SEDGES

A. Provide species as indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1 and the Landscape Planting Schedule.

2.5 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 30 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth.
   1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil based on soil tests (see Article 1.5, Paragraph B above). Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
      a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.

   2. Topsoil Source: Import topsoil or manufactured topsoil from off-site commercial sources.
   3. Amended Topsoil Source: From topsoil stockpile, amend as necessary to produce topsoil. Verify suitability of surface soil to produce topsoil with soil test (see Article 1.5, Paragraph B above). Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.6 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
   1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
   2. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
   3. Provide lime in form of dolomitic limestone.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

G. Sand: Clean, washed, natural or manufactured, free of toxic materials.

H. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.7 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch (19-mm) sieve; soluble salt content of 5% decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.
   2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.8 FERTILIZER

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.9 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
   1. Type: Ground or shredded hardwood (double hammered).

B. Stone Mulch: As indicated on plans. Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:
   1. Stone Mulch I: Angular, crushed limestone or granite rock 2 inch to 6 inch.
      Stone Mulch II: Angular, crushed rock 1”-minus

   2. Stone Mulch III: Rounded Rainbow River Rock:

      10% 6 inch nominal diameter.
      20% 4 inch nominal diameter.
      50% 2 inch – 3 inch nominal diameter.
      20% 3/4 inch < 1 inch nominal diameter.

   3. Stone Mulch IV: Rounded Rainbow River Rock

      1 inch to 1/2 inch nominal diameter.

2.10 TREE STABILIZATION MATERIALS

A. Stakes and Guys:
   1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
   2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.
   3. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch (2.7 mm) in diameter.

4. Hose Chafing Guards: Reinforced rubber or plastic hose at least 1/2 inch (13 mm) in diameter, black, cut to lengths required to protect tree trunks from damage.
5. Guy Cables: 5-strand, 3/16-inch- (4.8-mm-) diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches (75 mm) long, with two 3/8-inch (10-mm) galvanized eyebolts.
6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.

2.11 LANDSCAPE EDGINGS

A. Steel Header: Flexible carbon steel 14 gage by 125-mm by minimum 10-20 foot minimum length pieces, black factory paint finish, double staked overlap joints and designed to receive tapered steel stakes at 5 feet on center. Steel Header Stakes: Steel, tapered, 400-mm minimum length, with black paint finish, designed specifically to anchor steel header in place, manufactured by manufacturer or the steel header for which they will be used.
1. Basis-of-Design Manufacturer:
    a. Ryerson or approved equal.

2.12 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

2.13 PLANTING SOIL MIX

A. Planting Soil Mix: Based on soil reports, mix topsoil with the following soil amendments and additives in the following quantities:
1. Ratio of Organic Material to Topsoil by Volume: 50/50%.
2. 20 Pounds of Lime per 1000 Sq. Ft.
3. 5 Pounds of Potassium Sulfate per 1000 Sq. Ft.
4. 100 Pounds of Agricultural Gypsum per 1000 Sq. Ft.
5. 200 Pounds of Sand Plus 20 Percent per 1000 Sq. Ft.
6. 2 Pounds of Superphosphate per 1000 Sq. Ft.
7. 15 Pounds of Commercial Fertilizer per 1000 Sq. Ft.

B. Backfill Mix: Based on soil reports, organic amendments and well composted humus with the following properties:
1. 30% planting soil mix; 70% backfill from planting pit excavation.

C. Topsoil: Based on the recommendations of the soils reports, topsoil for shrub and lawn areas in the following quantities:
1. 6 Cubic Yards Organic Amendment per 1000 Sq. Ft.
2. 20 Pounds Polymeric Soil Conditioner per 1000 Sq. Ft.
3. 3 Pounds Ammonium Nitrate (34-0-0) per 1000 Sq. Ft.
4. 5 Pounds of Potassium Sulfate (0-0-50) per 1000 Sq. Ft.
5. 4 Pounds of Single Superphosphate per 1000 Sq. Ft.
6. 100 Pounds of Agricultural Gypsum per 1000 Sq. Ft.

PART 3. EXECUTION

3.1 EXAMINATION

A. Examine areas to receive exterior plants for compliance with requirements, rough grading and conditions affecting installation and performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before planting. Make minor adjustments as required.

D. Lay out exterior plants at locations directed by Landscape Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING BED ESTABLISHMENT

A. Loosen rough grade of planting beds to a minimum depth of 8 inches (200 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Apply superphosphate fertilizer directly to subgrade before loosening.
   2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
      a. Delay mixing fertilizer with planting soil if planting will not proceed within two working days.
      b. Mix lime with dry soil before mixing fertilizer.
   3. Spread planting soil mix to the finished grade elevations 8 inches (200 mm) but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, restore planting beds if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Pits and Trenches: Excavate circular pits with sides sloped inward to a diameter and depth shown on the Drawings. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
   1. Excavate approximately two times as wide as ball diameter for container-grown stock.

B. Subsoil removed from excavations may not be used as backfill.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE AND SHRUB PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.

B. Stake location of every tree where indicated on Drawings. Contact the Landscape Architect to review locations prior to excavating plant pits or installing irrigation.

C. Set container-grown stock plumb and in center of pit or trench with top of root ball 2 inch (50 mm) above adjacent finish grades.
   1. Carefully remove root ball from container without damaging root ball or plant.
   2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

D. Organic Mulching: Apply 2-inch (50-mm) average thickness of organic mulch extending 12 inches (300 mm) beyond edge of planting pit or trench. Do not place mulch within 3 inches (75 mm) of trunks or stems.

E. Circling Roots:
   1. If circling roots are encountered at root ball sides, notify Landscape Architect for field review.
   2. Upon Landscape Architect's acceptance, cut roots on 4 sides of root ball 90 degrees apart.

3.6 TREE AND SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees and shrubs as directed by Landscape Architect.

C. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

3.7 SOIL WATERING SAUCER

A. Install and configure soil watering saucer as shown on the drawings.

3.8 TREE STABILIZATION

A. Guying and Staking: Guy and stake trees unless otherwise indicated. Securely attach no fewer than 2 guys to stakes 1/2 tree height long, driven to grade.
   1. Support trees with chain lock tree ties at contact points with tree trunk and stakes. Allow enough slack to avoid rigid restraint of tree.

B. Rootball Anchoring: Basis for design shall be root anchor – underground tree support.

3.9 EDGING INSTALLATION

A. Steel Header: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced per manufacturer's requirements

3.10 PLANT MAINTENANCE

A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, adjusting and repairing stakes and guy supports, 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. Restore or replace damaged tree wrappings.

B. Ground Cover and Plant Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.

3.11 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

3.12 DISPOSAL

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION