

CITY OF COLUMBIA ENGINEERING REGULATIONS
PART 15: GENERAL SPECIFICATIONS
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CITY OF COLUMBIA ENGINEERING REGULATIONS

PART 15: GENERAL SPECIFICATIONS

15.1 Definitions of Terms

- 15.1.1 Whenever in these specifications and in the contract, or any documents or instruments pertaining to construction where these specifications govern the following terms are used, the intent and meaning shall be interpreted as follows:
- 15.1.1.1 A.A.S.H.T.O. - American Association of State Highway and Transportation Officials.
 - 15.1.1.2 A.D.A. - Americans with Disabilities Act of 1990
 - 15.1.1.3 A.N.S.I. - American National Standards Institute.
 - 15.1.1.4 A.S.T.M. - American Society for Testing Materials.
 - 15.1.1.5 A.W.W.A. - American Water Works Association.
- 15.1.2 Advertisement for Bids – The notice calling attention of bidders to the time and place for receiving bids, containing a brief description of the work and briefly setting forth the requirements and conditions for submission of proposals.
- 15.1.3 Bid Bond – The security to be furnished by the bidder as a guaranty of good faith that he will enter into a contract with the City and to execute the required bond covering the work contemplated, if same is awarded to him.
- 15.1.4 Bidder – Any individual, partnership, firm or corporation acting directly or through a duly authorized representative, submitting a proposal for the work contemplated.
- 15.1.5 Bridges – Water-way structures having a clear span in excess of 12 feet.
- 15.1.6 City – The City, as owner of the project, acting through its authorized representatives.
- 15.1.7 Council – The duly elected Council of the City.
- 15.1.8 Contract – The written agreement covering the performance of the work. The contract shall include the Proposal, Plans, Specifications, Special Provisions, Work Order, Contract Bond, Insurance Certificates, Addenda and all other documents pertinent to the contract. It shall also include any and all supplemental, signed, written agreements duly authorized by the owner which may be executed to complete the work, in accordance with the intent of the plans and specifications, in an acceptable manner.
- 15.1.9 Contract Period – The period from the date specified in the contract for the commencement of work to the date specified for its completion, both dates, inclusive.

- 15.1.10 Contract Sum – The aggregate sum obtained by multiplying the number of units of each class of work, as shown on the contract, by the unit prices specified in the contract for the class of work.
- 15.1.11 Contractor – The individual, partnership, firm or corporation executing a contract acting directly or through his lawful agents or employees, who is primarily liable for the acceptable performance of the work for which he was contracted and also for the payment of all legal debts pertaining to the work.
- 15.1.12 Contractor-(Sub) – Any person, firm, or corporation who has, with the approval of the Engineer, contracted with the Contractor to execute and perform in his stead all or part of the contract.
- 15.1.13 Design Engineer – The representative of the City directly in charge of the work.
- 15.1.14 Drainage – Drainage is the system of pipes, drainageways, ditches, and structures by which surface or subsurface waters are collected and conducted from the streets, alleys, or adjacent properties.
- 15.1.15 Employee – Any person working on the project to which these specifications apply, and who is under the direction or control of, or receives compensation from the Contractor or sub-contractor.
- 15.1.16 Engineer - City Engineer or his duly authorized representative.
- 15.1.17 Equipment – All machinery, together with the necessary supplies for upkeep and maintenance and also all tools and apparatus necessary for the proper construction and acceptable completion of the work.
- 15.1.18 Extra Work – Work performed by the Contractor, authorized by formal Change Order signed by the City Engineer, in order to complete the contract in an acceptable manner but for which there is no basis of payment provided in the contract.
- 15.1.19 Inspector – An authorized representative of the Engineer assigned to make all necessary inspection of the work performed or being performed, or for the materials furnished or being furnished by the Contractor.
- 15.1.20 Intention of Terms – Whenever, in these specifications or upon the plans the words “directed”, “required”, “permitted”, “ordered”, “prescribed”, “designed”, or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer is intended and similarly, the words “approved”, “acceptable”, “satisfactory”, or words of like import, shall mean approved by, or acceptable to or satisfactory to the Engineer subject in each to the final determination of the City Manager.
- 15.1.20.1 Any reference to a paragraph of sub-paragraph within a section shall include the general provisions of the section or sections and paragraph pertinent thereto.

- 15.1.21 Instructions to Bidders – The clauses setting forth, in detail, the information relative to the proposed work and requirements for the submission of Proposals.
- 15.1.22 Item – A specified class of work on which definite prices are set forth in the proposal or in the contract.
- 15.1.23 Laboratory – The official testing laboratories of the City or such other laboratories as may be designated by the Engineer.
- 15.1.24 Landscaping – The planning, planting, establishing and caring for trees, shrubs, vines and other vegetation to provide shade, reduce dust, control erosion or improve the general appearance of the project.
- 15.1.25 Lump Sum – Total price for an item or items of work regardless of the number of units of work to be performed.
- 15.1.26 Maximum Density and Optimum Moisture Content – The term “maximum density” as applied to the compaction of soils and similar materials shall be construed as the greatest density obtainable from the material passing a ¾” mesh sieve when it is compacted in the manner prescribed in current A.A.S.H.O. Method of Test 5-90 or the current Standard Proctor Method. Optimum moisture content shall be construed as the percentage of moisture corresponding to the maximum density in the above described test.
- 15.1.27 Notice of Award – A written notice to the successful bidder stating that his bid has been accepted and that, in accordance with the terms of the Advertisement for Bids and Specifications, he is required to execute the contract and furnish satisfactory contract bond.
- 15.1.28 Notice to Proceed – A written notice to the Contractor of the date on which he is to begin the prosecution of the work for which he has contracted.
- 15.1.29 Or Equal” Clause – “Or equal” shall be construed to mean that material or equipment will be acceptable only when, in the judgment of the Engineer, they are composed of parts of equal quality, or equal workmanship and finish, designed and constructed to perform or accomplish the desired result as efficiently as the indicated brand, pattern, grade, class, make or model. Written approval will be obtained from the Engineer prior to installation.
- 15.1.30 O.S.H.A. - Occupational Safety and Health Act.
- 15.1.31 Official Publications – The official publications and the formal resolutions and notices relative to the proposed improvements that are required by law to be published in a prescribed manner and that have actually been published in accordance with the statutes relating thereto. Attention is directed to the fact that these official publications are by statute vested with all of the force and effect of contract obligations.

- 15.1.32 Owner – The owner is any public agency which, through its authorized representatives and governing body, has authorized the project and can by their own acts bind the City in the accompanying contract.
- 15.1.33 Performance and Payment Bond – The approved form of security furnished by the Contractor and his Surety as a guarantee of good faith and ability on the part of the Contractor to execute the work in accordance with the terms of the plans, specifications and contract, and the payment of all debt pertaining to the work and the maintenance of the work as provided by law or by these specifications.
- 15.1.34 Plans – The official plans, working drawings or supplemental drawings or exact reproductions thereof, approved by the City, official copies of which are on file in the Department of Utilities and Engineering and which show the location, character, dimensions, and detail of the work to be done and which are to be considered as part of the contract, supplementary to these specifications.
- 15.1.35 Project – A project for the accomplishment of the improvement of certain municipal streets, alleys, sewers, drains, etc., based on a program of improvement adopted by the City Council.
- 15.1.36 Proposal – The written offer of the bidder, when submitted on the approved Proposal Form, to perform the contemplated work and furnish the necessary materials in accordance with the provision of the plans and these specifications.
- 15.1.37 Proposal Form – The approved form on which the written offer of formal bid is to be prepared and submitted for the construction to be done.
- 15.1.38 Public Agency – Public agency means a Municipality or other political subdivision; or a tax-supported organization.
- 15.1.39 Right-of-way – All lands or other property interests provided or acquired for the construction of the improvement and its appurtenances.
- 15.1.40 Roadbed – The area between the inside slopes of ditches or tops of fills slopes.
- 15.1.41 Roadway – The part of the right-of-way included between the outside lines of the slopes, gutters and side ditches of the road.
- 15.1.42 S.C.D.O.T. – South Carolina Department of Transportation
- 15.1.43 Shoulders – That portion of the road, street, or alley lying outside of the surfaced areas.
- 15.1.44 Sodding – The transplanting of established turf in the form of blocks or strips usually referred to as “sods”.
- 15.1.45 Special Provisions – The specific clauses setting of the conditions or requirements peculiar to the project under consideration, covering work or material involved in the

Proposal and estimate, which are not thoroughly or satisfactorily stipulated in these specifications.

- 15.1.46 Specifications – The directions, provisions, and requirements contained herein, supplemented by special provisions, pertaining to the method and manner of performing the work, or to the quantities, or the qualities of materials to be furnished under the contract.
- 15.1.47 Station – One hundred (100) lineal feet.
- 15.1.48 Structures – As used in these specifications, structures shall mean culverts, including headwalls and endwalls, drainage construction such as storm sewers, gutters, catch basins, drop inlets, manholes, retaining walls and other construction which may be encountered in the building of the improvements.
- 15.1.49 Sub-grade – That portion of the road, street or alley upon which the base-course is to be placed.
- 15.1.50 Superintendent – The executive representative for the Contractor present on the work site at all times during progress, authorized to receive and fulfill instruction from the Engineer and capable of superintending the work efficiently.
- 15.1.51 Supplemental Agreement – A written Proposal and Agreement executed by the Contractor and by the City, with the consent of the Contractor's Surety covering work not included in the Plans and Proposal which is necessary to the proper completion of the project.
- 15.1.52 Surety – The corporate body or individuals which are bound by the contract bond and the payment bond with and for the Contractor, and which engage to be responsible for the entire and satisfactory fulfillment of the contract and for the payment of all lawful debts incurred in fulfilling the contract.
- 15.1.53 Surfacing – The combined subbase, base and surface course of pavement shall be considered as a single unit, excluding shoulders, unless otherwise denoted.
- 15.1.54 The Work – All work including the furnishing of materials, tools, equipment, incidentals, etc., to be performed by the Contractor under the terms of the contract, plans and specifications.
- 15.1.55 Turf – The mass of matter, roots, of grass and certain other low-growing plants, including the layer of soil in which they are growing and the plant growth showing above. The density and quality of the turf mat will be influenced by the environmental conditions and service requirements, but in general maximum coverage with a minimum yield is desired, as distinct from agricultural productions.
- 15.1.56 Turfing – The process involved in the planting and development of turf, including preparation and improvement of soil, sowing, or planting, cultural practices and other operations necessary to its establishment and maintenance.

- 15.1.57 Working Day – A working day shall be any day other than a legal holiday or Sunday. Sundays or holidays on which the Contractor’s forces engage in regular work, requiring the presence of an inspector, will be considered as working days.
- 15.1.58 Working Time – The working time, stated in the Proposal and the contract, shall be given as a definite number of working days or as the date by which all work shall be completed as an essential part of the contract. When the notice to Contractors and Proposal form set forth the date of commencement and date of completion, then the contract period shall be the period from the specified date for beginning the work, to the specified date of completion, both dates inclusive. The contract period may be extended by the City as provided in these specifications, in which event the contract period includes the new date of completion.

15.2 Laws and Regulations

- 15.2.1 The Contractor shall keep himself fully informed of all Federal, State, City and County laws, ordinances and regulation in any manner affecting those engaged or employed in the work, or the materials used in the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency is discovered in this contract, or in the drawings or specifications herein referred to, in relation to any such laws, ordinances, regulation, order or decree, he shall immediately report the same in writing to the City. He shall at all times observe and comply with all such existing and future laws, ordinances, and regulations, and shall protect the surety, the City and their agents against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or by his employees.

15.3 Contract and Contract Documents

- 15.3.1 The instructions to bidders, contractor’s bid, plans, specifications and addenda shall form part of this contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The tables of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the contract documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.
- 15.3.2 Projects shall be constructed in accordance with the references made in the Contract Documents, Plans, Specifications and/or Special Provisions; however, payment shall be made as shown in the Bid Form included in the Contract Documents. Reference to any standards, specifications, manuals, and/or test designations of the American Society for Testing Materials, the American Association of State Highway and Transportation Officials, Federal Specifications, South Carolina Department of Transportation, the City of Columbia, County or any other recognized national organization shall mean it is all inclusive and shall be the current version in effect at the time the Contract is bid whether it is identified by a number and/or year of adoption. “All inclusive” shall mean to include all supplemental specifications, amendments and any other addenda associated with the standards, specifications and manual or test designation. Reference

to the “Department” or “SCDOT” in the South Carolina Department of Transportation Specifications shall be changed to “Owner/Engineer” unless otherwise noted.

15.4 Required Provisions Deemed Inserted

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

15.5 Notice and Service Thereof

15.5.1 All notices herein provided shall be considered as having been given upon being placed in the United States Mail, certified, postage prepaid, addressed to the contractor at the address herein set forth in the contract documents or to such other address as may be given to the City in writing.

15.5.2 All notices required to be delivered to the City shall, unless otherwise specified in writing to the Contractor, be delivered to the City Engineer, City of Columbia, Columbia, South Carolina, and any notice to or demand upon the City shall be sufficiently given if delivered to the office of said City Engineer, or if deposited in the United States Mail, certified, postage prepaid, in each case addressed to said City Engineer of the City of Columbia, South Carolina, unless otherwise specified in writing to the contractor by the City Engineer.

15.6 Prohibited Interests

15.6.1 No official of the City, who is authorized in such capacity and on behalf of the City to negotiate, make, accept, approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer, or inspector of or for the City, who is authorized in such capacity, and on behalf of the City to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any contract pertaining to the project.

15.6.2 The City shall, at its sole option and discretion, have the right to terminate this contract for any reason whatsoever by providing the Contractor with a notice of termination to be sent by registered mail, return receipt requested. A termination for default under Section 29.0 of this contract shall, if wrongfully made, be treated as a termination for convenience under this clause. Whenever the Contractor is terminated for convenience under this clause or is wrongfully terminated under any other clause of this contract, the Contractor shall only be entitled to the actual direct costs of all labor and material

expended on the job prior to the effective date of the termination plus 15% or the Contractor shall be entitled to be paid a pro-rate percentage of the total contract price which is equal to its percent of completion, whichever of the two methods provides the lowest sum to be paid to the Contractor. In no event shall the Contractor be entitled to anticipatory profit or damages for any termination under this clause. In no event shall the Contractor be entitled to assert a claim in quantum meruit or any other measure of damages other than that stated herein.

15.7 Encroachment Permits, Rights-of-way, Easements and Suspension of Work

15.7.1 The City shall furnish all necessary permits, land and rights-of-way necessary for the carrying out of this contract and the completion of the work herein contemplated, and will use due diligence in acquiring said encroachment permits, land and right-of-way as speedily as possible with the exception of obtaining additional temporary construction easements that the Contractor deems necessary in the performance of the contract. It is possible that all encroachment permits, lands and rights-of-way may not be obtained as herein contemplated before construction begins, in which event the Contractor shall begin his work upon such land and rights-of-way as the City may have previously acquired, and no claim for damages whatsoever will be allowed by reason of the delay in obtaining the remaining lands and right-of-way. Should the City be prevented or enjoined from proceeding with the work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation or by reason of its ability to procure any lands or rights-of-way for said work, the contractor shall not be entitled to make or assert claim for damage by reason of said delay or to withdraw from the contract except by consent of the City; but time for completion of the work will be extended to such time as the City determines, such determination to be set forth in writing.

15.7.2 In the event the Contractor obtains permissions for temporary easements, copies of all documents shall be submitted to the Engineer for approval and filing.

15.7.3 There will be no separate payment for these requirements. All cost for this work shall be included in other bid items.

15.8 Photographs

15.8.1 The contractor will be responsible for obtaining photographs in and adjacent to the construction area prior to beginning construction. The back of each photograph shall be annotated with the date, location (approximate station number), and direction of view (i.e., "looking north", etc.). There is no direct payment for this item, the cost of which shall be included in other bid items.

15.9 Video Taping of Project

15.9.1 The contractor shall video tape the entire project route, with an Engineer's representative in attendance, **prior to the start of construction**. The Engineer must be given 48 hours prior notice. Audio will be included on the tape with the property being

videoed identified by tax map number and street address. It is VERY IMPORTANT that the Contractor thoroughly documents the preexisting conditions of any and all roads, walkways, and parking lots which he will utilize including those used for access outside area of construction. A copy of this video will be given to the Engineer immediately following taping/copying.

15.9.2 **At the completion of the project** the contractor shall repeat the above requirement.

15.9.3 These video tapes are to protect the contractor from undue claims. If ANY situation arises where a claim is made by a party for damages by the Contractor, the Contractor must have documented prior evidence to the contrary or the City must side with the party making such claims, regardless if condition was pre-existing or not.

