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STATE ROUTE 21 SIDEWALK IMPROVEMENTS FOR THE CITY OF PORT WENTWORTH

BID DOCUMENTS

FEBRUARY 2019

PREPARED FOR

**THE CITY OF PORT WENTWORTH
305 SOUTH COASTAL HIGHWAY
PORT WENTWORTH, GEORGIA 31407**

TRL #2018-170 H

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ADVERTISEMENT FOR BIDS
STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA

Sealed proposals will be received by the CITY OF PORT WENTWORTH at 305 South Coastal Highway, Georgia, 31407, until 2:00 p.m. local time on Tuesday, March 12, 2019 at which time and place they will be publicly opened and read. No submitted bid may be withdrawn after the scheduled closing time for receipt of bids for a period of sixty (60) days.

The work to be done consists of furnishing all labor, equipment and materials to install approximately 990 linear feet of sidewalk along the Southside of Rice Mill Road and the Westside of State Route 21 from the end of the existing sidewalk to the entrance of the pedestrian ramp. Install approximately 525 linear feet on the Eastside of State Route 21 from the end of the pedestrian ramp to the existing sidewalk on Market Boulevard.

Proposals for the complete work in one or more general contracts shall be made on the proposal form provided and shall contain prices in words and figures for the work bid. All proposals shall be accompanied by a Bid Bond drawn in favor of the City of Port Wentworth, Georgia, in the amount of at least five percent (5%) of the lump sum bid for the complete work; such Bid Bond representing that the Bidder, if awarded the contract will promptly enter into a contract and furnish Performance Bond and Payment Bond as provided by law and approved by the Attorney for the City of Port Wentworth, Georgia. Each bond shall be equal to one hundred percent (100%) of the contract amount. The Bid Bond shall be forfeited to the City of Port Wentworth, Georgia as liquidated damages if the Bidder fails to execute the contract and provide Performance and Payment Bonds within ten (10) days after being notified that he has been awarded the contract.

Drawings and Specifications are open to public inspection at the City of Port Wentworth, City Hall, 305 South Coastal Highway, Georgia, 31407.

Copies of the plans and specifications may be obtained from T. R. Long Engineering, 114 North Commerce Street, Hinesville, Georgia, 31313, upon receipt \$150.00. Such fees represent reproduction cost and are non-refundable.

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

INSTRUCTIONS TO BIDDERS

1. **INTENTION**: It is intended that the Project Documents shall cover the complete work to which they relate.
2. **DEFINITION**: Where the following words, or the pronouns used instead occur herein, they shall have the following meaning:

"Owner" shall mean the **CITY OF PORT WENTWORTH, GEORGIA**, party of the first part to the "Contract Agreement" or its authorized and legal representative.

"Engineer" shall mean **T. R. Long Engineering, P.C** of 114 North Commerce Street, Hinesville, GA, 31313 acting for the Owner or other representative of such party.

"Contractor" shall mean the party of the second part to the following agreement, or the legal authorized representatives of such party.

3. **WORK TO BE DONE**: The work to be done consists of furnishing all materials, labor and equipment for construction of **STATE ROUTE 21 SIDEWALK IMPROVEMENTS**, complete with appurtenances, for the **CITY OF PORT WENTWORTH, GEORGIA**, all as set forth in the Proposal, as specified herein, and as shown on the Drawings.
4. **MATERIALS AND WORK BY THE OWNER**: The Owner will neither furnish materials nor perform labor for construction of work under this contract, unless otherwise stipulated elsewhere in the Project Documents.
5. **SITE EXAMINATION**: The Bidder is expected and requested to examine the location of the work, and to inform himself fully as to the structural and mechanical conditions; the conformation of the ground; the character, quality, and quantity of the materials to be encountered; the character of equipment and facilities needed to execute the work; the general and local conditions; and all other matters which can in any way affect the work to be done under the contract.

A sub-surface investigation has not been made on any portion of the work. Rock quantities shown in the Proposal are estimated based on results of similar work in the area. The prospective bidder must form his own opinion of the character of the sub-surface materials to be encountered in excavating for and the construction of the various facilities.

6. **PROPOSALS**: All Proposals must be made upon the Proposal forms provided and shall be for materials and work called for in the specifications and shown for each item in the Proposal. The total amount bid for the work in the Proposal shall be given in words and figures in the spaces provided. All blank spaces in the bid form shall be filled in with black ink in words and figures. The Certification must be completed and executed when submitted.
 - A. **Unit Price Items**: The itemized quantities given in the Proposal for unit price work shall be considered by the Contractor as the quantities required to complete the work. Should the actual quantities required in the construction of the work be greater or less than the quantities shown in the items, an amount equal to the difference in quantities at the unit prices bid for the item will be added to or deducted from the contract price.
 - B. **Lump Sum Price**: Where itemized prices are not given in the Proposal, the Contractor shall consider the lump sum prices bid for the work shown on the Drawings and/or specified to be sufficient for completion of his Contract.

- C. Total Amount Bid: The correct total amount bid is defined as the correct sum total of the amount bid for the items in the Proposal. The correct amount bid for each unit price item is defined as the product of the quantity listed in the Proposal for the item, multiplied by the unit price bid.
- D. The bids must be enclosed in a sealed envelope addressed to the City of Port Wentworth, 305 South Coastal Highway, Port Wentworth, Georgia, 31407, and marked "**BID DOCUMENTS FOR STATE ROUTE 21 SIDEWALK IMPROVEMENTS, for the CITY OF PORT WENTWORTH, GEORGIA**". Bids may be submitted intact in this book or may be submitted detached from the book. The sealed bid must contain items listed below if any item is missing the bid may be considered irregular and bid will not be considered.

1. Completed Proposal Form and Schedule of Items.
2. Completed and executed surety documents.
3. Executed Surety Requirement Form.
4. Completed statement of bidder's qualifications with references.
5. Completed Corporate Certificate Form
6. Completed Illegal Immigration Reform Affidavit for contractor.

7. RECEIPT AND OPENING OF BIDS: Proposals must be filed with the Owner at or before the hour specified in the advertisement, and proposals filed after the specified time will not be considered. Proposals sent by mail must be mailed with sufficient time allowed for the proposal to reach the Owner prior to the opening of bids.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within sixty (60) days after the actual date of the opening thereof.

Conditional bids shall not be considered.

Bidders are requested to be present at the opening of Proposals, which will be in public.

8. BID SECURITY: Each Proposal must be accompanied by a certified check or by a Bid Bond in an amount equal to not less than five percent (5%) of the amount of the Bid, to guarantee that the Successful Bidder will, within ten (10) days from the date of the notice of award of contract, enter into an Agreement with the Owner, and execute to the Owner a Performance Bond and Payment Bond, each equal to 100% of the contract amount, the agreement and bonds to be in the form set forth in this Book. If for any reason whatsoever the Bidder withdraws from the competition after the Bid opening time, or refuses to execute the required agreement and bonds, if his Bid is accepted, the Owner may retain the amount of the certified check, or proceed on the Bid Bond. The surety on the Performance Bond and the Payment Bond shall be a surety company authorized to do business in the State of Georgia and shall be countersigned by an agent residing in the State of Georgia. The bonds and surety thereon shall be subject to approval by the Attorney for the Owner.
9. RIGHT TO REJECT BIDS: The Owner reserves the right to reject all bids, and to waive informalities. No bids will be received after the Bid opening time. Unauthorized conditions, limitation, and provisions attached to the Proposal, except as provided herein, will render it informal and cause its rejection. Unbalanced bids will be subject to rejection. Any Bidder may withdraw his bid, either personally or by telegraphic or written request, at any time prior to the Bid opening time.
10. TELEGRAPHIC MODIFICATION: Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the Owner prior to the closing time, and provided further, the Owner is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder

was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic modification.

