

***Bid Package
For
Daniel Morgan Avenue
Streetscape Project***

CITY OF SPARTANBURG

JOB NO. 1604

November 28, 2016

Proposal No 1617-12-13-01

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City of Spartanburg
Procurement and Property Division
Post Office Drawer 1749, SC 29304-1749
Phone (864) 596-2049 - Fax (864) 596-2365

Legal Notice

Request for Proposal for

Daniel Morgan Avenue Streetscape Project

November 28, 2016

NOTICE IS HEREBY GIVEN – The City of Spartanburg is seeking proposals from vendors to provide construction services for Daniel Morgan Avenue Streetscape Project. This Project includes the demolition and removal of existing improvements, including concrete sidewalk, street trees, curb & gutter, asphalt, etc. The project includes the installation of approximately 1,100 L.F. of 18” concrete curb & gutter. Construction of the new concrete sidewalk approximately 1,220 S.Y. Storm Drainage includes the installation of new catch basins, modification of three existing catch basins, and 18” RCP. Also the installation of 5 - 2” conduit, and 1 – 1” conduit.

There will be a MANDATORY PRE-BID MEETING on Tuesday December 6, 2016 at 10:00 AM on site at the Corner of W. Main Street and Daniel Morgan Avenue, 189 W. Main Street, Spartanburg SC 29306.

Proposal No: 1617-12-13-01

The City of Spartanburg, hereby, notifies all proposers that it will affirmatively ensure that all disadvantaged and women’s business enterprises will be afforded full opportunity to submit proposals in response to this invitation and will not be discriminated against on the grounds of gender, race, color, or national origin in consideration for an award.

The City of Spartanburg reserves the right to reject any or all proposals or to waive any informality in the qualifications process. Proposals may be held by the City of Spartanburg for a period not to exceed sixty (60) days from the date of the opening of Proposals for the purpose of reviewing the Proposals and investigating the qualifications of prospective parties, prior to awarding of the Contract. The vendor that is awarded the proposal will be required to obtain a “City of Spartanburg Business License and Permits”. Vendors must have the insurance requirements in described in the bid documents.

Each bid must be accompanied by a Bid Bond or Bank Cashier’s Check payable to the Owner for five (5) percent of the total amount of the Bid. Please seal your bid bond or Cashier’s Check in a separate envelope titled BID BOND to be opened first.

Drawings and Specifications may be purchased from ARC (formerly Imaging Technologies) Construction Documents, including Drawings and Technical Specifications are on file and can be purchased at ARC located at 7092 Howard Street #K, Spartanburg, SC 864 585-8388.

Contract documents may be examined at the offices of the Owner, (City of Spartanburg 864-596-2049), or Associated General Contractors in Greenville, South Carolina and Charlotte.

Technical questions regarding the scope of services should be directed to Tim Carter, Engineering Administrator, 864-596-2838 or by email at tcarter@cityofspartanburg.org . Questions regarding the bid should be directed to Carl Wright, Procurement and Risk Manager at 864-596-2790 and 864-596-2049 or by email at cwright@cityofspartanburg.org. Questions regarding Minority and Women Business participation should be directed to Natasha Pitts, Minority Business Development Coordinator, at 864-596-3449 or 864, or by email at npitts@cityofspartanburg.org.

Sealed Proposals shall be submitted to Carl Wright, Procurement and Property Manager, on or before Tuesday, December 13, 2016 at 3:00, City Hall, 145 W. Broad Street, at which time they will be publicly opened and read aloud in the Training Room, same location. Complete proposal package also available at www.cityofspartanburg.org by following the links for bid opportunities.

Proposals can be hand delivered or mailed to the following address:

City of Spartanburg
P.O. Box 5107
145 W. Broad Street
Spartanburg, SC. 29304

Attn: Procurement and Property Division

For further information and complete Proposal Package, please contact the Procurement and Property office at (864) 596-2049. Complete proposal package also available at www.cityofspartanburg.org by following the links for Invitations for bids.

Proposal No: 1617-12-13-01

INFORMATION FOR BIDDERS

Bids will be received and opened as specified in the advertisement.

1. Bids

Each Bid must be submitted in a sealed envelope, as advertised. Each sealed envelope containing a BID must be plainly marked on the outside as BID for City of Spartanburg for **DANIEL MORGAN AVENUE STREETScape PROJECT**, and the envelope should bear on the outside the Bid Number, name of BIDDER, his/her address, all license information, etc., typed thereon and sealed. If forwarded by mail, the sealed envelope contained in the BID must be enclosed in another envelope addressed to the OWNER as advertised.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions herein and may waive any informality or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered.

All bids shall be on the printed form contained herein or on copies thereof, and shall be for all labor, material and equipment required to complete the work embraced in the contract in accordance with the plans and specifications. Bid Documents shall include the Bid, the Bid Quantity, the Non-Collusion Affidavit and the Statement of Bidder's Qualification. Bids shall be typewritten or completed in ink. All blank spaces for bid prices must be filled in, in figures, or in both words and figures if so indicated in the bid form. In addition, any other information requested in the bid form must be completed.

Each BIDDER is required to state in his proposal his/her name and place of residence and the names of all persons interested with him; in case of a corporation, the names of other than the president and secretary need not be given. Reference shall be furnished to establish the skill and business standing of the BIDDER.

If the Contract is awarded, it will be awarded by the Local Public Agency to a responsible Bidder on the basis of the lowest Bid and the selected Alternative Bid items, if any. The Contract will require the completion of the work according to the Contract Documents.

If called for in the bid, each bidder shall submit a price for all alternates listed therein. Failure to do so will result in the bid being considered incomplete and may result in rejection of the bid.

On the first sheet of the bid form, the bidder shall write his/her name and address, his/her bidder's license number; and contractor's license number, if required. In South Carolina, where a mechanical contract amounts to \$10,000 or more, the name and license number of the sub-contractor, where his/her bid is used, shall also be shown.

Following the BID opening, the OWNER shall determine the Items, Alternates, and Additions to be performed. Total BIDS will be calculated by adding the amounts BID by each BIDDER for such ITEMS, Alternates, and Additions, less the Deductions, so selected by the Owner in determining the low responsive, responsible BID. The OWNER reserves the right to reject any and all BIDS.

The successful BIDDER will be further required to furnish the OWNER with a complete breakdown of the total sum BID items to the satisfaction of the ENGINEER, before signing the contract documents.

The Owner reserves the right to hold bids for a period of sixty (60) days after date of opening and to award the contract at any time during that period.

2. INTERPRETATIONS OR ADDENDA

No oral interpretation will be made to any Bidder as to the meaning of the Contract Documents or any part thereof. Every request for such an interpretation shall be made in writing to the Local Public Agency. Any inquiry received seven or more days prior to the date fixed for 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 on file in the office of the Local Public Agency and the office of the Engineer at least five days before Bids are opened. In addition, all Addenda will be mailed to each person holding Contract Documents, but it shall be the Bidder's responsibility to make inquiry as to the Addenda issued. All such Addenda shall become part of the Contract and all Bidders shall be bound by such Addenda, whether or not received by the Bidders.

Each bidder shall acknowledge receipt of all addenda in the spaces provided in the bid form. It shall be each bidder's responsibility to assure him that all addenda have been received. No claim for failure to receive addenda will be considered.

3. INSPECTION OF SITE

Each Bidder should visit the site of the proposed work and fully acquaint himself/herself with the existing conditions there relating to construction and labor, and should fully inform himself/herself as to the facilities involved, the difficulties and restrictions attending the performance of the Contract. The Bidder should thoroughly examine and familiarize himself/herself with the Drawings, Technical Specifications, and all other Contract Documents. The Contractor by the execution of the Contract shall in no way be relieved of any obligation under it due to his/her failure to receive or examine any form or legal instrument or to visit the site and acquaint himself/herself with the conditions there existing and the Local Public Agency will be justified in rejecting any claim based on facts regarding which he/she should have been on notice as a result thereof.

4. ALTERNATIVE BIDS

No alternative bids will be considered unless alternative bids are specifically requested by the technical specifications.

5. BID GUARANTY

Each Bid must be accompanied by a BID BOND payable to the OWNER for five percent of the total amount of the Bid. As soon as the BID prices have been compared, the OWNER will return the bonds of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A Certified check may be used in lieu of a BID BOND. A performance bond and payment bond, each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract in the form attached hereto. Attorneys-in-fact who sign BID BONDS or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

6. COLLUSIVE AGREEMENTS

Each Bidder submitting a Bid to the Local Public Agency for any portion of the work contemplated by the documents on which Bidding is based shall and attach thereto, an affidavit substantially in the form herein provided, to the effect that he/she has not entered into a collusive agreement with any other person, firm, or corporation with regard to any Bid submitted.

Before executing any subcontract the successful Bidder shall submit the name of any proposed subcontractor for prior approval.

7. STATEMENT OF BIDDER'S QUALIFICATIONS

Each Bidder shall upon request of the Local Public Agency 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/her experience record in constructing the type of improvements embraced in the contract, his/her organization and equipment available for the work contemplated, and when specifically requested by the Local Public Agency, a detailed financial statement. The Local Public Agency shall have the right to take such steps as it deems necessary to determine the availability of the Bidder to perform his/her obligations under the Contract and the Bidder shall furnish the Local Public Agency 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 Local Public Agency that the Bidder is qualified to carry out properly the terms of the Contract.

8. UNIT PRICES

The unit price for each of the several items in the proposal of each Bidder shall include its pro-rata share of overhead so that the sum of the products obtained by multiplying the quantity shown for each item by the unit price Bid represents the total Bid. Any Bid not conforming to this requirement may be rejected as informal. The special attention of all Bidders is called to this provision, for should questions make it necessary to revise the quantities, no limit will be fixed for such increased or decreased quantities nor extra compensation allowed, provided the net monetary value of all such additive and subtractive changes in quantities of such items of work (i.e., difference in cost) shall not increase or decrease the original contract price by more than twenty-five (25%) percent, except for work not covered in the Drawings and Technical Specifications.

The quantities listed in the proposal form are to be considered as approximate and are to be used only for the comparison of the BIDS and as basis for computing amounts of security or penal sums of bonds to be furnished. The unit prices to be tendered by the BIDDERS are to be tendered expressly for the scheduled quantities as they may be increased or decreased. Payments, except for lump sum contracts, and except for lump sum items in unit price contracts, will be made to the CONTRACTOR for the actual quantities only of work performed or materials furnished in accordance with the plans and specifications, and it is understood that the scheduled quantities of work to be done and materials to be furnished may each be increased or diminished without in any way invalidating the unit BID prices.

9. CORRECTIONS

Bids which are incomplete, unbalanced, conditional or obscure, or which contain additions not called for, erasures, alterations or irregularities of any kind or which do not comply with the contract documents may be rejected at the option of the Owner.

Erasures or other changes in the Bids must be explained or noted over the signature of the Bidder.

10. TIME FOR RECEIVING BIDS

Bids received prior to the advertised hour of opening will be securely kept, sealed. The officer whose duty it is to open them will decide when the specified time has arrived, and no Bid received thereafter will be considered: except that when a Bid arrives by mail after the time fixed for opening, but before the reading of all other Bids is completed, and it is shown to the satisfaction of the Local Public Agency that the non-arrival on time was due solely to delay in the mail for which the Bidder was not responsible, such Bid will be received and considered.

11. OPENING OF BIDS

At the time and place fixed for the opening of Bids, the Local Public Agency will cause to be opened and publicly read aloud every Bid received within the time set for receiving Bids, irrespective of any irregularities therein. Bidders and other persons properly interested may be present, in person or by representative.

12. WITHDRAWAL OF BIDS

Bids may be withdrawn on written or telegraphic request dispatched by the Bidder in time for delivery in the normal course of business to the time fixed for opening; provided, that written confirmation of any telegraphic withdrawal over the signature of the Bidder is placed in the mail and postmarked prior to the time set for Bid opening. The Bid guaranty of any Bidder withdrawing his/her Bid in accordance with the foregoing conditions will be returned promptly.

13. AWARD OF CONTRACT: REJECT OF BIDS

The Contract will be awarded to the responsible Bidder submitting the lowest Bid complying with the conditions of the Invitation for Bids. The Bidder to whom the award is made will be notified at the earliest possible date. The Local Public Agency, however, reserves the right to reject any and all Bids and to waive any informality in Bids received whenever such rejection or waiver is in its interest. The Local Public Agency reserves the right to consider as unqualified to do the work of general construction any Bidder who does not habitually perform with his/her own forces the major portions of the work involved in construction of the Improvements embraced in this Contract.

14. EXECUTION OF AGREEMENT: PERFORMANCE BOND, PAYMENT BOND, BUSINESS LICENSE

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

Having satisfied all conditions of award as set forth elsewhere in these documents, the successful Bidder shall, within the period specified in this document, furnish a surety bond in a penal sum not less than the amount of the Contract as awarded, as security for the faithful performance of the Contract, and for the payment of all persons, firms, or corporations to whom the Contractor may become legally indebted for labor, materials, tools, equipment, or services of any nature including utility and transportation services, employed or used by him/her in performing the work. Such bond shall be in the same form as that 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. This bond shall be obtained from companies holding certificates of authority as acceptable sureties (31 CFR 223).

The failure of the successful Bidder to execute such Agreement and to supply the required bond or bonds within ten days after the prescribed forms are presented for signature, or within such extended period as the Local Public Agency may grant, based upon reasons determined sufficient by the Local Public Agency, shall constitute a default, and the Local Public Agency may either award the Contract to the next lowest responsible Bidder or re-advertise for Bids, and may charge against the Bidder the difference between the amount of the Bid and the amount for which a Contract for the work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the Bid Bond. If a more favorable Bid is received by re-advertising the defaulting Bidder shall have no claim against the Public Agency for a refund.

The NOTICE OF AWARD shall be accompanied by the necessary Agreement and bond forms.

15. NOTICE TO PROCEED

The NOTICE TO PROCEED shall be issued within 10 days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period; the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the 10 day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

16. WAGES AND SALARIES

Attention of Bidders is particularly called to the requirements concerning the payment of not less than the prevailing wage and salary rates specified in the Contract Documents and the conditions of employment with respect to certain categories and classifications of employees.

The rates of pay set forth under the General Wage Determination for the State of South Carolina are the minimums to be paid during the life of the Contract. It is therefore, the responsibility of Bidders to inform themselves as to local labor conditions, such as the length of work day and work week, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustments of rates.

17. EQUAL EMPLOYMENT OPPORTUNITY

Attention of Bidders is particularly called to the requirement for ensuring that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, or national origin.

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

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

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

Timetables	Goals for minority Participation for each trade	Goals for female participation in each trade
	16.0%	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered areas. The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a) and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulation in 41 CFR, Part 60-4. Compliance with the goals will be measured against the total work hours performed.

1. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.
2. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county, and city, if any).

18. ILLEGAL ALIENS/WORKERS

Attention to bidders is also called to requirements to verify the hiring eligibility of its employees as required under South Carolina's Eligible Immigration Reform Act, S. C. Code Ann., 41-8-10, et seq. by either registering and participating in the Federal Work Authorization Program (e-verify) pursuant to the Statute or employ only workers who at the time of their employment possess a valid South Carolina Driver's License or Identification Card or are eligible to obtain same or possess a valid Driver's License or Card from another state deemed by the Director of the Department of Motor Vehicles to have requirements at least as strict as those in South Carolina. Bidder also understands that he/she will comply with the Statute in its entirety and agrees to provide the Public Agency with documentation to establish applicability of the Statute.

19. GENERAL GUARANTY

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the Improvements embraced in this Contract by the 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 of 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 there from which shall appear within a period of 12 months from the date of final acceptance of the work. The Local Public Agency will be given notice of defective materials and work with reasonable promptness.

20. LOCAL PUBLIC AGENCY

Wherever the term "Local Public Agency" is referenced in the contract documents, it shall mean the Owner which is the City of Spartanburg.