15.9.4 There is no direct payment for this item, the cost of which shall be included in other bid items.

15.10 **Indemnity**

15.10.1 The Contractor agrees to and fully indemnify, defend, hold harmless and reimburse the Owner, the Engineer and their respective agents, employees and successors from and against any and all losses, liabilities, judgments, expenses, costs and all claims for damages of any nature whatsoever:

- relating to or arising out of any action or failure to act; or,
- resulting from a taking of property, real or personal, or by inverse condemnation; or,
- relating to or arising out of the performance or failure to perform any of the obligations required by the contract; or,
- resulting from failure to comply with or violation of any local, state or federal regulation

by the Contractor, its subcontractors, officers, agents and employees or for anyone **for whose acts any of them may be liable for**. Losses, liabilities, expenses and claims for damages shall include, but not limited to, civil and criminal fines and penalties, judgments, loss of use and/or services, bodily injury, injury to or the taking of real or personal property, defense costs and attorney's fees.

15.11 **Contract Security**

15.11.1 The Contractor shall furnish a performance and payment bond in an amount at least equal to one hundred (100) percent of the contract prices as security for the faithful performance of this contract, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with the contract. The performance bond and payment bond may be in one or in separate instruments in accordance with local law. Before final acceptance, each bond must be approved by the City.

15.12 Assignments

15.12.1 The Contractor shall not assign the whole or any part of this contract or any money due or to become due hereunder without written consent of the City. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this contract.

15.13 Subcontracting

15.13.1 The Contractor may utilize the services of specialty subcontractors on those parts of the work which under normal contracting practices are performed by specialty subcontractors.

15.13.2 The Contractor shall not award any work to any subcontractor without prior written approval of the City, which approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the City may require.

15.13.3 The Contractor shall be as fully responsible to the City for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

15.13.4 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Specifications and other contract documents insofar as applicable to the work of subcontractors and to give the contractor the same power as regards terminating any subcontractor that the City may exercise over the Contractor under any provisions of the contract documents.

15.13.5 Nothing contained in this contract shall serve to create any contractual relationship between any subcontractor and the City.

15.14 Mutual Responsibility of Contractors

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

15.15 Separate Contracts

15.15.1 The contractor shall coordinate his operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractor, shall keep informed of the progress and the detail work of other contractors and shall notify the Engineer immediately of lack of progress or defective workmanship on the part of other contractors. Failure of a contractor to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

15.16 Contractor's Obligation

15.16.1 **The Contractor shall have the sole responsibility of determining the best and proper method or means of construction and the Owner or the Engineer acting in behalf of the Owner shall not be held responsible for determining or suggesting a method or means of construction, except as expressly indicated in the contract documents.**

15.16.2 The Contractor shall, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications, and in accordance with the plans and drawings covered by this contract and any and all supplemental plans and drawings, and in accordance with the directions of the Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of the contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Engineer and the City.

15.16.3 The Contractor will at all times have one complete set of all contract documents (special provisions, specifications, drawings, bulletins, etc.) maintained at the project sites and the Contractor's person in charge must be familiar with all phases of the project.

15.16.4 The Contractor agrees to personally see to the execution of the contract and not to sublet any portion of the same without the consent, in writing, of the City. The Contractor shall be responsible for the faithful completion of that part of the work. The subletting will not release the Contractor from any of his obligations or requirements under this contract.

15.16.5 The Contractor shall immediately remove and reconstruct or replace, at his own expense, all work or materials not in accordance with this contract. The payment of estimates, including certain work or materials, shall not be considered as an acceptance of that work or those materials at any time before the final acceptance of the entire work and materials included in the contract.

15.17 Payments by Contractor

15.17.1 The Contractor shall pay for the following:

15.17.1.1 For all transportation and utility services not later than the twentieth (20) day of the calendar month following that in which services are rendered;

15.17.1.2 For all materials, tools, and other expendable equipment to the extent of ninety (90) percent of the cost thereof not later than the twentieth (20) day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the thirtieth (30) day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used; and

15.17.1.3 To each of his subcontractors not later than the fifth (5) day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest therein.

15.18 Contractor's Local/ Field Office

15.18.1 The Contractor shall maintain a field office, with telephone, in the general area of the work, and will be required to have a responsible representative on call at all times.

15.18.2 Should the Contractor so desire, he may build shanties or provide other structures for housing men, tools, machinery and supplies, but they will only be permitted at approved places, and their surroundings shall be maintained at all times in a sanitary and satisfactory manner. On or before the completion of the work, all such structures shall be removed, together with all rubbish and trash, at the expense of the Contractor.

15.18.3 Upon completion of the contract, the Contractor shall remove the field office and all such temporary facilities from the site and leave the premises in a condition acceptable to the City Inspector. In the event the Contractor leases or rents office space for the field office, the Contractor shall vacate the rented or leased space in a condition acceptable to the property owner.

15.19 Supervision

15.19.1 The work shall be conducted under the general direction of the Engineer and will be inspected by inspectors appointed by him. However, in no case will the Engineer or Inspector be responsible for the supervision of the work. The inspectors will keep a record of work done and see that the location and limit marks are kept in proper order. The presence of an inspector shall not relieve the Contractor of responsibility for the proper execution of the work.

15.19.2 The Contractor shall furnish at his own expense such labor, organization and materials as may be reasonably necessary in inspecting and supervising the work. Should the Contractor refuse, neglect, or delay compliance with this requirement, the specified

facilities may be furnished and maintained by the City and the cost thereof deducted from any amounts due, or to become due the Contractor.

15.19.3 Unless otherwise provided for in these specifications, all expense of inspection will be borne by the Contractor.

15.19.4 It is understood that any instruction or decision given by the Engineer is to be considered the instruction or decision of the City, where, under the terms of this contract, such decision rests with the Engineer.

15.19.5 The work shall be entirely under the control of the Engineer, and he, or his authorized representative, shall have access to same at all times. The Engineer may require the Contractor to dismiss any employee he deems to be incompetent or careless.

15.20 Organization, Superintendence, Construction Progress

15.20.1 The Contractor shall employ only competent, experienced and skilled foremen and personnel in charge of their particular class of work. The Contractor shall give his personal superintendence to the work or shall have a competent superintendent or foreman present at all times when the work is in progress who shall have full authority to act for the Contractor. Whenever the Contractor is absent from any part of the work, the Superintendent or Foreman in charge of that particular work shall receive and execute the instructions of the Engineer. It is understood that such representative shall be acceptable to the Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.

15.20.2 The Contractor shall, upon request of the Engineer, immediately remove any Superintendent, Foreman or employee considered by the Engineer to be incompetent or disorderly.

15.20.3 The Contractor shall employ an ample force of properly experienced workers and provide construction equipment properly adapted to the work, of sufficient capacity and efficiency to accomplish the work in a safe and workmanlike manner, at a rate of progress satisfactory to the City. The equipment shall be maintained in a good working order and provision shall be made for immediate emergency repairs. No reduction in the capacity of the equipment employed on the work shall be made that negatively impacts the rate of the work. The measure of the capacity of the equipment and work force shall be its actual performance on the work to which these specifications apply. Award of this contract shall not be construed as a guaranty by the City that the equipment and work force listed by the Contractor for use on this contract is adequate for the performance of the work.

15.20.4 Should the Contractor fail to maintain a rate of progress which, in the opinion of the City, will complete work within the time limit specified, the City may require that additional work forces be added, if necessary, during additional periods or shifts, or additional equipment, or both, be placed on the work, or a reorganization of work forces and/or equipment be effected in order that the progress of the work be brought up to schedule

and so maintained. Should the Contractor refuse or neglect to increase the number of workers, working period, and/or equipment, or to reorganize the sequencing of the work in the manner satisfactory to the City, the latter may proceed under the provisions of the contract to rectify the conditions.

15.21 Inspection by Agencies

15.21.1 The representatives of the South Carolina Department of Health and Environmental Control and certain Local, State and Federal agencies shall have access to the work wherever it is, in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection. Upon contractor's request, the City Engineer's office will enumerate those agencies that shall have access to the work.

15.22 Additional Instructions and Detail Drawings

15.22.1 The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the contract documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry on the work in accordance with the additional detail drawings and instructions. The Contractor and the Engineer will prepare jointly: (a) a schedule fixing the dates at which special detail drawings will be required, such drawings, if any to be furnished by the Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work.

15.23 Correlation of Plans and Specifications

15.23.1 The contract, plans and specifications are to be interpreted as mutually explanatory or supplementary, and therefore any features shown in one and not in the other shall have the same force and effect as if shown in both, and shall be fully executed. Prior to execution of the work, the Contractor shall check all drawings and specifications, and shall immediately report all errors, discrepancies, conflicts and omissions discovered therein to the Engineer. All such errors, discrepancies, conflicts, and omissions will be adjusted by the Engineer, and adjustment by the Contractor without prior approval shall be at his own risk. The settlement of any complication arising from such adjustments shall be made by the Contractor at his own expense and to the satisfaction of the City.

15.24 Ownership of Drawings

15.24.1 All drawings, specifications, and memoranda relating to the work are the property of the City and are to be carefully used and returned to the City at completion, or cessation of the work for any cause.

15.24.2 Contract Documents to be Furnished: Five (5) sets of the plans and specifications will be furnished to the Contractor without charge. Additional sets can be secured from the

Engineer upon request at cost of reproduction. The Contractor shall have available on the project site at all times one (1) copy of each of said plans and specifications.

15.25 Submittals Prior to Construction

- 15.25.1 At the Preconstruction Meeting, the Contractor shall provide schedules and submittals that are required in the Contract Documents including, but not limited, to the following:
 - 15.25.1.1 Construction progress and sequencing schedules: The Contractor shall deliver to the City an estimated construction progress and sequencing schedule in form satisfactory to the City. It shall show the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents along with the order and/or sequencing of the work.
 - 15.25.1.2 Construction meeting dates, times and location
 - 15.25.1.3 Names of certified testers, plants, laboratories, and/or licenses
 - 15.25.1.4 Names and contact information of responsible persons
 - 15.25.1.5 Material testing procedures and schedules
 - 15.25.1.6 Complete preliminary schedules for shop drawings, product data, and samples including a list of each required submittal and the times for submitting, reviewing, and processing each submittal
 - 15.25.1.7 Equipment delivery schedule – The Contractor shall prepare a schedule of anticipated shipping dates for materials and equipment. It is intended that equipment and materials be so scheduled as to arrive at the job site just prior to time for installation to prevent excessive materials on hand for inventory and the necessity for extensive storage facilities at the job site.
 - 15.25.1.8 Payroll schedule
 - 15.25.1.9 The Contractor shall also furnish a schedule of values for all work with a detailed estimate and a complete breakdown of the contract price; and periodic itemized estimates of work done that shall be used as a basis for the Contractor’s applications for payment. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price. The sum of all values listed in the schedule shall not exceed the total contract sum.
- 15.25.2 The Contractor shall provide copies of photographs and videotapes taken of the extents of the project prior to the start of all demolition and construction work to document existing conditions. Photographs shall include a description of the view including, but not limited to, the location, direction, etc.

- 15.25.3 Shop drawings and Submittals: Prior to the beginning of construction, the Contractor shall submit (4) copies of each submittal and/or shop drawing for the City of Columbia's use; Contractor shall provide additional copies as needed for their records. Submittal and shop drawing review shall be limited to general design requirements only and shall not relieve the Contractor from responsibility for errors and/or omissions or responsibility for resulting consequences due to deviations from the Contract Documents. Changes shall not be made to any submittal after it has been reviewed; a new submittal must be presented for review and approval if changes are requested.
- 15.25.3.1 Shop drawings and/or submittals shall include the information listed below:
- 15.25.3.1.1 Project Name as shown on the Contract Document Cover.
- 15.25.3.1.2 Prime Contractor and Applicable Subcontractor.
- 15.25.3.1.3 Name of Engineer of Record.
- 15.25.3.1.4 Owner's Name.
- 15.25.3.1.5 Applicable Specification and Drawings Reference.
- 15.25.3.1.6 A stamp signed and dated by the Contractor stating that the Contractor has checked the materials and/or equipment for conformance with the Contract Documents, plans and specifications and that the Contractor has satisfied the Contractor's obligations under the Contract Documents.
- 15.25.3.1.7 A place for the Engineer to stamp.
- 15.25.3.2 Submittals that do not comply with the requirements listed above may be returned to the Contractor for re-submittal. Submittals that are acceptable will be reviewed and returned with comments/notes to the contractor not later than 15 working days after receipt by the City of Columbia. The need for re-submittals will not be a basis for an extension of contract time for the Contractor.
- 15.25.3.3 The inclusion of the Contractor's signature and date on the submittals and shop drawings warrants that the Contractor has determined and verified that all product identification, field measurements, quantities, applicable standards, specified performance and design criteria, construction criteria, installation requirements, relation to adjacent or critical features of the work or materials, catalog numbers and all other data have been checked and meet the requirements of the Contract Documents. Additionally, the Contractor is verifying that catalog data, manufacturer's technical data and/or shop drawings show complete information on material composition, test results, physical properties, dimensions, diagrams, procedures, methodology, performance curves, schedules, templates, patterns, calculations, instructions, etc. and that all are suitable with respect to their intended use, fabrication, shipping, handling, storage, assembly and installation per the Contract Documents. Product data includes standard printed information on materials, products, and systems. Manufacturer's standard printed recommendations shall include application and use of all products, compliance

with standards, labels and seals, verification of field measurements, special coordination requirements, catalog data and manufacturer's technical data complete with material composition, physical properties, and dimensions of all material used during the course of the project. The product data shall also include the manufacturer's recommendations for the handling and storage of materials and repair of damaged materials. Required data shall be collected into one submittal for each unit of work or system and **each copy shall be marked to show which choices and options are applicable to the project.**

- 15.25.3.4 **Materials and items installed in the work that have not been approved through the submittal and/or shop drawing process shall be removed and an approved product shall be installed and/or constructed at the Contractor's expense.** Review and approval of submittals will not extend to, nor does it in any way relieve the Contractor of Contractor's responsibilities for means, methods, techniques, sequences and procedures of construction, and safety precautions and programs incident to performing the work unless such is specifically and expressly called for by the Contract Documents.
- 15.25.3.5 Contractor shall give specific written notice of any variations from the Contract Documents on all submittals. This notice shall be both a written communication separate from the shop drawing and/or submittal; and, in addition, by a specific notation made on each shop drawing or submittal for review and approval of each such variation.
- 15.25.3.6 The Contractor shall attach current documentation, certifications, the current Approval List published by SCDOT, etc. to appropriate submittals for review and approval by the Engineer. Submittals are required for Contractors, plants, materials, etc. that are required to be certified and/or approved by the South Carolina Department of Transportation (SCDOT). Failure of the Contractor to attach the proper documentation to the submittals may result in delays of reviews and approvals.
- 15.25.3.7 The Contractor shall be responsible for providing updated certifications/approvals prior to expiration of such. Uncertified and/or unapproved Contractors, materials, plants, etc. shall not participate in or perform work on this project until such time as documentation is provided to the Engineer showing recertification and/or approval.
- 15.25.3.8 The Contractor shall make the required corrections as noted on the submittals and shall return the required number of corrected copies of shop drawings and/or submittals as required for review and approval. The Contractor shall direct specific attention in writing to the required corrections and any additional revisions other than the corrections called for on previous submittals.
- 15.25.3.9 The Contractor shall not receive time extensions or additional cost for expired certifications and/or delays to submittal reviews and approvals.
- 15.25.4 Review and approval of schedules and submittals by the Engineer will not impose responsibilities on the City or interfere with or relieve the Contractor from the Contractor's full responsibilities.

15.25.5 There will be no direct payment for this work, the cost of which shall be included in other bid items.

15.26 Benchmark

15.26.1 The benchmark is provided on the plans.

15.27 Materials, Services, and Facilities

15.27.1 It is understood that, except as otherwise specifically stated in the contract documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, gas, lights, power, transportation, superintendence, taxes, insurance, temporary contraction of every nature and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

15.27.2 In order to use water from a fire hydrant, the Contractor shall apply for a temporary hydrant meter. The City of Columbia shall waive all fees for such application for this project. However, the Contractor shall be responsible for all water usage fees.

15.27.3 Any work necessary to be performed after regular working hours, on Sundays, or legal holidays, shall be performed without additional expense to the Owner.

15.28 "Or Equal" (Substitute Materials)

15.28.1 Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material, products or equipment of other Suppliers may be submitted to the City for review under the circumstances described below:

15.28.2 "Or-Equal" Items: If in the Engineer's discretion an item of material, product or equipment proposed by the Contractor is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by the Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in the Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph, a proposed item of material, product or equipment will be considered functionally equal to an item so named if it is determined that all of the following are met:

15.28.2.1 It is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics,

15.28.2.2 It will reliably perform its intended function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

- 15.28.2.3 It has a proven record of performance and availability of responsive service,
- 15.28.2.4 The Contractor certifies that, if approved and incorporated into the Project, there will be no increase in Contract Times or cost, and it will conform substantially to the detailed requirements of the item shown in the Contract Documents.
- 15.28.3 Substitute Items:
 - 15.28.3.1 If in the Engineer's discretion, an item of material, product or equipment proposed by the Contractor does not qualify as an "or-equal" item under the above Section, they will consider a proposed substitute item.
 - 15.28.3.2 The Contractor shall submit sufficient information to allow the Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute thereof. Requests for review of proposed substitute items of material, product or equipment will not be accepted by the Engineer from anyone other than the Contractor.
 - 15.28.3.3 The Engineer will require for review supplemental in addition to the General Requirements as the Engineer deems appropriate under the circumstances.
 - 15.28.3.4 The Contractor shall request to use substitute materials, products and/or equipment in writing and shall provide the Engineer certification that the proposed substitute will:
 - 15.28.3.4.1 Perform the functions and achieve the results called for in the plans and the design.
 - 15.28.3.4.2 Be similar in substance to that specified.
 - 15.28.3.4.3 Be suited to the same use in the same conditions as that specified.
 - 15.28.3.5 The Contractor shall:
 - 15.28.3.5.1 State the extent, if any, to which the use of the proposed substitute will prejudice the Contractor's achievement of project completion.
 - 15.28.3.5.2 State whether or not the use of the proposed substitute item in the work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the City for other work on the Project) to adapt the design to the proposed substitute item.
 - 15.28.3.5.3 State whether or not incorporation or use of the proposed substitute item in connection with the work is subject to payment of any license or other fee.
 - 15.28.3.5.4 Identify all variations and differences of the proposed substitute item from that specified.
 - 15.28.3.5.5 Identify available engineering, sales, maintenance, repair and replacement services.