11. DETERMINATION OF LOW BID: The contract will be awarded, if it is awarded, to the low, responsible, responsive bidder. The Owner will decide which the low, responsible, responsive bidder is. Responsiveness shall be defined by (a) the completeness and regularity of Bid Form, (b) a bid form without exclusions or special conditions, and (c) a bid form having no substitute bids for any items except as allowed under these Specifications. Responsibility will be based on whether the Bidder involved (a) maintains permanent place of business; (b) has adequate equipment to do the work properly and within the time limit established; (c) has suitable financial status to meet obligations incident to the work; and (d) has appropriate technical experience.
 - A. The Bidder is requested to list prices of at least two manufacturers for each item of major equipment if listed on the Proposal form. Use lowest price for base bid. If the make of any item listed in the base bid column does not meet specifications, the next lowest priced make listed for that item which does meet specifications will be used in determining the lowest bid price. If all of the listed makes of the item failed to meet specifications, the bid will be rejected on the grounds that it is nonresponsive.
 - B. The Owner has the right to apply any or all "Deductions or Additions" (if any), listed in the proposal by the Engineer, for the purpose of making an award.
12. RETURN OF BID SECURITY: Owner will, within ten (10) days following the Bid opening, return the Bid security of all Bidders, except the Security posted by the three lowest Bidders; upon the award and execution of the contract, the remaining Bid securities will be promptly returned.
13. INTERPRETATION OF DRAWINGS AND SPECIFICATIONS: If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of -the Drawings, Construction Specifications and other documents, and as to the scope of any part of the work, he must submit to the Engineer a written request for an interpretation thereof The person submitting the request will be responsible for its prompt delivery in ample time for an interpretation to be issued before the Bid opening date. Interpretations of the Project Documents will be made only by Addendum; a copy of each Addendum will be mailed or delivered to each person receiving a set of the Project Documents. The Engineer will not be responsible for other interpretations of the Project Documents.
14. COMPLETE WORK REQUIRED: The Construction Specifications, Drawings and all other documents are essential parts of the contract; requirements occurring in one are as binding as though occurring in all. Documents are intended to be cooperative, and to describe and provide for a complete work. In case of discrepancies on the Drawings, figured dimensions shall govern. In case of omissions from the Construction Specifications as to items of equipment, and materials or quantities therefore, the Drawings shall govern. It shall be the responsibility of the Bidder to call to the attention of the Engineer obvious omissions of those magnitudes which would affect the strength, adequacy, function, completeness (and cost of any part of the work, and in ample time for amendment by Addendum prior to the Bid opening date).
15. SUBCONTRACTS: The Bidder's attention is directed to the General Conditions concerning subcontracts. The Bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract under this contract.
 - A. Must be acceptable to the Owner. Approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such as the Owner may require.

- B. Must provide insurance equal to that of the bidding contractor. Approval of the proposed subcontract award cannot be given by the Owner unless and until the proposed subcontractor has submitted the Certification and or other evidence showing that it has fully complied with any reporting requirements to which it is or was subject.

Although the bidder is not required to attach such Certifications by proposed subcontractors to his bid, the bidder is here advised of this requirement so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

- 16. DRAWINGS: The character, location, and essential details of the work are shown upon a set of Drawings, entitled:

**STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA**

The Drawings and Specifications shall form a part of the contract for the work. The Drawings shall be supplemented by working drawings as necessary. All authorized alterations affecting the requirement and information given on the Drawings shall be in writing.

- 17. EXTRA WORK ITEMS IN PROPOSAL: The Proposal contains certain unit price items entitled "Extra Work If Ordered by Engineer". In each of those items, the estimated quantity is based upon the average amount of extra work encountered in a typical job. The stated quantities are not guaranteed to be required or not to be required, but are included in the Proposal in order to determine, in advance of construction, the actual low bidder. No work described by those items will be approved for payment without advance authorization by the Engineer.
- 18. NOTICE OF SPECIAL CONDITIONS: Attention is particularly called to those parts of the Contract Documents and Specifications which deal with the following:
 - A. Inspection and testing of material
 - B. Insurance requirements
- 19. POWER OF ATTORNEY: Attorneys-in-fact who sign Bid Bonds or Contract Bonds must file with each bond a certified and effectively dated copy of their Power of Attorney.
- 20. AUTHORITY TO SIGN: If a Proposal is made by an individual, his name and Post Office address must be shown. If made by a firm, or partnership, the name and Post Office address of each member of the firm or partnership must be shown. If made by a Corporation, the person, or persons, signing the Proposal must show the name of the State under the laws of which the Corporation is chartered and his or their, authority for signing same, and the names, titles and addresses of the President Secretary and Treasurer, and the Corporate Authority for doing business in this state.
- 21. WORKING DRAWINGS: Working drawings for any structure shall consist of such detailed plans as may be required for the prosecution of the work but not included in the plans. All necessary working drawings shall be furnished by the Contractor. They shall include shop details, erection plans, masonry layout diagrams, and bending diagrams for reinforcing steel, approval of which by the Engineer must be obtained before any work involving these plans may be performed. Plans for false-work, centering and form work may also be required and such cases shall be likewise subject to approval by the Engineer.

It is expressly understood, however, that approval by the Engineer of the Contractor's working drawings does not relieve the Contractor of any responsibility for accuracy of dimensions and details. The Contractor shall be responsible for agreement and conformity of his working drawings with the Drawings and Specifications.

The contract price shall include the cost of furnishing all working drawings and the Contractor will be allowed no extra compensation for such drawings.

22. COOPERATION OF CONTRACTOR: The Contractor will be supplied with five (5) copies of the Drawings and Specifications. The Contractor shall have available on the work, at all times, one (1) copy of each of said Drawings and Specifications. He shall give the work the constant attention necessary to facilitate the progress thereof and shall cooperate with the Engineer and with other contractors in every way possible. The Contractor shall at all times have a Superintendent, satisfactory to the Engineer, capable of acting as his agent on the work, who shall receive instructions from the Engineer or his authorized representatives. The superintendent shall have full authority to execute the orders or directions of the Engineer without delay and to promptly supply such materials, tools, plant equipment and labor as may be required.

23. CONSTRUCTION STAKES: Subsidiary lines and grades shall be laid out by the Contractor from the controlling lines and bench marks furnished by the Engineer or from measurements shown on the Drawings. All lines and grades shall be subject to checking by the Engineer, but this checking shall in no way relieve the Contractor from responsibility for their correctness.

The Contractor shall provide such stakes, materials, and such labor and assistance as the Engineer may require in laying out work, establishing bench marks and checking and measuring the work.

24. AUTHORITY AND DUTIES OF INSPECTOR: Inspectors shall be authorized to inspect all work done and materials furnished, including preparation, fabrication and manufacture of the materials to be used. The Inspector shall not be authorized to alter or waive any requirements of the Specifications. He shall call the attention of the Contractor to any failure of the work or materials to conform to the Specifications and Contract. He may reject materials or suspend the work until any questions at issue can be referred to and decided by the Engineer.

The presence of the Inspector shall in no way lessen the responsibility of the Contractor. The Contractor in no way relieves himself of responsibility for adequacy of the work by following the directives of the Inspector.

25. INSPECTION: The Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work performed and materials used are in accordance with the requirements and intent of the Specifications and Contract. No work shall be done or materials used without suitable supervision or inspection by the Engineer or his representative. Failure to reject any defective work or materials shall not in any way prevent later rejection when such defect is discovered, or obligate the Owner to final acceptance.

All materials furnished and work done when not in accordance with the Specifications and Contract will be rejected and shall immediately be removed and other work done and materials furnished in accordance therewith. If the Contractor fails to remove the work and materials as above ordered, within forty-eight (48) hours, then the Engineer shall have the right and authority to stop the Contractor and his work at once and to supply men and material at the cost and expense of the Contractor to remove said work and materials.

26. DEFECTIVE WORK AND MATERIALS: The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill his Contract and defective work shall be made good, notwithstanding that such work and materials have been previously inspected by the Engineer and accepted or estimated for payment. The failure of the Engineer to condemn improper materials or workmanship shall not be considered as a waiver of any defect which may be discovered later, or as preventing the Owner at any time subsequently from recovering damages for work actually defective. All work shall be guaranteed against defects in workmanship or materials for a period of one year after final acceptance.

27. CORRECTIONS: Should any portions of the Drawings and Specifications be obscure or in dispute, they shall be referred to the Engineer and he shall decide as to the true meaning and intent. He shall also have the right to correct any errors or omissions at any time when such corrections are necessary for the proper fulfillment of said Drawings and Specification.
28. DISAGREEMENT: Should any disagreement or difference arise as to the estimated quantities or classifications or as to the meaning of the Drawings or Specifications, on any point concerning the character, acceptability and nature of the several kinds of work, any materials and construction thereof, the decisions of the Engineer shall be final and conclusive and binding upon all parties to the Contract.
29. WEATHER: During unseasonable weather, all work must stop when the Engineer so directs and all work must be suitably protected.
30. RIGHT OF WAY: The necessary land for the construction of the work will be furnished by the Owner. The Contractor is directed to the Owner for right-of-way actually acquired. The Owner will provide no right-of-way over other property. The contractor shall take every possible precaution to inconvenience as little as possible the owners and tenants of adjacent property. Public highways shall not be obstructed in such a way as to cut off traffic. The Contractor shall, at his own expense, repair any damage or injury to either public or private property during the progress of the work. Wholesale cutting of trees on the right-of-way will not be permitted except as necessary for construction.
31. CONSTRUCTION SCHEDULE: A construction schedule showing the work in the order proposed by the Contractor and the time required to complete each phase will be required and shall be submitted to the Engineer for approval. Approval of the construction schedule is required prior to receipt of the notice to proceed. This schedule shall include the dates for beginning and completion of all phases of the work. If, in the opinion of the Engineer, the Contractor falls behind in his schedule or will not be able to complete the project in the time limits, he may require the Contractor to revise his schedule and put additional equipment on the job as so ordered.
32. ORDER OF WORK: The order or sequence of the work shall be as provided herein or as approved by the Engineer, which approval shall in no way affect the responsibility of the Contractor.
33. COMPETENT LABOR: The Contractor shall employ only competent and skilled personnel on the work. The Contractor shall at all times have a Superintendent satisfactory to the Engineer, capable of acting as the Contractor's agent on the work and who shall receive instructions from the Engineer or his authorized representative. The Superintendent shall have full authority to execute the orders and directions of the Engineer without delay, and to promptly supply the materials, tools, plant equipment, and labor as may be required. The Contractor shall upon demand by the Engineer, immediately remove that Superintendent, Foreman, and Workman whom the Engineer may consider to be incompetent or undesirable, or both.
34. LAWS AND REGULATIONS: The Contractor shall keep himself fully informed of all laws, ordinances, and regulations of State and County in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency should be discovered in this Contract, or in the Drawings or Specifications herein referred to, in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report the same in writing to the Owner. He shall at all times himself observe and comply with all such existing and future laws, ordinances and regulations, and shall protect and indemnify the Owner and its agents against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, order of decree, whether by himself or by his employees.