21. TAXES

Attention is called to the following provisions of the South Carolina Tax laws: South Carolina law requires that a withholding tax of two percent (2%) be withheld from payments made to non-resident contractors performing a business of temporary nature in South Carolina, and provided the contract exceeds \$10,000. The withholding of two percent (2%) may be waived provided the nonresident taxpayer posts with the South Carolina Tax Commission a non-resident withholding tax bond. This provision insures the South Carolina Tax Commission that the non-resident contractor will comply with applicable provisions of the Income Tax Act of 1926, as amended. The prime contractor or employer of the non-resident contractor is held responsible for the tax due to be withheld and must withhold the tax unless he is notified by the South Carolina Tax Commission that a non-resident withholding bond has been posted covering the contract in question.

In addition to the above, the non-resident contractor is required to act as withholding agent for the State of South Carolina and withhold tax from wages paid to his employees working in South Carolina. It is the responsibility of the non-resident contractor to apply for an employer account number and file the quarterly withholding reports on or before the appropriate due dates.

22. ENGINEER

Wherever the "Engineer" is referenced in the contract documents, it shall mean the City Engineering Administrator, P. O. Drawer 1749, Spartanburg, S. C. 29304, telephone (864) 596-2838.

**PROPOSAL FOR
DANIEL MORGAN AVENUE STREETScape PROJECT**

CITY OF SPARTANBURG

Job No. 1604

BID NUMBER 1617-12-13-01

FROM:

BIDDER _____ **Date** _____

Address _____ **Telephone** _____

Bidder's License No. _____

Contractor's License No. _____

TO: CITY OF SPARTANBURG (OWNER)

145 West Broad Street
Post Office Drawer 5107
Spartanburg, S. C. 29304

The undersigned, as bidder, hereby declares that the only person, or persons, interested in this bid as principal(s) is, or are, named herein, and that no other person has any interest in the bid or the contract to be entered into; that this bid is made without connection with any person, company or parties making a bid; and that it is in all respects fair and in good faith without collusion or fraud.

The bidder further declares that he has examined the site of the work and informed himself/herself fully in regard to all conditions pertaining to the place where the work is to be done; that he has examined the contract documents relative thereto; and that he/she has satisfied himself/herself as to the work to be performed.

The bidder further proposes and agrees, if this bid is accepted, to contract with the Owner in the attached form of agreement, to furnish all material, equipment, tools, apparatus means of transportation, and labor necessary to complete the project in full and complete accordance with the contract documents, to the full and entire satisfaction of the Owner, at the prices and amounts listed below.

The bidder further agrees to commence work on the date stipulated in the notice to proceed and to fully complete the project within the number of consecutive calendar days thereafter as listed below. The bidder also agrees to pay as liquidated damages, the sum as listed below for each consecutive calendar day thereafter the project remains incomplete.

Completion Time: 45 days

Liquidated Damages: \$300.00 per day

The undersigned Bidder agrees that if this Proposal shall be accepted, the undersigned will, within ten (10) days after notifications of such acceptance, enter into the contract for their performance of all work proposed under this improvement within the number of calendar days as stated herein, and, as a guaranty of the faithful performance thereof, to furnish at the time of executing the contract a performance bond in an amount not less than one hundred

percent (100%) of the total amount bid, and with sureties subject to the approval of the Owner. Upon failure to execute the contract and bond as aforesaid, it is agreed that the undersigned shall forfeit check accompanying this proposal to the Owner as liquidated damages caused by such failure.

The work consists of the approximate quantities shown herein which will be used as a basis for comparison of bids and not for final estimate. The Owner does not, by expression or by implication, agree that the actual amount of work will correspond with the estimated quantities.

In case of error in extension, the unit price shall govern rather than the amount. For lump sum items, the individual amounts shall govern the total of the bid in case of discrepancy.

The Owner may delete from the contract any or all of the alternates listed in the bid form.

The prices and amounts listed below include all labor, materials, tools, equipment, transportation, removal, overhead, profit, insurance, taxes, etc., to cover the finished work in place.

Request for Proposal

S Daniel Morgan Avenue Streetscape Project

Streetscape Portion (Eastside of street from W. Main St. to Harris Place)

Proposal # 1617-12-13-01

_____ submits herewith our proposal in response to the bid request.

(Company Name)

Unit Cost

Item	Description	Unit	Qty.	Unit Price	Total
1	Demolition Asphalt, Concrete, Trees, Bricks, & Debris Ect. (As shown on drawing)	S.Y.	1730		
2	Saw Cut Existing Asphalt (8")	L.F.	900		
3	18" Curb and Gutter	L.F.	1100		
4	Crushing Run Under New Curb & Gutter	Tons	700		
5	Concrete 4" Concrete Sidewalk (See drawing for control joint pattern)	S.Y.	1220		
6	Bore and Install 4 - 3" PVC Sleeves (W. Broad Street)	L.F.	80		
7	Installation of 1 - 2" White PVC Conduit (Irrigation)	L.F.	630		
8	Installation of 4 - 2" Gray PVC Conduit (Future use)	L.F.	850		
9	Installation of 17"x 30"x 30" Quazite Box (Future use)	Ea.	3		
10	Installation of 1 - 1" Gray PVC Conduit (Electrical)	L.F.	850		
11	Modify Existing Type 1 C.B. to Solid Top with M.H. Cover	Ea.	2		
12	Modify Existing Type 5 C.B. to Solid Top with M.H. Cover	Ea.	1		
13	Modify Existing Type 7 C.B. into New Type 17 C.B.	Ea.	1		
14	Install Type 1 Hood & Grate C.B. with Safe Walking Surface (0' to 5' Deep)	Ea.	3		
15	Installation of 18" RCP (0' to 5' Deep)	L.F.	26		
16	Mobilization	L.S.	1		
17	Traffic Control	L.S.	1		

Totals

Total Bid Written in Words

SIGNATURE OF COMPANY REPRESENTATIVE

Name

Print Name & Title

Date

The work consists of the approximate quantities shown herein which will be used as a basis for comparison of bids and not for final estimate. The Owner does not, by expression or by implication, agree that the actual amount of work will correspond with the estimated quantities.

In case of error in extension, the unit price shall govern rather than the amount. For lump sum items, the individual amounts shall govern the total of the bid in case of discrepancy. The owner may delete from the contract any or all of the alternates listed in the bid form.

The amounts listed above include all labor, materials, tools, equipment, transportation, removal, overhead, profit, insurance, tax, etc. to cover the finished work in place.

Bidder acknowledges receipt of the following Addenda:

Addenda Received: No. _____

Date _____

The undersigned further agrees that in case of failure on his part to execute the said contract and bonds within 10 consecutive calendar days after written notice has been given of the award of the contract, the check and/or bid bond accompanying this bid and the monies payable thereon will be paid into the funds of the Owner as liquidated damages for such failure; otherwise, said check or bid bond will be returned to the undersigned.

The bidder further purposes and agrees hereby to commence the work with adequate forces and equipment within 10 days after being notified by the Owner or Engineer to proceed, and to complete the work within the specified time.

ATTACHED HERETO is a certified check on the _____

_____ Bank of _____ and/or bid bond

with the _____ Company for the sum of _____

Dollars (_____), made payable to the Owner as a bid guarantee.

The attached completed and executed Debarred Firms certification is hereby made a part of this bid.

Address:

_____ Firm _____

_____ By _____ (L.S.)

Title _____

(SEAL is bid is by a corporation)

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of South Carolina)

ss.

County of Spartanburg)

_____, being first duly sworn,
deposes and says that:

- 1) He/She is _____ OF _____, the Bidder that has submitted the attached Bid:
- 2) He/she is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid:
- 3) Such Bid is genuine and is not a collusive or sham Bid:
- 4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Spartanburg, S.C. or any person interested in the proposed Contract; and
- 5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(signed) _____
Title

Subscribed and sworn to before me this

_____ day of _____, 20____

Title

Attest:

By: _____ Affix
Corporate
Seal

Countersigned

by _____

⁶Attorney-in-Fact, State of _____

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that
I am the _____, Secretary
of the Corporation named as Principal in the within bond: that
_____ who signed the said bond on behalf
of the Principal was then _____ of said corporation: that I know his
signature, and his signature thereto is genuine: and that said bond was duly
signed, sealed, and attested to, for and in behalf of said corporation by authority
of this governing body.

_____ (Corporate Seal)

Title: _____

⁶Power-of-attorney for person signing for surety company must be attached to bond.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____,
(Corporation, Partnership or Individual)

hereinafter called Principal, and

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

CITY OF SPARTANBURG

(Name of Owner)

145 WEST BROAD STREET, SPARTANBURG, SOUTH CAROLINA 29306

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____

Dollars, \$ _____ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof for the construction of:

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

PROVIDED, FURTHER, that the said surety, for value received hereby stipulate and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____
(number)
counterparts, each one of which shall be deemed an original, this the
_____ day of _____, 20____.

ATTEST:

Principal

(Principal Secretary)

(SEAL)

BY _____ (s)

(Address)

(Witness as to Principal)

(Address)

(Surety)

ATTEST:

BY _____
Attorney-in-Fact

Witness as to Surety

(Address)

Address

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR in Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____
(Corporation, Partnership or Individual)

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

CITY OF SPARTANBURG

(Name of Owner)

145 WEST BROAD STREET, SPARTANBURG, SOUTH CAROLINA 29306

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____

Dollars, \$ _____ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREOF, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs or machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether

by SUBCONTRACTOR or otherwise then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulate and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed there under or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____
(number)
counterparts, each one of which shall be deemed an original, this the _____
day of _____, 20_____.

ATTEST:

Principal

BY _____ (s)

(Principal Secretary)

(SEAL)

(Witness as to Principal)

(Address)

(Address)

(Surety)

ATTEST:

(Surety) Secretary

(SEAL)

Witness to Surety

BY _____
Attorney-in-Fact

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR in Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

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00700-01. SCOPE OF DRAWINGS AND SPECIFICATIONS:

- A. *Any provisions contained in the specifications or shown on standard drawings which are not applicable to the work under this contract shall be disregarded.*
- B. *The Owner will be responsible for the adequacy of the general design of the finished work. The design of standard products used in the work; temporary work required to protect existing work or adjoining property; and temporary work required to keep existing or new facilities in operation shall be the sole responsibility of the Contractor.*
- C. *Reference to standard Specifications (ASTM, AWWA, ANSI, etc.), national codes, local or state codes, and laws and ordinances shall mean the latest edition of said document in effect at the time of taking bids, unless specifically stated otherwise.*
- D. *It is the intent that the work under this contract shall result in a complete, properly usable and operating installation, structure, or plant; and that workmanship shall be of the best quality consistent with the materials and construction methods shown on drawings and as specified.*
- E. *The words "furnish", "furnish and install", "install" and "provide" or similar words shall mean, unless otherwise specifically stated, "furnish and install complete in place and ready for service".*
- F. *Incidental work and miscellaneous accessories not specifically mentioned or shown, but necessary for the proper completion of the work, shall be provided without change in the contract price. Such incidental work and accessories shall be of the same quality as specified for the major component of which the incidental work or accessory is an essential part.*
- G. *The work of all trades under this contract shall be coordinated by the Contractor in such a manner as to obtain the best workmanship possible for the entire project. All components of the work shall be installed or erected in accordance with the best practices of the particular trade.*
- H. *The Contractor shall be responsible for making the construction of habitable structures completely weatherproof, and for making equipment and utility installations properly perform the specified function. If he is prevented from so doing by any limitations of the drawings or specifications, the Contractor shall immediately notify the Engineer in writing of such limitations before proceeding with construction in the area where the problem or limitation exists.*
- I. *Materials or methods described by words which have a well known technical or trade meaning shall in fact refer to that recognized standard. Standard specifications or manufacturer's literature, when referenced, are intended to establish the minimum acceptable requirements.*
- J. *Any reference to manufacturer's brand or trade names or model numbers is intended merely to establish the standard of quality required for the particular product or material. Products or materials of other manufacturers, which in the opinion of the Engineer are equal to that specified with respect to quality, workmanship and economy of operation, and are suitable for the purpose intended, will be acceptable.*
- K. *The Contractor shall be responsible for making all necessary arrangements with governmental departments, public utilities, public carriers, service companies and corporations owning or controlling roadways, railways, water, sewer, gas, electrical, telephone and telegraph facilities, such as pavements, track, piping, wires, cables, conduits, poles, guys, etc., including incidental*

structures connected therewith, that are encountered in the work in order that such items may be properly shored, supported, protected or relocated. He shall give all proper notices, shall comply with the requirements of such parties in the performance of his work, shall permit entrance of such parties on the project in order that they may perform their necessary work, and shall pay all charges and fees made by such parties for this work.

- L. The Contractor's attention is called to the fact that there may be delays on the project due to work to be done by governmental agencies, public utilities and others in repairing or moving poles, conduits, etc. The Contractor shall cooperate with the above parties, in every way possible, so that construction can be completed in the least possible time.*
- M. Unless otherwise specified, the Contractor shall provide at his expense all tests and testing services required by the contract documents.*

00700-02. PERMITS:

The Contractor shall be responsible for procuring any permits for the use of property beyond the limits of the Owner's property or a permanent rights-of-way as necessary for working or storage space during the prosecution of the work.

00700-03. SUBMISSIONS, REPORTS, RECORDS AND DATA:

- A. The Contractor shall submit all schedules, quantities, costs, payrolls, reports, estimates, records, shop drawings, details and other data as required by the contract documents or as may be specifically requested.*
- B. The apparent successful bidder shall furnish to the Engineer for approval a complete cost breakdown of his bid, within 10 days after submission of bids. The breakdown shall include all items for each unit of construction, and shall show the cost for labor, materials and equipment, other necessary costs, and the total cost for each unit of work. Bidders shall consult with the Engineer prior to submitting the breakdown to insure a complete understanding of the requirements. Names of the project superintendent and others responsible for the work shall be included.*
- C. The Contractor shall furnish periodic itemized estimates for work done for the purpose of making partial payments thereon. The costs employed in making up these estimates will be used only for determining the basis of partial payments and will not be considered as a basis for changes in the contract price.*
- D. The Contractor shall notify the Engineer of the source of all materials and equipment required for the work, and shall supply samples of materials as specified in the technical sections or at the Engineer's request. Samples shall be submitted for approval by the Engineer prior to purchase and delivery to the job. Unless otherwise specified, three samples of each type or grade of material, showing construction, color, finish, etc., shall be submitted.*
- E. Prior to submittal of any shop drawings, the Contractor shall prepare a list of all materials, equipment and items that require shop drawings and submit this list to the Engineer. The list shall include each specific item along with the applicable specification section. The Engineer reserves the right to require shop drawings on any item, whether or not specified. Shop drawings will not be reviewed until this list is submitted to the Engineer.*

00700-04. JOB SITE DRAWINGS AND SPECIFICATIONS:

- A. *The Contractor shall maintain, in good and legible condition at the job site, one complete set of working drawings and specifications for the work, including all shop drawings. Such drawings and specifications shall be available for use by the Engineer or his/her representative at all times.*
- B. *The drawings and specifications shall be marked, or notes acceptable to the Engineer provided, in order to reflect as-built conditions. Changes indicating such conditions shall be kept current at all times. Upon completion of the project, this complete set of drawings and specifications or notes, showing as-built conditions, shall be returned to the Engineer.*

00700-05. PROHIBITED INTEREST:

No official of the Owner who is authorized by 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, will become directly or indirectly interested personally in this matter or in any part thereof. No officer, employee, architect, attorney, engineer or representative of or for the Owner who is authorized by the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, will become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

00700-06. MUTUAL RESPONSIBILITY OF CONTRACTORS:

If, through acts of neglect on the part of the Contractor, any other contractor or subcontractor suffers loss or damage on the work, the Contractor agrees to settle with the other contractor or subcontractor by agreement or arbitration if the other contractor or subcontractor agrees. If any other contractor or subcontractor asserts any claim against the Owner on account of damage alleged to have been sustained, the owner will notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

00700-07. ORDER AND PROSECUTION OF WORK:

- A. *The Contractor shall not begin any work on the project without first notifying the Owner and the Engineer. The notice shall be in writing and shall be received by the Owner and the Engineer at least three days prior to the beginning of work. Any work done without prior notice will not be accepted. Upon request, the Contractor shall meet with the Owner and Engineer prior to beginning work in order to discuss and clarify all phases of the work.*
- B. *The Contractor shall be solely responsible for the means, methods and sequence of construction, and for the safety of workers and other persons on the construction site and of all materials and equipment to be incorporated in the work. The work shall be prosecuted at as many different points, at such times, in such sections and with such forces as may be necessary to secure its completion within the contract time. The Contractor shall not suspend work without the prior approval of the Owner or Engineer.*
- C. *Pipeline work shall be prosecuted in such a manner that completed portions of the work can be*

- D. *properly dressed off as work progresses. In case of work on streets and highways, two or more crews shall not work on contiguous areas at the same time. Streets and roads shall be dressed off as soon as work is completed therein.*

00700-08. PUBLIC CONVENIENCE AND PROTECTION:

- A. *During progress of the work, the convenience and protection of the public must be provided for and interference held to a minimum.*
- B. *The Contractor shall, at all times, conduct the work in such a manner as to insure the least practicable obstruction to public travel. The convenience of the general public and of the residents along and adjacent to the area of the work shall be provided for in a satisfactory manner, consistent with the operation and local conditions. Roads and streets shall be kept open at all times or suitable detours provided. When necessary to close streets, suitable signs and barriers shall be placed immediately adjacent to the work, at such locations as traffic demands, and the Owner, law enforcement agencies, fire departments and parties operating emergency vehicles shall be notified before the street is closed and again as soon as it is opened. Access to fire hydrants and other fire fighting equipment shall be maintained at all times.*
- C. *When necessary, the Contractor shall provide watchmen, and lights to burn between twilight and sunrise, and shall erect and maintain barriers and all other necessary protection about the work at his own expense. He/She shall also take other precautions necessary to protect life, limb and property. The owner reserves the right to remedy any neglect on the part of the Contractor in connection with protection of the work after 24 hours notice in writing; and, in cases of emergency, the Owner will have the right to remedy any neglect without previous notice; and in either case deduct the cost of such remedy from money due to the Contractor.*

00700-09. SANITARY PROVISIONS:

The Contractor shall provide temporary toilet facilities for the use of construction personnel. These facilities shall be maintained in a clean and sanitary condition, and shall comply with all applicable codes and regulations. Temporary sanitary facilities shall be removed upon completion of the work and the premises left clean. Construction personnel shall not use permanent washroom facilities in existing facilities or new work except by written permission of the Owner.

00700-10. EXISTING FACILITIES:

- A. *Dimensions and elevations indicated on the drawings in reference to existing structures, location of utilities, sewer inverts, or other information on existing facilities, are based on the best available data, but are not guaranteed by the Owner. The Owner will not be responsible for their accuracy. Before proceeding with any work dependent upon such data, the Contractor shall field check and verify all dimensions, grades, inverts, lines, elevations, or other conditions or limitations at the site of the work to avoid construction errors or damage to existing facilities. If work is performed by the Contractor, or any subcontractors, prior to adequate verification of applicable data, any resultant extra cost for adjustment of work necessary to conform to existing conditions, or to repair damage to existing facilities, shall be assumed by the Contractor without additional cost to the Owner.*

- B. *In executing the work, the Contractor shall exert every effort not to damage existing facilities or to break into them. Damage that is done thereto shall be promptly repaired by the Contractor at his own expense. He/She shall not interrupt or interfere with operation of the existing facilities during construction except when absolutely necessary. Whenever existing facilities or utilities must be taken out of service, the Contractor shall consult with the Engineer and the Owner as to procedure, and shall be governed by their decision.*
- C. *The Owner does not guarantee that all existing buildings, structures, fences, pipelines, electrical lines, conduit, telephone cable, service connections or other facilities are shown on the drawings. It shall be the Contractor's responsibility to locate and protect all such existing facilities prior to beginning construction.*
- D. *Existing surface or subsurface improvements, such as pavement, curbs, sidewalks, pipes, utilities, footings, structures (including portions thereof), trees and shrubbery, not indicated on the drawings or specified to be removed or altered, shall be protected from damage at all times during construction.*
- E. *All such improvements damaged during construction shall be restored to a condition equal to that existing at the time of award of contract.*
- F. *The Contractor shall connect his/her work to each part of the existing work or work previously installed in accordance with the drawings and specifications to provide a complete installation.*
- G. *The Contractor shall do all cutting and patching of the work required to make the several parts fit together properly and to receive the work of others. The Contractor shall not endanger the work of others by cutting, excavating or otherwise altering their work, and shall not cut or alter the work of others without the written consent of the Engineer. All cut and patched work shall be restored to the satisfaction of the Engineer.*
- H. *The Contractor shall be responsible for removing and disposing of obstructions or obstacles at the job site or along the right-of-way to the satisfaction of the Engineer. Minor obstructions shall be removed and properly disposed of or protected and re-erected in as good condition as existing, at the same or other locations, and directed by the Engineer.*
- I. *Fences, at the site or along the right-of-way, which interfere with construction operations, shall be maintained by the Contractor until completion of work, unless written permission is obtained from the Owner to leave the fence dismantled until construction is completed. The Contractor shall remove, rebuild and extend fences as necessary to keep livestock away from the construction area or from straying away. Upon completion of work, all fences shall be restored to their original location and condition, unless otherwise noted. The Contractor shall purchase new material, if necessary, to replace all materials damaged, lost or destroyed.*

00700-11. WORK DURING INCLEMENT WEATHER:

No work shall be done except by permission of the Engineer when the weather is unfit for good and careful work to be performed. If the severity of the weather continues, the Contractor, upon the direction of the Engineer, shall suspend all work until instructed to resume operations by the Engineer, and the contract time will be extended as required to cover the duration of the order. Work damaged during periods of suspension due to inclement weather shall be repaired and/or replaced by the Contractor at his/her own expense.

00700-12. RIGHTS-OF-WAY:

- A. *The Owner will obtain all land and rights-of-way necessary for all work under this contract. If all land and rights-of-way are not obtained before construction begins, the Contractor shall start work only upon such land and rights-of-way previously obtained by the Owner, and no claim for damages will be allowed because of such delay. If the Owner is unable, for any reason, to obtain the land and rights-of-way necessary for the work, the contract time will be extended as required to cover the time lost by such delay.*
- B. *The Contractor shall confine his construction operations to the immediate vicinity of the locations shown on the drawings, and in no case shall he/she encroach beyond the limits of the Owner's property or rights-of-way. He/She shall place materials, equipment, supplies, etc., so as to cause the least possible damage to property and interference with traffic.*
- C. *The Contractor shall locate the limits of the rights-of-way, or property lines, prior to beginning construction. He/She shall be responsible for damage to trees, crops or other property outside the limits of the right-of-way, and shall make satisfactory settlement for damage directly with the property owner involved.*
- D. *Where timber is located on the property or right-of-way, the Contractor shall preserve and protect from damage all trees that do not directly interfere with the prosecution of the work. The Contractor shall not cut any tree greater than 6 inches in diameter and located more than 8 feet from the centerings of the ditch or structure without first consulting the Engineer.*
- E. *Except where specifically directed otherwise by the property owner, all grassed areas within the construction right-of-way and adjacent disturbed areas shall be restored to original or better condition. Within 30 days after backfilling, topsoil shall be replaced and seed planted, fertilized and watered until a permanent grass cover satisfactory to the Engineer and property is obtained. If necessary, a temporary grass cover shall be provided until a permanent cover can be established. If required by the property owner, shrubbery shall be replaced to the satisfaction of the Engineer and property owner.*

00700-13. WORK ON HIGHWAY RIGHT-OF-WAY:

- A. *The Contractor shall not begin work in the right-of-way of any State, County or City Department of Transportation until he has secured the necessary permits. He shall conform to all requirements of the Department of Transportation in the prosecution of this portion of the work. Each bidder shall contact the local Department of Transportation representative to determine the exact requirements for work to be done.*
- B. *The Contractor shall provide full time flagmen, with appropriate red flags, at all times when work is in progress along highways. Suitable warning and descriptive signs shall be placed at each end of the working area while work is in progress along highways. These signs shall be well tended, and shall be placed at sufficient distances from the work so that ample warning is given to approaching traffic. Signs shall be adequately lighted at night.*
- C. *Where pipe is installed in open cut across a highway, the cut shall be immediately backfilled and all work of repairing the pavement completed immediately. The Contractor shall keep at least one full lane open for traffic at all times. Any subsequent settlement shall be immediately corrected and repaired.*
- D. *Where a pipeline crossing under a highway is installed within encasement pipe as shown, the encasement pipe shall be provided as specified in the technical sections.*

- E. *Unless otherwise indicated, no excavated material shall be placed on the pavement side of the ditch along highways. The least possible amount of ditch shall be left open when work is not in progress, and equipment shall be removed from the pavement and shoulders during shutdown periods. Shoulders of roadways shall be left in good acceptable condition, and all disturbed topsoil and grass shall be replaced.*

00700-14. WORK ON RAILROAD RIGHT-OF-WAY:

- A. *The Contractor shall not begin work on railroad property until he has secured the necessary permits. He/She shall conform to all requirements of the railroad in the prosecution of this portion of the work.*
- B. *Where a pipeline crosses under a railroad, a larger encasement pipe shall first be installed and the pipe laid in it. The work shall be done in accordance with requirements of the railroad company. Encasement pipe shall be provided as specified in the technical sections, and shall be of the size shown on the drawings.*
- C. *The Contractor shall furnish the railroad company the following:*
- 1) *Certificate of Workman's Compensation or Employer's Liability insurance according to state law.*
 - 2) *Certificate of the Contractor's Public Liability Insurance, to protect the Contractor and subcontractor:*
 - a) *For loss of life or injury to person in an amount not less than \$150,000 for any one person, and not less than \$300,000 for any one accident.*
 - b) *For property loss or damage in an amount not less than \$150,000 for any one accident, and not less than \$300,000 aggregate.*
 - 3) *The original policy of Railroad Protective Liability insurance naming the railroad company as the insured:*
 - a) *For loss of life or injury to person in an amount not less than \$150,000 for any one person, and not less than \$300,000 for any one accident.*
 - b) *For property loss or damage in an amount not less than \$150,000 for any one accident, and not less than \$300,000 aggregate.*
 - c) *The Railroad Protective Liability policy shall show the location and description of the work and the name of the Owner for whom the work is done.*
- D. *The Contractor shall pay the cost of flagmen and other expenses of the railroad in protecting traffic. He shall notify the railroad of the time that the work will be done and shall not begin work until authorized by railroad officials.*

00700-15. USE OF PREMISES:

- A. *The Contractor shall confine his equipment, the storage of materials and equipment, and his/her*

operations to areas permitted by law, ordinances, permits, the requirements of the contract documents, and as directed by the Owner and Engineer, and shall not unreasonably encumber the premises with materials or equipment.

- B. The Contractor shall not overload any part of any structure with weights that will endanger its safety, nor shall he subject any part of the work to stresses or pressures that will endanger it.*
- C. The Contractor shall comply with and enforce the Owner's rules and instructions in connection with signs, advertisements, fires, smoking, and the routing and parking of vehicles on the premises.*
- D. Unless otherwise directed by the Engineer, the Contractor shall notify the Engineer, with a copy to the Owner, of all blasting operations at least 48 hours before such operations begin.*

00700-16. LINES AND GRADES:

- A. The Engineer will establish control points and base lines for control of the work, and will establish bench marks and determine their elevation. The Contractor shall provide such stakes and non-technical assistance as the Engineer may require for the work.*
- B. The Contractor shall have on the job, at all times, a man who is capable of setting stakes and replacing damaged stakes, and who understands the value and use of stakes and cut sheets, to whom the Engineer may deliver information. The Contractor shall furnish and set necessary batter boards and other means of control and shall be fully responsible for their accuracy. Lines and grades will be established as follows:
 - 1) For sewers and storm drains, the Contractor shall stake all offset lines with trench centers. These shall be set sufficiently off from the center line to allow for construction, and not over 50 feet apart when using batter boards. The Contractor shall be responsible for protecting all stakes and shall make necessary replacements. After stakes have been set, the Contractor shall determine necessary elevations and furnish necessary cut sheets for field use. Copies of all cut sheets shall be furnished to the Engineer.*
 - 2) For water mains, the Engineer will stake necessary control points to establish the center line of the main, which is to be located by the Contractor. The Engineer will also indicate locations of fire hydrants and valves.*
 - 3) For plant or building work, the Engineer will stake a construction base line, establish a bench mark and give its elevation to the Contractor. The Contractor shall stake all individual structures, provide batter boards, and set elevations for the work.**
- C. The Contractor shall establish all necessary lines and reference points for partitions, walls, floors, ceilings, openings, etc., both before and after concrete, masonry and other "roughing-in" materials are placed. Locations of all lines and points shall be verified by and overall distance check, end to end or side to side as applicable, of all intermediate dimensions.*

00700-17. SITE DATA:

The Owner will make available to all prospective bidders, prior to the receipt of bids, information that he/she may have as to sub-surface conditions in the vicinity of the work, topographical maps, or other information that may assist the bidder in properly evaluating the amount and character of the work required for construction. Such information is given, however, as being the best information available to the Owner at the specific location without

the assumption of responsibility for its accuracy or for any conclusions that the Contractor might draw therefrom. The Contractor shall satisfy himself as to the nature of the work, shall investigate all other matters which may in any way affect the work under this contract, and shall determine the character of equipment and facilities needed preliminary to and during the prosecution of work. No verbal agreement or conversation with any officer, agent or employee of the Owner or the Engineer, either before or after the execution of this contract, shall affect or modify any of the terms or obligations contained herein.

700-18. EQUIPMENT INSTALLATION:

When equipment of any kind is to be installed in a building or structure, and minor changes are necessary in the building or structure to accommodate the equipment, such changes shall be considered incidental to the proper completion of the work, and shall be made by the Contractor without additional compensation therefore.

00700-19. QUANTITIES OF ESTIMATES: *The estimated quantities of work to be done and materials to be furnished under this contract shown in any of the documents, including the bid, are given for use in comparing bids and to indicate approximately the total amount of the contract. The Owner reserves the right to increase or decrease the amount of work under this contract as specified elsewhere in these contract documents.*

00700-20. CLEANING UP:

- A. *During construction, the Contractor shall maintain the site and adjacent public and private property, including streets and highways, free from accumulations of waste, debris, rubbish and dirt caused by his operations. Dry materials and rubbish shall be wet down as necessary to prevent blowing dust.*
- B. *At completion of the work, the Contractor shall remove all waste materials, rubbish, tools, construction equipment and machinery, surplus materials and temporary facilities, and shall clean all exposed finished surfaces to prepare the project for occupancy by the Owner.*
 - 1) *Grease, dust, dirt, stains, labels, fingerprints and other foreign materials shall be removed from all exposed finished surfaces. All surfaces so designated shall be polished to a shine finish.*
 - 2) *Marred or damaged surfaces shall be repaired, patched or touched up to the specified finish or to match adjacent surfaces.*
 - 3) *Floors and paved surfaces shall be broom clean. Other surfaces of the grounds shall be raked clean.*
 - 4) *Both sides of all glass surfaces shall be cleaned.*
- C. *Cleaning and disposal operations shall be conducted in accordance with local ordinances and anti-pollution laws. Wastes shall not be disposed of into streams or waterways.*

00700-21. INSPECTION CERTIFICATES, BONDS AND GUARANTEES:

Upon final completion of the work and prior to submission of certificate for final payment, the Contractor shall have had electrical plumbing, heating and other work, as applicable inspected by the proper authorities as required by the technical sections of the specifications and all applicable codes, laws and ordinances. Before final payment is made, the Contractor shall submit all inspection certificates to the Engineer covering such work, signed by the proper authorities, together with all required bonds and guarantees.