- 15.28.3.5.6 Prepare an itemized estimate of the cost or credits that will result directly or indirectly from the use of the proposed item, including cost of redesign and claims of other Contractors affected by any resulting changes.
- 15.28.4 Any item which the bidder desires to substitute as an “or equal” in preparing his bid shall be presented to the Engineer in writing (minimum of four (4) copies for the City’s use – Contractor shall provide additional copies for his use), with all necessary information required to make an evaluation, at least fifteen (15) days prior to the bid opening. This will allow time for evaluation and issuing of an addendum. Any modification required due to the proposed “or equal” and not on the plans shall be the responsibility of the Contractor.

15.29 Standard Products and Materials Not Specified

- 15.29.1 The Contractor shall provide all materials and equipment required to complete the project as shown on the plans and in accordance with the contract documents. Materials not specified elsewhere shall be of such manufacture as is generally accepted for that portion of the work to which they pertain. The bid sheet is intended to be a comprehensive representation of all labor and materials required to complete the project as shown on the plans. Unless otherwise specified in these Special Provisions, unit prices shall include all necessary labor and materials necessary to complete the work as shown on the plans and as described in the contract documents. Items not specifically identified on the bid sheet shall be considered incidental to the construction project and costs for such items shall be reflected in the unit price provided for the portion of the work to which the incidental items pertain.

15.30 Product Data

- 15.30.1 Product data includes standard printed information on materials, products, and systems. Manufacturer’s standard printed recommendations for application and use of all products shall be included as well as their compliance with standards, application of labels and seals, notation that field measurements have been checked, and special coordination requirements. It shall include the catalog data and manufacturer’s technical data showing complete information on material composition, physical properties, and dimensions of all material used during the course of the project. The product data shall also include the manufacturer’s recommendations for the handling and storage of materials and their recommendations for the repair of damaged materials. Required data shall be collected into one submittal for each unit of work or system, and each copy shall be marked to show which choices and options are applicable to the project. The submittal shall be delivered to the Engineer for review and approval. The review and approval by the Engineer does not relieve the Contractor of meeting the contract requirements.

15.31 Samples

- 15.31.1 Samples include both fabricated and unfabricated physical examples of materials, products, and units of work, both as complete units and as smaller portions of units of

work, either for limited visual inspection or, where indicated, for more detailed testing and analysis. Units shall be provided that are identical to the final condition of proposed materials or products for the work. A full set of optional samples shall be provided where the Engineer's selection is required. Samples shall also be prepared to match the Engineer's sample where indicated. Information shall be included with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.

15.32 Patents

- 15.32.1 The Contractor shall hold and save the City and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expense for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the City, unless otherwise specifically stipulated in the contract documents.
- 15.32.2 If the Contractor uses any design, device or materials covered by letter, patent, or copyright, he shall provide for such use by suitable agreement with the City for such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the contract prices shall include all royalties or costs arising from the used of such design, device or materials in any way involved in the work. The Contractor and/or his Sureties shall indemnify and save harmless the City from any and all claims for the infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the City for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

15.33 Delivery, Storage, and Handling

- 15.33.1 All materials furnished by the Contractor shall be delivered and distributed at the site by the Contractor. No materials will be furnished by the Owner unless otherwise noted.
- 15.33.2 The Contractor shall deliver, store, and handle pipe and fittings and any other materials as recommended by manufacturer and required to prevent damage.
- 15.33.3 If the coating, lining, etc. of new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or replaced as required by the Engineer at the Contractor's expense, before proceeding further.
- 15.33.4 In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.
- 15.33.5 There shall be no direct payment for these items, the cost of which shall be included in other bid items.

15.34 Contractor's Title to Materials

15.34.1 No materials or supplies for the work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage, conditional sales contract, or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him, free from all liens, claims or encumbrances.

15.35 Inspection and Testing Materials, Quality, and Guarantees

15.35.1 All work done and all materials furnished, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Engineer or his inspector(s) on the work site, or at the place of shipment, delivery, or manufacture of materials to insure that the work done and materials furnished under this contract conform in every respect to the plans, specifications and instructions.

15.35.2 The Engineer shall have the right to mark rejected materials to distinguish them as such. The Contractor shall furnish the inspector with the necessary facilities and assistance for carrying out his duties. The work and materials shall be supervised by the Engineer and the inspectors to obtain the finished product in accordance with the plans, specifications and contract with as little inconvenience to the public as possible. The City shall not assume any liabilities of the Contractor or relieve him of any of his obligations.

15.35.3 All materials, supplies and parts, or assemblies thereof, entering into the work shall be tested as specified herein or otherwise required, according to approved methods for the particular type and class of work.

15.35.4 The inspection and testing of materials and finished articles to be incorporated in the work shall be made by persons, laboratories, or agencies approved by the City. The cost of such inspection and testing shall be paid by the Contractor.

15.35.5 When required, all tests and trials shall be made in the presence of the authorized representative of the Engineer. When the presence of the inspector is not required, sworn statements in duplicate of the tests made and the results thereof shall be furnished to the Engineer as soon as possible after completion of tests.

15.35.6 Where standard published specifications of recognized authorities or organizations are specified, the latest revision of such specification at the time the work is executed shall govern, unless otherwise authorized or directed.

15.35.7 Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

15.35.8 All materials, parts and equipment furnished and incorporated in the work shall be high grade, free from defects and imperfections, of recent manufacture and unused.

Workmanship shall be of the highest grade and in accordance with the best modern standard practice.

- 15.35.9 The City Engineer shall determine the quality and quantity of the several kinds of work and materials which are included in this contract. He shall determine all questions relating to lines, levels and dimensions of the work, and interpretations of the plans and specifications.
- 15.35.10 Where the specifications call for certified copies of mill or shop tests to establish conformance with the specifications, it shall be the responsibility of the Contractor to assure the delivery of such certifications to the City Engineer.
- 15.35.11 No materials or finished articles shall be incorporated in the work until such materials and finished articles have passed any required tests. The Contractor shall promptly segregate and remove rejected material or finished articles from the site of the work. Failure to condemn the material on preliminary inspection shall not be grounds for acceptance if defects are found later.
- 15.35.12 The testing and approval of materials by the laboratory, or laboratories, shall not relieve the Contractor of his obligations to fulfill his contract and guarantee workmanship and materials. The Contractor may, at his option, and at his own expense, cause such other test to be conducted as he may deem necessary to assure suitability, strength and durability of any material or finished article.
- 15.35.13 The Engineer shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval and/or do not conform to the requirements of the specifications, upon notice from the Engineer, they shall be removed from the work, forthwith reconstructed, made good, replaced and/or corrected as the case may be by the Contractor at his own expense. Rejected materials shall immediately be removed from the site. If, in the opinion of the Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount that, in the judgment of the Engineer, shall be equitable.

15.36 Material Testing

- 15.36.1 The Contractor is responsible for providing the Engineer a copy of the proposed Quality Control and Quality Acceptance Program for review and for maintaining such program for the duration of the project. This program shall include all activities necessary for the design, production, placement, inspection, compaction, sampling, and testing of subgrade, base coarse, concrete, flowable fill, asphalt and all other materials as required in the Contract Documents and in accordance with South Carolina Department of Transportation Standard Specifications for Highway Construction, latest edition, with supplemental specifications.

- 15.36.2 Tests required per these Contract Documents are considered a necessary part of the work. The Contractor shall make all arrangements for such tests, inspections, and approvals with a testing laboratory certified by the South Carolina Department of Transportation and acceptable to the City. The Contractor shall bear all related cost of tests, inspections and approvals and shall give the City Inspector timely notice (minimum of 48 hours) of when and where tests and inspections are to be made so that Inspector can be present for such procedures.
- 15.36.3 The Contractor shall provide the Engineer copies of the Contractor-selected South Carolina Department Of Transportation Certified material testing laboratories and a current organizational chart including names, telephone numbers and current certifications of personnel responsible for the Quality Control Program, testing, inspection, etc. on the project at the Pre-Construction Meeting. All tests performed shall be under the supervision of certified personnel or it may result in non-payment, delay and/or reduction in payment for the material of concern.
- 15.36.4 The Contractor shall submit a signed and certified written report, in duplicate, of each inspection, test, or similar quality control and quality assurance service performed to the Engineer within three (3) working days of the performed service; this copy can be faxed but will be considered a copy. All original final written reports shall be turned over to the Engineer at substantial completion of the project. Written reports and attached forms of each inspection, test or similar service shall be complete and accurate, shall specify the test locations on a drawing, shall specify the tests performed, shall include the methods used to perform the test and shall be signed, stamped and dated by the certified person in the firm. Any reports or forms that are not completely filled out and/or signed and dated by the certified party may not be accepted by the City of Columbia and may result in non-payment, delay and/or reduction in payment. Receipt of these reports by the Engineer shall not relieve the Contractor of the responsibility of notifying the Engineer of any noted testing deficiencies or to make adjustments and/or corrections to any materials and/or items that do not meet the testing requirements.
- 15.36.5 The Contractor shall manage and coordinate all material testing and sequencing of activities to avoid the necessity of removing and replacing construction work to accommodate inspections and tests. The Contractor is responsible for scheduling times for inspections, testing, taking samples, and similar activities and shall be responsible for ensuring all tests are performed in accordance with the Contract Documents and South Carolina Department of Transportation Standard Specifications for Highway Construction, latest edition and the supplemental specifications. The City Inspector may require the Contractor to perform additional testing of questionable materials and/or construction methods for verification that the resulting product(s) meets the required specifications at no cost to the City. Failure to comply with this requirement may result in non-payment, delay and/or reduction of payment. Decisions regarding acceptance, rejection or acceptance at an adjusted price will be based on the material testing results that are within the specification limits.

- 15.36.6 If testing, inspection and/or approval reveal that portions of the work fail and/or do not comply with the Contract Documents, all cost for the correction and re-testing of the work shall be borne by the Contractor.
- 15.36.7 Hot Mix Asphalt (HMA):
- 15.36.7.1 This project is considered Low Tonnage Paving according to the South Carolina Department of Transportation (SCDOT) latest specifications and Supplemental Technical Specifications for Hot Mix Asphalt (HMA) Quality Assurance.
- 15.36.7.2 The Contractor shall coordinate the required plant acceptance tests as identified in Section 3.6.2 of the referenced Supplemental Technical Specification in 1.7.1 at a frequency of one (1) test per 500 tons, or a minimum of three (3) tests over the life of the project if the amount installed is spread over more than three (3) days, whichever is greater. Each core will be tested for the presence of hydrated lime in the mix. All documentation and test results shall be submitted to the Engineer in accordance with SCDOT specifications and copies may be provided to SCDOT when applicable to SCDOT-owned streets. If any of the tested properties fail to meet the job mix formula requirements, the Contractor shall follow the procedures as outlined in Sections 3.7 of the referenced Supplemental Technical Specifications.
- 15.36.7.3 In-place Density and Thickness Determination in the Roadway/Travel Lane:
- 15.36.7.3.1 Resurfacing:
- 15.36.7.3.2 The determination of the in-place density and thickness of asphalt and binder courses will be based on the core data for each day's production. A minimum of two (2) 6-inch cores will be obtained for each day of asphalt pavement work.
- 15.36.7.3.3 Specification Limits for In-Place Density will be in accordance with SCDOT specifications based on the Percent of Theoretical Maximum Density for all types of intermediate and surface courses. Pavements that do not meet the specification requirements will be removed and replaced at no additional cost to the City.
- 15.36.7.3.4 The average pavement thickness must be equal or greater than the plan thickness with no individual measurement thinner than the minimum thickness minus 0.25. Pavements that do not meet these minimum thickness requirements will either be removed and replaced or overlaid at the discretion of the Engineer at no additional cost to the City.
- 15.36.7.4 Full Depth Patching:
- 15.36.7.4.1 The Contractor shall maintain an approved density gauge on site during all HMA placing and compaction operations and use the gauge to assist in the quality control of the compaction process.
- 15.36.7.5 If the asphalt mixture is obviously contaminated, segregated, or otherwise unacceptable, the Contractor shall perform tests to determine if the material meets the specifications.

Failure to meet the specifications shall result in rejection, removal and replacement at the Contractor's expense.

- 15.36.8 No additional payments will be made to the Contractor for performance of this work.
- 15.36.9 Soils Testing
 - 15.36.9.1 The Contractor shall have a testing agency to sample and test soils at the site of the work. All soils testing shall be conducted by a testing laboratory qualified and approved by the City to perform the required sampling, analysis, testing and report services.
 - 15.36.9.2 Reports for moisture-density tests shall include the date, the location of the tests, the evaluation or depth at which the test was taken, the maximum dry density, and the moisture contents as well as moisture-density curves for each change in sample. The report shall also include the plastic index (PI) and liquid limit classification for each change in sample in accordance with SCDOT standards and specifications.
 - 15.36.9.3 Written reports shall be forwarded to the Engineer within the required time frame. The Contractor shall submit all the required Proctor and Classification soil tests prior to construction.
- 15.36.10 The sampling and testing frequency of backfill, compaction, subbase, base course, concrete, asphalt and all other materials shall be altered from testing frequencies established by SCDOT due to the length of the project. Testing frequencies shall be increased to insure adequate assurance of the Contractor's Quality Control and Quality Acceptance Program. If the material is obviously contaminated, segregated, excessively wet or otherwise unacceptable, the Contractor shall perform tests to determine if the material meets the specifications.
- 15.36.11 No separate payment will be made for testing, inspecting, meetings, travel expenses, direct costs, overhead, profit, insurance, costs for expendable supplies, certifications, materials, equipment, mileage, disposal fees, or any other activities or expenses associated with the performance of testing.
- 15.36.12 At the City of Columbia's discretion, any materials may be submitted to a qualified testing lab approved by the City.
- 15.36.13 Payment for all testing shall be the Contractor's responsibility. No separate payment will be made by the City of Columbia.

15.37 Experience of Manufacturer

- 15.37.1 The manufacturer of materials shall submit to the City, when requested by the City Engineer, evidence of having consistently produced materials of satisfactory quality and performance for a period of at least two years.

15.38 Completed Portions of Work

15.38.1 The owner reserves the right to accept and use any portion of the completed work deemed necessary by the City Engineer to protect the public health and safety.

15.39 Changes in Work

15.39.1 No changes in the work covered by the contract documents shall be made without having prior written approval of the City. Charges or credits for the work covered by the approved change shall be determined by one, or a combination of the following methods:

15.39.1.1 Unit bid prices previously approved.

15.39.1.2 An agreed lump sum.

15.39.1.3 The actual cost of:

15.39.1.3.1 Labor, including foreman.

15.39.1.3.2 Materials entering permanently into the work.

15.39.1.3.3 The ownership or rental cost of construction plant and equipment during the time of use on the extra work.

15.39.1.3.4 Power and consumable supplies for the operation of power equipment.

15.39.1.3.5 Insurance.

15.39.1.3.6 Social Security, old age and unemployment contributions.

15.39.1.3.7 In addition to the actual costs, there can be added a fixed fee to be agreed upon by the Contractor and the City, but not to exceed 15 percent of the estimated cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expense.

15.39.2 The Contractor shall include a breakdown of all materials, labor and equipment necessary to perform the work and shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested, provide the City access to accounts relating thereto.

15.40 Claims for Extra Work

15.40.1 Without invalidating the contract, the City may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the surety being obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the City, or the Engineer acting officially for the City, and the price is stated

in such order. Extra work shall be performed only upon the receipt of change orders. Without a written order, the Contractor shall not be entitled to payment for extra work.

15.41 Estimated Quantities of Work

15.41.1 The estimated quantities of work to be done and materials to be furnished under this contract, shown in any of the documents, including the proposal, are given for use in comparing bids, and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the City to complete the work contemplated by this contract, and such increase or diminution “shall in no way vitiate” this contract, nor shall any such increase or diminution give cause for claims or liability for damages. Payment for such alterations will be made based on the pricing derived from the Contractor’s bid prices.