35. PROTECTIVE WORKS: The Contractor shall furnish and install all necessary temporary works for the protection of the work, including barricades, warning signs, and lights at night.
36. SAFETY AND OSHA REGULATIONS: The performance of work under this Contract shall comply with safety regulations prescribed by the Owner, those of the National Occupational Safety and Health Act of 1970. (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-054), and the requirements of the State where project is located. Each bidder shall satisfy himself as to the character and extent of such regulations.
37. SANITARY REGULATIONS: Necessary sanitary conveniences for the use of the laborers on the work shall be erected and maintained by the Contractor in such a manner and at such points as shall be approved by the Engineer. Their use shall be strictly enforced.
38. STORAGE FACILITIES: Should the Contractor so desire, he may build storage facilities or other structures for housing men, tools, machinery and supplies, but they will be permitted only 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.
39. WATER SUPPLY: The water for the Contractor's use shall be supplied by the Contractor. The Contractor shall make his own arrangements for obtaining a water supply for his construction operations.
40. ELECTRIC POWER: The Contractor shall make his own arrangements for electrical power supply for his construction operations.
41. SOIL EROSION: The Contractor shall be required to take the necessary steps to minimize siltation and soil erosion during construction.
42. ACCESS ROADS: Streets, roads and drives used by the Contractor for access to and from the site of his work shall be protected from damage in connection with construction work. Any such damage done shall be repaired immediately and left in good condition at the end of the construction period.
43. PROGRESS PAYMENT: On or before the 15th day of each calendar month the Owner shall make progress payments to the Contractor on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the Contractor, including materials delivered to the site and undelivered specifically manufactured equipment, less retainage as per Paragraph 19 of the General Conditions which is to be retained by the Owner until all work has been performed strictly in accordance with the Contract Documents and until such work has been accepted by the Owner. Progress payment requests from the Contractor shall be submitted to the Engineer for approval on or before the 1st day of each calendar month.
44. ALLOWABLE TIME FOR COMPLETION: The time allowed for completion on all work to be done under this contract shall begin after notification by the Engineer to proceed with the work. Such notification will be issued upon completion of the contract arrangements, and in accordance with approved construction schedule, arranged to be within the contract time for completion. The time allowed for completion of the work is for (90 days).
45. COMPLETION DATE: The contractor must be complete and have the final invoice submitted for payment prior to the agreed upon date.
46. LIQUIDATED DAMAGES: The Contractor shall pay to the Owner as liquidated damages the sum of **FIVE HUNDRED (\$500.00)** dollars for each calendar day that he shall be in default of completing the work in his Contract within the time limit named therein.

47. SALES TAX AND/OR USE TAX: Bidders shall include in amounts bid in the Proposal an allowance for payment of state Sales Tax and/or Use Tax on taxable materials specified to be furnished by the Contractor and incorporated into the work under this Contract.
48. CONTRACTOR'S LOCAL OFFICE: The Contractor shall maintain a local office with a telephone in the general area of the work, and will be required to have a responsible representative on call at all times.
49. MUTUAL RESPONSIBILITY OF CONTRACTORS: If, through acts of neglect of 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 of arbitration if such other Contractor or subcontractor shall assert any claims against the Owner, on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall indemnify and save harmless the Owner against such claim.
50. EMERGENCY WORK: The Contractor shall at all times (nights, weekends or holidays) have a responsible man available to act in case of emergency repairs who the Owner may contact. Upon notification of emergency work necessary, the Contractor's representative shall immediately take steps to make such repairs.
51. INSURANCE REQUIREMENTS: The Contractor's attention is directed to requirements for insurance coverage as set forth in the General Conditions.
52. FLOOD HAZARD INSURANCE: The Contractor will be required to acquire and maintain during the life of the contract any flood insurance made available under the National Flood Insurance Act of 1968, as amended. The insurance shall be in an amount at least equal to the contract amount costs, excluding cost of uninsurable improvements, or to the maximum limit of coverage made available under the National Flood Insurance Act of 1968, as amended, whichever is less.
53. BUILDING PERMITS AND BUSINESS LICENSE: The Contractor shall be required to obtain applicable Building Permits and Business Licenses as required by the City of Port Wentworth, Port Wentworth Georgia.
54. CONCRETE MATERIAL: The city will provide the concrete for the proposed contract.

CITY OF PORT WENTWORTH, GEORGIA

PROPOSAL FORM

TO: The City of Port Wentworth
Chatham County, Georgia
Port Wentworth, Georgia 31407

Gentlemen:

In compliance with your Notice To Contractors, the undersigned, hereinafter termed the Bidder, proposes to enter into a Contract with the City of Port Wentworth to provide the necessary machinery, tools, apparatus, and other means of construction, and all materials and labor specified in the Contract, necessary to complete the work in the manner therein specified within the time specified, as therein set forth, for:

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FOR
THE CITY OF PORT WENTWORTH**

The Bidder has carefully examined and fully understands the Contract, Plans and Specifications, and other Contractual Documents hereto attached, and has made a personal examination of the Site of the proposed Work, and has satisfied himself as to the actual conditions and requirements of the Work, and hereby proposes and agrees that if his proposal is accepted, he will contract with the City of Port Wentworth in full conformance with the Contract Documents.

It is the intent of this Proposal to include all items of construction and all Work indicated on the Drawings and called for in the Specifications.

In accordance with the foregoing, the undersigned proposes to furnish and construct the items listed in the attached Schedule of Items for the unit prices stated.

The Bidder agrees that the cost of any work performed, materials furnished, services provided or expenses incurred, which are not specifically delineated in the Contract Documents but which are incidental to the scope, intent, and completion of the Contract, shall be deemed to have been included in the prices bid for the various items scheduled.

The bidder further proposes and agrees hereby to promptly commence the Work with adequate force and equipment within ten (10) calendar days from receipt of Notice to Proceed, and to complete the Work within 90 calendar days.

The Bidder declares that he understands that the quantities shown for unit price items, are approximate only, are valid only upon written authorization of the County Engineer, and are subject to either increase or decrease and that should the quantities of any items of work be increased, the Bidder proposes to do the additional at the unit prices stated herein; and should the quantities be decreased, the Bidder also understands that payment will be made on the basis of actual quantities at the unit price bid and will make no claim for anticipated profits for any decrease in quantities, and that actual quantities will be determined upon completion of the work, at which time adjustment will be made to the Contract amount by direct increase or decrease.

Attached hereto is an executed Bid Bond or certified check on the (Bank) _____ of _____ (City, State) _____ for _____ Dollars. (\$ _____) (Five Percent of Amount of Bid).

If this proposal shall be accepted by the City of Port Wentworth and the undersigned shall fail to execute a satisfactory contract in the form of said proposed Contract, and give satisfactory Performance and Payment Bonds, or furnish satisfactory proof of carriage of the insurance required, within fifteen days from the date of Notice of Award of the Contract, then the City of Port Wentworth may at its option, determine that the undersigned abandoned the Contract and thereupon this proposal shall be null and void, and the sum stipulated in that attached Bid Bond or certificate check shall be forfeited to the City of Port Wentworth as liquidated damages.

Bidder acknowledges receipt of the following addenda:

| Addendum No. | Date Received |
|--------------|---------------|
| _____ | _____ |
| _____ | _____ |

Bidder further declares that the full name and resident address of all persons and parties interested in the foregoing bid as principals are as follows:

Signed, sealed, and dated this _____ day of _____, _____, 201__.