00700-22. ESTIMATES NOT TO PREVENT FINAL REJECTION:

Final inspection and acceptance of the work will take place at completion of the work under this contract. Any inspection or acceptance of materials and workmanship at mills, shops or elsewhere to facilitate the progress of the work will not preclude rejection of such materials or workmanship thereafter if the same is found unsuitable or not in complete accordance with the contract documents.

00700-23. FINAL INSPECTION:

Upon written notice from the Contractor that the work is complete, the Engineer, Owner and applicable jurisdictional agencies will make a final inspection, and will notify the Contractor in writing of all defective, incomplete or otherwise unacceptable work revealed by the inspection. The Contractor shall immediately correct all such deficiencies to the satisfaction of the Engineer.

00700-24. GUARANTEES:

- A. *If, in fulfilling the requirements of this contract, the Contractor disturbs any work guaranteed under another contract, he/she shall restore such disturbed work to a condition satisfactory to the Engineer, and shall guarantee such restored work to the same extent as it was guaranteed under the other contract.*
- B. *All special guarantees applicable to specific parts of the work that may be stipulated in the contract documents shall be subject to the terms of the general one-year guaranty (see General Conditions) during the first year of the life of such special guarantee.*

00700-26. TEMPORARY UTILITIES:

- A. *The Contractor shall provide all equipment, fuel, supplies, services and attendance for interim heating as required during construction to protect the work against damage from cold weather. Unless otherwise specified, the permanent heating system shall not be used to provide temporary heat. The Contractor's proposed methods of heating shall be submitted to the Engineer for approval.*
- B. *During construction, the Contractor shall provide all interim electrical power and wiring required for operation of power tools, equipment and machinery and for temporary lighting. Lighting shall be provided where necessary for proper workmanship, inspection and safety. Temporary electrical service shall be installed and maintained by a qualified electrical contractor approved by the Engineer. The Contractor shall pay all charges for electrical service required for temporary power and lighting.*

00700-27. UNAUTHORIZED DISCHARGES:

During construction, the Contractor shall be solely responsible for prevention of unauthorized discharges of wastewater and sludge which may result in such environmental problems as fish kills, contaminated water supplies and the interruption of the intended use of certain stream segments. Such unauthorized discharges are a violation of state law and will be strictly enforced in accordance with all applicable laws and regulations. The Contractor shall be liable for all civil penalty assessments as prescribed for such violations.

End of Section

**SECTION 02060
DEMOLITION****PART 1. GENERAL****1.1 DESCRIPTION**

- A. Work included: Demolish and remove from the site those items so indicated on the Drawings, including sidewalks, curbs, buildings, building pads, parking and roadway areas, miscellaneous structures, poles, walls, utilities, signs, etc.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
 - 2. Section 02110 - Clearing and Grubbing.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with the Standard Building Code with due regard to the protection of the public and the provision of safeguards during the performance of the work.
- C. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner.
- D. Comply with requirements of governmental agencies having jurisdiction.
- E. Contractor is responsible for being aware of and complying with Asbestos NESHAP regulations, as well as other applicable codes, laws and regulations.
 - 1. The Owner is to be notified immediately upon discovery of asbestos materials.

PART 2. PRODUCTS

Not Used

PART 3. EXECUTION**3.1 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the safe, timely, and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 DEMOLITION

A. General:

1. Prior to start of demolition, carefully study the Drawings and these Specifications.
 2. In company with the Owner's representative, visit the site and verify the extent of demolition to be performed under this Contract.
- B. Using only the means and equipment approved for this purpose by the governmental agencies having jurisdiction, demolish and completely remove from the job site the existing construction designated to be removed.
1. Shut off, cap, reroute, and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction.
 2. Remove rocks larger than 6" diameter, roots, wood, and debris.
- C. Demolished material shall be considered to be property of the Contractor and shall be completely removed from the job site unless directed otherwise by owner.
- D. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Use any means necessary to protect the public safety during the demolition process.
- F. Use whatever means necessary to protect the adjacent structures from damage during demolition.
- G. Protection of trees: It may become desirable to save certain trees in areas where cut or fill is eighteen inches or less and in parking areas. Consequently, the Contractor shall obtain approval from Engineer prior to removal of significant trees from such areas. The Contractor shall protect existing trees to remain during construction by constructing barricades around such trees as directed.
- H. Erosion control: Construct and maintain erosion control as shown on the Drawings and in accordance with the local City requirements.

3.3 MEASUREMENT AND PAYMENT

- A. No separate measurement or direct payment will be made for the work under this Section and all costs for same shall be included in the lump sum price bid for the project.

END OF SECTION

**SECTION 02221
TRENCHING & BACKFILLING FOR UTILITIES****PART 1. GENERAL****1.1 DESCRIPTION**

- A. Work included: Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.3 JOB CONDITIONS

- A. Existing utilities:
 - 1. There now exists in the construction areas, waterworks, storm drainage, sanitary sewers, street paving, gas mains and other utilities.
 - 2. Approximate location of certain underground lines and structures are shown on the plans for information only, other underground lines or structures are not shown.
 - 3. Locate these and other possible unknown utility lines using electronic pipe finder, or other approved means.
 - 4. Locate, excavate and expose all existing underground lines in advance of trenching operations.
 - 5. The Contractor will be held responsible for the workmanlike repair of any damage done to any of these utilities in the execution of his work under this Section.
 - 6. The Contractor shall familiarize himself with the existing conditions and be prepared to adequately care for and safeguard himself and the Owner from damage.
- B. Notification of intent to excavate:

1. South Carolina Underground Utility Damage Prevention Act (S.C. Code Ann, 58-35-10, CT-SEQ, Supp. 1978) requires persons to ascertain the location of underground public utility property prior to excavation or demolition in certain situations. The Act also requires such persons to give timely notice of intent to excavate or demolish prior to commencing such operations. Failure to comply could subject the violator to a civil penalty of up to one thousand dollars (\$1,000) for each violation of the Act.
 2. Notification of intent to excavate may be given by calling this toll free number: 1-800-922-0983.
- C. Protecting trees, shrubbery and lawns:
1. Trees and shrubbery in developed areas and along the trench line shall not be disturbed unless absolutely necessary, and subject to the approval of the Engineer.
 - a. Any such trees and shrubbery necessary to be removed shall be heeled in and replanted.
 2. Where trenches cross private property through established lawns, sod shall be cut, removed, stacked and maintained in suitable condition until replacement is approved by the Engineer.
 - a. Topsoil underlying lawn areas shall be removed and kept separate from general excavated materials.
- D. Clearing:
1. Perform all clearing necessary for installation of the complete work.
 2. Clearing shall consist of removing all trees, stumps, roots, brush and debris in the rights-of-way obtained for the Work.
 3. All timber of merchantable size shall remain the property of the Owner and shall be trimmed and cut in such lengths as directed and stacked along the edge of the right-of-way.
 4. All other material, including trimmings from above, shall be completely disposed of in a satisfactory manner.
- E. Removing and resetting fences:
1. Where existing fences must be removed to permit construction of utilities:
 - a. Remove such fences and, as the Work progresses, reset the fences in their original location and condition.
 - b. Provide temporary fencing or other safeguards as required to prevent stock and cattle from wandering to other lands.
- F. Restoration of disturbed areas:

1. Restore all areas disturbed by, during or as a result of construction activities to their existing or better condition.
 2. Do not interpret this as requiring replacement of trees and undergrowth in undeveloped sections of the rights-of-way.
- G. Minimizing silting and bank erosion during construction:
1. During construction, protective measures shall be taken and maintained to minimize silting and bank erosion of creeks and rivers adjacent to the work being performed during construction.
 2. Sack breakers are to be used on steep slopes along creek banks and fill slopes to prevent washing of ditch. Sack breakers are to be placed at the direction of the Engineer.
- H. Blasting:
1. Store all explosives in a secure manner, complying with all laws, ordinances, and regulations.
 2. Contractor shall be responsible for damage caused by blasting operations.

PART 2. PRODUCTS

2.1 EXCAVATED MATERIALS

- A. Perform all excavation of every description and of whatever substances encountered to depths indicated or specified.
- B. Pile material suitable for backfilling in an orderly manner at safe distance from banks or trenches to avoid overloading and to prevent slides or cave-ins.
- C. Remove and deposit unsuitable or excess materials as directed by the Engineer.

2.2 BACKFILL MATERIALS

- A. Provide from materials excavated for installation of utility.
 1. Select soil material free from organic matter and deleterious substances, containing no rocks or lumps over 2" in greatest dimension for backfill up to 12" above top of utility being covered.
 2. Do not permit rocks larger than 2" in greatest dimension in top 6" of backfill.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3. EXECUTION**3.1 PROCEDURES****A. Existing utilities:**

1. Unless shown to be removed, protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by operations under this Section.

C. Dewatering:

1. Remove all water, including rain water, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
2. Keep trenches and site construction area free from water.

D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.**E. Maintain access to adjacent areas at all times.****3.2 TRENCH EXCAVATION (Unclassified)****A. Remove all materials of whatever substance encountered.**

- B. Comply with pertinent OSHA regulations in regards to the excavation of utilities.

3.3 BACKFILLING

A. General:

1. Backfill trenches and excavations immediately after the pipes are laid, unless other protection is directed or indicated.
2. Select and deposit backfill materials with special reference to the future safety of the pipes.
3. Reopen trenches which have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the Engineer.
4. Surplus material shall be disposed of as directed by the Engineer.
5. Original surface shall be restored to the approval of the Engineer.

B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to the density of the adjacent soil until there is a cover of not less than 24" over sewers and 12" over other utility lines.
2. Take special care in backfilling and bedding operations not to damage pipe and pipe coatings.

C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with material free from stones larger than 6" or \square the layered thickness, whichever is smaller, in any dimension.
2. Deposit backfill material in layers not exceeding the thickness specified, and compact each layer to the minimum density directed by the soil engineer.

D. Adjacent to buildings: Mechanically compact backfill in 6" layers within ten (10') feet of buildings.

E. Under roads, streets and other paved areas:

1. Mechanically tamp in 6" layers using heavy duty pneumatic tampers or equal.
2. Tamp each layer to a density equivalent of not less than 95% of an ASTM D698 Proctor Curve.
3. Provide additional compaction by leaving the backfilled trench open to traffic while maintaining the surface with crushed stone.

4. Refill any settlement with crushed stone and continue such maintenance until replacement of pavement is authorized by the Engineer.
- F. Undeveloped areas:
1. Backfill in wooded, swampy or undeveloped areas shall be as specified hereinbefore, except that tamping of the backfill above a level 2' over the top of the pipe will not be required.
 2. Mound excavated material neatly over the ditch to provide for future settlement.

3.4 MEASUREMENT AND PAYMENT

- A. Unclassified excavation:
1. No measurement or direct payment will be made for the Work under this Section and all costs for same shall be included in the price bid for the utility line to which it pertains.

END OF SECTION

SECTION 02525
CONCRETE CURB AND GUTTER, AND SIDEWALK

PART 1. GENERAL

1.1 DESCRIPTION

- A. Work included: Provide cast-in-place concrete, including formwork, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Section 03250 - Concrete Specialty Items.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Reference standards: Comply with the following codes, specifications and standards, except as otherwise shown or specified:
 - 1. American Concrete Institute (ACI) Publications:
 - a. ACI 305 Recommended Practice for Hot Weather Concreting
 - b. ACI 306 Recommended Practice for Cold Weather Concreting
 - 2. American Society for Testing and Materials (ASTM) Publications:
 - a. A 185 Welded Steel Wire Fabric for Concrete Reinforcement
 - b. C 31 Making and Curing Concrete Test Specimens in the Field
 - c. C 33 Concrete Aggregates
 - d. C 39-72 Compressive Strength of Cylindrical Concrete Specimens
 - e. C 94 Ready-Mixed Concrete
 - f. C 150 Portland Cement
 - g. C 260 Air-Entraining Admixtures for Concrete

- C. Testing agency: A testing laboratory will be retained by the Owner to perform material evaluation tests required by these specifications.
- D. Qualifications of contractors performing concrete work: Minimum of two (2) years experience on comparable concrete projects.
- E. Plant qualification: Plant equipment and facilities shall meet all requirements of the Check List for Certification of Ready Mixed Concrete Production Facilities of the National Ready Mixed Concrete Association and ASTM C94.

1.3 SUBMITTALS

- A. Comply with the pertinent provisions of Section 01340.
- B. Within 21 calendar days after receiving the Owner's Notice to Proceed, submit proposed mix designs for approval.
 - 1. Proportions shall be determined by means of laboratory tests of concrete made with the cement and aggregate proposed for use.
 - 2. Provide report in detail from an approved testing laboratory showing 7-day and 28-day strengths obtained using materials proposed.
 - 3. Required average strength above specified strength:
 - a. Determinations of required average strength above specified strength (f_c) shall be in accordance with ACI 318 and ACI 301.
 - 4. Cost of this work shall be borne by the Contractor.
- C. Manufacturer's data: Submit manufacturer's specification with application instructions for proprietary materials and items, including curing compound, form release agents, admixtures, patching compounds, and others as required by the Engineer.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2. PRODUCTS

2.1 FORMS

- A. Use form materials conforming to ACI 347.
- B. Form coatings: Form release coating shall be neat oil with surface wetting agent or chemical release agent which effectively prevents absorption of moisture, prevents bonding with concrete, is non-staining to concrete and leaves the concrete with a paintable surface.
 - 1. On surfaces to receive an applied coating, use a residual free chemical form release agent which is compatible with the applied coating and will not prevent the applied finish from satisfactorily bonding to the concrete.

2.2 SIDEWALK REINFORCEMENT

- A. Provide welded wire mesh for sidewalk reinforcement in compliance with ASTM A 185.

2.3 PREMOLDED JOINT FILLERS

- A. In concrete pavements (exterior) and concrete sidewalks, use asphalt impregnated cellulose fiber joint fillers complying with ASTM D1751.

2.4 CONCRETE MATERIALS

- A. Cement: Use portland cement: ASTM C150, Type I, Type I-P or Type II, low alkali.

- B. Aggregates:

1. Fine aggregate: Conform to ASTM C33.
2. Coarse aggregate: Conform to ASTM C33, Size #57.

- C. Water: Clean and potable and free from injurious amounts of deleterious materials.

- D. Admixtures shall conform to the following:

1. Air entraining admixture: ASTM C260.
2. Water reducing, set controlling admixture: Conform to ASTM C494.
 - a. Type A - water reducing.
 - b. Type D - water reducing and retarding.
3. Do not use admixtures containing calcium chloride.

- E. Curing compounds:

1. On all vertical and formed surfaces and construction joints, use a non-residual, non-staining curing compound conforming to ASTM C309 Type 1 and 1D. Acceptable products are:
 - a. L&M Cure by L&M Construction Chemicals, Inc.
 - b. Horn WB-75 by A.C. Horn Company.
 - c. Sonosil by Sonneborn, Inc.
 - d. Approved equal.

2.5 CONCRETE MIXES

- A. Provide concrete with the compressive strength of 3000 psi for a 28-day strength as minimum:
- B. Entrained air: 3000 psi concrete, 5% □ 1%

- C. Slump: 3000 psi concrete, 4" \pm 1"
- D. Production of concrete:
 - 1. General: Concrete shall be ready mixed and shall be batched, mixed and transported in accordance with ASTM C94 except as otherwise indicated.
 - 2. Monitor time and mix proportions by plant delivery slips.
 - 3. Air entraining admixtures: Add air entraining admixture into the mixture as a solution and measure by means of an approved mechanical dispensing device.
 - 4. Water reducing and retarding admixture: Add water reducing and retarding admixture and measure as recommended by the manufacturer.
 - 5. Addition of water to the mix upon arrival at the job site shall not exceed that necessary to compensate for a 1" loss in slump, nor shall the design maximum water-cement ratio be exceeded. Water shall not be added to the batch at any later time.
 - 6. Weather conditions: Control temperature of mix as required by ACI 306 "Cold Weather Concreting" and by ACI 305 "Hot Weather Concreting".