15.42 Time for Completion, Liquidated Damages, and No Damages for Delays

15.42.1 It is hereby understood and mutually agreed by and between the Contractor and the City that the time for completion as specified in the contract is an essential condition of the contract. It is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the notice to proceed.

15.42.2 The Contractor agrees that said work shall be prosecuted regularly, diligently and interruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the City, that the time for completion of the work described herein is a reasonable time for completion of same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

15.42.3 If the Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the City, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the City the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work. The said amount is fixed and agreed upon by and between the Contractor and the City because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the City would sustain and said amount shall be retained from time to time by the City from current periodic estimates.

15.42.4 It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of the work, the new time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to:

- 15.42.4.1 Any preference, priority or allocation order duly issued by the Government.
- 15.42.4.2 Unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including but not restated to acts of God, or of the public enemy, acts of the City, acts of another contractor in the performance of a contract with the City; fires, floods, epidemics, quarantine, restrictions, strikes, freight embargos, unusually severe weather; and
- 15.42.4.3 Any delays of subcontractors or suppliers occasioned by any of the causes specified in the above two subsections of this article.
- 15.42.5 Provided, further, that the Contractor shall, within seven (7) days from the beginning of such delay, unless the City shall grant a further period of time prior to the date of final settlement of the contract, notify the City in writing of the causes of delay. The City shall ascertain the facts and extent of delay and notify the Contractor within a reasonable time of its decision in the matter, and grant such extension of time as it shall deem suitable and just.
- 15.42.6 The Contractor agrees to make no claim for damages, additional payment or additional compensation because of any hindrance or delay in the performance of this contract occasioned by any act or omission to act by the City or any of its representatives of occasioned by any other cause whatsoever, whether such act, omission to act or cause by avoidable or unavoidable. Contractor agrees that any such claim shall be fully compensated for by an extension of time to complete the performance of this contract and such extension of time shall be Contractor's sole and EXCLUSIVE REMEDY for any hindrance or delay in the performance of this contract.

15.43 Construction Schedule and Periodic Estimates

- 15.43.1 After execution and delivery of the contract and before the first partial payment is made, the Contractor shall deliver to the City an estimated construction progress schedule in form satisfactory to the City. It shall show the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule.
- 15.43.2 The Contractor shall also furnish: (a) a detailed estimate, giving a complete breakdown of the contract price; and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.
- 15.43.2.1 Equipment delivery schedule – The Contractor shall also prepare a schedule of anticipated shipping dates for materials and equipment. It is intended that equipment and materials be so scheduled as to arrive at the job site just prior to time for installation to prevent excessive materials on hand for inventory and the necessity for extensive storage facilities at the job site.

15.43.2.2 City's Right to Withhold Certain Amounts and Make Application Thereof – The Contractor agrees that he will indemnify and save the City harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance of this contract. The Contractor shall, at the City's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid discharged, or waived. If the Contractor fails to do this the City may, after having served written notice on the Contractor, either pay unpaid bills, of which the City has written notice, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all lawful claims. When satisfactory evidence is furnished that all liabilities have been fully discharged, payment to the Contractor shall be resumed in accordance with the terms of this contract. In no event shall the provisions of this paragraph be construed to impose any obligations upon the City to either the Contractor or his surety. In paying any unpaid bills of the Contractor, the City shall be deemed the agent of the contractor, and any payment so made by the City shall be considered as payment made under the contract to the Contractor, and the City shall not be liable to the Contractor for any such payment made in good faith.

15.44 Procedures for Submitting Pay Requests

15.44.1 The contractor shall submit his estimate for payment on or before the third day of each month. The City will pay to the contractor ninety (90) percent of the value of the work performed, as estimated by the City Engineer, less the aggregate of previous payments, on or before the fifteenth (15) day of each month. Estimates that are submitted later will require additional time for processing for payment.

15.44.2 Requests for payment will be made using the owner's standardized Application for Payment. Construction Management will provide the Contractor a copy of the documents on disc, electronically and/or in hard copy form prior to the first pay request. The contractor must reference the project name, description, and owner's project number on all pay requests.

15.44.3 All requests for payment must be addressed to the City Construction Management Division and mailed directly to the division's office at P.O. Box 147, Columbia, SC 29217. Four (4) original Application for Payments must be signed, dated, notarized and submitted for payment. Payments will not be processed from copies. If Construction Management makes any changes prior to payment, the contractor will be mailed a remittance copy reflecting those changes.

15.44.4 The Contractor shall submit for review a completed itemized Application for Payment to the City Inspector that includes the work completed as of the date the application is submitted, with supporting documentation showing the extents of the work and/or quantities in the request for payment. Supporting documentation shall be in a form such as drawings that represent the actual measurements and dimensions so they can be field verified and/or used in subsequent Applications for Payment. Previous quantities paid shall also be shown in the supporting documentation for comparison purposes and

for tracking previous quantities paid and the respective locations at which they were paid.

- 15.44.5 Submittal of an itemized Application for Payment and supporting documentation by the Contractor shall indicate that the Contractor has inspected those portions of the work included in the application and has determined and certifies that all portions of the work are in compliance with the Contract Documents and that the quantities submitted for payment are true and accurate.
- 15.44.6 The City Inspector will review the submitted itemized Application for Payment and will indicate in writing either recommendation for payment or request corrections/ adjustments prior to recommending payment and return such to the Contractor. The Contractor shall make the necessary corrections and resubmit the Application. Errors and/or discrepancies discovered by the City Inspector in the Application for Payment and/or any supporting documentation will be noted and returned to the Contractor for correction. Such errors and/or discrepancies may result in delay of payment to the Contractor.
- 15.44.7 Recommendations for payment will constitute a representation by the City Inspector based on supporting data and documentation that, to the best of the City Inspector's knowledge, information and belief, the work has progressed to the point indicated. However, recommendation for payment does not waive claims for defects, does not constitute acceptance of work not in accordance with the Contract Documents, does not indicate that the work was constructed in accordance with the Contract Documents and does not relieve the Contractor of the responsibility to correct any deficiencies or damaged work that may be found at a later date.
- 15.44.8 If payment is requested on a basis of materials not yet incorporated into the work but which are delivered, suitably stored, and verified by the Inspector, the bill of sale, invoice, or other documentation shall be submitted with the Application for Payment warranting to the City of Columbia that the materials are free and clear of all Liens and evidenced that the materials are covered by appropriate property insurance or other arrangements showing protection of materials.
- 15.44.9 The City of Columbia may withhold, in whole or in part, payments previously made to such extent as may be necessary in the City's opinion to protect the City from loss for which the Contractor is responsible, including loss resulting from acts and/or omissions of the Contractor's employees, subcontractors and their agents and employees, and other persons or entities performing portions of the work for, or on behalf of, the Contractor or any of its subcontractors because of, but not limited to, the following:
- 15.44.9.1 Defective work not remedied;
- 15.44.9.2 Third party claims filed or reasonable evidence indicating probable filing or such claims unless security acceptable to the City is provided by the Contractor;

- 15.44.9.3 Failure of the Contractor to make payments properly to subcontractors or for labor, materials and/or equipment;
- 15.44.9.4 Reasonable evidence that the work cannot be completed for the unpaid balance of the Contract Sum;
- 15.44.9.5 Damage to the City or another Contractor;
- 15.44.9.6 Reasonable evidence that the work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- 15.44.9.7 Persistent and repeated failure to carry out the work in accordance with the Contract Documents, Plans and Specifications.
- 15.44.10 City's Right to Withhold Certain Amounts and Make Application Thereof - The Contractor agrees that he will indemnify and save the City harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance of this contract. The Contractor shall, at the City's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid discharged, or waived. If the Contractor fails to do this the City may, after having served written notice on the Contractor, either pay unpaid bills, of which the City has written notice, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all lawful claims. When satisfactory evidence is furnished that all liabilities have been fully discharged, payment to the Contractor shall be resumed in accordance with the terms of this contract. In no event shall the provisions of this paragraph be construed to impose any obligations upon the City to either the Contractor or his surety. In paying any unpaid bills of the Contractor, the City shall be deemed the agent of the contractor, and any payment so made by the City shall be considered as payment made under the contract to the Contractor, and the City shall not be liable to the Contractor for any such payment made in good faith.
- 15.44.11 The owner will make payments for undisputed work within 21 days from receipt of the Application for Payment by owner. Disputed work will be addressed in writing to the contractor.
- 15.44.11.1 All material and work covered by partial payment shall become the sole property of the City. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of materials and work upon which payments have been made, the restoration of any damaged work, or as a waiver of the right of the City to require the fulfillment of all terms of the contract.
- 15.44.12 Upon completion and final acceptance by the City of all work covered under this contract, the City will pay to the Contractor the amount remaining to be paid him under the contract.

15.45 Acceptance of Work, Final Payment, and Closeout Procedures

- 15.45.1 When the Contractor considers the work to be complete, he shall notify the City Inspector of such in writing and shall include a comprehensive list of items that are incomplete and/or deficient, the value of the incomplete/deficient work and the reason why the work is incomplete and/or deficient. Failure to include all items on the comprehensive list of incomplete/deficient work does not relieve the Contractor of his responsibility to complete the work in accordance with the Contract Documents and does not indicate a waiver of the correction of such work by the City of Columbia.
- 15.45.2 The Engineer will review the comprehensive list for the purpose of determining if the work is sufficiently complete to schedule inspections. If they determine that the work is not sufficiently complete, they will notify the Contractor of such in writing. The Contractor will complete and/or correct the items and will submit another comprehensive list to the Engineer for review.
- 15.45.3 After submittal and review of the Record Drawings, the Contractor shall submit a written request for individual inspections of the various components of the work, i.e. sewer systems, water, storm, pavements, etc. The Inspector and Contractor shall schedule inspections of the work to determine the status of completion. Any items or construction found to be incomplete, damaged or not in accordance with the Contract Documents will be noted in writing with a copy provided to the Contractor. If the City of Columbia determines the work is not ready for inspection, the inspection will be cancelled and the Contractor will be notified in writing giving the reason therefore. There shall be no time extensions given to the Contractor when it is determined that the work is not ready for inspections.
- 15.45.4 The Contractor shall provide the Inspector a schedule acceptable to the City of Columbia of when the work will be corrected and/or completed. After completion of all work, the Contractor shall submit a request for another inspection in writing and the above-mentioned process will be repeated.
- 15.45.5 The Warranty for the project will not begin until all portions of the work have been inspected and the work has been accepted by the City of Columbia.
- 15.45.6 Operating Test – Before acceptance of the whole or any part of the work, it shall be subjected to test to determine that it is in accordance with the contract drawings and specifications. The Contractor shall maintain all work in first-class condition for a thirty (30) day operating period after the work has been completed, the final inspection has been made, and the Engineer has notified the Contractor in writing that the work has been finished to his satisfaction. The retained percentage, as provided herein, will not become due or payable to the Contractor until after the thirty (30) day operating period has expired.
- 15.45.7 Cleaning Up - Before the work is considered complete, all rubbish and unused material due to or connected with the construction must be removed and the premises left in a condition satisfactory to the City. Streets, curbs, cross-walks, pavements, sidewalks,

fence and other public and private property disturbed or damaged shall be restored to their former condition. Final acceptance will be withheld until such work is finished.

- 15.45.8 Prior to the submission of final payment request, the Contractor shall submit the following to the Engineer:
 - 15.45.8.1 Videotapes and television inspection reports and photographs as required.
 - 15.45.8.2 All Record Drawings, stamped, signed and dated by a registered surveyor licensed to practice in the state of South Carolina.
 - 15.45.8.3 All material testing results including tests that failed along with follow up tests showing that the materials passed.
 - 15.45.8.4 Submit all records as required in the Contract Documents in binders that are labeled with the project name, date, subject matter of contents and/or identification for easy reference. Records shall include, but not be limited to, specific warranties, workmanship bonds, certifications, product data and installation information, deviations in products installed on the project, and any other information associated with the work.
- 15.45.9 The Contractor shall submit the following to the City of Columbia prior to the City releasing final payment and retainage:
 - 15.45.9.1 An affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the project for which the City or the City's property might be responsible or encumbered (less amounts withheld by the City) have been paid or otherwise satisfied.
 - 15.45.9.2 A certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the City.
 - 15.45.9.3 A written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents.
 - 15.45.9.4 Consent of surety, if any, to final payment.
 - 15.45.9.5 Data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the City. Final acceptance of the work will not be granted and the retained percentage will not be due or payable until the Contractor has furnished the City proper and satisfactory evidence under oath that all claims for labor and material employed or used in the construction of the work under this contract have been settled, and that no legal claims can be filed against the City for such labor or materials.

- 15.45.10 The making of final payment and retainage shall constitute a waiver of Claims by the City except those arising from:
- 15.45.10.1 Liens, claims, security interests or encumbrances arising out of the Contract and unsettled.
- 15.45.10.2 Failure of the work to comply with the requirements of the Contract Documents.
- 15.45.10.3 Terms of special warranties required by the Contract Document.
- 15.45.11 Final Payment – Upon compliance with the above requirements, the Engineer will issue a certificate of final acceptance of the work. The Contractor shall then prepare his final estimate. After review and approval of the final estimate by the Engineer and the City, the payment shall become due.

15.46 Record Drawing

- 15.46.1 Prior to the Contractor’s written request of walk-throughs and/or inspections and submission of final payment request, the Contractor shall prepare and provide the Engineer two (2) sets of as-built record drawings stamped, signed and dated by a registered surveyor licensed to practice in the state of South Carolina certifying that all locations, dimensions and facilities are accurately shown or indicated on the Record Drawings.
- 15.46.2 Coordinates on the as-built drawings shall be based on South Carolina State Plane Coordinate System: NAVD 88 Vertical Control and NAD 83 Horizontal Control. The Contractor shall provide the Engineer a digital file of the surveyed points including elevations on a CD in which the data can be downloaded into the City of Columbia’s GIS map and CAD file.
- 15.46.3 The plans shall also be marked showing distances to permanent points such as property irons, property corners and other unmovable items for every new installation below grade – building corners are not acceptable unless they coincide with the property corner. The Contractor shall include the type, size and depth of all utility installations.
- 15.46.4 Record drawings shall be considered incidental to the construction and will not be paid for separately.

15.47 Acceptance of Final Payment as Release

- 15.47.1 The acceptance by the Contractor of final payment shall and shall operate as a release to the City of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the City and others relating to or arising out of this work. No payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this contract or the performance and payment bond.

15.48 General Warranty for Three Years After Completion of Contract

15.48.1 For a period of at least three years after the completion of the contract, the contractor warrants the fitness and soundness of all work done and material and equipment put in place under the contract. Neither the certificate of final acceptance, payment of the final estimate, nor any provision in the Contract Document, nor partial or entire occupancy of the premises by the City shall constitute an acceptance of work not done in accordance with the Contract Documents, nor relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of three years from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

15.49 Right of City to Terminate Contract

15.49.1 In the event any of the provisions of this contract are violated by the Contractor or by any of his subcontractors, the City may serve written notice upon the Contractor and the surety of its intention to terminate the contract. Notices shall contain the reasons for the intention to terminate the contract. Unless within then (10) days after the serving of the notice the violation or delay ceases and satisfactory arrangements for correction are made, the contract shall cease and terminate. In the event of termination, the City shall immediately serve notice thereof upon the surety and the Contractor. The surety shall have the right to take over and perform the contract; provided, however, if the surety does not commence performance thereof within ten (10) days from the date of the mailing of notice of termination, the City may take over the work and prosecute same to completion by contract at the expense of the Contractor. The Contractor and his surety shall be liable to the City for any excess cost occasioned the City there by, and in such event the City may take possession of and utilize in completing the work any materials, appliances and plant that may be on the site of the work and necessary thereto.

15.49.2 If the Contractor should die, be declared incompetent, bankrupt or insolvent, or make an assignment for the benefit of creditors during the term of his contract, the City may terminate the contract in the manner and under the procedure set forth above with the exception that no notices to the Contractor shall be required. However, the City must make a reasonable effort to notify the estate of the Contractor, his guardian, assignee, or legal representative of the intention to terminate and fact of termination, if there is any guardian, assignee, or legal representative at the time the City desires to terminate.

15.50 Termination for Convenience and Suspension of Work

15.50.1 Should the City be prevented or enjoined from proceeding with the work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation, rules, regulations, laws, or ordinances of another governmental entity, the Contractor shall not be entitled to make or assert claims for damage by reason of said delay or to withdraw from the contract except by consent of the City. The time for

completion of the work shall be extended to such time as the City determines, such determination to be set forth in writing.