Bidder: _____ (Seal)
(Company Name)

Bidder Mailing Address:

Phone # _____

By: _____

Title: _____

**SCHEDULE OF ITEMS
STATE ROUTE 21 SIDEWALK IMPROVEMENTS
CITY OF PORT WENTWORTH**

| ITEM | DESCRIPTION | QUANTITY | | COST | |
|------|---|-----------------|--------------|----------|------------|
| | | NUMBER OF UNITS | UNIT MEASURE | PER UNIT | TOTAL COST |
| | IDENTIFICATION | | | | |
| | Rice Mill Road | | | | |
| 1 | Grading Modified | 0.10 | Miles | | |
| 2 | 5' Sidewalk, 4" Thick, 3000psi (Less Concrete) Along Rice Mill Road | 155 | SY | | |
| 3 | Handicap Ramp, GDOT Standard | 2 | EA | | |
| 4 | Pavement Markings - Thermoplastic | 1 | SUM | | |
| 5 | Silt Fence, Type NS | 500 | LF | | |
| 6 | Mulching | 0.14 | AC | | |
| 7 | Temporary Vegetation | 0.14 | AC | | |
| 8 | Permanent Vegetation | 0.14 | AC | | |
| | SUBTOTAL | | | | |
| | State Route 21 | | | | |
| 1 | Grading Modified | 0.16 | Miles | | |
| 2 | 5' Sidewalk, 4" Thick, 3000psi (Less Concrete) Along SR 21 | 260 | SY | | |
| 3 | 5' Sidewalk, 8" Thick, 3000psi (Driveway) (Less Concrete) Along SR 21 | 55 | SY | | |
| 4 | Remove 10' Sidewalk and Fill Area w/Topsoil | 436 | SY | | |
| 5 | Silt Fence, Type NS | 500 | LF | | |
| 6 | Mulching | 0.25 | AC | | |
| 7 | Temporary Vegetation | 0.25 | AC | | |
| 8 | Permanent Vegetation | 0.25 | AC | | |
| | SUBTOTAL | | | | |

| ITEM | DESCRIPTION | QUANTITY | | COST | |
|-----------------------------|--|-----------------|--------------|----------|------------|
| | | NUMBER OF UNITS | UNIT MEASURE | PER UNIT | TOTAL COST |
| | Chatham County Board of Education | | | | |
| 1 | Grading Modified | 0.12 | Miles | | |
| 2 | 5' Sidewalk, 4" Thick, 3000psi (Less Concrete) Chatham County Board of Education | 390 | SY | | |
| 3 | Silt Fence, Type NS | 500 | LF | | |
| 4 | Mulching | 0.18 | AC | | |
| 5 | Temporary Vegetation | 0.18 | AC | | |
| 6 | Permanent Vegetation | 0.18 | AC | | |
| | SUBTOTAL | | | | |
| Grand Total | | | | | |
| GRAND TOTAL IN WORDS | | | | | |
| OPTIONAL ITEMS | | | | | |
| 1 | 5' Sidewalk, 4" Thick, 3000psi (Including Concrete) Along Rice Mill Road | 155 | SY | | |
| 2 | 5' Sidewalk, 4" Thick, 3000psi (Including Concrete) Along SR 21 | 260 | SY | | |
| 3 | 5' Sidewalk, 8" Thick, 3000psi (Including Concrete) Along SR 21 | 55 | SY | | |
| 4 | 5' Sidewalk, 4" Thick, 3000psi (Including Concrete)Chatham County Board of Education | 390 | SY | | |

STATEMENT OF BIDDER'S QUALIFICATIONS

To accompany proposals submitted for construction of the **STATE ROUTE 21 SIDEWALK IMPROVEMENTS FOR THE CITY OF PORT WENTWORTH.**

Full legal name of Bidder: _____

Business Address: _____

Business Phone Number: _____

Bidder is a (check one) Corporation ___ Partnership ___ Individual Proprietorship ___

Other ___ (Specify) _____

Year Organized: _____ Year Incorporated: _____

If Bidder is a partnership, list all names of all partners: _____

How many years have you been in the contracting business under the present firm name?

Credit available for this contract: \$ _____

Contracts now in hand, Gross Amount: \$ _____

Have you ever refused to sign a contract at your original bid? _____

Have you ever defaulted on a contract? _____

Remarks: _____

(The above statements must be subscribed and sworn to before a Notary Public)

Sworn to and subscribed before me,

Date: _____

This _____ day of _____, 201__.

Firm Name: _____

By: _____

(Notary Public)

Title: _____

REFERENCES:

Provide references for work completed, minimum of six, three within the last 12 months of similar size and nature. References will afford the owner opportunity to judge as to capabilities and performance of the contractor.

Provide name, brief description, address, phone number and contact person for each project listed.

Failure to complete this section in its entirety will be grounds for rejection.

CITY OF PORT WENTWORTH, GEORGIA

CORPORATE CERTIFICATE

I, _____, certify that I am the Secretary of the Corporation named as Contractor in the foregoing proposal; that _____, who signed said proposal in behalf of the Contractor, was then (Title) _____ of said Corporation; that said proposal was duly signed for and in behalf of said Corporation by authority of its Board of Directors, and is within the scope of its corporate powers, that said Corporations organized under the laws of the State of _____.

This _____ day of _____, 201____.

Signature (SEAL)

CITY OF PORT WENTWORTH, GEORGIA

SURETY REQUIREMENTS

A Bid Bond for five percent (5%) of the amount of the bid is required to be submitted with each bid.

A Performance Bond for one hundred percent (100%) of the bid will be required of the successful bidder.

The Bidder certifies that he/she has examined all documents contained in this bid package, and is familiar with all aspects of the proposal and understands fully all that is required of the successful bidder. The Bidder further certifies that his/her bid shall not be withdrawn for ninety (90) days from the date on which the bid is publicly opened and read.

The Bidder agrees, if awarded this bid, he/she will:

- A. Furnish, upon receipt of an authorized City of Port Wentworth Purchase Order or Notice of Award, all items indicated thereon as specified in this bid proposal for the bid amount, or;
- B. Enter a contract with the City of Port Wentworth to do and/or furnish everything necessary to provide the service and/or accomplish the work as stated and/or specified in this bid proposal for the bid amount, and;
- C. Furnish, if required, a Performance Bond, and acknowledges the City of Port Wentworth's right to require a Performance Bond of a specific kind and origin, and;
- D. Forfeit the amount of the Bid Bond as liquidated damages if he/she fails to enter a contract with the City of Port Wentworth as stated in (B) above, within ten (10) days of the date on which he/she is awarded the bid, and/or;
- E. Forfeit the amount of the Performance Bond as liquidated damages if he/she fails to execute and fulfill the terms of the contract entered. The amount of forfeiture shall be:
 - 1. The difference between his/her bid and the next lowest, responsible bid that has not expired or been withdrawn, or;
 - 2. The difference between his/her bid and the amount of the lowest, responsible bid received as a result of re-bidding, including all costs related to re-bidding.

COMPANY _____

DATE _____

SIGNATURE _____

TITLE _____

TELEPHONE NUMBER _____

CITY OF PORT WENTWORTH, GEORGIA

BID BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE _____ (hereinafter called the Principal) and _____ (hereinafter called the Surety), a Corporation chartered and existing under the laws of the State of _____ with its principal offices in the City of _____ and authorized to do business in the State of Georgia, are held and firmly bound unto the City of Port Wentworth, Chatham County, Georgia in the full and just sum of _____ Dollars (\$ _____) good and lawful money of the United States of America, to be paid upon demand of the City of Port Wentworth, Chatham County, Georgia, to which payment well and truly to be made, we bind ourselves, our heirs, executors, administrators, and assigns jointly and severally and firmly by these presents.

WHEREAS, the Principal is about to submit, or has submitted, to the City of Port Wentworth, Chatham County, Georgia, a proposal for furnishing materials, labor and equipment for:

**STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA**

WHEREAS, the Principal desires to file this Bond in accordance with law in lieu of a certified Bidder's check otherwise required to accompany this Proposal.

NOW, THEREFORE, the conditions of this obligation are such that if the proposal be accepted, the Principal shall within ten (10) days after receipt of notification of the acceptance, execute a Contract in accordance with the Proposal and upon the terms, conditions, and prices set forth in the form and manner required by the City of Port Wentworth, Chatham County, Georgia, and execute a sufficient and satisfactory Performance Bond and Payment Bond payable to the City of Port Wentworth, Chatham County, Georgia, each in an amount of 100% of the total contract price, in form and with security satisfactory to said City of Port Wentworth, Chatham County, Georgia, and otherwise, to be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the City of Port Wentworth, Chatham County, Georgia, upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this _____ day of _____, 201__.

Surety (SEAL)

Principal (SEAL)

BY: _____

BY: _____

OCCUPATIONAL TAX CERTIFICATE - Vendors/Contractors whose Business is located within the unincorporated area of Chatham County, or within any of the incorporated areas of the City of Port Wentworth, are to submit a copy of the appropriate Business License.