PART 3. EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Water, mud, organic, and other detrimental material shall be removed from excavations before concrete is deposited.
- C. Notify the Engineer prior to placing concrete and place no concrete until the formwork, reinforcing and embedded items have been inspected by the Engineer.

3.2 FORMWORK

- A. General:
 - 1. Construct forms in conformance with ACI 347.
 - 2. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement.
 - 3. Coat form contact surfaces with approved form coating compound prior to placing reinforcing steel.
- B. Formwork reuse: Reuse only forms that are in good condition and which maintain a uniform surface texture on exposed concrete surfaces.

1. Apply a light sanding as necessary to obtain a uniform texture.

C. Removal of forms:

1. Do not disturb or remove forms until the concrete has hardened sufficiently to permit form removal with complete safety.
2. Exercise care in removing forms from finished concrete surfaces so that surfaces are not marred or gouged and that corners are true, sharp and unbroken.
3. Whenever the formwork is removed during the curing period, continue to cure the exposed concrete by one of the methods specified herein.

3.3 REINFORCEMENT

A. Welded wire mesh: Install welded wire fabric in as long length as practicable and lay flat before placing concrete.

1. Support and tie mesh to prevent movement during concrete placement.
2. Lap adjoining pieces at least one full mesh and lace splices with wire.

3.4 PLACING CONCRETE

A. Preparation:

1. Remove foreign matter accumulated in the forms.
2. Rigidly close openings left in the formwork.
3. Wet wood forms sufficiently to tighten up cracks. Wet other material sufficiently to maintain workability of the concrete.
4. Use only clean tools.
5. Provide and maintain sufficient tools and equipment on hand to facilitate uninterrupted placement of the concrete.
6. Before commencing concrete, inspect and complete installation of formwork and wire mesh.

B. Conveying:

1. Transport and handle concrete from the truck to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients to maintain the quality of the concrete.
2. Provide equipment for lifting, dumping, chuting, pumping or conveying the concrete, of such size and design as to insure a practically continuous flow of concrete at the delivery and without separation of materials.

3. Do not use concrete that is not placed within 1 hour after water is first introduced into the mix unless the slump is such that it meets the specified limits without the addition of water to the batch.
- C. Placing:
1. Deposit concrete as nearly as practicable in its final location so as to avoid separation due to rehandling and flowing.
 2. Place concrete at such a manner that concrete upon which fresh concrete is deposited is still plastic.
- D. Hot weather placement: Place concrete in hot weather in accordance with ACI 305 "Hot Weather Concreting" and as specified herein.
1. Do not place concrete whose temperature exceeds 100°F.
 2. Thoroughly wet forms and reinforcing prior to placement of concrete.
 3. Use additional set retarder as necessary to increase set time.
 4. Start curing as soon as the concrete is sufficiently hard to permit without damage.
- E. Cold weather placement: Place concrete in cold weather in accordance with ACI 306 and as specified herein.
1. Do not place concrete when the atmospheric temperature is below 40°F.
 2. Do not add salts, chemicals, or other materials to the concrete mix to lower the freezing point of the concrete.
- F. Consolidation:
1. Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.
 - a. Use vibrators having a 2" head diameter and a minimum frequency of 8000 vibrations per second.
 - b. Provide sufficient number of vibrators to properly consolidate the concrete, keeping up with placement operations.
 - c. Provide at least one spare vibrator on site.
 2. Insert and withdraw vibrators at points approximately 18" apart.
 3. Do not vibrate forms.
 4. Do not use vibrators to transport concrete inside the forms.

3.5 PROTECTION

- A. Protect the surface finish of newly placed concrete from damage by rainwater or construction traffic.
- B. Do not apply design loads to structures until the concrete has obtained the specified strength.

3.6 CURING

- A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures and mechanical injury.
- B. Curing compound: Apply curing compound immediately after completion of the finish on unformed surfaces and within two hours after removal of forms on formed surfaces.
 - 1. Spray the entire surface with two coats of liquid curing compound, applying the second coat in the direction of 90° to the first coat.
 - 2. Apply compound in accordance with the manufacturer's instructions to cover the surface with a uniform film which will seal thoroughly.

3.7 CONCRETE FINISHING

- A. Finish schedule: Unless otherwise indicated on the drawings, finish all concrete surfaces in accordance with the following schedule:
 - 1. Form finish: Formed surfaces not ordinarily exposed to view, including:
 - a. The underside of slabs not exposed to view.
 - 2. Broom finish: Exterior, outdoor slabs exposed to view including:
 - a. Outdoor floor slabs and walkways.
 - b. Other floors that may become wet or otherwise require a non-skid surface.
 - c. Sidewalks and concrete pavements.
 - 3. Edge finish: Exposed edges of slabs not receiving chamfer including:
 - a. Sidewalk edges and joints.
 - b. Pavement edges and joints.
 - c. Other slab edges not chamfered.
- B. Finishing procedures:
 - 1. Form finish:
 - a. Repair defective concrete.

- b. Fill depressions deeper than 1/4".
 - c. Fill tie holes.
 - d. Remove fins exceeding 1/4" in height.
2. Broom finish:
 - a. Float finish as specified herein.
 - b. Provide a scored texture by drawing a broom across the surface.
 3. Edge finish: Tool slab edges and joints with a 1/4" radius edging tool.

3.8 SURFACE REPAIR

- A. Patching mortar:
 1. Make a patching mortar consisting of 1 part portland cement to 2 1/2 parts sand by damp loose volume.
 2. Mix the mortar using one part acrylic bonding admixture to two parts water.
- B. Surface defects:
 1. Remove all defective concrete down to sound solid concrete.
 2. Chip edges perpendicular to the concrete surface or slightly undercut, allowing no feather edges.
 3. Dampen surfaces to be patched.
 4. Patch defects by filling solidly with repair mortar.
- C. Allow the Engineer to inspect the work before placing the patching mortar.
- D. Repair defective areas greater than 1 sq.ft. or deeper than 1 1/4" as directed by the Engineer using materials approved by the Engineer at no additional expense to the Owner.

3.9 JOINTS

- A. Construction joints:
 1. Unless otherwise approved by the Engineer, provide construction joints every ten (10) feet, or as shown on the drawings.
 2. Continue all reinforcing across construction joints and provide 1 1/4" deep keyways unless indicated otherwise on the drawings.
- B. Expansion joints:

1. Provide $\frac{1}{2}$ -inch expansion joints with premolded joint filters every thirty (30) feet.

3.10 FIELD QUALITY CONTROL

A. Concrete cylinder tests:

1. During construction, prepare test cylinders for compressive strength testing, using 6" diameter by 12" long single use molds, complying with ASTM C31.
 - a. Make a set of three test cylinders from each pour.
 - b. Identify each and tag cylinder as to date of pour and location of concrete which it represents.
 - c. Deliver cylinders to testing lab selected by the Owner.
 - d. Cost for preparation and delivery of cylinders shall be borne by the Contractor. Cost for testing cylinders will be borne by the Owner.
2. Should strengths shown by test cylinders fail to meet specified strengths for the concrete represented, then:
 - a. Engineer shall have the right to require changes in the mix proportions as he deems necessary on the remainder of the work.
 - b. Additional curing of those portions of the structure represented by the failed test cylinders shall be accomplished as directed by the Engineer.
 - c. Upon failure of the additional curing to bring the concrete up to specified strength requirements, strengthening or replacement of those portions of the structure shall be as directed by the Engineer.
 - d. The Engineer may require additional testing of concrete in question by either non-destructive methods such as the Swiss Hammer, Windsor Probe or Ultrasonics or by coring and testing the concrete in question in accordance with ASTM C42. Such testing shall be performed at no additional cost to the Owner.

B. Other field concrete tests:

1. Slump tests: Either the Engineer or a testing laboratory representative will make slump tests of concrete as it is discharged from the mixer.
 - a. Slump test may be made on any concrete batch at the discretion of the Engineer.
 - b. Failure to meet specified slump requirements will be cause for rejection of the concrete.
2. Temperature: The concrete temperature may be checked at the discretion of the Engineer.
3. Entrained air: Air content of the concrete will be checked by a representative of the testing laboratory at the discretion of the Engineer.

- C. Coordination of laboratory services: The Contractor shall be responsible for coordination of laboratory services.
 - 1. Maintain a log recording quantities of each type of concrete placed, date and location of pour.
 - 2. Inform the testing laboratory of locations and dates of concrete placement and other information as required to be identified in the laboratory's test reports.
- D. Tests required because of extensive honeycombing, poor consolidation of the concrete or any suspected deficiency in the concrete will be paid for by the Contractor.
- E. Dimensional tolerances:
 - 1. Dimensional tolerances for allowable variations from dimensions or locations of concrete work, including the locations of embedded items shall be as given in ACI 301.
- F. Concrete which fails to meet strength requirements, dimensional tolerances, watertightness criteria, or is otherwise deficient due to insufficient curing, improper consolidation or physical damage shall be replaced or repaired as instructed by the Engineer at no expense to the Owner.

3.11 MEASUREMENT AND PAYMENT

- A. No measurement or direct payment will be made for the work under this Section and all costs for same shall be included in the price bid for the project.

ALTERNATE NO. 2:

- B. Payment will be made at the unit prices per linear foot as stated in the Proposal, and shall include cost of excavation, finishing, backfilling, clean-up, etc.

END OF SECTION

SECTION 02780**UNIT PAVERS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Interlocking unit pavers and accessories with sand-filled joints, with setting bed as follows:
 - 1. Sand setting bed.
 - 2. Permeable gravel and sand setting bed.
 - 3. Asphalt setting bed.
 - 4. Concrete setting bed.

1.2 RELATED SECTIONS

- A. Section 02741 - Hot-Mix Asphalt Paving; for asphalt base under unit pavers.
- B. Section 02751 - Portland Cement Concrete Paving; for concrete base under unit pavers and concrete used as edge restraint.
- C. Section 02795 - Porous Pavement, for unit paving using grid pavers or pavers with openings between them.
- D. Section 07500 - Roofing; for roof pavers.
- E. Section 09630 - Masonry Flooring; for brick flooring for interior applications.

1.3 REFERENCES

- A. ASTM International (ASTM)
 - 1. ASTM C 33 ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. ASTM C 140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 - 3. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
 - 4. ASTM C 936 - Standard Specification for Solid Concrete Interlocking Paving Units.
 - 5. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.
 - 6. ASTM C 1645 - Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units.
 - 7. ASTM D 698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft³/600 kN-m/m³).
 - 8. - Standard Specification for Concrete Aggregates.
 - 9. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8, Freezing and Thawing.
 - 10. ASTM D 1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³/2,700 kN-m/m³).

11. ASTM D 2940 - Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
- B. Interlocking Concrete Pavement Institute (ICPI):
 1. ICPI Tech Spec Technical Bulletins.
 2. ICPI Permeable Interlocking Concrete Pavements.
- C. BEES Database: National Institute for Standards and Technology (NIST) Building for Environmental and Economic Sustainability Database.
- D. United States Green Building Council (USGBC): LEED Reference Guide for Green Building Design and Construction.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including but not limited to the following:
 1. Storage and handling requirements and recommendations.
 2. Installation methods.
- C. Shop Drawings: Drawings with details including but not limited to relationship to adjoining materials and assemblies, indication of perimeter conditions, expansion and control joints, paver layout, patterns, color arrangement, installation, and setting details.
- D. Test Reports:
 1. Sieve analysis for grading of bedding and joint opening aggregates.
 2. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
- E. Verification Samples: For each finish product specified, four representative full-size samples of each paver type, thickness, color and finish specified that indicate the range of color variation and texture expected in the finished installation.

1.5 LEED REQUIREMENTS / CREDIT

- A. SS Credit 7.1 - Sustainable Sites: Heat Island Effect - Non-roof; for non-roof paving surfaces indicated on Drawings as high solar reflectance.
 1. Documentation indicating Solar Reflectance Index calculated according to ASTM E 1980: 1 Credit.
- B. SS Credit 7.2 - Sustainable Sites: Heat Island Effect - Roof; for roof surfaces indicated on Drawings as high solar reflectance.
 1. Documentation indicating Solar Reflectance Index calculated according to ASTM E 1980: 1 Credit.
- C. MR Credit 4 - Materials and Resources: Recycled Content; for products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
 1. Statement indicating cost for each product, and fraction by weight that is considered recycled: greater than 10 percent, 1 Credit.

2. Statement indicating cost for each product, and fraction by weight that is considered recycled: greater than 20 percent, 2 Credits.
- D. MR Credit 5: Materials and Resources: Regional Materials - 10 percent extracted, processed and manufactured regionally; For products and materials required to comply with requirements for regional materials, certificates indicating location materials have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
1. Statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional: greater than 10 percent, 1 Credit.
 2. Statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional: greater than 20 percent, 2 Credits.
- E. ID Credit 1.1 - Innovative Design:
1. Material Use. For CalStar pavers, provide documentation of innovative performance in waste diversion, reduced embodied energy, and reduced carbon footprint.
 - a. Include statement indicating cost of CalStar pavers: 1 Credit.
 2. Exemplary Performance:
 - a. For projects with at least 30% recycled materials: 1 Credit.
 - b. For projects with at least 30% regional materials: 1 Credit.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Pavers: For each color required, provide pavers of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics from a single manufacturer to the greatest extent possible.
- B. Product Certificates:
1. Signed by manufacturer, including name and address of contractor, project location, and the quantity, and date or dates of shipment of delivery to which certificate applies.
 2. Indicating that pavers meet specified requirements.
 3. Indicating testing laboratory's facilities and qualifications of its principals and key personnel to perform tests specified.
- C. Mock-Ups:
1. Install a 7 ft x 7 ft (2 m x 2 m) paver area in accordance with Interlocking Concrete Paver Institute Tech Spec No. 2, Construction of Interlocking Concrete Pavements.
 2. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
 3. This area will be used as the standard by which the work will be judged.
 4. Do not proceed with remaining work until workmanship, color, and texture are approved by Architect.
 5. Use mock-up to test cleaning methods.
 6. Subject to acceptance, mock-up may be retained as part of finished work.
 7. When directed by Architect, remove and properly dispose of mock-up.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened labeled packaging.

- B. Comply with instructions and recommendations of manufacturer for special delivery, storage, and handling requirements.
 - 1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
 - 2. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 - 3. Unload pavers at job site in such a manner that no damage occurs to the product.
- C. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials.
 - 1. Cover bedding sand and joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
 - 1. Do not install sand or pavers during heavy rain or snowfall.
 - 2. Do not install sand and pavers over frozen base materials.
 - 3. Do not install frozen sand or saturated sand.
 - 4. Do not install concrete pavers on frozen or saturated sand.

1.9 EXTRA MATERIALS

- A. Extra Materials: Furnish extra units amounting to 2 percent of installed materials, for each color or color blend of pavers installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Pine Hall Brick Company (See drawings for brick types and sizes)
- B. Substitutions: Not permitted.

2.2 INTERLOCKING CONCRETE PAVERS

- A. Interlocking Concrete Pavers: Non-Fired Holland Pavers; unit pavers composed of Class C fly ash and fine aggregates as manufactured by CalStar Products, Inc.
 - 1. Pavers for Standard Installation:
 - a. Nominal Size: 4 inches wide by 2-3/8 inches high by 8 inches long.
 - b. Actual Dimensions: 98.5 mm wide by 60 mm high by 198.5 mm long.
 - c. Average Compressive Strength (ASTM C 140): 8000 psi (55 MPa) with no individual unit under 7200 psi (50 MPa).
 - d. Spacers for Pavers: Standard, integral spacers for 1/16 inches (1.5 mm) gaps.
 - 2. Pavers for Permeable Installation:
 - a. Nominal Size: 4-1/2 inches wide by 3-1/8 inches high by 9-1/4 inches long.