15.51 Reporting on Job Retention and Creation

- 15.51.1 On City projects that are being funded in whole or in part by stimulus money, the successful bidder will be required to report an estimate of jobs directly created or retained by the proposed project in conjunction with the submittal of each pay request. The Contractor will be required to report an aggregate number for the cumulative jobs created or retained for each payment period. Contractors will also be asked to provide a narrative description of the employment impact.
- 15.51.2 On projects not being funded by stimulus money, the City of Columbia is requesting assistance from the successful bidder in monitoring how City projects are helping to retain and/or create job positions.
- 15.51.3 Reporting requirements include the following:
- 15.51.3.1 The Contractor shall report an estimate of jobs directly created or retained by the project in conjunction with the submittal of each pay request. The Contractor shall report an aggregate number for the cumulative jobs created or retained for each payment period. The Contractor will also be asked to provide a narrative description of the employment impact. A job created is a new position created and filled or an existing unfilled position that is filled as a result of this project; a job retained is an existing position that would not have been continued to be filled were it not for this project. A job cannot be counted as both created and retained.
- 15.51.3.2 The estimate of the number of jobs required by this contract should be expressed as “full-time equivalent” (FTE), which is calculated as total hours worked in jobs created or retained divided by the number of hours in a full-time schedule, as defined by the Contractor (see Calculation Methodology for more information). The FTE estimates must be reported cumulatively each pay period.
- 15.51.3.3 The Contractor must include in the aggregate number and the narrative description an estimate of jobs created and retained by their subcontractors.
- 15.51.3.4 The Contractor should not attempt to report on the employment impact on materials suppliers and central service providers (so-called “indirect” jobs) or on the local community (“induced” jobs). Employees who are not directly charged to this project, who, nonetheless, provide critical indirect support, e.g., clerical/administrative staff preparing reports, institutional review board staff members, departmental administrators, are NOT counted as jobs created/retained.
- 15.51.3.5 The narrative should include a brief description of the types of jobs created or retained. This description may rely on job titles, broader labor categories, or the Contractor’s existing practice for describing jobs as long as the terms used are widely understood and describe the general nature of the work.

15.51.4 Calculation Methodology:

15.51.4.1 The requirement for reporting jobs is based on a simple calculation used to avoid overstating the number of other than full-time, permanent jobs. This calculation converts part-time or temporary jobs into “full-time equivalent” (FTE) jobs. In order to perform the calculation, the Contractor will need the total number of hours worked on this project. The Contractor will also need the number of hours in a full-time schedule for a pay period. The formula for reporting can be represented as:

$$\text{FTE} = \frac{\text{Cumulative Hours Worked}}{\text{Cumulative Hours in a Full-time Schedule}}$$

15.51.4.2 Example:

15.51.4.2.1 Assume that a Contractor is preparing its first payment application and that the Contractor required two full-time employees and one part-time employee working half days for the quarter. Also assume that the Contractor’s full-time schedule for the period is 173 hours (2080 hours in a work-year divided by 12). To convert hours worked to number of FTE for the first period, aggregate all hours worked and divide by the number of hours in a full-time schedule for the period. In this example, full-time hours worked (173 hrs x 2 employees = 346 hrs) + part-time hours worked (87 hrs) ÷ number of hours in a full-time schedule for the period (173 hrs) = 2.5 FTE reported in the first period report. Because jobs are reported cumulatively each period, this same number of FTE would be reported for the second period if the same number of employees worked the same number of hours.

15.51.4.2.2 Reporting is cumulative across the project lifecycle, and will not reset at the beginning of each calendar or fiscal year. In the example above, the 2.5 FTE reported in the first report will stay the same through the project lifecycle, assuming the same number of employees work the same number of hours. The table below shows the FTE calculations through the lifecycle of a 4 month project that uses full-time, part-time, and temporary workers.

Table 15-1. FTE Calculation Example: Lifecycle of a 4 Month Project

Period	1st pay period	2nd pay period	3rd pay period	4th pay period
Full Time Schedule	173	346	519	692
Full Time Employee 1	173	346	519	692
Full Time Employee 2	173	346	519	692
Part Time Employee (1/2)	87	174	261	348
Temporary Employee	0	0	43	86
Total Hours Worked	433	866	1342	1818
FTE per Period	2.50	2.50	2.58	2.63

15.52 Wages and Overtime Computation

15.52.1 The Contractor and each of his subcontractors shall comply with all applicable Federal, State and local laws or ordinances with respect to the hours worked by laborers and

mechanics engaged in work on the project and with respect to compensation for overtime.

15.53 Protection of Material, Work, and Property; and Injuries to Persons and Property

- 15.53.1 The Contractor shall at all times take reasonable and proper precautions to protect and safeguard the City's, public and private property, including his own work and all materials of every description both before and after use in the work, from damage or injury or loss in connection with this contract.
- 15.53.2 The Contractor shall at all times take reasonable and proper precautions to protect and safeguard persons and animals, and must maintain public safety during execution of this contract.
- 15.53.3 The Contractor shall furnish, erect, install and maintain all necessary temporary works which shall include, but not be limited to, barricades, fences, railings, warning signs, traffic control devices and lights for protection of his work and excavations at night. A sufficient number of lights shall be placed about the work and shall be kept burning from twilight to sunrise. Barricades, warning signs, traffic control devices and other safety devices shall meet the requirements of OSHA, South Carolina Department of Transportation and City of Columbia requirements. No work will commence until the Contractor has secured approval from the agency responsible for the right-of-way in which construction is proposed.
- 15.53.4 The Contractor shall be held responsible for all injuries to persons and animals and for all damages to the property of the Owner or others caused by or resulting from the negligence of himself, his employees or his agents, during the progress of or in connection with the prosecution of the work, whether within the limits of the work under the contract proper or as extra work.
- 15.53.5 The Contractor must, as far as practical and consistent with good construction, permit access to private and public property and leave fire hydrants, catch basins, streets, etc., free from encumbrances.
- 15.53.6 The Contractor must restore, replace or make good at his own expense, unless such was caused directly by errors contained in the Contract, by the City, or its duly authorized representatives, any and all damage, loss, or injury to persons, animals, and/or property caused by any negligence of omission or commission on his part or on the part of his agent, including sidewalks, curbing, sodding, pipes, conduits, sewers, buildings, fences, retaining walls, tanks, power lines, or any other private or public property to a condition of equal or better comparison to the condition of the property when he entered upon the work.
- 15.53.7 In case of failure on the part of the Contractor to restore such property or make good such damage, the Owner may upon forty-eight (48) hours notice proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary, and the cost

thereof will be deducted from any money due or which may become due under this contract.

- 15.53.8 The Contractor shall indemnify and hold harmless the Owner or the Engineer acting in behalf of the Owner from all suits and actions that may be brought against it by reason of any injury, or alleged injury, to the person or property of another resulting from negligence or carelessness in the execution of the work, or on account of any negligent act or omission, or improper methods or means of construction on the part of the Contractor, his representatives, or employees.

15.54 Safety Regulations

- 15.54.1 All methods of construction including, but not limited to, trenching, sheeting and bracing, boring and jacking and pipeline construction shall be done in accordance with the latest O.S.H.A. regulations. A trench box or trench shield may be used in lieu of sheeting when permitted by O.S.H.A.
- 15.54.2 In conformance with OSHA requirements, excavations greater than 20 feet shall be designed and certified by a Professional Engineer, registered in the State of South Carolina. Certified copies of all such excavation bracing design shall be submitted to the Engineer for review and approval. Design must be submitted to the Engineer prior to the start of work and before any pay requests will be approved; however, submittal does not relieve the Contractor of his responsibility for the design.
- 15.54.3 The Contractor is fully and solely responsible for complying with all laws, regulations, ordinances, and governmental orders pertaining to safety in the performance of this Contract. He shall be responsible for employing adequate safety measures and for taking all actions that are reasonably necessary to protect the life, health, work and safety of the public and adjacent properties during construction of the project. The Contractor shall conform to OSHA requirements and regulations while operating in a confined space that requires a permit.
- 15.54.4 The Contractor shall submit to the Engineer for review and comment a written site-specific Safety Plan for this project at the Pre-Construction Meeting. Any comments provided by the Engineer on the Safety Plan shall not in any way relieve the Contractor of any responsibility or liability for the Safety Plan and will not constitute grounds for contract time extensions or delays if submittal of the written Safety Plan is delayed.
- 15.54.5 The Contractor shall have a designated, qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintenance and supervision of safety practices, precautions and programs.
- 15.54.6 All associated cost for this work shall be included in other bid items.

15.55 Protection of Employees' Lives and Health

- 15.55.1 In order to protect the lives and health of his employees under the contract, the Contractor shall comply with all pertinent provisions of the Occupational Safety and

Health Act and the “Manual of Accident Prevention of Construction” issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the contract. The Contractor alone shall be responsible for the safety, efficiency and adequacy of his plant, appliances and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

15.56 Weather Conditions and Emergency

15.56.1 In the event of temporary suspension of work or during inclement weather, or whenever the Engineer shall direct, the Contractor and subcontractors shall provide an enclosure or special protection from weather and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather without additional cost to the City. If, in the opinion of the Engineer, any work or materials are damaged or injured by reason of failure of the Contractor or his subcontractors to protect their work, such materials shall be removed and replaced at the expense of the Contractor. Partial payments under the contract will not relieve the Contractor from this responsibility. When materials and work at the site which have been partly paid for are not adequately protected by the Contractor, such materials will be protected by the City at the expense of the Contractor, and no further partial payment will be made thereon.

15.56.2 The Contractor shall at all times (including nights, weekends or holidays) have a responsible person available to act in case of emergency repairs whom the Owner may contact. Upon notification of any emergency work necessary, the Contractor’s representative shall immediately take steps to make such repairs as may be required.

15.56.3 In case of any emergency which threatens loss or injury of property and/or safety or life, the Contractor will be allowed to act, without previous instructions from the Engineer, in a diligent manner. He shall notify the Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Engineer for approval.

15.56.4 Where the Contractor has not taken action but has notified the Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property that is not in any way related or due to the Contractor’s work, negligence or performance, he shall act as instructed or authorized by the Engineer. The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in the item entitled “Changes in Work” in these specifications.

15.57 Mobilization

15.57.1 This work consists of preparatory work and operations, including those necessary for movement of personnel, equipment, supplies, and incidentals to the project site; the establishment of offices, buildings, and other facilities necessary for work on the project;

the cost of bonds and any required insurance; and other preconstruction expenses necessary for start of the work, excluding the cost of construction materials.

- 15.57.2 Mobilization costs shall not exceed 5% of the total bid price. Bidders found to have exceeded this requirement will have their mobilization costs adjusted down to meet the 5% requirement with all other unit costs remaining the same.

15.58 Surveys, Lines, Grades, Stakes, and Templates

- 15.58.1 The Contractor shall be responsible for providing construction staking and for verifying the accuracy of all construction staking prior to the beginning of construction. The Contractor's execution of the work shall conform with any and all requirements stated or shown in encroachment permits, easement descriptions and/or plats applications to the work.

- 15.58.2 Coordinates on the plans are based on South Carolina State Plane Coordinate System: NAVD 88 Vertical Control and NAD 83 Horizontal Control unless otherwise noted. The data collection methods used for this project may be survey grade, mapping grade GPS equipment and/or a combination of both.

- 15.58.3 There shall be no additional payment for this item, the cost of which shall be included in other bid items.

15.59 Clean Up and Restoration

- 15.59.1 As the work progresses, disturbed areas shall be completely restored at a rate consistent with the rate of the utility installation. There shall never be any more than 400 linear feet of unrestored trench from pipe installation, as measured along the trench line. All work in this area must be completed including the reestablishment of permanent services, closing of all excavated pits, restoration of pavement, shoulders, ditches, etc. prior to continuation of project. This distance shall not be exceeded without prior approval of the Engineer.

- 15.59.2 The Contractor shall clean up frequently and dispose of all surplus materials and refuse, rubbish, scrap materials, false work, temporary structures, foundations and debris of every nature caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance.

- 15.59.3 The Contractor shall store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors.

- 15.59.4 Upon completion of the work, the Contractor shall restore to pre-existing or better condition all public and private property and areas damaged and/or disturbed by, during or as a result of construction activities. Areas should be restored as soon as possible or as directed by the Engineer or City Inspector.

- 15.59.5 Damage to areas of undeveloped land shall be kept to a minimum. All necessary action should be taken to avoid disturbing or destroying plants and animals that are protected by Local, State, and/ or Federal governments.
- 15.59.6 All grass areas that are disturbed must be replaced with sod of the same type of grass. Seeding such areas is unacceptable. The Contractor will be solely responsible for adequately watering the new sod 3 times a week for the first 2 weeks once the sod has been placed.
- 15.59.7 The Contractor shall be responsible for cleaning equipment and disposing of unused material in a workmanlike manner and shall inform the Engineer of his plans prior to working.
- 15.59.8 Combustible, worthless matter will be disposed of in a manner consistent with Air Quality Control and Solid Waste Management Ordinances and State regulations as designated by the Engineer and approved by the appropriate authorities.
- 15.59.9 There will be no direct payment for clean up. All costs associated with restoration shall be included in the unit price as indicated on the Bid Form.

15.60 Use of Explosives

- 15.60.1 Should the Contractor elect to use explosives to loosen rock or for any other purposes in the prosecution of the work, he shall obtain the required permits and the written permission of the Engineer. The City Fire Chief and Police Chief shall be notified. If construction is outside the City Limits, the Contractor shall be responsible for determining whether a County permit is required and for obtaining any permit so required. The Contractor's methods and procedures in the transportation, handling, storage and use of explosives shall comply with requirements of Federal and State laws, County regulations, if applicable, City regulations, the Standard Fire Prevention Code and O.S.H.A. Rules and Regulations. The Contractor shall be responsible for and shall repair at his expense any damage caused by lasting or accidental explosions.
- 15.60.2 Blasting for excavation will be permitted only after securing the approval of the Engineer and only when proper precautions are taken for the protection of persons and property. The hours of blasting will be fixed by the Engineer. The Contractor' methods and procedures in blasting shall conform to requirements of laws and regulations listed in the paragraph above.

15.61 Sediment and Erosion Control

- 15.61.1 During construction, protective measures shall be taken and maintained to minimize silting and road shoulder erosion in disturbed areas and adjacent to the work being performed during construction. The Contractor shall fully comply with the South Carolina Land Resources Conservation Commission's Standards for Stormwater Management and Sediment Reduction, the South Carolina Department of Health and Environmental Control's Standards for Stormwater Management, the Richland County's Sediment and Erosion Control Ordinance, and the City of Columbia's Sediment and

Erosion Control Ordinance as applicable. The Contractor shall furnish all erosion control devices and take any erosion control measures necessary to comply with these ordinances and standards. Fines assessed to the City of Columbia due to the Contractor's noncompliance with the stormwater management requirements will be deducted from the Contractor's pay estimate.

15.61.2 The Contractor must perform inspections on sediment and erosion control devices daily at locations that are disturbed by construction activities including, but not limited to, storage areas, at discharge locations and at vehicle exit and entrance site locations. Observed deficiencies shall be corrected immediately.

15.61.3 **The Contractor must protect ALL storm drain structures and systems from sediment and debris. If excavated material or fill material washes into existing storm drainage systems and/or yards, the Contractor shall be responsible for immediate clean-up at no additional cost to the City.** All materials must be covered by a thick plastic to prevent dust and erosion. The Contractor shall prevent all construction materials including, but not limited to, wood materials such as form work, macadam base, stone, concrete materials, soils, concrete and flowable fill truck washouts, steel debris, cardboard, etc. from entering the storm drainage system.

15.61.4 All excavated material and/or delivered materials (macadam base, stone, etc.) must be covered by methods that will prevent dust and erosion. The Contractor shall use all means necessary, throughout construction of the project, to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

15.61.5 All costs associated with sediment and erosion control shall be included in other bid items.

15.62 Construction Near or Under Drainage Pipes, Sewers, and Ditches

15.62.1 Special attention shall be given to construction near existing drainage ditches. The Contractor shall be responsible for re-establishing proper drainage in the area to the satisfaction of the Engineer. Shoulders, side slopes and bottoms of disturbed drainage ditches shall be re-established to proper grade and cross section and properly stabilized by grassing as specified. In addition, all drain pipes shall be cleared.

15.62.2 There will be no direct payment for any costs associated with this work, the cost of which shall be included in other bid items.

15.63 Unclassified Excavation/ Geotechnical Investigation

15.63.1 All excavation is unclassified. No borings or soil investigations have been done by the City of Columbia. The Contractor shall assume all risks of unforeseen ground conditions encountered and shall be responsible for completing the project as specified regardless of these conditions.