CURRENT OCCUPATIONAL TAX CERTIFICATE NUMBER _____

CITY NUMBER _____

COUNTY NUMBER _____

OTHER _____

SIGNATURE _____

DATE _____

PRINTED NAME _____

CITY OF PORT WENTWORTH, GEORGIA

OATH OF SUCCESSFUL BIDDER

Personally appeared before the undersigned officer duly authorized by law to administer oaths and _____ who, after being first duly sworn, depose and say that they are all the officers, agents, persons, or employees who have acted for or represented (Company Name) in bidding or procuring a Contract with the City of Port Wentworth, Chatham County, Georgia on the following project:

**STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA**

and that said _____ has not by (himself, themselves) or through any persons, officers, agents, or employees prevented or attempted to prevent by any means whatsoever competition in such bidding; or by any means whatsoever prevented or endeavored to prevent anyone from making a bid therefore, or induces or attempted to induce another to withdraw a bid for said work.

BY: _____
Signature of Successful Bidder

Name - Printed

Title

Sworn to and subscribed before me this
_____ Day of _____, 201__.

Notary Public

SEAL

CONTRACT AGREEMENT

THIS AGREEMENT made and entered into as of the (Date) _____, _____, by and between (County), Georgia, (Party of the First Part, Hereinafter called the County) and _____ (Contractor Name) (Party of the Second Part, Hereinafter called the Contractor).

WITNESSETH: That the said Contractor has agreed, and by these presents does agree with the said County, for and in consideration of _____ (\$ _____) and other good and valuable consideration, and under the penalty expressed in Bonds hereto attached, to furnish all equipment, tools, materials skill, and labor of every description necessary to carry out and complete in good, firm, and substantial, and workmanlike manner, the Work specified, in strict conformity with the Drawings and the Specifications hereinafter set forth, which Drawings and Specifications together with the base bid Proposal made by the Contractor, General Conditions, Special Provisions, Detailed Specifications, and this Agreement, shall all form essential parts of this Contract. The Work covered by this Contract includes all Work indicated on Plans and Specifications and listed in the Proposal entitled:

**STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA**

The Contractor shall commence the Work with adequate force and equipment within (10) ten days from receipt of Notice to Proceed from the County, and shall complete the Work within 180 calendar days.

The Contractor hereby assumes the entire responsibility and liability for any and all injury to or death of any and all persons, including the Contractor's agents, servants, and employees, and in addition thereto, for any and all damages to property caused by or resulting from or arising out of any act or omission in connection with this Contract or the prosecution of Work hereunder, whether caused by the Contractor or the Contractor's agents, servants, or employees, or by any of the Contractor's subcontractors or suppliers.

This Contract, executed in triplicate, constitutes the full agreement between the parties, and the Contractor shall not sublet, assign, transfer, pledge, convey, sell or otherwise dispose of the whole or any part of this Contract or his right, title, or interest therein to any person, firm or corporation without the previous consent of the County in writing.

CONTRACT AGREEMENT

IN WITNESS WHEREOF, the Parties hereto, acting through their duly authorized agents, have signed and sealed this agreement.

Executed this ____ day of _____, 20 ____.

CONTRACTOR

ATTEST: _____
(SEAL)

BY: _____

TITLE: _____

TITLE: _____

Approved as to Form:

BY: _____

Attorney
City of Port Wentworth, Georgia

CITY OF PORT WENTWORTH, GEORGIA

ATTEST: _____
(SEAL) Administrator, City of Port Wentworth
(Owner)

BY: _____
Mayor, City of Port Wentworth
(Owner)

Executed in Triplicate

CONTRACT PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE _____
(hereinafter called the Principal) and _____
(hereinafter called the Surety) are held and firmly bound unto City of Port Wentworth, Chatham County, Georgia (hereinafter known as the City of Port Wentworth, for the use of said obligee and all persons doing work or furnishing skill, tools, machinery, supplies, or material under or for the purpose of the Contract hereinafter referred to, in the full and just sum of _____
(\$ _____) lawful money of the United States of America, to be paid to said Owner, its successors, and assigns to which payment well and truly to made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bound Principal has entered into a contract or contracts with the said OWNER, bearing date of _____, 201__, for furnishing material, labor and equipment for:

**STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA**

WHEREAS, it was one of the conditions of the award by said Owner pursuant to which said Contract was entered into, that these presents shall be executed.

NOW THEREFORE, the conditions of this obligation are such that if the above bound Principal shall in all respects fully comply with the terms and conditions of said Contract and his obligation thereunder, including the Specifications and Proposal, therein referred to and made a part thereof, and such alterations as may be made in said Specifications as therein provided for, and including one-year guarantee period from date of final acceptance, and shall indemnify and save harmless the Owner against and from all costs, expenses, damages, injury or loss, to which the said Owner may be subjected by reason of any wrongdoing, misconduct, want of care or skill, negligence, or default, including patent infringement, on part of said Principal, his agents, or employees, in the execution or performance of said Contract, and shall promptly pay all just claims for damages or injury to property and for all work done, or skills, tools, and machinery, supplies, labor, and materials furnished and debts incurred by said Principal in our about the construction or improvement contracted for this obligation to be void; otherwise, in full force and effect.

And the said Surety to this Bond, for value received, hereby stipulates and agrees that no change, extensions of time, alterations, or additions to the terms of the Contract or to the Work to be performed thereunder or the Specifications accompanying same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alterations, or additions to the terms of the Contract or to the Work or the Specifications.

CONTRACT PERFORMANCE BOND

This Bond shall be for the use of all persons doing Work or furnishing skill, tools, machinery, or materials under or for the purpose of this Contract, in accordance with the provisions of the Official Code of the State of Georgia, as amended, and is intended to be and shall be construed to be a bond in compliance with the requirements thereof.

The life of this Bond extends through the life of the Contract including the sixty-day maintenance period, and until one year after the final acceptance of the Work by the Owner.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed in triplicate, this _____ day of _____, 201__.

CONTRACTOR

(Company Name)

Attest: _____
(Seal)

By: _____

Title: _____

Title: _____

SURETY

(Company Name)

Attest: _____
(Seal)

By: _____

Title: _____

Title: _____

BY: _____
(Local Agent's Signature)

(Name - Printed or Typed)

(Company Name)

(Address)

Executed in Triplicate

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE _____
hereinafter called the Principal) and _____
(hereinafter called the Surety) are held and firmly bound unto City of Port Wentworth, Chatham County,
Georgia (hereinafter known as the Owner), in the full sum of _____
(\$ _____) for the use and protection of said Owner and all
subcontractors and all persons supplying labor, materials, and machinery, and equipment for the
performance of the Work provided for in the contract hereinafter referred to, for the payment of which well
and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns,
jointly and severally by these presents.

WHEREAS, the above bound Principal has entered into a Contract or Contracts with the said OWNER,
bearing date of _____, for furnishing material, labor and equipment for:

**STATE ROUTE 21
SIDEWALK IMPROVEMENTS
FOR
THE CITY OF PORT WENTWORTH, GEORGIA**

WHEREAS, it was one of the conditions of the award by the City of Port Wentworth, Chatham County
pursuant to which said Contract was entered into, that these presents shall be executed.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall
promptly pay all subcontractors and all other persons supplying labor, materials, machinery, and equipment
furnished for the performance of the Work provided for by said Contract, and such alterations or additions
as may be made therein or in the Plans and Specifications, then this bond to be void; otherwise, in full force
and effect, and

The surety to this bond, for value received, agrees that no change, extensions of time, alterations or
additions to the terms of the Contract or the Work to be performed thereunder of the Specifications
accompanying the same shall in any way affect its obligation on this bond, and alterations or additions to
the terms of the Contract or the Work or to the Specifications. It is agreed that this bond is executed
pursuant to and in accordance with the provisions of the Official Code of the State of Georgia, as amended,
and is intended to be and shall be construed to be a bond in compliance with the requirements thereof.

PAYMENT BOND

IN WITNESS WHEREOF, the Principal and Surety have caused these presents to be duly signed and sealed in triplicate, this _____ day of _____, 201__.

CONTRACTOR

(Company Name)

Attest: _____
(Seal)

By: _____

Title: _____

Title: _____

SURETY

(Company Name)

Attest: _____
(Seal)

By: _____

Title: _____

Title: _____

BY: _____
(Local Agent's Signature)

(Name - Printed or Typed)

(Company Name)

(Address)

Executed in Triplicate

Illegal Immigration Reform and Enforcement Act of 2011

House Bill 87, also known as the Illegal Immigration Reform and Enforcement Act of 2011, was passed during the 2011 session of the Georgia General Assembly and was signed by Governor Nathan Deal on May 13, 2011. The bill, status history, votes, and sponsors, can be viewed on the Georgia General Assembly's website:

<http://www.legis.ga.gov>

All bidders are strongly encouraged to review the contents of this law.