- b. Actual Dimensions: 114 mm wide by 80 mm high by 234 mm long.
 - c. Average Compressive Strength (ASTM C 140): 8000 psi (55 MPa) with no individual unit under 7200 psi (50 MPa).
 - d. Spacers for Pavers: Spacers for permeable pavers, integral spacers for 3/32 inches (2.5 mm) gaps.
- B. Materials: Comply with material standards set forth in ASTM C 936.
1. Fabrication: Non-fired paver with no Portland cement.
 2. Curing: Fly ash, aggregate, mineral oxide pigments, and proprietary ingredients mixed with water, vibro-compacted, and cured into stable cementitious solid.
 3. Composition: Primary ingredients are ASTM C 618 Class C fly ash, self-cementing byproduct of coal combustion and sand.
 4. Average Water Absorption (ASTM C 140): 5 percent with no unit greater than 7 percent.
 5. Freeze/Thaw Resistance (ASTM C 1645): Resistant to 28 freeze/thaw cycles with no greater than 225 g/m² loss of material, or 49 freeze/thaw cycles with no greater than 500 g/m² loss of material. Freeze-thaw testing requirements shall be waived for applications not exposed to freezing conditions.
 6. Dimensional Tolerance: Exceeds tolerance requirements of ASTM C 936 for Concrete Paver.
- C. Color and Texture: Provide fly ash pavers colored with pigments conforming to ASTM C 979, Solar Reflectance Index (SRI) calculated according to ASTM E 1980.
1. Color: Natural, tumbled. with Solar Reflectance (SRI) of 29 or greater.
 2. Color: Natural, untumbled.
 3. Color: Tan, tumbled. with Solar Reflectance (SRI) of 29 or greater.
 4. Color: Tan, untumbled.
 5. Color: Tangerine, tumbled.
 6. Color: Tangerine, untumbled.
 7. Color: Light Red, tumbled.
 8. Color: Light Red, untumbled.
 9. Color: Light Gray, tumbled.
 10. Color: Light Gray, untumbled.
 11. Color: Brown, tumbled.
 12. Color: Brown, untumbled.
 13. Color: Dark Red, tumbled.
 14. Color: Dark Red, untumbled.
 15. Color: Dark Gray, tumbled.
 16. Color: Dark Gray, untumbled.
 17. Color: Autumn Range, tumbled.
 18. Color: Autumn Range, untumbled.
 19. Color: Harvest Range, tumbled.
 20. Color: Harvest Range, untumbled.
 21. Color: Olive Range, tumbled.
 22. Color: Olive Range, untumbled.
 23. Color: Prairie Range, tumbled.
 24. Color: Prairie Range, untumbled.
 25. Color: As selected by Architect from manufacturer's full range.
 26. Color: As indicated on Drawings.
- D. Environmental Performance:

1. Recycled Content: 37 percent post-industrial waste by weight, fly ash content.
 2. Embodied Energy: Not to exceed 1000 BTUs per paver, as certified by manufacturer.
 3. Carbon Footprint: Not to exceed 0.045 kg (0.1 lb) of carbon dioxide per paver, as certified by manufacturer.
- E. Paving Cleaner: Cleaner type in compliance with manufacturer's instructions.
1. Detergent type cleaner selected for each type of paver used and recommended in writing by paver manufacturer.
 2. Muriatic acid cleaners are not acceptable.

2.3 BEDDING AND JOINT SAND FOR STANDARD PAVER INSTALLATION

A. Bedding and Joint Sand:

1. Provide bedding and joint sand as follows:
 - a. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
 - b. Do not use limestone screenings, stone dust, or sand for bedding sand material that does not conform to grading requirements of ASTM C 33.
 - c. Do not use mason sand or sand conforming to ASTM C 144 for bedding sand.
 - d. Where concrete pavers are subject to vehicular traffic, utilize sands that are as hard as practically available.
 - e. Sieve according to ASTM C 136.
 - f. Bedding Sand Material Requirements: Conform to the grading requirements of ASTM C 33 with modifications as shown below:
 - 1) Grading Requirements for Bedding Sand:
 - (a) Sieve Size: 3/8 inch (9.5 mm).
 - (1) Percent Passing: 100.
 - (b) Sieve Size: No. 4 (4.75 mm).
 - (1) Percent Passing: 95 to 100.
 - (c) Sieve Size: No. 8 (2.36 mm).
 - (1) Percent Passing: 85 to 100.
 - (d) Sieve Size: No. 16 (1.18 mm).
 - (1) Percent Passing: 50 to 85.
 - (e) Sieve Size: No. 30 (0.600 mm).
 - (1) Percent Passing: 25 to 60.
 - (f) Sieve Size: No. 50 (0.300 mm).
 - (1) Percent Passing: 10 to 30.
 - (g) Sieve Size: No. 100 (0.150 mm).
 - (1) Percent Passing: 2 to 10.
 - (h) Sieve Size: No. 200 (0.075 mm).
 - (1) Percent Passing: 0 to 1.
 - g. Joint Sand Material Requirements: Conform to the grading requirements of ASTM C 144 as shown with modifications below:
 - 1) Grading Requirements for Natural Joint Sand:
 - (a) Sieve Size: No. 4 (4.75 mm).
 - (1) Percent Passing: 100.
 - (b) Sieve Size: No. 8 (2.36 mm).
 - (1) Percent Passing: 95 to 100.
 - (c) Sieve Size: No. 16 (1.18 mm).
 - (1) Percent Passing: 70 to 100.

- (d) Sieve Size: No. 30 (0.600 mm).
 - (1) Percent Passing: 40 to 75.
- (e) Sieve Size: No. 50 (0.300 mm).
 - (1) Percent Passing: 10 to 35.
- (f) Sieve Size: No. 100 (0.150 mm).
 - (1) Percent Passing: 2 to 15.
- (g) Sieve Size: No. 200 (0.075 mm).
 - (1) Percent Passing: 0 to 1.
- 2) Grading Requirements for Manufactured Joint Sand:
 - (a) Sieve Size: No. 4 (4.75 mm).
 - (1) Percent Passing: 100.
 - (b) Sieve Size: No. 8 (2.36 mm).
 - (1) Percent Passing: 95 to 100.
 - (c) Sieve Size: No. 16 (1.18 mm).
 - (1) Percent Passing: 70 to 100.
 - (d) Sieve Size: No. 30 (0.600 mm).
 - (1) Percent Passing: 40 to 100.
 - (e) Sieve Size: No. 50 (0.300 mm).
 - (1) Percent Passing: 20 to 40.
 - (f) Sieve Size: No. 100 (0.150 mm).
 - (1) Percent Passing: 10 to 25.
 - (g) Sieve Size: No. 200 (0.075 mm).
 - (1) Percent Passing: 0 to 10.

2.4 BEDDING AND JOINT SAND FOR PERMEABLE PAVER INSTALLATION

A. Crushed Stone Filler, Bedding, Base And Subbase:

- 1. Provide bedding and joint sand as follows:
 - a. Crushed stone with 90 percent fractured faces, LA Abrasion less than 40 per ASTM C 131, minimum CBR of 80 percent per ASTM D 1883.
 - b. Do not use rounded river gravel for vehicular applications.
 - c. All stone materials shall be washed with less than 1 percent passing the No. 200 sieve.
 - d. Bedding and Joint/Opening Filler: No. 8 conforming to ASTM D 448 gradation as shown with modifications below:
 - 1) Grading Requirements for Bedding and Joint/Opening Filler:
 - (a) Sieve Size: 1/2 inch (12.5 mm).
 - (1) Percent Passing: 100.
 - (b) Sieve Size: 3/8 inch (9.5 mm).
 - (1) Percent Passing: 85 to 100.
 - (c) Sieve Size: No. 4 (4.75 mm).
 - (1) Percent Passing: 10 to 30.
 - (d) Sieve Size: No. 8 (2.36 mm).
 - (1) Percent Passing: 0 to 10.
 - (e) Sieve Size: No. 16.
 - (1) Percent Passing: 0 to 5.
 - e. Base: No. 57 conforming to ASTM D 448 gradation as shown with modifications below:
 - 1) Grading Requirements for Base:
 - (a) Sieve Size: 1-1/2 inches (37.5 mm).

- (1) Percent Passing: 100.
 - (b) Sieve Size: 1 inch (25 mm).
 - (1) Percent Passing: 95 to 100.
 - (c) Sieve Size: 1/2 inch (12.5 mm).
 - (1) Percent Passing: 25 to 60.
 - (d) Sieve Size: No. 4 (4.75 mm).
 - (1) Percent Passing: 0 to 10.
 - (e) Sieve Size: No. 8 (2.36 mm).
 - (1) Percent Passing: 0 to 5.
- f. Subbase: No. 2 conforming to ASTM D 448 gradation as shown with modifications below:
- 1) Grading Requirements for Subbase:
 - (a) Sieve Size: 3 inches (75 mm).
 - (1) Percent Passing: 100.
 - (b) Sieve Size: 2-1/2 inches (63 mm).
 - (1) Percent Passing: 90 to 100.
 - (c) Sieve Size: 2 inches (50 mm).
 - (1) Percent Passing: 35 to 70.
 - (d) Sieve Size: 1-1/2 inches (37.5 mm).
 - (1) Percent Passing: 0 to 15.
 - (e) Sieve Size: 3/4 inch (19 mm).
 - (1) Percent Passing: 0 to 5.

B. Gradation Criteria For The Bedding And Base:

- 1. D15 base stone / D15 bedding stone less than 5.
- 2. D50 base stone / D50 bedding stone greater than 2.

2.5 EDGE RESTRAINTS

- A. Provide edge restraints installed around the perimeter of all interlocking concrete paving unit areas as follows:
- 1. Manufacturer: _____.
 - 2. Material: Plastic.
 - 3. Material: Concrete.
 - 4. Material: Aluminum.
 - 5. Material: Steel.
 - 6. Material: Pre-cast concrete.
 - 7. Material: Cut stone.
 - 8. Material: Concrete.

2.6 ACCESSORIES

A. Geotextile Fabric:

- 1. Material Type and Description: **Clay Bricks 2 1/4"x 4"x8" English Edge, Full Range.**
- 2. Manufacturer: Acceptable to interlocking concrete paver manufacturer, **PINE HALL.**

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates, subgrade and base have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, do not proceed with installation. Notify Architect of unsatisfactory preparation immediately.
- C. Commencement of full installation represents acceptance of existing substrate conditions.

3.2 NON-PERMEABLE INSTALLATION

- A. Comply with recommendations for installation, progress cleaning, and final cleaning of pavers in accordance with manufacturer's instructions and recommendations.
- B. Install in accordance with ICPI publication Tech Spec No. 2, Construction of Interlocking Concrete Pavements
 - 1. Spread bedding sand evenly over the base course and screed to a nominal 1 inch (25 mm) thickness, not exceeding 1-1/2 inch (40 mm) thickness. Spread bedding sand evenly over the base course and screed rails, using the rails and/or edge restraints to produce a nominal 1 inch (25 mm) thickness, allowing for specified variation in the base surface.
 - a. Do not disturb screeded sand.
 - b. Screeded area shall not substantially exceed that which is covered by pavers in one day.
 - c. Do not use bedding sand to fill depressions in the base surface.
 - 2. Lay pavers in patterns shown on Drawings. Place units hand tight without using hammers. Make horizontal adjustments to placement of laid pavers with rubber hammers and pry bars as required.
 - 3. Provide joints between pavers between 1/16 inch and 3/16 inch (2 mm and 5 mm) wide. No more than 5 percent of the joints shall exceed 1/4 inch (6 mm) wide to achieve straight bond lines.
 - 4. Joint (bond) lines shall not deviate more than +/-1/2 inch (+/- 15 mm) over 50 ft (15 m) from string lines.
 - 5. Fill gaps at the edges of the paved area with cut pavers or edge units.
 - 6. Cut pavers to be placed along edge with double blade paver splitter or masonry saw.

3.3 PERMEABLE INSTALLATION

- A. Comply with recommendations for installation, progress cleaning, and final cleaning of pavers in accordance with manufacturer's instructions and recommendations.
- B. Install in accordance with ICPI publication Permeable Interlocking Concrete Pavements
 - 1. General:
 - a. Any excess thickness of soil applied over excavated soil sub-grade to trap sediment from adjacent construction activities shall be removed before application of geotextile and sub-base materials.
 - b. Keep area where pavement is to be constructed free from sediment during entire job. Geotextiles, base and bedding materials contaminated with sediment shall be removed and replaced with clean materials.

- c. Do not damage drainpipes, overflow pipes, observation **wells, or any inlets and other** drainage appurtenances during installation. Report any damage immediately to project engineer.
2. Geotextiles:
 - a. Place on bottom and sides of soil sub-grade as indicated on Drawings. Secure in place to prevent wrinkling from vehicle tires and tracks.
 - b. Overlap a minimum of 12 inches (0.3 m) in the direction of drainage.
 - c. Overlap a minimum of 24 inches (0.6 m) in the direction of drainage.
3. Open-Graded Sub-base and Base:
 - a. Moisten, spread and compact the No. 2 sub-base in 4 inch to 6 inch (100 mm to 150 mm) lifts without wrinkling or folding the geotextile. Place subbase to protect geotextile from wrinkling under equipment tires and tracks.
 - b. For each lift, make at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 t (10 T) vibratory roller until there is no visible movement of the No. 2 stone. Do not crush aggregate with the roller.
 - c. The surface tolerance of the compacted No. 2 sub-base shall be +/- 2-1/2 in. (+/- 65 mm) over a 10 ft (3 m) straightedge.
 - d. Moisten, spread, compact No. 57 base layer in one 4 inch (100 mm) thick lift.
 - e. On this layer, make at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 t (10 T) vibratory roller until there is no visible movement of the No. 2 stone. Do not crush aggregate with the roller.
4. The surface tolerance the compacted No. 57 base should not deviate more than. +/- 1 inch (25 mm) over a 10 ft (3 m) straightedge.
5. Bedding Layer:
 - a. Moisten, spread and screed the No. 8 stone bedding material.
 - b. Fill voids left by removed screed rails with No. 8 stone.
 - c. The surface tolerance of the screeded No. 8 bedding layer shall be +/- 3/8 inch (10 mm) over a 10 ft (3 m) straightedge.
 - d. Do not subject screeded bedding material to any pedestrian or vehicular traffic before paving unit installation begins.
6. Permeable Interlocking Concrete Pavers And Joint/Opening Fill Material:
 - a. Lay the paving units in the patterns and joint widths shown on the Drawings. Maintain straight pattern lines.
 - b. Fill gaps at the edges of the paved area with cut units. Cut pavers subject to tire traffic shall be no smaller than 1/3 of a whole unit.
 - c. Cut pavers and place along edges with double-bladed splitter or masonry saw.
 - d. Fill the openings and joints with No. 8 stone.
 - e. Remove excess aggregate on the surface by sweeping pavers clean.
 - f. Compact and seat the pavers into the bedding material using a low-amplitude, 75-90 Hz plate compactor capable of at least 5,000 lbf (22 kN) centrifugal compaction force. This will require at least two passes with the plate compactor.
 - g. Do not compact within 6 ft (2 m) of the unrestrained edges of the paving units.
 - h. Apply additional aggregate to the openings and joints if needed, filling them completely. Remove excess aggregate by sweeping then compact the pavers. This will require at least two passes with the plate compactor.
 - i. Pavers within 6 ft (2 m) of the laying face must be left fully compacted at the completion of each day.

- j. The final surface tolerance of compacted pavers shall not deviate more than +/- 3/8 (10 mm) under a 10 ft (3 m) long straightedge.
- k. The surface elevation of pavers shall be 1/8 inch to 1/4 inch (3 mm to 6 mm) above adjacent drainage inlets, concrete collars or channels.