- 15.63.2 If any subsurface condition information is available to the City, it will be made available for examination by prospective bidders. However, it is understood and agreed that the City shall in no way be held responsible for interpretation of this information, its accuracy or its thoroughness. Prospective bidders shall make such subsurface explorations as they believe necessary to verify and supplement information received from the City.
- 15.63.3 No direct payment will be made for rock excavation, if encountered, or varying ground conditions that may affect the Contractor's ability to complete the work. Rock shall be excavated to a depth of six (6) inches below the bottom of the pipe subgrade elevation as shown on the plans or as directed by the Engineer. The Contractor shall backfill to the subgrade elevation with suitable materials approved by the Engineer. Such material shall be properly compacted and shaped into the required elevation and cross section. The cost of these items will be included in the other bid items.
- 15.63.4 When the removal of existing structures or materials is classified separately as a contract pay item, payment will be made in accordance with the contract price; otherwise, such work will be considered as incidental work and will not be paid for directly, but its cost shall be included in the unit price for other items of work. In either case, such price or prices shall be full compensation for all labor, materials, tools, equipment, and incidentals necessary to complete the work.
- 15.64 Excavation and Trench Stabilization**
- 15.64.1 Where work space will permit, trenches may be excavated by machine, provided that by so doing, public and private improvements will not be subjected to an unreasonable amount of damage; otherwise, hand excavation shall be employed.
- 15.64.2 The trench shall be so braced and drained that the workmen may work in it safely and efficiently. A trench box or trench shield may be used in lieu of sheeting when permitted by O.S.H.A. When close-sheeting is used, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting. Sheeting and bracing that have been ordered left in place shall be cut off at the elevation ordered by the Engineer. Trench bracing, except that ordered left in place, may be removed when the backfilling has reached the respective levels of bracing. Sheeting, except that ordered left in place, may be removed after the backfilling has been completed or has been brought to an elevation that permits its safe removal.
- 15.64.3 The width of the trench shall be ample to permit the pipe to be laid and joined properly, and the backfill to be placed and compacted as specified. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, sheeting and bracing, and handling of specials.
- 15.64.4 All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks, driveways and travel lanes. Fire hydrants under pressure, valve pit covers, valve boxes, curb stop boxes and other utility control shall be

left unobstructed and accessible. Gutters shall be kept clear or other satisfactory provisions made for street drainage. Natural watercourses shall not be obstructed.

15.64.5 Where the excavation is carried beyond or below the lines and grades given by the Engineer, the Contractor shall, at his expense, refill all such excavated space with suitable material as approved by the Engineer.

15.64.6 Any costs associated with trench stabilization including but not limited to use of sheeting, shoring, bracing, and trench boxes shall be borne by the contractor. There will be no direct payment for this item, the cost of which shall be included in the unit bid prices for pipe installation.

15.65 Dewatering

15.65.1 The Contractor shall keep trenches and excavated areas as well as the construction site free from water. The Contractor shall remove all water, including rainwater, encountered during trench and sub-structure work by pumps, drains, and other approved methods.

15.65.2 A dewatering system of sufficient capacity to remove water on a continuous basis shall be provided. Dewatering shall be performed in such a manner that removal of soil particles is held to a minimum. The discharge of dewatering shall be conducted into a sediment trap that complies with the requirements of all erosion and sediment control standards mentioned in these Contract Documents. No sanitary sewer shall be used for disposal of trench water.

15.65.3 There will be no direct payment for dewatering, the cost of which shall be included in bid prices for pipe installation. The Contractor shall maintain access to adjacent areas at all times.

15.66 Backfilling

15.66.1 The Contractor shall be solely responsible for determining all existing soil conditions. Where the excavated material is unsuitable backfill material, the Contractor shall provide select backfill material. **There will be NO direct payment for providing and compacting selected backfill material or for the proper disposal of the unsuitable backfill material.** Thus, it is extremely critical that the Contractor takes whatever steps he deems necessary to determine all existing soils and conditions so that he can bid accordingly. All material used in backfilling shall be a selected soil that meets all SCDOT specifications. A Soils Testing Company must approve ALL selected backfill material as meeting all SCDOT standards and specifications and provide written confirmation to the Engineer and the SCDOT. At the time of use, the selected granular backfill shall be free of frozen lumps and foreign materials that may have become mixed with it during handling.

15.66.2 All selected backfill material shall be placed and compacted in a maximum of **6-inch lifts** and shall be tested by an approved Soils Testing Company to determine the compaction. A qualified technician shall acquire samples of soil to perform moisture-density tests according to ASTM D698. During backfilling, a minimum of one moisture- density test and maximum of two moisture-density tests shall be performed per lift for every 500

feet of construction. Each 6-inch lift must have a minimum compaction of 95% the standard Proctor maximum dry density. If at any time a representative from the City and/or SCDOT arrives on site and finds the Contractor backfilling material in greater lifts than 6-inches, the Contractor shall remove all selected backfill material within the last 300 L.F. of the trench and begin proper backfilling and compacting again, all at the Contractor's expense.

- 15.66.3 The Contractor shall submit all soils testing results to the City and SCDOT in a timely fashion. The reports shall include the location where the soil was tested, a description of the types of soils used in backfilling for each road and a written confirmation that all of the selected backfill soils meet all SCDOT standards, signed and dated by the certified tester.
- 15.66.4 It shall be the responsibility of the Contractor to hire a Soils Testing Company and to pay for all testing and analysis needed to meet all requirements of these specifications and the requirements of the SCDOT.
- 15.66.5 There will be no direct payment for this, the cost of which will be included in other bid items. There will be NO additional payment for ANY additional material that may be needed due to slumping of trench walls.

15.67 Flowable Fill

- 15.67.1 Flowable fill used as backfill shall be in accordance with SCDOT Standard Specifications for Highway Construction, latest edition and latest supplemental technical specifications. Flowable Fill Mix Designs along with compressive test results from the same mix design shall be submitted for approval by the City of Columbia prior to the start of construction.
- 15.67.2 The selection of flowable fill shall be as specified or otherwise approved by the Engineer. The Contractor is responsible for producing a mix design that is excavatable per SCDOT requirements. The Contractor shall provide the Engineer a certification from the supplier stating that it meets these requirements. The Contractor shall provide sampling and testing results of flowable fill and the materials used to produce it at the discretion of the Engineer at no additional cost. The expected 28-day compressive strength is 150 psi maximum. If the compressive strength exceeds this strength, the Contractor shall redesign the mix so that the compressive strength is not exceeded. The flowable fill shall exhibit no settlement. The Contractor shall use all necessary construction techniques to assure that the finished material will perform as intended.
- 15.67.3 All delivery tickets for flowable fill placed on the project shall be submitted for review. Each ticket shall contain the project designation, date, time, class and quantity of flowable fill, proportions of actual ingredients, quantity of water withheld and quantity of water added prior to placing on the project. Each ticket shall be signed by the deliverer and Contractor indicating that the material meets the specifications and that all information provided is correct. All mixes that do not meet SCDOT specifications, including the compressive strength, whether determined by test results or by field observations, will be rejected by the City.

- 15.67.4 Flowable fill shall be used as backfill in areas where trenches are within three (3) feet from the edge of the pavement and in open cuts along or across roadways. Flowable fill shall be placed up to the bottom of the base course or street repair as applicable.
- 15.67.5 Payment for flowable fill backfill used in the paved roadway will be included and paid for in the appropriate bid item on the Bid Form. The Contractor shall provide actual quantities of flowable fill used as backfill material on this particular job by furnishing the Engineer all flowable fill delivery tickets with the particular job and job number typed on each ticket, the date the flowable fill was placed and the location in which it was placed at the time the work is accomplished. **OR**- There will be no direct payment for the use of flowable fill.

15.68 Maintenance of Traffic

- 15.68.1 The Contractor shall implement the traffic control plans as provided as a part of this project in accordance with the SCDOT standard specifications, the Manual On Uniform Traffic Control Devices (MUTCD), and all addenda to date. All proposed changes to traffic control plans shall first be approved by the City of Columbia, SCDOT, and/or Richland County before implementation. The Contractor may implement Traffic Control only after receiving approval from the Engineer. The Engineer will not be responsible for delays to the Contractor due to his failure to abide by this requirement.
- 15.68.2 The Contractor is responsible for furnishing, installing and maintaining all signs, construction barricades, supplemental warning lights, cones, drums, flashing arrow boards, arrow boards with truck-mounted attenuators, changeable message signs, truck-mounted "Prepare To Stop" signs, temporary concrete barriers and pavement markings as required through the duration of the project in accordance with the MUTCD, the SCDOT Standard Specifications for Highway Construction, and the Special Provisions. All traffic control devices shall be kept operational when in use and all signs shall be kept legible and plumb day and night during their use.
- 15.68.3 In the event the Engineer finds Traffic Controls are not being provided as outlined, then the Contractor will be notified. If the condition is not promptly corrected, then all work shall be suspended until such conditions are corrected. During such suspension, the charging of work time shall be continued. The Engineer shall have the authority to withhold partial payment for any work on this contract if traffic control is not being provided in accordance with the Special Provisions.
- 15.68.4 The Contractor shall provide flaggers near all intersections or any areas of this project where construction and/or equipment create a "blind spot" for oncoming or turning traffic.
- 15.68.5 The Contractor shall be required to provide individuals who are properly trained in traffic control practices. The job duties of these individuals shall be restricted to providing quality assurance of the traffic control installation. The Contractor shall be required to have a person in charge of the traffic control on the job site at all times when construction activities are in progress.

- 15.68.6 Maintenance of traffic control devices shall be performed in accordance with these Specifications and as deemed necessary by the Engineer. When maintenance of traffic control devices is required, the Contractor shall be required to give the Engineer a prior notification before conducting any maintenance activities. Traffic control maintenance performed without proper notification may be rejected by the Engineer. Also, traffic control maintenance performed without proper notification or which fails to meet required performance levels due to poor workmanship and/or factory defects shall be rejected and corrected at the Contractor's expense. The Engineer shall immediately notify the Contractor and the Contractor shall be required to begin corrective measures immediately. Failure to comply with these requirements shall result in an immediate suspension on all work.
- 15.68.7 **It is the Contractor's responsibility to notify property owners, in writing, at least seven (7) business days in advance of any inconvenience, which will be caused to each owner due to construction. The Contractor's contact name and telephone number shall be included in the written notice. The Contractor shall not cut off access to any more driveways than is absolutely necessary at any given time.**
- 15.68.8 The Contractor shall be responsible for the immediate removal of such traffic hazards as mud, debris, loose stone, and trash as may be washed or spilled on the traveled roadway as a result of the construction work.
- 15.68.9 Storage of material and equipment shall not be permitted within 15 feet of a travel lane unless in an area protected by guardrail or temporary concrete barrier.
- 15.68.10 In addition to the limitations in the plans, the City Inspector and/or Engineer may further restrict the length of roadway on which the Contractor may work.
- 15.68.11 All construction exposed to pedestrian traffic including, but not limited to, temporary by-pass piping, temporary service connections, pits and trenches shall comply with all requirements as set forth by the most recent version of the American with Disabilities Act and the MUTCD.
- 15.68.12 No individual measurement will be made of temporary construction signs, traffic cones, drums, warning lights, arrow boards, arrow boards with truck-mounted attenuators, changeable message signs, truck-mounted "Prepare to Stop" signs, flaggers, or construction barricades. These items and all costs associated with traffic control will be included in the lump sum for Traffic Control.
- 15.69 Access Roads**
- 15.69.1 All streets, roads and drives used by the Contractor for access to and from the site of his work shall be protected from damage. If the areas are disturbed during construction of the project, they shall be restored to their preconstruction condition or better, unless noted otherwise. Any such damage done shall be repaired immediately, and left in good condition at the end of the construction period.

- 15.69.2 Where the work is not accessible from existing streets and roads, the Contractor shall prepare necessary roads, and grade or otherwise smooth irregular terrain, along the right-of-way and/or easement so that material and power equipment may be moved to and operated on and along the site. Any work done under the foregoing requirements will be subject to the Engineer's approval. Easements and/or permission to construct such roads must be in the possession of the contractor.
- 15.69.3 There will be no direct payment for this work. The costs of this work shall be included in other bid items.

15.70 Ingress and Egress to Public or Private Premises

- 15.70.1 At crossings and other locations as may be directed by the City Engineer, open trenches shall be bridged in a secure manner to prevent interruption of travel upon roadways, sidewalks and driveways to public or private premises. The material used and the mode of constructing such bridges and approaches must be satisfactory to the Engineer. The cost of all such work must be included in the unit bid prices for other items.

15.71 Rights-of-ways and Easement Clearing

- 15.71.1 The right-of-ways and/or easement areas are intended to provide reasonable access and working area for efficient operations to be performed within the restrictions shown on the plans. The Contractor shall be responsible for organizing his operations to perform within the restrictions shown on the plans.
- 15.71.2 The Contractor shall clear only that portion of the rights-of-ways and/or easements necessary for construction of the project, including removing and replacing or disposing obstructions. Obstructions may include, but not be limited to, signs, lights, mailboxes, walls, fences, buildings, debris, brush and trees, including stumps, etc. The work shall be performed in strict accordance with easement agreements and/or permits between the City and property owners and the Contractor shall maintain proper barricades and watchpersons to keep the public and utilities safe during these operations. Precautions shall be taken by adequate sheeting or other approved method to prevent any cave-in or disturbance beyond the easement or right-of-way limits or damage to improvements within the easement and/or right-of-way. No object, tree, building, structure, etc. partially encroaching on the right-of-way and/or easement, or located so as not to interfere with the construction operations shall be removed unless specifically noted on the plans or as directed by the Engineer.
- 15.71.3 The Contractor shall take all precautions to avoid disturbing areas outside of the scope of work covered in the Contract Documents. If it is found that the Contractor damaged areas outside of the work covered in the Contract Documents due to negligence as determined by the Engineer and/or City Inspector, the Contractor shall be solely responsible for all repairs at no additional cost to the City.
- 15.71.4 The Contractor shall familiarize himself with the existing conditions and be prepared to adequately care for and safeguard himself and the Owner from damage. It is the practice

of the City to permit property owners to extend their terraces, lawns, shrubbery and other plantings into the right-of-way of the street. The Contractor is strongly advised to review the existing landscaping within the proposed construction area. 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. The Contractor shall take all measures necessary to preserve and replant all ornamental shrubbery and trees that absolutely require removal. Any deciduous tree or ornamental shrubbery damaged by the Contractor will be replaced and replanted with the same variety and of similar size at the Contractor's expense. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing. The Contractor will be required to maintain replaced and/or replanted trees and shrubbery for a period of 12 months and any other work deemed necessary by the Engineer.

- 15.71.5 Where trenches cross private property through established lawns, sod shall be neatly cut, removed, carefully stored, kept watered and maintained in suitable condition until it is replaced by the Contractor. All topsoil, whether underlying lawn areas or not, shall be removed for its full depth and kept separate from general excavated materials until it is replaced. All grass areas that are disturbed must be replaced with sod of the same type of grass; seeding such areas is unacceptable. The Contractor will be required to do all maintenance necessary to keep sodded areas as well as all plants in a satisfactory condition during construction and for a period of twelve (12) months after final payment. This shall include, but not be limited to, trimming, mowing, repairing washes, replacing plants, and applying: topsoil, sod, fertilizer, and/or mulch to areas where a satisfactory stand of grass has not been achieved. Once sod is replaced, the Contractor shall be responsible for adequately watering the sod three times a week for two weeks.
- 15.71.6 The Contractor will be responsible for locating and protecting private underground irrigation systems along the route and for any damage caused and the workmanship of the repair to these systems in the prosecution of his work under this contract.
- 15.71.7 At all locations where existing fences must be removed to permit construction of the project, the Contractor shall remove such fences and reset the fences in their original location and condition. Fences shall be replaced on the same day as removed. As necessary, the Contractor shall provide such temporary fencing, or employ other safeguards, as required to prevent animals from wandering to other lands.
- 15.71.8 No additional trees outside the easement or construction area shall be removed without the approval from the Engineer. Before any tree is cut down, the tree shall be completely topped in an acceptable manner approved by the Engineer so as to protect all utilities, public and private properties. All trees so cut shall be sawed into commercial lengths and stacked adjacent to the right-of-way and/or easement for the property owner if required or requested by the owner. The Contractor shall be responsible for removing branches, foliage, stumps, brush, and other debris resulting from the clearing of the construction site. If any structures and/or utilities are damaged during the removal of a

tree or brush, the Contractor shall replace the damaged portions at his/her own expense as directed by the Engineer.

- 15.71.9 The Contractor shall furnish, maintain and operate at all times such equipment as is necessary to keep the streets and easements along the construction route in good condition throughout the life of the contract. All material piles, equipment and pipe which may serve as obstructions to traffic shall be enclosed by fences or barricades and shall be protected by proper lights when the visibility is poor. The rules and regulations of O.S.H.A. and appropriate authorities respecting safety provisions shall be observed.
- 15.71.10 There shall be no direct payment for this work. All costs associated with this work including, but not limited to, labor, materials, equipment and apparatus not specifically mentioned herewith or noted, but which are incidental and necessary to complete the work shall be included in other bid items. Any structures or items damaged shall be replaced at the Contractor's expense.