O.C.G.A. §13-10-91(b) (1) states, in part, "A public employer shall not enter into a contract ... for the physical performance of services unless the contractor registers and participates in the federal work authorization program. Before a bid for any such service is considered by a public employer, the bid shall include a signed, notarized affidavit from the contractor attesting to the following:

- A. The affiant has registered with and is authorized to use, and uses the federal work authorization program;
- B. The user identification number and date of authorization for the affiant;
- C. The affiant will continue to use the federal work authorization program throughout the contract period; and
- D. The affiant will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the same information required by subparagraphs (A), (B) and (C) of this paragraph."

O.C.G.A. §13-10-91(b) (2) states, in part, "A contractor shall not enter into any contract with a public employer for the physical performance of services unless the contractor registers and participates in the federal work authorization program."

A subcontractor shall not enter into any contract with a contractor unless such subcontractor registers and participates in the federal work authorization program. A subcontractor shall submit, at the time of such contract, an affidavit to the contractor in the same manner and with the same information required in O.C.G.A. §13-10-91(b) (1). It shall be the duty of any subcontractor receiving an affidavit from a sub-subcontractor to forward notice to the contractor of the receipt, within five business days of receipt, of such affidavit. It shall be the duty of a subcontractor receiving notice of receipt of an affidavit from any sub-subcontractor that has contracted with a sub-subcontractor to forward, within five business days of receipt, a copy of such notice to the contractor. Requirements for sub-subcontractors are also contained in this law.

The "Illegal Immigration Reform and Enforcement Act of 2011" establishes alternatives to the required affidavits for reporting purposes. Only the authorized alternatives will be considered.

It shall be the duty of the contractor to submit copies of all affidavits, drivers' licenses, and identification cards required pursuant to this subsection to the public employer within five business days of receipt.

Copies of the required affidavits for the contractor, subcontractor and sub-sub contractor are included in the package. **The contractor submitting a bid/proposal for the work covered in these documents is required to supply a fully completed affidavit with the submission of the bid/proposal. Bids received that do not include the required affidavit, or allowed substitution, will not be considered.**

Contractor Affidavit under O.C.G.A. § 13-10-91(b) (1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of (_____) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Contractor

State Route 21 Sidewalk Improvements for The City of Port Wentworth

Name of Project

City of Port Wentworth

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 201__ in _____ (city), _____ (state)

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME

ON THIS THE _____ DAY OF _____, 201__

NOTARY PUBLIC

My Commission Expires:

Subcontractor Affidavit under O.C.G.A. § 13-10-91(b) (3)

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with (_____) on behalf of (_____) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice of receipt of an affidavit from any sub-subcontractor that has contracted with a sub-subcontractor to forward, within five business days of receipt, a copy of such notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Subcontractor

State Route 21 Sidewalk Improvements for The City of Port Wentworth

Name of Project

City of Port Wentworth

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 201__ in _____ (city), _____ (state)

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME

ON THIS THE _____ DAY OF _____, 201__

NOTARY PUBLIC

My Commission Expires: _____

Sub-subcontractor Affidavit under O.C.G.A. § 13-10-91(b) (4)

By executing this affidavit, the undersigned sub-subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract for (_____) and (_____) on behalf of (_____) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned sub-subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned sub-subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the sub-subcontractor with the information required by O.C.G.A. § 13-10-91(b). The undersigned sub-subcontractor shall submit, at the time of such contract, this affidavit to (_____). Additionally, the undersigned sub-subcontractor will forward notice of the receipt of any affidavit from a sub-subcontractor to (_____). Sub-subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Sub-subcontractor

State Route 21 Sidewalk Improvements for The City of Port Wentworth

Name of Project

City of Port Wentworth

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 201__ in _____ (city), _____ (state)

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME

ON THIS THE _____ DAY OF _____, 201__

NOTARY PUBLIC

My Commission Expires: _____

GENERAL CONDITIONS

1. Definitions
2. Additional Instructions
3. Schedules, Reports, and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services, and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, Regulations
11. Protection of Work, Property, Persons
12. Supervision by Contractor
13. Changes in the Work
14. Changes in Contract Price
15. Time for Completion and Liquidated Damages
16. Correction of Work
17. Subsurface Conditions
18. Suspension of Work, Termination and Delay
19. Payments to Contractor
20. Acceptance of Final Payment as Release
21. Insurance
22. Contract Security
23. Assignments
24. Indemnification
25. Separate Contract
26. Subcontracting
27. Engineer's Authority
28. Land and Rights-of-way
29. Guaranty
30. Arbitration by Mutual Agreement
31. Taxes

1. DEFINITIONS

- 1.1 Whenever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:
- 1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATION, by additions, deletions, clarifications or corrections.
- 1.3 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.
- 1.4 BIDDER - Any person, firm or corporation submitting a BID for WORK.
- 1.5 BONDS - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.
- 1.6 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.
- 1.7 CONTRACT DOCUMENTS - The contract, including Advertisement for Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.
- 1.8 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

- 1.9 CONTRACT TIME - The total number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.
- 1.10 CONTRACTOR - The person, firm or corporation with whom the OWNER has executed the Agreement.
- 1.11 DRAWINGS - The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the work to be performed and which have been prepared or approved by the ENGINEER.
- 1.12 ENGINEER - The person, firm or corporation named as such in the CONTRACT DOCUMENTS.
- 1.13 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME issued by the ENGINEER to the CONTRACTOR during construction.
- 1.14 NOTICE OF AWARD - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.
- 1.15 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.
- 1.16 OWNER - A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.
- 1.17 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.
- 1.18 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.
- 1.19 SHOP DRAWINGS - All drawings, diagrams, brochures, schedules, and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrates how specific portions of the WORK shall be fabricated or installed.
- 1.20 SPECIFICATION - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of material, equipment, construction systems, standards and workmanship.
- 1.21 SUBCONTRACTOR - An individual, firm or corporation having a direct contact with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.
- 1.22 SUBSTANTIAL COMPLETION - That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

- 1.23 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to the General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.
- 1.24 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at this site.
- 1.25 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.
- 1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

- 2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.
- 2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

- 3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.
- 3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including the dates at which he will start the various parts of the WORK, estimated date of completion of each part and, as applicable:
 - 3.2.1 The dates at which special detail drawings will be required; and
 - 3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.
- 3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

- 4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment and transportation necessary for the proper execution of the

WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

- 4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern general DRAWINGS.
- 4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

- 5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the work as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWINGS shall not release the CONTRACTOR from responsibility for deviations from CONTRACT DOCUMENTS. The approval of any SHOP DRAWINGS which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.
- 5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.
- 5.3 Portions of the WORK requiring a SHOP DRAWING or submission shall not begin until the SHOP DRAWING has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

- 6.1 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, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the WORK within the specified time.
- 6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspections.
- 6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

- 6.4 Materials, supplies or equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.
- 6.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

- 7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.
- 7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.
- 7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.
- 7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.
- 7.5 Inspections, tests or approvals by the engineer or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.
- 7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.
- 7.7 If any WORK is covered contrary to the written instruction of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his inspection and replaced at the CONTRACTOR'S expense.
- 7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of WORK in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such

uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS

- 8.1 Whenever a material, article or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to a brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to a brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. PATENTS

- 9.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design or product of a particular manufacturer or manufacturers is specified, however if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

- 10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR, shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets
- 10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.
- 10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or

permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13. CHANGES IN THE WORK

11. PROTECTION OF WORK, PROPERTY, AND PERSONS

- 11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- 11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.
- 11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

- 12.1 The CONTRACTOR will supervise and direct the WORK He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The

supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

- 13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.
- 13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

- 14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:
- a) Unit prices previously approved.
 - b) An agreed lump sum.
 - c) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- 15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.
- 15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

- 15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.
- 15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.
- 15.4.1 To any preference, priority or allocation order duly issued by the OWNER.
- 15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather, and
- 15.4.3 To any delay of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

- 16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.
- 16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

- 17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:
- 17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or
- 17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those originally encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

- 17.2 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

- 18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK will be resumed. The CONTRACTOR will resume WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.
- 18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.
- 18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.
- 18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

- 18.5 If, through no act of fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK
- 18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time;, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME or both shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

- 19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. The OWNER at any time, however, after fifty (50) percent of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five (5%) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. This retainage shall be placed in an interest bearing Escrow account by the OWNER. The account shall be

maintained for the duration of the project and full accounting shall be turned over to the CONTRACTOR with retainage and interest earned when final payment is made. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

- 19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.
- 19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.
- 19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.
- 19.5 Upon completion and acceptance of the WORK the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.
- 19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be, resumed in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.
- 19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

- 20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

- 21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts.

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees.

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees.

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person.

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

- 21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least thirty (30) days prior WRITTEN NOTICE has been given to the OWNER.

- 21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising in or out

of connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident, and such a limit of liability of not less than \$1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 aggregate for any such damage sustained by two or more persons in any one accident.