C. Do not use polymeric sands.

3.4 PROTECTION

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

END OF SECTION

SECTION 02618
HIGH-DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1. GENERAL

1.1 WORK INCLUDED

- A. Leachate collection piping (solid and perforated)
- B. HDPE Cleanouts
- C. HDPE Manholes

1.2 RELATED WORK

- A. Section 02221 - Trenching, Backfilling, and Compacting
- B. Section 02200 - Earthwork
- C. Section 02271 - Geotextiles

1.3 REFERENCES

- A. ASTM D 638 Test Method for Tensile Properties of Plastics
- B. ASTM D 790 Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- C. ASTM D 1239 Test Method for Flow Rates of Thermal Plastics by Extrusion Plastometer
- D. ASTM D 1248 Specification for Polyethylene Plastics Molding and Extrusion Materials
- E. ASTM D 1505 Test Method for Density of Plastics by the Density Gradient Technique
- F. ASTM D 1599 Test Method for Short Time Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings
- G. ASTM D 1693 Test Method for Environmental Stress Cracking of Ethylene Plastics
- H. ASTM D 2122 Method for Determining Dimensions of Thermal Plastic Pipe and Fittings
- I. ASTM D 2837 Method for Obtaining Hydrostatic Design basis for Thermal Plastic Pipe Materials
- J. ASTM D 3350 Specification for Polyethylene Plastics Pipe and Fittings Material
- K. ASTM F 1248 Determination of Environmental Stress Crack Resistance (ESCR) of Polyethylene Pipe
- L. ASTM D 4219 Test Method of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique

- M. ASTM F 714 Standard Specification for Polyethylene Plastic Pipe Based on Outside Diameter

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect pipe from sun, elements, and weather changes.
- B. Store pipe in areas that are safe from construction activities.
- C. Handle pipe to prevent scratches or mars. No rocks or other materials which scratch or gouge pipe shall be in storage area.

1.5 SUBMITTALS

- A. Submit product data using MANUFACTURER'S product tracking system to include the information required in Subsection 2.1 A through I.
- B. Include specifications, shop drawings, dimensions, joint details, design and installation details, and descriptive literature on pipe materials, manholes, pipe fittings, and accessories.
- C. Submit "flat sketches" of the piping systems and components.
- D. Verify to CQA CONSULTANT that the specified pipe bedding and backfill materials and requirements are acceptable to the pipe manufacture, or submit alternative installation recommendations from the pipe manufacturer.
- E. Inspect material a minimum of 7 days prior to installation, and indicate in writing any deficiencies to CQA CONSULTANT.

PART 2. PRODUCTS

2.1 GENERAL REQUIREMENTS

Piping and accessories shall be high quality, durable materials manufactured and installed with good commercial practices that conform to the manufacturer's "Design and Installation Guidelines". It is not the intent of the drawings and specifications to give every detail needed for a complete piping system, or that may be recommended for the project by experienced piping vendors. However, the CONTRACTOR shall furnish and install the piping system with every detail needed for the work to be free from faults and defects. Any design modifications or additions to any part of the piping system recommended by the CONTRACTOR to prevent faults or defects under the intended use shown on the drawings shall be submitted to the OWNER in writing before the Agreement is executed.

2.2 ACCEPTABLE MANUFACTURERS/SUPPLIERS

A. HDPE Materials:

- | | |
|---|--|
| 1. ISCO
3435 Stanwood Blvd.
Huntsville, AL 35811
(800) 462-0860 | 2. Plexco/Spirolite
Chevron Chemical CO.
1050 Busse Highway,
Suite 200
Bensenville, IL 60106
(708) 350-3700 |
| 3. Plastic Fusion Fabricators,
Inc.
2455 Stanwood Blvd.
Huntsville, AL 35811
(205) 852-0378 | 4. Phillips Driscopipe, Inc.
2929 North Central
Expressway
Richardson, TX 75083
(800) 527-0662 |
| 5. Poly Pipe Industries, Inc.
Drawer HH
Gainesville, TX 76240
(800) 433-5632 | |

2.3 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

- A. Material Physical Properties: Materials used for the manufacture of polyethylene pipe and fittings shall meet the following physical property requirements:

PROPERTY	UNIT	TEST PROCEDURE	EXTRUDED PIPE TYPICAL VALUE
Material Designation	-	PPI/ASTM D-2837	PE 3408
Hydrostatic Design Basis	-	PPI TR-4	800 psi
Material Classification	-	ASTM D-1248	III C 5 P34
Cell Classification	-	ASTM D-3350	345434C
Density (3)	g/cm ³	ASTM D-1505	0.955
Melt Index (4)	g/10 min	ASTM D-1238	0.11
Flexural Modulus (5)	psi	ASTM D-790	133,000
Tensile Strength (4)	psi	ASTM D-638	3200 - 3500
EXCR (3)	fail % hr.	ASTM D-1693	for > 5000
HDB (4)	psi	ASTM D-2837	1600 (23°C)
UV Stabilizer (C)	% Carbon Black	ASTM D-1603	2 to 3
Elastic Modulus	psi	ASTM D-638	110,000 -159.,000

PROPERTY	UNIT	TEST PROCEDURE	EXTRUDED PIPE TYPICAL VALUE
Brittleness Temperature	°F	ASTM D-746	<- 180
Vicat Softening Temperature	°F	ASTM D-1525	+255
Thermal Expansion	in/in/°F	ASTM D-696	8 x 10 ⁻⁵
Hardness	Shore D	ASTM D-2240	64

- B. **Material Testing, Certification, and Listing:** The pipe and fitting manufacturer shall certify that samples of his production pipe have undergone stress regression testing, evaluation, and validation in accordance with ASTM D-2837 and PPI TR-3. Under these procedures, the minimum hydrostatic design basis shall be certified by the pipe and fitting manufacturer to be 1600 psi at 73.4°F and 800 psi at 140°F.

Material shall be Listed in the name of the pipe and fitting manufacturer by the Plastics Pipe Institute (PPI) in PPI TR-4 with the following Standard Grade ratings:

	<u>73.4°F</u>	<u>140°F</u>
Hydrostatic Design Basis (HDB)	1600 psi	800 psi
Hydrostatic Design Stress (HDS)	800 psi	400 psi

- C. **Pipe and Fittings.** Pipe and fittings shall be the same manufacturer from identical materials meeting the requirements of this specification.

Pipe and fittings shall be pressure rated to meet the service pressure requirements specified by the OWNER. Whether molded or fabricated, fittings shall be fully pressure rated to at least the same service pressure rating as the pipe to which joining is intended.

Molded fittings shall meet the requirements of ASTM D-3261 and this specification. Fittings shall be molded unless otherwise approved by the ENGINEER. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the diameter and wall thickness specifications of the mating system pipe. Fitting markings shall include a production code from which the location and date of manufacture can be determined. Upon request, the manufacturer shall provide an explanation of his production code.

Fittings shall be manufactured in facilities designed for that purpose. Field fabricated fittings are not allowed.

Outside diameter controlled pipe shall be manufactured in accordance with ASTM F 714 or ASTM D-3035. Inside diameter controlled pipe shall be manufactured to ASTM F-894 and the specifications provided by the manufacturer. Printline markings shall include a production code from which the location and date of manufacture can be identified. Upon request, the manufacturer shall provide an explanation of his production code.

- D. **STANDARD DIMENSION RATIO (SDR).** The SDR's shall be as follows:

<u>Pipe Inside Diameter (inches)</u>	<u>SDR</u>
3	17
4 (Carrier)	17
6 (Solid and Perforated)	17
8 (Solid and Perforated)	17

- E. PIPE MARKING: During extrusion production, the HDPE pipe shall be continuously marked with durable printing on the pipe outside surface following this format:

1.1.1.1	Nominal Size	6 inches
1.1.1.2	Dimension Ratio	SDR 17
1.1.1.3	Pressure Rating	160 psi
1.1.1.4	Type	(Trade Name)
1.1.1.5	Material Classification	PE3408
1.1.1.6	Certification Bases	ASTM F714
1.1.1.7	Blank Position for NSF/FM Use	NSF-PW
1.1.1.8	Pipe Test Category	C3
1.1.1.9	Plant	<u>P . . . for Pryor</u>
1.1.1.10	Extruder Number	#5
1.1.1.11	Date	06 Feb 89
1.1.1.12	Operator Number	55
1.1.1.13	Shift Letter	A
1.1.1.14	Resin Supplier Code	P

EXAMPLE: 6" IPS SDR 17 160 psi (Trade Name) PE 3408 ASTM F-714 NSF-PW C3
P5 06FEB89 55A P

- F. MANUFACTURER'S QUALITY CONTROL. The pipe and fitting manufacturer shall have an established quality control program responsible for inspecting incoming and outgoing materials. At minimum, incoming polyethylene materials shall be inspected for density per ASTM D 1505, melt flow rate per ASTM D 1238, and contamination. All incoming polyethylene materials shall be certified by the supplier. Certifications shall be verified by Quality Control. Incoming materials shall be approved by Quality Control before processing into finished goods.

The pipe shall be produced with the nominal physical properties outlined in Section A, and to the dimensions and tolerances specified in ASTM F-714. Additionally, the pipe shall be inspected per industry accepted manufacturer standards for:

- Diameter
- Wall Thickness
- Concentricity
- Quick Burst Pressure and Ductability
- Joint Length
- Straightness
- Ovality
- Toe-In
- Overall Workmanship Inspection on ID & OD
- Print Line

- G. **MANUFACTURER'S QUALITY ASSURANCE.** The pipe and fitting manufacturer shall have an established quality assurance program responsible for assuring the long term performance of materials and products. Representative samples of polyethylene materials shall be tested against the physical property requirements of this specification.

Tests required on pipe samples for this section are:

• Compressed Ring (Pipe)	ASTM F-1248	F50, Hr	>1000
• Slow Crack Growth	Battelle method	Days to failure	F0 >32
• Hydrostatic Design Basis	ASTM D-2837-90	800 psi	1,600 psi

(MANUFACTURER to provide certification that the stress regression testing has been performed on the specific product.)

- H. **QUALITY CONTROL AND QUALITY ASSURANCE RECORDS.** The pipe and fittings MANUFACTURER shall maintain QA/QC records for a minimum of one year from date of production.
- I. **MANUFACTURER'S CERTIFICATION OF MATERIALS AND PRODUCTS.** If requested by the CQA CONSULTANT, the pipe and fitting MANUFACTURER shall provide certified copies of the quality control data taken during product manufacture.
- J. **JOINING AND FUSION TRAINING.** Pipe and fittings shall be butt fusion joined in accordance with the MANUFACTURER'S recommended procedure. The CONTRACTOR must have a factory trained fusion technician to fuse pipe. If the CONTRACTOR elects to fuse pipe with his operators, training from an authorized representative, trained by the manufacturer, must be obtained for at least two days on-site regardless of prior job experience. Training must be provided by a factory trained and authorized representative of the MANUFACTURER.
- K. **FLANGE CONNECTIONS.** Where flange connections are used, the MANUFACTURER'S procedure for tightening flanges must be followed. In general, the bolts will be tightened on one day and retightened on the following day. A written copy of this procedure will be required and approved prior to starting the job.
- L. **HANDLING, CONSTRUCTION, AND INSTALLATION.** The pipe and fitting MANUFACTURER shall package products for shipment in a manner suitable for safe transport by commercial carrier. When delivered, a receiving inspection shall be performed, and any shipping damage reported to the pipe and fitting MANUFACTURER within 7 days. Pipe and fittings shall be handled, installed, and tested in accordance with MANUFACTURER'S recommendations, and the requirements of this specification.
- M. **FIELD TESTING OF PRESSURE PIPING**
1. **Test Restrictions:** Test pressure shall be 90 psi. The CONTRACTOR shall provide temporary plugs at open pipe ends, or other locations at the CONTRACTOR'S expense.
- Every effort shall be made to keep lines clean during installation. Flush pipelines prior to a pressure test lines shall be flushed by partially opening and closing valves and hydrants

several times under expected line pressure, with flow velocities adequate to flush foreign material out of the valves and hydrants.

Joints shall not be backfilled until after the pressure test is completed.

2. Test Procedure: The test procedure shall consist of initial expansion and test phases. For the initial expansion phase, add makeup water as required to maintain the test pressure for three hours. For the test phase, reduce the test pressure by 10 psi. If the pressure remains steady (within 5 percent of the initial value) for an hour, the test will be satisfactory.
3. Pressurization: After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to the specified hydrostatic pressure. Each valved section of pipe shall be slowly filled with water, and the specified test pressure, based on the elevation of the highest point of the supply and return lines or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the ENGINEER. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. Allow the system to stabilize at the test pressure before conducting the test.
4. Air Removal: Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the CONTRACTOR shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the OWNER.
5. Examination: Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to the CQA CONSULTANT.
6. All visible leaks are to be repaired, regardless of the amount of leakage.

2.4 HIGH DENSITY POLYETHYLENE MANHOLES AND INSERTS

A. GENERAL

1. This specification covers the requirements of solid wall High Density Polyethylene (HDPE) manholes, valve box, and inserts as indicated on the drawings.
2. The manhole shall be manufactured by the fabrication of HDPE as defined in Section 2.4. The pipe used to make the structure shall be made to the requirements of ASTM F-714. An SDR 32.5 shall be used for the manhole body. The inlet and outlet piping shall be the same as the inlet and outlet piping.
3. The bottom of the manhole shall be made of 1-inch sheet for manholes and valve boxes 36 inches or smaller. For manholes or valve boxes larger than 36 inches, 1.5-inch sheet shall be used for the bottom.

PART 3. EXECUTION**3.1 TRENCH, EXCAVATION, BEDDING, BACKFILLING AND COMPACTION**

Unless otherwise specified or indicated, trench excavation, pipe bedding, trench backfilling, and compaction shall be accomplished in accordance with Section 02221.

3.2 INSPECTION

- A. Inspect pipe, fittings, and other appurtenances before installation to verify quality of material.
- B. Bends to be fabricated in the field, prefabricated, or made by straight sections of pipe.

3.3 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove dirt and foreign material, inside and outside, from pipe and fitting materials before assembly.
- C. Make straight field cuts without chipping or cracking pipe.

3.4 INSTALLATION

- A. Make heat butt fusion joints in accordance with manufacturer's specifications.
- B. Install pipe and fittings to the line and grade specified on the drawings.
- C. Lay pipe from the low end toward the high point. Provide continuous smooth invert.
- D. The maximum allowable tolerance for grade is 0.05 foot.
- E. Install bedding and backfill material with care to avoid damage to pipe. Minimize traffic and turning of traffic over pipe.
- F. Provide a yellow warning ribbon and 12-gauge metallic tracing wire in all pipe trenches.

3.5 FIELD QUALITY CONTROL

- A. When fusing joints and fittings, follow supplied manufacturer's directions and procedures for heat jointing pipes and fittings.

END OF SECTION

**SECTION 02271
GEOTEXTILES****PART 1. GENERAL****1.1 WORK INCLUDED**

Provide Geotextile to protect and separate the HDPE liner from the select aggregate fill, underneath any placed riprap, as shown for construction of access roads, and other locations as shown on the Drawings.

1.2 RELATED WORK

- A. Construction Quality Assurance (CQA) Plan
- B. Section 01300 – Submittals
- C. Section 02200 – Earthwork
- D. Section 02278 - HDPE Geomembrane
- E. Section 02273 - Riprap

1.3 REFERENCES

- A. ASTM D 4491 – Permittivity
- B. ASTM D 4751 - Apparent Opening Size
- C. ASTM D 4632 - Grab Tensile Properties (Tensile Strength, Break, Elongation)
- D. ASTM D 3776 - Mass Per Unit Area
- E. ASTM D 4833 - Puncture Resistance
- F. ASTM D 4533 - Trapezoidal Tear
- G. ASTM D 3786 - Mullen Burst
- H. ASTM D 4354 - Sampling of Geotextiles for Testing

1.4 SUBMITTALS

- A. Comply with OWNER's General and Special Conditions.
- B. Refer to 2.4 in Section 02271 of the Specifications.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store out of sunlight and away from moisture, otherwise the geotextile shall be furnished with a wrapping which will protect the fabric from ultraviolet radiation and from abrasion.
- B. Handle with care so as not to rupture or puncture.
- C. Rolls shall be clearly marked showing the type of fabric.
- D. Each shipping document shall include a notation certifying that the geotextile is in accordance with the manufacturer's certificate and guarantee previously filled with the purchaser.
- E. Label the fabric and its container with the manufacturer's name fabric type or trade, lot number, and quantity.
- F. Inspect material a minimum of 7 days prior to deployment, and indicate in writing any deficiencies to ENGINEER and CQA CONSULTANT.