15.72 Existing Utilities and Structures

- 15.72.1 **NO UTILITY OR FIELD VERIFICATION HAS BEEN PERFORMED.** The following may exist in the construction areas: water works, storm drainage, sewer mains, gas mains, telephone, fiber optics, power lines & power poles, sprinkler systems, and other utilities. The Contractor shall familiarize himself with the existing conditions and be prepared to adequately care for and safeguard himself and the Owner from damage.
- 15.72.2 The Contractor shall proceed with caution when performing excavation of any kind so that the exact location of underground structures, both known and unknown, may be determined so as to not damage or disturb existing underground or above ground utilities. The Contractor must protect and support all utilities during execution of the work. There may be above ground and underground utilities in the designated work area; existing lines may not be shown on the plans. The approximate position of certain underground utilities is shown on the plans for information only. The Contractor shall locate these and other possible unknown utility lines by use of an electronic pipe finder, or other means he may prefer, and **shall excavate and expose all existing underground lines in advance of any excavation work under this contract. When the Contractor has located all utilities, he shall be responsible for planning and coordinating the required work around the existing utilities.**
- 15.72.3 **Prior to proceeding with trench excavation, the Contractor shall contact the Palmetto Utility Protection Service, telephone 1-800-922-0983 and such other utility companies in the area as necessary to aid in locating above and underground services.**
- 15.72.4 The Contractor is responsible for exact location of all utilities within and adjacent to the project areas. **The Contractor shall be solely responsible and liable for any damage (i.e. such as cutting or disturbing, etc.) to any utilities, services, poles and other structures resulting from or incident to the Contractor's performance of these projects and shall be replaced or repaired at the Contractor's expense.** The Contractor shall be responsible for notifying appropriate companies to protect or move the affected

facilities, if any of the specified work is in the area of these affected facilities. However, in the event of a break in an existing utility, the Contractor shall immediately notify the responsible official of the organization operating the utility that it is interrupted. The Contractor shall lend all possible assistance in restoring services and shall assume all cost, charges or claims connected with the interruption and repair of such service if the location of said utility was marked by the owner thereof prior to excavation.

15.72.5 The power and communication companies may require that all poles within 5 feet of construction be held in place during construction by their own forces, and will bill time and expenses. The Contractor is advised to familiarize himself with the proposed routing and location of utility poles before the submittal of bid.

15.72.6 All costs associated with “Existing Utilities and Structures” shall be included in other bid items and no additional cost will be considered.

15.73 Interruption of Service

15.73.1 No valve or other control device on the City of Columbia’s or any utility company’s existing utility systems shall be operated by the contractor without permission from the City Engineer or utility company’s representative.

15.74 Conflicts With and Relocation of Existing Utilities

15.74.1 Existing utilities, utility poles and/or guy wires may be located near or across the proposed utility and/or may be located within the construction area. The Contractor shall be responsible for contacting the proper utility company and/or owner and for coordinating and performing all tasks necessary to construct the project in accordance with the Contract Documents. Tasks may include, but not be limited to, obtaining any and all permits, coordinating with the utility company for temporary and/or permanent relocations and/or supports, and for paying for all associated costs.

15.74.2 All utility adjustments must be coordinated with the Engineer and property owner prior to making the adjustments. The Contractor shall make advanced arrangements with property owners if utility service is to be interrupted at any time.

15.74.3 Utility companies may bill for time and expenses for the above items. **All of the above costs, including utility relocation, utility support, and/or potential repair should any utility be damaged during construction, shall be the responsibility of the Contractor.** The Contractor is specifically advised to familiarize himself with the proposed route and location of utilities before the submittal of the bid.

15.74.4 There shall be no direct payment for any costs associated with this work, the cost of which shall be included in other bid items.

15.75 Ordinance Relating to Utility Lines in Streets

15.75.1 All installation of utility lines in streets shall conform to the following ordinance:

COLUMBIA CITY CODE OF ORDINANCES
CHAPTER 22 – STREETS, SIDEWALKS AND OTHER PUBLIC PLACES
ARTICLE V. UTILITY INSTALLATIONS IN STREETS*

***Cross references:** Utilities and Engineering generally, Ch. 23.

Sec. 22-131. Permit.

- (a) Required: submission of plans. Prior to constructing any underground pipeline, utility line, cable line, etc., under a paved public street, a permit shall be secured from the office of the City Engineer. The request for the permit shall be accompanied by an appropriate drawing, if applicable, showing the location of the proposed utility installation and any other pertinent information necessary to determine conflicts with other utilities as requested by the City Engineer.
- (b) Specifications for construction. The construction will be accomplished in accordance with specifications of the City Engineer.
- (c) Fee. At the time of filing the application, a permit fee to cover inspection shall be paid to the City in the amount of \$10.00.

(Code 1979, § 4-2102)

Sec. 22-4. Boring required on major streets.

Only bored on cased crossings shall be permitted within the paved portion of major or arterial streets, except when soil and other conditions make boring impractical as determined by the city Engineer, or when an emergency is deemed to exist. All crossings shall be a minimum of 24 inches below the paved surface unless otherwise specifically approved by the City Engineer.

(Code 1979, § 4-2102)

Sec. 22-5. Emergency cutting.

An emergency shall be deemed to exist when the preservation of the peace, health and safety of the City and its inhabitants are jeopardized. The determination of an emergency shall be made by an official of the utility designated in writing filed with the city Engineer. In crossing a major or arterial roadway when it is deemed an emergency, a cut may be made only after written approval by the designated official of the utility, which must be forwarded to the City Engineer within 24 hours after the cut is made. A paving cut permit fee to cover inspection shall be charged, and the applicant shall be responsible for permanent repair of the cut in accordance with the current specifications.

(Code 1979, § 4-2103)

Sec. 22-6. Inspections.

Line, boring or paving cut repairs must be inspected and approved by the City Engineer upon completion of the project and again one year from that date, during which period the permit applicant and/or owner shall remain liable for the cost of repairs and any damages which may be due the City arising from such work.

(Code 1979, § 4-2105)

Sec. 22-7. Bond. (This section does not apply to projects under City contract.)

In addition to the permit fee to cover inspection, the applicant for a permit under this article shall file with the City Clerk a bond in the sum of \$5,000.00 approved by the City Manager and the City Attorney as to form.

(Code 1979, § 4-2105)

Sec. 22-8. Payment of costs of construction and relocation.

Prior to construction of any underground utility line, pipeline, cable line, etc., under a paved street, the applicant shall agree as a condition of the permit that the underground utility line, pipeline, cable line, etc., shall be constructed at the applicant's sole risk and expense, and that upon demand by the City, when such demand is deemed necessary for a public street purpose, any underground utility line, pipeline, cable line, etc., shall be relocated by the applicant at the applicant's sole expense.

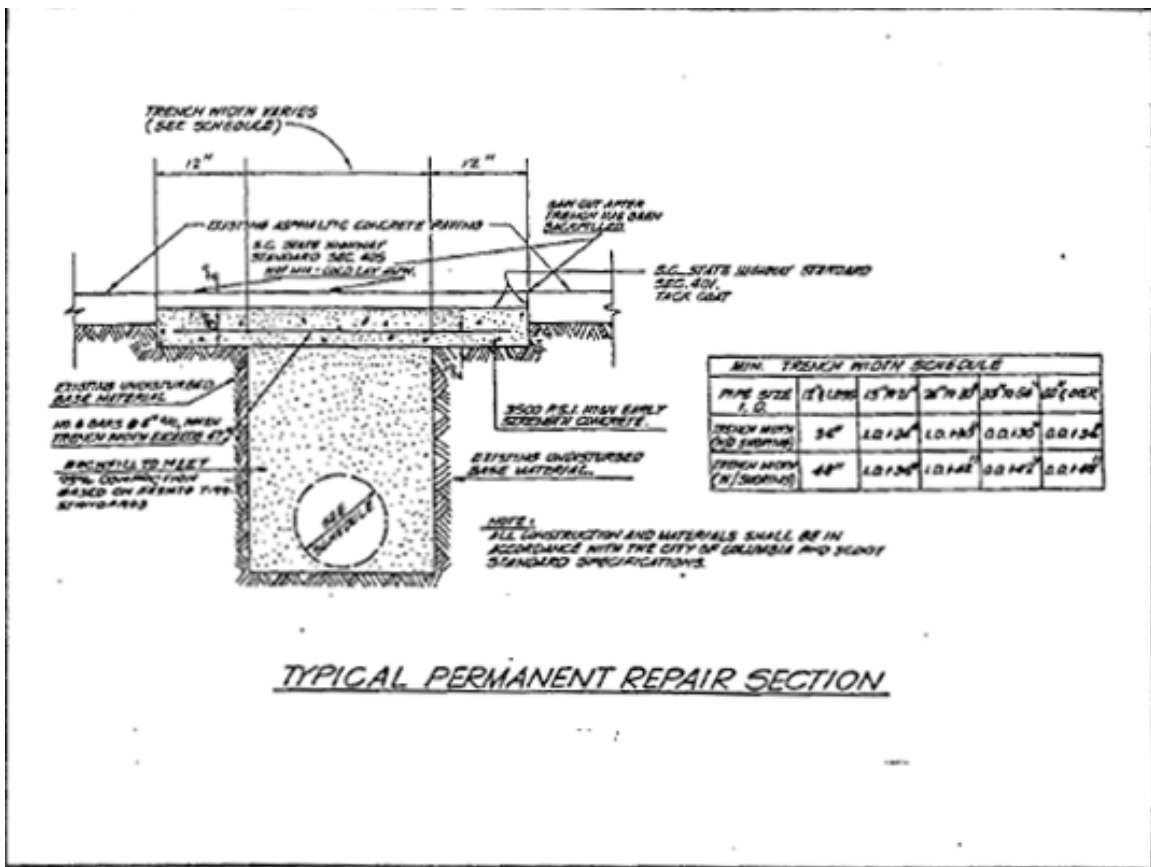
(Code 1979, § 4-2106)

Sec. 22-9. Underground utilities.

It shall be unlawful to erect, construct, maintain or use any pole, overhead wires or associated structure for new service or in replacement of existing service, excepting such poles as are necessary to support street lighting, traffic signals, and transmission lines above 43,000 volts.

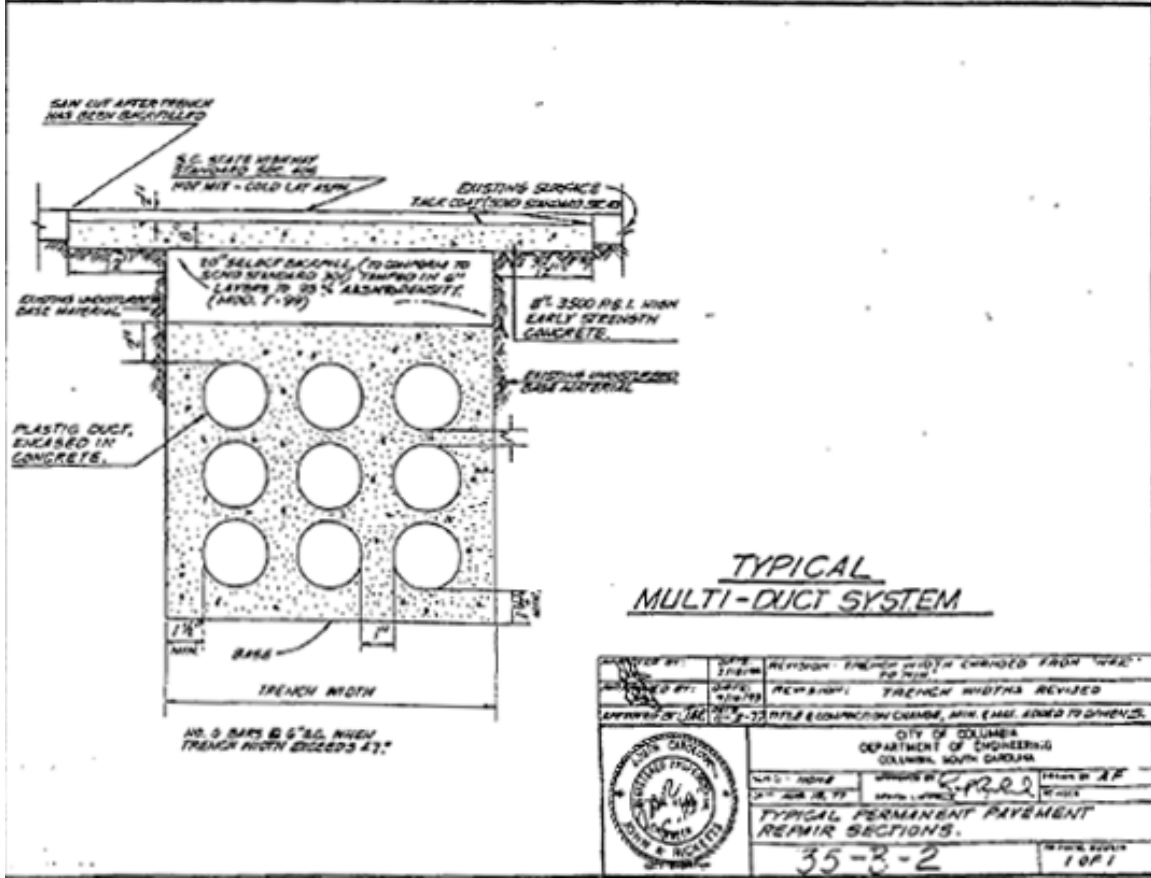
(Ord. No. 2005-012, 2-16-05)

Sec. 22-138–22-160. Reserved.



MIN. TRENCH WIDTH SCHEDULE					
PIPE SIZE I. D.	12" DIA.	15" DIA.	24" DIA.	30" DIA.	36" DIA.
TRENCH WIDTH (OLD EXISTING)	36"	40"	48"	54"	60"
TRENCH WIDTH (NEW EXISTING)	48"	54"	60"	66"	72"

TYPICAL PERMANENT REPAIR SECTION



TYPICAL MULTI-DUCT SYSTEM

DESIGNED BY: [Signature]	DATE: 12/1/93	REVISION: TRENCH WIDTH CHANGED FROM 48" TO 54"
CHECKED BY: [Signature]	DATE: 12/1/93	REVISION: TRENCH WIDTHS REVISED
APPROVED BY: [Signature]	DATE: 12/1/93	REVISION: TITLE & CONSTRUCTION CHANGE, MIN. CLEAR. ADDED TO OTHERS.
CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA		
PROJECT NO. 35-3-2 DATE: 12/1/93 DRAWN BY: [Signature]		CHECKED BY: [Signature]
TYPICAL PERMANENT REPAIR SECTION		
35-3-2		SHEET NO. 1061

Figure 15-1. Typical Permanent Repair Section and Typical Multi-Duct System

15.76 Replacing Shoulder Material

15.76.1 Where utility lines are to be laid in the shoulder of paved streets and where shoulders have not been surface-treated, the Contractor will be required to remove and stockpile the select material used in the construction of the shoulders. If the removed material is select material, it shall be replaced and compacted to full depth of material in its original position. If the removed materials are not select materials and are unsuitable materials, the Contractor shall dispose of the unsuitable materials and backfill with compacted select materials. The Contractor shall supply at his own cost select material needed to supplement the select material so removed.

15.76.2 There will be no direct payment for this item, the cost of which shall be included in other bid items.

15.77 Asphalt Paving, Repairing, and/or Resurfacing Roadways

15.77.1 All asphalt materials, construction and its installation on SCDOT, County and/or City of Columbia streets shall comply with SCDOT standards and specifications, latest edition, and shall be the type shown on the plans, as described in the Special Provisions, as required by permits and/or as directed by the Engineer.

15.77.2 Before base is to receive a layer of hot mix asphalt (HMA), the subgrade and stone base, if applicable, shall be compacted to 100% Standard Proctor unless otherwise noted. A tack coat conforming to SCDOT standards must first be applied to the existing asphalt, saw cut edges, utility features, milled surfaces, etc.

15.77.3 The top surface of the new asphalt shall be flush with the top surface of the existing adjacent asphalt. There will be no valley or peak at the repair site due to the construction work or resurfacing of the roads. No resurfacing will be allowed over concrete gutter and feathering edges of resurfacing is prohibited.

15.77.4 Pavement conditions may vary over the scope of the project. Pavement replacement and repair shall be per the plans, permits, as directed by the Engineer, or shall match the pre-existing pavement type and thickness.

15.77.5 The Contractor shall hire a paving Contractor that meets all the requirements of SCDOT and the Contract Documents. The paving Contractor must be approved by SCDOT prior to paving any streets. The Contractor is responsible for obtaining approval prior to the start of the paving operations.

15.77.6 The Contractor is advised that the City of Columbia does NOT apply asphalt binder cost adjustments to asphalt paving, repairing and/or resurfacing roadways as well as any indirect asphalt related items associated with city utility projects.

15.77.7 Payment for this work shall be included in the unit bid item on the Bid Form and shall include all costs associated with the work such as labor, materials, equipment, hauling, disposal, and all apparatus not specifically mentioned herewith or noted, but which are incidental and necessary to complete the work specified.