- 21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROTECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.
- 21.4 The CONTRACTOR shall procure and maintain at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the work is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any work is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide adequate and suitable insurance for the protection of his employees not otherwise protected.
- 21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

- 22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety

Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such bond is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal BONDS, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

- 23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

- 24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
- 24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.
- 24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

25. SEPARATE CONTRACTS

- 25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the, introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the

CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

- 25.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK and shall properly connect and coordinate his WORK with theirs.
- 25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefore as provided in Sections 14 and 15.

SUBCONTRACTING

- 26.1 The CONTRACTOR may utilize the services of specialty SUB- CONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.
- 26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR (S) in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.
- 26.3 The CONTRACTOR shall be fully responsible to the OWNER 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.
- 26.4 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 CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.
- 26.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

- 27.1 The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased

manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

- 27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of the materials, workmanship and execution of the WORK. Inspection may be made at the factory or fabrication plant of the source if material supply.
- 27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures or construction safety.
- 27.4 The ENGINEER shall promptly make decisions relative to the interpretation of the CONTRACT DOCUMENTS.

28. LANDS AND RIGHTS-OF-WAY

- 28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.
- 28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.
- 28.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER and additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

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

30. ARBITRATION BY MUTUAL AGREEMENT

- 30.1 All claims, disputes, and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by making an acceptance of final payment as provided by Section 20, may be decided by arbitration if the parties

mutually agree. Any agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

- 30.2 Notice of the request for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and a copy shall be filed with the ENGINEER. Request for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.
- 30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

- 31.1 The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.

SUPPLEMENTAL GENERAL CONDITIONS

1. These "Supplemental General Conditions" shall apply to work as whole and to each and all branches of the work. Subcontractors shall be supplied with a copy of the "Supplemental General Conditions" and no arrangement of contracts with the subcontractors is to be such as to conflict with same. They shall also apply to any modifications or extra work.
2. SPECIFICATIONS AND DRAWINGS - In addition to Sections 4.2 and 4.3 of the "General Conditions", if the Contractor fails to call any discrepancy to the attention of the Engineer, the subsequent decision of the Engineers, regarding the Specifications and Drawings, as to which is correct shall be binding and final.
3. SANITARY PROVISION - The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees as may be necessary to comply with the regulation of the State Board of Health and all local ordinances. No nuisance will be permitted.
4. AS-BUILT DRAWING - As the work progresses, the Contractor shall regularly record on one (1) set of drawings all changes and deviations from the Contract Drawings and record the exact final locations of any deviation and original work. Upon completion, the Contractor shall have these drawings and records certified as to their completeness and correctness by the Resident Inspector and deliver them to the Engineer for incorporation in the tracings. Final As-Built alignment, invert elevations and locations are to be supplied by the Contractor.

As-Built information shall be provided monthly to the Engineer and submitted with the partial pay request.

5. SOCIAL SECURITY TAX AND SALES TAX - The Contractor assumes and is liable specifically for all State and Federal so-called Payroll or Social Security Taxes and for all State and Federal Sales and Use Taxes that may be in force at the time of the award of the Contract, and guarantees to hold the Owner harmless in every respect against same.
6. USE OF PREMISES- The Contractor shall not load nor permit any part of any structure to be loaded with a weight which will endanger its safety. The Contractor shall confine his apparatus, the storage of materials, and the operations of his workmen to the limits defined by laws, ordinance, permits or directions of the Engineer and shall not unduly encumber the premises with his material.

The Contractor shall enforce the instructions of the Engineers regarding signs, advertisements, fire and smoking.

7. GUARDS, LIGHTS, ETC. - The Contractor shall provide all barricades, guards, lights or other such protection and walks around his work as are required by the regulation of State, County or Federal laws and shall assume all responsibility of same, and keep them in repair. The necessary lighting, if required, to facilitate overtime work shall be provided. All barricades, etc., shall be promptly removed on completion of the work.
8. MOVING MATERIALS - If it becomes necessary at any time during the construction to move materials which are to enter into the construction, the materials having been temporarily placed,

the Contractor or subcontractor shall, when so directed by the Engineer, move them or cause them to be moved without additional cost to the Owner.

9. CLEANING DURING CONSTRUCTION AND AT COMPLETION OF WORK - The General Contractor shall keep the premises clean at all times and shall remove all rubbish as often as directed by the Resident Inspector or Owner. If the Contractor does not at all times provide men to attend to the cleaning up, on request, in a manner satisfactory to the Resident Inspector, the Resident Inspector may employ such men to direct and charge the cost of same to the account of the Contractor. Every effort shall be made to minimize siltation and bank erosion during construction.

Upon completion of the work, the Contractor shall leave the grounds in a neat and clean condition. Construction areas shall be replanted with grass and shrubs where they have been removed and where necessary, at the request of the Engineer, the ground shall be sprigged or sodded. All areas disturbed by construction shall be restored to present or better condition. Any existing structure which is damaged during construction shall be repaired or replaced to original condition at the Contractor's expense.

10. REMOVAL OF MATERIALS - All materials of unsound or otherwise unfit character and not in accordance with the terms of the Contract will be condemned by the Engineer.

The Contractor shall promptly remove from the premises all condemned materials whether incorporated in the work or not. The Contractor shall promptly replace the materials to the satisfaction of the Engineer. If the Contractor does not remove such condemned materials within a reasonable time, fixed by written notice, the Owner may remove them and store at the expense of the Contractor. If the Contractor does not pay to the Owner the expense of such removal within ten (10) days time thereafter, the Owner may upon ten (10) days written notice sell such materials at auction or private sale and shall account for the net proceeds thereof, after deduction of all cost and expenses that rightfully should have been borne by the Contractor.

11. MAINTENANCE - The Contractor will be required to maintain all work done by him in a first class condition for thirty (30) days after the same has been completed as a whole and the Engineers have notified the Contractor in writing that the work has been finished to their satisfaction. The retained percentage will not be due or payable to the Contractor until the thirty (30) day maintenance period has expired.

Any damage to the site or surroundings, including paving, shoulders, culverts, drainage structures, grass, etc., shall be repaired by the Contractor and all parts of the site shall be left in as good repair as before the work started.

12. QUANTITIES OF ESTIMATE - 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 to indicate approximately the total amount of the contract; the right is especially reserved, except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirably by the Owner to complete the work contemplated by this contract.

13. PUBLIC CONVENIENCE AND SAFETY - No street, alley, or other roadway shall be closed to the public by the Contractor, except by written permission of the Engineer, and except while so closed, the Contractor shall maintain traffic over, through or around work, with the maximum practical convenience for the full twenty-four (24) hours of each day, whether or not work has ceased temporarily. The Contractor shall notify the Engineer in writing, at the earliest practicable date and in any case before starting any construction that might in any way inconvenience or endanger traffic, regarding each proposed closure and proposed schedule of operations thereon, so that all necessary arrangements may be made.

The convenience of the general public and of residents along the working area shall be provided for in a reasonably adequate and satisfactory manner. Where existing roadways are not available for use as detours, traffic shall be permitted to pass through the work, except as otherwise specified or directed by the Engineer. The Contractor shall provide and maintain at his expense, and in a manner approved and deemed practicable by the Engineer such temporary roads as may be necessary to provide convenience access to driveways, houses, buildings, business establishments, and other property abutting the work, as well as temporary approaches to and crossings of, intersecting streets and other roadways. The Contractor shall provide at his expense temporary bridges for pedestrians, as required, at all street intersections over ditches, etc.

Materials and equipment, stored along streets and other roadways, shall be so placed and the work at all times shall be conducted as to insure minimum danger and obstruction to the traveling public.

Fire hydrants in operating condition shall be accessible at all times to the Fire Department. No material or other obstructions shall be placed closer to an operating fire hydrant than permitted by ordinances, rules or regulations. No operating fire hydrant shall be disconnected, removed or otherwise rendered inoperable without the written permission of the Fire Department.

The Contractor shall give the Chief of the Fire Department at least twenty-four (24) hours notice in writing before closure of each street and each street intersection.

14. PUBLIC UTILITIES - The Contractor will be held responsible for the protection of the property and services of public utilities within the limits of the work. Where such physical properties conflict with the performance of the work under the Contract, he shall anticipate such conflicts and give proper advance written notice thereof to the owners of the utilities involved. Until satisfactory arrangements are made for continuance of service, the Contractor shall not commence any operations which may interfere with or impair the efficiency of the existing physical properties.

Unless otherwise specified or approved, utility lines shall be maintained in continuous service, and shall be properly supported and protected by the Contractor.

In no case shall interruption to water or sewer service be allowed to exist outside of working hours, except as permitted by the Engineer on the pipe lines to be altered or replaced under this Contract. Operating fire hydrants shall be kept accessible to the Fire Department at all times, and shall be kept clear of excavated materials and other materials, as specified in Paragraph 13.