1.6 CONSTRUCTION QUALITY ASSURANCE PLAN

- A. The installation of all geotextiles shall be performed as specified and in accordance with the Construction Quality Assurance (CQA) Plan.
- B. The INSTALLER and CONTRACTOR shall be aware of the activities outlined in the CQA Plan and shall account for these CQA activities in the installation schedule.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. T.C. Mirafi
365 South Holland Drive
Pendergrass, Georgia 30567
- B. AMOCO
900 Circle 75 Parkway
Suite 300
Atlanta, GA 30339
- C. Synthetic Industries
40-19 Industry Drive
Chattanooga, TN 37416
- D. TNS Advanced Technologies
681 DeYoung Rd.
Greer, SC 29651
- E. Evergreen Technologies
5775-B Glenridge Dr., Suite 450
Atlanta, GA 30328

2.2 MATERIALS

- A. Fibers used in the manufacture of geotextiles, and the thread used in joining geotextiles by sewing, shall consist of long-chain synthetic polymers, composed of at least 85 percent by weight polyesters or polypropylene. They shall be formed into a network such that filaments or yarns retain dimensional stability relative to each other, including selvages. These materials shall conform to the physical requirements of Tables 02271-1 and 02271-2 for the indicated application.
- B. The geotextile shall be a nonwoven fabric consisting of either nonwoven polyester or polypropylene fibers. Nonwoven geotextile will be needle punched. Slit film woven fabric shall not be used for this work.
- C. All geotextile used for cushioning shall be certified to having been continuously monitored by needle detection equipment and exposed to magnetic removal devices.

Table 02271-1
Geotextile Acceptance Specifications

TEST	TYPE A BENEATH ROADWAYS	TYPE B BENEATH RIPRAP	CRITERION
Apparent Opening Size (US Sieve Number)	100	70	Max
Grab Tensile Properties - Tensile Strength (lb.)	200	150	Min
Grab Tensile Properties - Break Elongation (%)	50	50	Min
Permittivity (gal/min/ft ²)	80	90	Min
Puncture Resistance (lb.)	130	120	Min
Mullen Burst (psi)	450	410	Min
Trapezoidal Tear (lb)	80	65	Min

Table 02271-2
Geotextile Cushion Acceptance Standards

TEST	GEOCUSHION™
Grab Tensile	300 lb.
Mass/Area	16 oz/yd ² (1,080g/m ²)

2.3 SAMPLING AND TESTING

The product shall be subject to sampling and testing. Sampling shall be in accordance with ASTM D4354, and testing procedures shall be in accordance with the methods given in Table 1. On the basis of testing these samples, the CQA CONSULTANT may choose to accept a portion of the batch while rejecting the remainder.

2.4 CERTIFICATION (MANUFACTURER'S CERTIFICATE)

- A. The manufacturer shall file with the CQA CONSULTANT a certificate stating
 - 1. Name of the manufacturer,
 - 2. Chemical composition of the filaments or yarns,
 - 3. Other pertinent information so as to fully describe the geotextile,
 - 4. Guarantee stating that the geotextile that is furnished meets the requirements of the specification.
- B. Certificate shall be attested to by a person having legal authority to bind the company.
- C. Mismatching or misrepresentation by the manufacturer shall be reason to discontinue acceptance under these specifications.
- D. Notice sent to manufacturer by the CQA CONSULTANT regarding the discontinuance of acceptance will be considered to be notice all wholesalers, jobbers, distributors, agents, and other intermediaries handling the manufacturer's product.

PART 3. EXECUTION

3.1 PREPARATION

- A. The area shall be graded smooth and all stones, roots, sticks, or other foreign material which would interfere with the fabric being completely in contact with the soil shall be removed prior to placing the fabric.

If there is any nonconformity with the material specifications, then the INSTALLER shall withdraw the rolls from use in the project at the INSTALLER's sole risk, cost, and expense. Once withdrawn, the same rolls shall not be resubmitted for use. The INSTALLER shall be responsible at its sole risk, cost, and expense for removing this Geotextile from the site and replacing it with acceptable Geotextile.

3.2 GEOTEXTILE PLACEMENT AND HANDLING

- A. Installer shall handle all Geotextile in such a manner as to ensure it is not damaged in any way.
- B. If necessary, the Geotextile shall be positioned by hand after being unrolled to minimize wrinkles.
- C. In the presence of wind, Geotextiles shall be weighted with sandbags or equivalent. Such sandbags shall be installed during placement and shall remain until replaced with earthen covered material.
- D. During placement, care shall be taken not to entrap any stones, excessive dust, or moisture that could cause clogging of the drainage system and/or stones that could damage the underlying geomembrane.

- E. Geotextile shall be cut using an approved cutter only. If in place, special care must be taken to protect the geomembrane from damage which could be caused by cutting of Geotextiles.
- F. Examination of Geotextile over entire surface, after installation, shall be conducted to ensure that no potentially harmful foreign objects, such as needles, are present. Any foreign objects encountered shall be removed by INSTALLER, or Geotextile shall be replaced.
- G. No horizontal joints or overlaps will be allowed on slopes steeper than 5-horizontal to 1-vertical (*i.e.*, seams will be along, not across, the slope), except as part of a patch.
- H. The Geotextiles shall be overlapped a minimum of 6 inches. Geotextile above the geomembrane shall be continuously sewn or overlapped at least 12 inches.
- I. Any sewing shall be done using polymeric thread with chemical resistance properties equal to or exceeding those of geotextile. Sewing shall be performed using a Type 401 double thread locking stitch made on a flat (prayer) type seam.

3.3 PLACEMENT OF AGGREGATE MATERIALS OVER GEOTEXTILE

- A. Geotextile placed over the geomembrane on the base shall be completely covered with a minimum 18-inch thick layer of Granular Fill within 14 days of installing Geotextile.
- B. Installer shall place all General Fill (rooting zone layer) located on top of Geotextile in such a manner as to ensure:
 - 1. No damage of Geotextile
 - 2. Minimal slippage of Geotextile on underlying layers.
 - 3. No excess tensile stresses in Geotextile.
- C. Place Aggregate Fill over Geotextile by pushing material out over Geotextile ahead of equipment with an initial minimum lift thickness of 12 inches. Equipment used to install Aggregate Fill over the Geotextile shall have a maximum contact pressure of 8 psi inch on earthen material. Thickness of Aggregate Fill over Geotextile shall be 12 inches or more before equipment used to place Aggregate Fill shall be permitted to cross areas where Geotextile has been installed. Thickness of cover material over Geotextile shall be a minimum of 2.5 foot before vehicles with contact pressure greater than 8 psi inch shall be permitted to cross areas where Geotextile has been installed.

END OF SECTION

INSURANCE REQUIREMENTS

CONTRACTOR INSURANCE REQUIREMENTS

Contractor shall provide, pay for and maintain in full force and effect, all insurance outlined herein with limits of liability not less than the limits of liability shown covering Contractor's activities, those of any subcontractors or anyone directly or employed by any of them, or by anyone for whose acts any of them might be liable.

Insurer Qualifications

All insurance should be provided through insurance companies authorized to do business in South Carolina with an A M Best's Rating of no less than A and shall be approved by and acceptable to Owner.

Certificates of Insurance

Within **5 (five) days** of execution of Contract but **PRIOR** to commencing Work, Contractor's insurer shall provide to Owner a Certificate of Insurance issued by an authorized representative of its insurer certifying that the insurance as required in this Exhibit is in full force and effect. Certificates should be sent via fax or mail to the following:

Risk Coordinator
City of Spartanburg
P. O. Box 1749
Spartanburg, SC 29304
Fax:# 864-596-2262
Email: kbooker@cityofspartanburg.org

The original of the Certificate is to be sent as well. The Certificate shall include a statement that the policies will not be canceled or non-renewed without 30 days advance written notice to Owner.

Primary Insurance

All insurance coverage required of the Contractor shall be primary over any insurance or self insurance carried by City of Spartanburg.

Duration of Coverage

All required insurance coverage shall be maintained without interruption during the entire term of the Contract plus an additional 3 years for Products and Completed Operations Coverage following final acceptance of the Work by Owner.

Subcontractor's Insurance

The Contractor shall require any Subcontractor to purchase and maintain insurance of same types and limits required herein.

Waiver of Subrogation

The Contractor shall require all policies of insurance as required herein to be endorsed to provide that the insurance company shall waive all of its right of recovery or subrogation against Owner. The Contractor shall require similar waivers from any Sub-contractors.

Additional Insured

The Contractor's insurance policies as required herein with the exception of Workers Compensation shall be endorsed to name Owner as an additional insured.

Insurance Coverage and Limits

Workers' Compensation: The Contractor shall provide and maintain Workers Compensation insurance in each jurisdiction in which the Work is located.

Limits:

Coverage A – State Statutory Benefits	
Coverage B - Employers Liability	\$1,000,000

Specific Coverage:

- United States Longshoremen and Harbor Workers Act
- Coverage endorsement must be provided if any work is to be performed on or around navigable water.

Automobile Liability: Contractor shall provide and maintain Business Auto

Liability insurance covering bodily injury and/or property damage liability arising out of the use of any auto (including owned, hired, and non-owned autos).

Limits:

Combined Single Limit Each Accident:	\$1,000,000
--------------------------------------	-------------

Commercial General Liability: Contractor shall provide and maintain in full force and effect Commercial General Liability Insurance covering all operations by or on behalf of Contractor on an occurrence basis against claims for bodily injury, personal in-jury, and/or property damage (including loss of use).

Limits:

Each Occurrence	\$1,000,000
General Aggregate	\$2,000,000
Products/Completed Operations	\$2,000,000

Specific Coverage:

Occurrence Form
Blanket Contractual Liability
Underground Explosion and Collapse

Umbrella/Excess Liability: Contractor shall provide and maintain Umbrella/Excess Liability Insurance on an occurrence basis with coverage as broad as underlying policies.

Limits:

Each occurrence:	\$2,000,000
Annual Aggregate:	\$2,000,000

Specific Coverage:

Blanket Contractual Liability
Follow Form Primary

Other Insurance: Any other insurance as specified by Owner in the Contract Documents.

Changes: Exceptions to specified insurance requirements shall be submitted at time of any bid.

CITY OF SPARTANBURG

BUSINESS LICENSE APPLICATION

(864) 596-2055 (864) 596-2424 Fax

P O Box 1749 Spartanburg, SC 29304

Year _____

Bus Lic# _____

All City of Spartanburg Business License expire December 31st of each year

___ New Business ___ Renewal of License ___ Change of Ownership ___ Change of Location

Name of Business: _____

Mailing Address: _____

Business Location: _____ Start Date: _____

Telephone number: Business () _____ or () _____

Federal Tax ID No. _____ Social Security No. _____

Type of ownership: ___ Sole Proprietor ___ Partnership ___ Corporation ___ Other

Are you a Contractor? ___ Yes ___ No Are you located ___ inside or ___ outside the city limits?

State Contractors License No. _____ SC State Sale Tax No. _____

Do you have Coin Operated Machines? ___ Yes ___ No How many? _____

Do you own the Machines? ___ Yes ___ No What type of Machines? _____

Types of Business or Profession - Please describe in detail products sold or services provided.

Computation of Fees

A. New Business - (Fees are due Prior to beginning operation in the City)

- 1. Estimated total gross sales/revenue for remaining of the year ending December 31, _____ \$ _____
- 2. Calculate and enter fee based on A1. _____ \$ _____

B. Existing Business (After 2nd year of operation)

Bus License fee is due/payable by last day of February

- 1. Total actual gross sales/revenue for preceding December 31, _____ \$ _____
- 2. Total Gross receipts _____ \$ _____
- 3. Calculate fee based on B3. _____ \$ _____
- 4. Penalties due (Delinquent after end of February) _____ % \$ _____
- 5. Total Fees _____ \$ _____

Owner Information

Name of Owner _____ Social Security No. _____

Telephone number: () _____ Home () _____

I UNDERSTAND THAT ISSUANCE OF A CITY BUSINESS LICENSE DOES NOT RELIEVE ME OF THE RESPONSIBILITY OF MEETING ALL CITY OF SPARTANBURG ZONING AND BUILDING CODE REQUIREMENTS. I AM SUBJECT TO ALL PROVISIONS OF THE BUSINESS LICENSE ORDINANCE OF THE CITY OF SPARTANBURG.

I CERTIFY THAT THE INFORMATION GIVEN IN THIS APPLICATION IS TRUE.

owner _____ TITLE _____ DATE _____

NOTE: AN ORIGINAL CITY OF SPARTANBURG BUSINESS LICENSE APPLICATION IS INCLUDED IN THIS BID PACKET FOR YOU TO COMPLETE

MWBE Good Faith Effort Participation Commitment Contract

This form should be filled out completely and *included in your bid document*. This form should also be accompanied by an executed Letter of Intent from each Sub-Contractor firm listed in this form. You may use additional sheets if necessary.

BID NO:		DATE:	
PROJECT NAME:		ADDRESS:	
PRIME CONTRACTOR:		CITY:	STATE:
CONTACT PERSON:		EMAIL:	
TELEPHONE: ()		FAX: ()	

MWBE SUBCONTRACTORS

COMPANY	MWBE CLASS	CITY, STATE	CONTACT	PHONE	TYPE OF WORK TO BE PERFORMED	SUBCONTRACT AMOUNT	% OF WORK
						\$	%
						\$	%
						\$	%
						\$	%
Total MWBE Participation						\$	%
Total Contract Amount						\$	
MWBE CLASSIFICATION							
MBE-B - African American MBE-S - Asian American MBE-H - Hispanic American WBE - American Woman MBE N/A - Native American							

NON-MWBE SUBCONTRACTORS

COMPANY	MWBE CLASS	CITY, STATE	CONTACT	PHONE	TYPE OF WORK TO BE PERFORMED	SUBCONTRACT AMOUNT	% OF WORK
						\$	%
						\$	%
						\$	%
						\$	%
Total Non-MWBE Participation						\$	%
Total Contract Amount						\$	

INTENT TO PERFORM CONTRACT WITH OWN WORKFORCE

I HERBY CERTIFY THAT IT IS OUR INTENT TO PERFORM 100% OF THE WORK REQUIRED FOR THE ABOVE PROJECT. IN MAKING THIS CERTIFICATION, THE BIDDER STATES THAT THE BIDDER DOES NOT CUSTOMARILY SUBCONTRACT ELEMENTS OF THIS TYPE OF PROJECT, AND NORMALLY PERFORMS AND HAS THE CAPACITY TO PERFORM AND WILL PERFORM ALL ELEMENTS OF THE WORK PROJECT WITH HIS/HER OWN CURRENT WORK FORCES; AND IF THE BIDDER DOES NOT PERFORM 100% OF THE WORK REQUIRED, THE BIDDER WILL PROVIDE A LIST OF SUBCONTRACTORS

THE BIDDER AGREES TO PROVIDE ANY INFORMATION OR DOCUMENTATION TO THE CITY OF SPARTANBURG IN SUPPORT OF THE ABOVE STATEMENT.

THE UNDERSIGNED HEREBY CERTIFIES THAT HE OR SHE HAS READ THIS DOCUMENTATION AND IS AUTHORIZED TO BIND THE BIDDER TO THE COMMITMENTS HEREIN SET FORTH.

The listing of an MWBE shall constitute a representation by the bidder/responder to City of Spartanburg that such MWBE has been contacted and properly apprised of the upcoming City of Spartanburg project. Bidders/Responders are advised that the information contained herein is subject to verification by the Minority & Women Business Enterprise Program Coordinator and that submission of said information is an assertion of its accuracy. These documents are a part of this solicitation and contract. You are required to fill out this information.

I certify that the above information is true to the best of my knowledge:

Signature: _____

Title: _____

Date: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Signature

Notary Seal

THIS DOCUMENT MUST BE PROVIDED WITH THE SUBMITTAL AND SIGNED BY THE PERSON SIGNING THE SUBMITTAL