15.78 Removing, Milling, and Disposing of Asphalt Pavement

- 15.78.1 All pavement to be removed and/or milled will be done in accordance with South Carolina Department of Transportation specifications, as shown on the plans and/or as directed by the Engineer.
- 15.78.2 Pavement Removal
 - 15.78.2.1 All excavations and trenches in the existing roadway are to be saw cut to produce clean edges. If saw cut edges of roadway and patches are damaged during construction, they shall be saw cut again to produce clean edges. All pavements removed shall be properly disposed of by the Contractor and are not to be used as fill.
 - 15.78.2.2 Measurement for payment will be measured per linear feet as indicated on the bid form. All costs associated with this work such as labor, materials, equipment, hauling, disposal, saw cutting and all apparatus not specifically mentioned herewith or noted, but which are incidental and necessary to complete the work specified shall be included in the unit bid price.
- 15.78.3 Milling
 - 15.78.3.1 Where installation of the utility line is inside the paved area and the construction is generally paralleling the centerline of the roadway, or where shown on the plans and/or permit, the entire roadway shall be resurfaced. The Contractor shall mill the existing pavement at locations shown on the drawings to the depth and width indicated on the plans, permits, or as directed by the Engineer.
 - 15.78.3.2 On streets with existing curb and gutter, the existing asphalt pavement shall be milled to a uniform depth below the edge of the gutter prior to resurfacing. The milled surface shall be reasonably smooth and free of scarification marks or other damages. All asphalt millings shall be properly disposed of by the Contractor.
 - 15.78.3.3 Payment for this item shall be based on quantities determined by field measurements taken by the Contractor in the presence of the City Inspector and/or Engineer at the unit cost listed in the Bid Form and shall include all costs associated with the work such as labor, materials, equipment, hauling, disposal, and all apparatus not specifically mentioned herewith or noted, but which are incidental and necessary to complete the work specified.

15.79 Remove and Replace Concrete and Asphalt Drives

- 15.79.1 All materials, construction and its installation on SCDOT, City of Columbia streets and right-of-ways and/or easements shall comply with SCDOT standards and specifications, latest edition, and shall match the type and thickness of the existing pavement, as required by permits, or as directed by the Engineer, unless otherwise noted herein.
- 15.79.2 Where trenches cross concrete and asphalt drives a minimum of six (6) feet from the expansion joint or change in pavement material, remove and replace the pavement from

the edge of the trench to the road by saw cutting the pavement. Where the trench cut is less than six (6) feet from the expansion joint, remove and replace the whole section of the drive to the first expansion joint. Where there are cracks in the pavement, saw cut a straight edge beyond the crack, remove and replace the pavement from the saw cut.

15.79.3 All openings in the existing pavement are to be saw cut so as to produce clean edges. If saw cut edges of existing pavement surface are damaged during construction, they shall be saw cut again to produce clean edges. All concrete and asphalt removed shall be properly disposed of by the Contractor. They are not to be used as fill.

15.79.4 The top surface of the new pavement shall be flush with the top surface of the existing adjacent pavement. There will be no valley or peak at the repair site due to the installation of the pavement or flowable fill.

15.79.5 Measurement for payment will be measured along the construction centerline as listed in the Bid Proposal and shall include labor, materials, testing, equipment and apparatus not specifically mentioned herewith or noted, but which are incidental and necessary to complete the work specified. There will be no additional payment for trench width due to soil conditions, obstructions, etc.

15.80 Concrete Curb and Gutter and Concrete Sidewalks

15.80.1 Removed and/or damaged curb and gutters shall be replaced from joint to joint with 2500 psi concrete to the depth, section, and alignment of the existing curbs and gutters unless noted otherwise in the contract documents. Concrete shall be cut on a straight and true line, along expansion joints, using a powered concrete saw.

15.80.2 Removed and/or damaged sidewalks shall be replaced from joint to joint with 2500 psi concrete to the depth of the existing sidewalk, but not less than 4 inches unless noted otherwise in the contract documents. Concrete shall be cut on a straight and true line, along expansion joints, to a minimum depth of 2 inches, using a powered concrete saw. The remaining depth can be sheared off by use of pneumatic tools.

15.80.3 The Contractor shall provide all labor, tools, equipment and materials necessary to complete this work including, but not limited to, saw cutting, proper disposal of all debris and removed materials, hauling, proper preparation of the subgrade including compaction, form work, curing and all other operations necessary to complete the work..

15.80.4 Payment for this work may or not be made as indicated in the Bid Form for each project.

15.81 Pavement Markings

15.81.1 The Contractor shall apply temporary pavement markings as required in accordance with SCDOT specifications. Permanent pavement markings shall be thermoplastic in accordance with SCDOT specifications to match pre-existing markings including reflectors.

- 15.81.2 The Contractor shall use fast dry paint or thermoplastic for temporary pavement markings that are white or yellow in color as required that match pre-existing pavement marking patterns. Ensure that temporary markings are on SCDOT's Qualified Products Listing or have been tested and approved by the OMR and are in conformance with applicable SCDOT Specifications, SCDOT Standard Drawings, and the MUTCD.
- 15.81.3 The Contractor shall apply permanent thermoplastic pavement markings, with raised pavement markers (reflectors) as applicable, within the limits of the project to delineate the travel lanes, channel traffic and match pre-existing pavement markings on the final pavement surface course. Contractor shall ensure that permanent markings are on SCDOT's Qualified Products Listing or are certified as meeting SCDOT specifications (provide manufacturer's certification to the Engineer with the submittal) and are in conformance with applicable SCDOT Specifications and Standard Drawings and the MUTCD.
- 15.81.4 The Contractor shall apply temporary and permanent markings that are the color, pattern, width and length prescribed by the MUTCD, SCDOT and/or the Engineer as applicable. This work includes supplying all necessary labor, equipment and materials for the correct application of the marking material to the pavement surface and protecting pavement markings during installation.
- 15.81.5 Do not apply paint that is more than 12 months old.
- 15.81.6 Ensure that the markings are straight and uniform in curvature and conform uniformly to tangents, curves and transitions. Make certain that symbols and markings are of the dimensions shown in the SCDOT Standard Drawings and the MUTCD or as directed by the Engineer.
- 15.81.7 There shall be no direct payment for temporary pavement markings, for establishing control points or guides for applying pavement markings, for removing existing pavement markings or for repairing damage to pavement surfaces that occurred during the construction operation. This work is considered incidental to the work under this section and the cost of which shall be included in other bid items. There may or may not be payment for permanent pavement markings as indicated on the Bid Form.

15.82 Protection of Tree Root Zones Within Street Right-of-way

- 15.82.1 The tree root zone is defined as the area extending outward from the face of the tree in all directions a distance of one (1) foot for each inch of diameter of the tree trunk measured 4.5 feet above the natural ground surface. Trenches shall not be permitted within this zone.
- 15.82.2 All pipes, conduits and similar underground structures shall be installed by the dry bore method. The minimum ground cover over the top of such pipes or conduits shall be 24 inches. Dry bores shall be placed as shown on detail DB-1 attached hereto.
- 15.82.3 Installations of Tree Protection Barrier

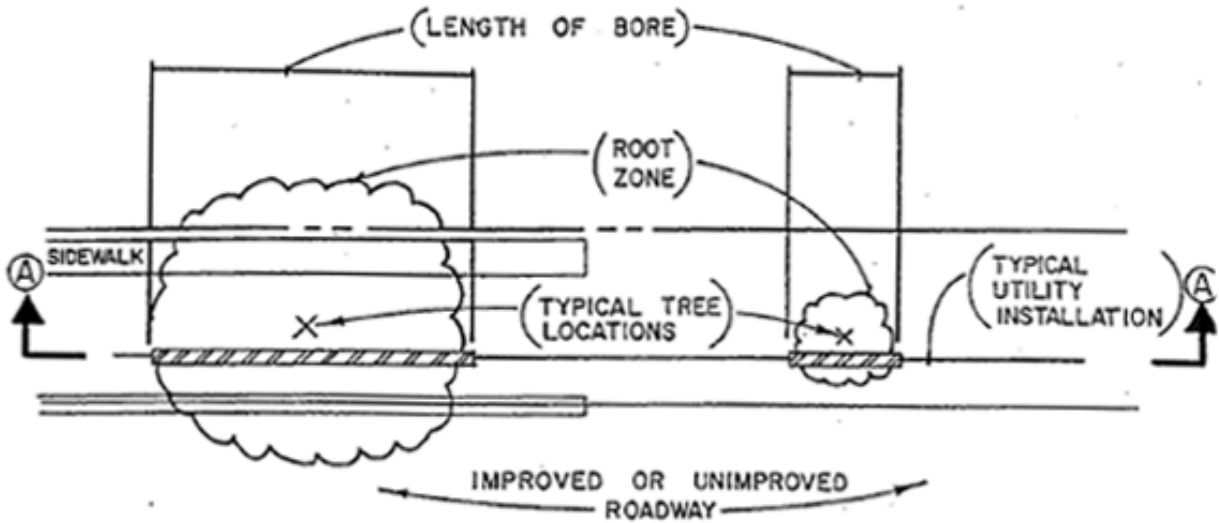
- 15.82.3.1 A tree protection barrier shall be constructed around each existing tree that is to remain on site. Each barrier shall be constructed immediately after the demolition and hand removal of pavement within ten feet of the tree and BEFORE any additional demolition – or construction- related activities occur.
- 15.82.3.2 The established protected perimeter around the tree shall be based on one foot in radius per one inch of the tree diameter as measured 4.5 feet above grade (e.g. A seven inch diameter tree will have a protected area with a 7 foot radius and 14 foot diameter around the tree.) unless shown otherwise on the plans.
- 15.82.4 Demolition Near Trees
- 15.82.4.1 Concrete and other pavement within a ten-foot radius of the tree trunks shall be broken up with a jackhammer and removed to prevent root and root crown injuries. Attempts to lift large sections of concrete near the tree would likely result in lifting of roots and abrasion injuries and shall be avoided.
- 15.82.4.2 Pavements outside the ten-foot radius can be lifted in large sections provided they are not dragged or pushed into the tree trunk or major roots. Care must be taken to prevent demolition equipment such as loaders from striking the tree canopy or trunk.
- 15.82.4.3 When removing/loading demolition debris, loaders shall not scoop materials from below the existing grade, thereby avoiding inadvertent digging and damage in the root area.
- 15.82.4.4 Once pavements have been demolished and removed, no equipment shall be permitted to park or idle under the canopy of the trees, thereby avoiding soil compaction, mechanical damage to surface roots and heat injury from exhaust to tree canopies.
- 15.82.4.5 The removal of electric conduits and water standpipes that have grown into the trunks and root systems could damage trees. Pipes and conduit shall be cut off close to the tree; do not remove portions underneath the bark or wood. Do not remove bark growing around the pipe, conduit or other attachments.
- 15.82.4.6 Any overhead poles or other infrastructure removed near trees shall not be pushed or allowed to fall into the canopies. Equipment used to remove these items shall not operate from under a tree canopy.
- 15.82.5 Methods of Excavation Near Tree:
- 15.82.5.1 For the installation of utility lines the contractor shall consult with the City of Columbia Forestry and Beautification Division prior to trenching to establish an acceptable method of excavation. The City of Columbia Construction Administrator and /or Forestry and Beautification Department shall approve the method of excavation and shall be one of the methods described in this section.
- 15.82.5.2 Equipment for Excavation Near Roots

- 15.82.5.2.1 Air Spade – Soil excavation near tree roots and/or to determine location of tree roots in the areas outline below shall be conducted with a model 2000 Air Spade equipped with a 225 scfm (6.23/ min.) nozzle. Further specifications for this spade and ordering information is available.
- 15.82.5.2.2 Compressor – The Air Spade and nozzle combination listed above requires a 250 scfm or greater air compressor. Air compressors with less pressure will overheat during use and cause poor tool performance.
- 15.82.5.2.3 Sewer Vacuum – A sewer vacuum can be used to remove the soil dislodged by the Air Spade if it cannot be easily blown clear of the hole or trench.
- 15.82.5.2.4 Boring under tree roots shall be an acceptable method for excavation for the installation of utilities in order to avoid cutting roots. Bores shall be at a minimum depth of 30”.
- 15.82.5.3 Interval Exploratory or Test Trenches shall be dug with the Air Spade to determine the location of roots before any digging within the established protected perimeter area around the tree based on a radius equal to one foot per one inch of tree diameter as measured 4.5 feet above grade.
- 15.82.6 Test trenches
 - 15.82.6.1 Test trenches shall be eight inches deep and four to six inches wide.
 - 15.82.6.2 Root Conflicts
 - 15.82.6.2.1 When roots are encountered in test trenches, they shall not be cut if they are larger than 2 inches in diameter or are closer than the established protected perimeter area around the tree based on a radius equal to one foot for every inch of tree diameter as measured 4.5 feet above grade (e.g. A seven inch diameter tree will have a protected area with a 7 foot radius and 14 foot diameter around the tree.).
 - 15.82.6.2.2 Roots smaller than 2 inches in diameter that must be severed shall be cut with a hand pruning saw.
 - 15.82.6.2.3 Paints and wound treatments shall not be used on any cut surfaces.
- 15.82.7 Soil and Material Storage – No excavated soils, fill dirt, amended soils or other materials shall be stored under the canopy of any protected trees.
- 15.82.8 Avoiding Tree Trunk and Branch Damage
 - 15.82.8.1 Mechanical - Care shall be taken not to contact the canopy when operating large equipment or vehicles in the proximity of any protected trees.
 - 15.82.8.2 Heat – Equipment and trucks shall not be operated or left idling under the canopy of any protected trees, so that no damage occurs from radiant heat or exhaust. Paving

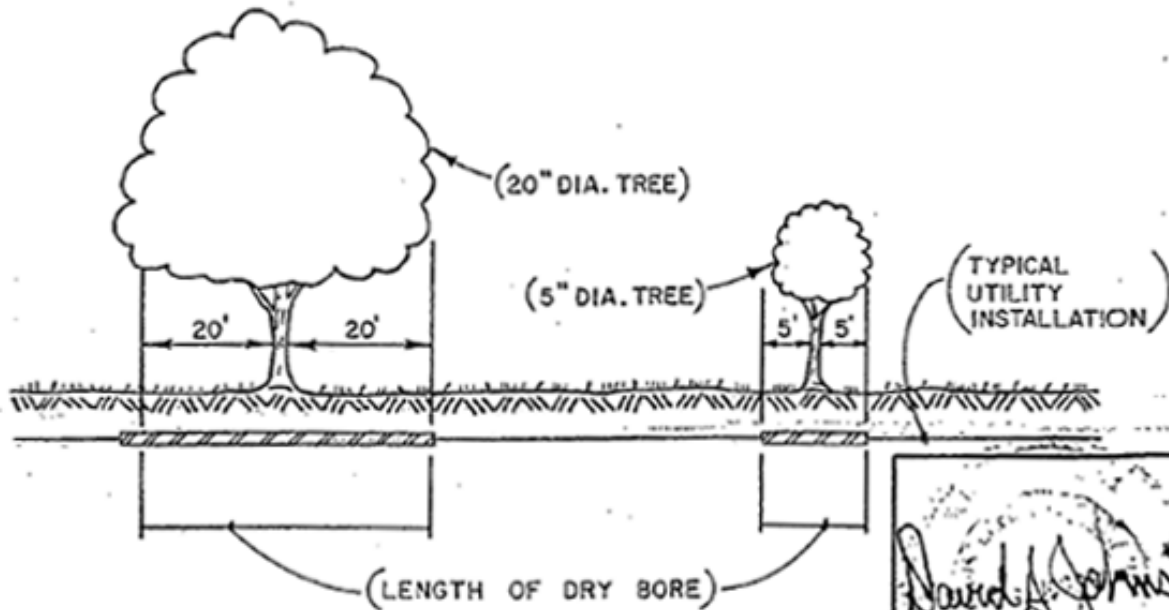
equipment is particularly damaging and shall not be operated under the tree canopies any longer than is required to pave the area.

- 15.82.9 Uncovered Roots – When roots have been excavated, but not cut, they shall not remain uncovered for more than two days.
- 15.82.10 Severed Roots – Roots that have necessarily been pruned shall be recovered with soil within one hour.
- 15.82.11 Installation of Utilities Near Trees
 - 15.82.11.1 Traffic Light Poles – Because installation of traffic light poles near trees has a high likelihood of causing damage to the tree branches and major roots, an arborist from the City of Columbia Forestry & Beautification Department shall be on site when this work is being done.
 - 15.82.11.2 Buried Wiring and Plumbing Near Trees – Wiring for the streetlights or traffic lights, communication conduits, or plumbing for irrigation which is in conflict with roots 2 inches or greater in diameter or is closer than the established protected perimeter area around the tree shall be installed in a trench dug by an air spade and the conduit and/or plumbing fitted around the tree roots.
 - 15.82.11.3 Sewer Service Lines – Where existing sewer lines are identified to run in areas with roots 2 inches or greater in diameter or is closer than the established protected perimeter area around a tree an arborist from the City of Columbia Forestry & Beautification Department shall be consulted before digging for line replacement begins to discuss possible alternatives to avoid damaging tree roots. Once a mutually acceptable method has been identified, the arborist shall remain on site until work on the sewer service line is completed.
 - 15.82.11.4 Water Service Lines – When the trench for water service lines is located in an area with roots 2 inches or greater in diameter or is closer than the established protected perimeter area around a tree, digging shall be done with an Air Spade and the pipes installed beneath the tree roots.

DETAILS FOR PROTECTION OF TREE ROOT ZONES WITHIN STREET R.O.W.



PLAN VIEW ▲



SECTION A-A ▲

David A. Johnson
8-29-86
CITY ENGINEER
DATE: JULY 30, 1986

Figure 15-2. Details for Protection of Tree Root Zones Within Street R.O.W.

15.83 Re-establishment of Property Irons

15.83.1 Any property iron disturbed during construction shall be re-established by a registered land surveyor. There shall be no additional payment to the Contractor for these services.