In the event of interruption to water or other utility services as a result of accidental breakage, the Contractor shall promptly notify the proper authority, and shall cooperate with the said authority in the restoration of service as promptly as practicable. In the event that such pipes or other facilities are broken or improperly supported, the Contractor will be held responsible for their complete and prompt restoration in substantial and workmanlike manner, and for any claim for damage which may arise as a result of such interruption of service.

15. FUEL AND ELECTRIC CURRENT - The Contractor shall furnish fuel and electric current required for construction purposes, including any temporary incoming power connections, transformers, poles and metering equipment required therefor. The Contractor may use existing electrical systems while modifying existing facilities subject to approval by the Engineer. The Owner will furnish, without charge, all electric current required for operating tests of permanent equipment installed under the contract, and for permanent operation.

16. MAINTENANCE DURING CONSTRUCTION - The Contractor shall maintain at his expense the work during construction and until final acceptance of all work under the Contract. Continuous and effective work shall be prosecuted day by day, with adequate equipment and forces as required to keep the backfill, pavement, structures, pipe lines and other features in satisfactory and acceptable condition at all times.

In the event that the Contractor fails to remedy any unsatisfactory maintenance, within twenty-four (24) hours after receipt of written notice from Engineer describing the unsatisfactory conditions, the Owner may immediately proceed with adequate forces and equipment to maintain the project, and the entire cost of this maintenance will be deducted from the monies otherwise due the Contractor under the Contract. As an alternative to the above specified maintenance, all of the items which are not properly maintained may be deducted at the Contract prices from the current partial payment estimate even if such items have been paid for in previous estimates.

17. ERRORS AND OMISSIONS - The Contractor shall take no advantage of any apparent error or omission in the Plans or Specifications; but if such error or omission does occur, the Engineer shall have the authority to make corrections and interpretations deemed necessary to fulfill the intent of the Drawings and Specifications; nor shall such corrections or interpretations, if any, be construed as a waiver of any Contract provision.

18. USE OF CHEMICALS - All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either A.P.A. or U.S.D.A. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

19. SCHEDULE OF WORK - The Contractor shall schedule his work so as to create as little interruption as possible of the treatment process of the existing facility and the work schedules and functions of the plant personnel. The schedule of work shall conform to that specified in Section 1, General Requirements. The Contractor shall notify the Engineer and City personnel before starting any new phase of construction to verify that no unavoidable interruption of service will be encountered.

20. PROGRESS PAYMENT REQUESTS - The proposed format for use in monthly pay requests along with an estimated schedule of progress payment amounts for the full construction period must be submitted for approval before notice to proceed will be issued.

A. Work in place

B. Material and/or equipment which have been delivered to the construction site and when conditional or final acceptance is made by the Owner. It shall be the Contractor's responsibility to provide adequate insurance and appropriate security measures for the protection of the subject materials and/or equipment.

21. CONTRACTOR PROPOSED WORK SCHEDULE - A work schedule showing the proposed work schedule with the time required to complete each phase shall be submitted for approval prior to the notice to proceed. This work schedule shall be updated and resubmitted with each monthly payment request. Approval of the work schedule is required by the Engineer.

22. SHOP DRAWINGS - The Contractor shall submit six (6) sets of shop drawings and details covering the required items of work, and such other items which may be necessary for the successful completion of this contract, to the Engineer for checking and approval before any fabrication, erection or installation shall commence. An approved set of shop drawings with stamp of approval shall be kept on the job at all times.

The Contractor shall notify the Engineer in writing about any information in the shop drawings which deviates from the Contract Document.

23. COORDINATION - The Contractor shall coordinate with the Engineer and plant personnel to insure the proper and successful completion of this contract.

24. RESIDENT INSPECTOR - The Resident Inspector as the Engineer's representative on the project shall assist and advise the Contractor as to interpretation of the Drawings and Specifications. He shall be authorized to inspect all work done and all materials furnished, including preparation, fabrication and manufacture of the materials to be used. The Resident Inspector shall not be authorized to alter or waive any requirements of the Specifications without prior approval from the Engineer. He shall call the attention of the Contractor to any failure of the work or material to conform to the Specifications and Contract. He may reject material or suspend the work until any questions at issue can be referred to and decided by the Engineer.

The presence of the Resident Inspector shall in no way lessen the responsibility of the Contractor. The Contractor in no way relieves himself of responsibility for adequacy of the work by following the directives of the Resident Inspector.

25. PRECONSTRUCTION CONFERENCE - A preconstruction conference shall be held prior to issuance of notice to proceed. The Contractor shall be represented by at least one (1) principal of the firm, the job superintendent and, if applicable, the superintendent of the electrical subcontractor. The Contractor shall at that time present the construction schedule, progress payment format and estimates, any available subcontractor approval requirements, required insurance, and any other documents deemed necessary.

26. EXISTING PIPING AND STRUCTURES - The Contractor shall verify the location of existing piping and structures in an area prior to beginning new construction in that area.
27. INSURANCE - In addition to the requirements of Section 21 of the General Conditions, the Owner and the Engineer shall be listed as insureds on the Contractor's General Liability Policy and Builders Risk in the same amounts as required for the Contractor.
28. MODIFICATIONS - The Contractor and his subcontractors must submit in writing any requests for modifications to the plans and specifications. Shop drawings that are submitted to the Engineer for his review do not constitute "in writing" unless it is brought to the attention of the Engineer that specific changes are being suggested. In any event, changes to the plans and specifications by means of shop drawings become the responsibility of the person initiating such changes.

**SECTION 01150
MEASUREMENT AND PAYMENT**

PART 1 – GENERAL

1.01 QUANTITIES

- A. Quantities: Quantities listed in the Bid are approximate only and are intended to serve as a guide in comparing bids, and may be increased or decreased without invalidating the unit price bid.
- B. Payment: Contractor shall be paid for actual in place quantities as determined by the Engineer field measurements.
- C. Discrepancies: In case of discrepancies between the figures shown in the unit prices and totals, the unit prices shall apply and the totals shall be corrected to agree with the unit price.

PART 2 – MEASUREMENT AND PAYMENT

2.01 GRADING MODIFIED

- A. Measurement: Grading (modified) including haul will be measured in linear miles along the centerline of the road or the median, including ramps when so shown on the plans. Surplus material may be disposed of beyond the end of the project, but the mileage measured for payment will not extend beyond the established termini.
- B. Payment: The item of Grading (modified) including haul will be paid for at the contract unit price per linear mile complete in place, which price shall be full compensation for clearing and grubbing inside the construction limits where the item is not shown as a separate item in the contract, for all grading all excavation to the typical section required or as modified herein, compaction, compaction testing, formation of embankments, construction of shoulders, backing out subgrades for pavement, flushing fill slopes and ramps, filling washes, wasting surplus or unsuitable material, furnishing and placing structural fill material as required, finishing and dressing, cleaning of side ditches, all hauling of excavation, driveway and drainage demolition and removal, traffic control, relocation of mailboxes and other structures or any incidentals necessary to complete the item. It is clearly understood that in no case will any separate payment be made for finishing and dressing, and that the cost of necessary finishing and dressing to comply with these specifications shall be included in the contract unit price of Grading Modified including haul.

2.02 5' SIDEWALK

- A. Measurement: Measurement shall be made based on each square yard of Sidewalk installed accordance with the plans and specifications or as directed by the engineer.
- B. Payment: Payment will be made at the unit price bid for all sidewalk installed as shown on the plans. The unit price bid shall include, but not be limited to, grading, excavation, subgrade preparation and compaction, forming, furnishing concrete,

installing expansion and stress joints, form wrecking, backfilling surface restoration and complete cleanup. If specifically stated, furnishing concrete may be omitted.

2.03 HANDICAP RAMP

- A. Measurement: Measurement will be made on the basis of the completed item in accordance with the construction plan.
- B. Payment: Payment will be made at the unit price bid for all Handicap Ramps installed as shown on the plans. The unit price bid shall include, but not be limited to, grading, excavation, subgrade preparation and compaction, saw cutting, forming, furnishing concrete, installing expansion and stress joints, truncated domes, form wrecking, backfilling surface restoration and complete cleanup.

2.04 REMOVE AND REPLACE CONCRETE PAVEMENT

- A. Description: The Contractor shall furnish all labor and materials to remove and replace roadway, driveways, sidewalks or parking areas, curb and gutter in accordance with the Contract Documents.
- B. Work Includes:
 - 1. Marking, cutting, and removal of pavement material as necessary.
 - 2. Disposal of water material.
 - 3. Installation of temporary traffic control measures such as barrels, markers and the like.
 - 4. Trench maintenance and crusher run stone as required to maintain level traffic surface during construction period.
 - 5. Necessary shoring, sheeting, excavation, dewatering and the like.
 - 6. Providing and installing geotextile fabric complete.
 - 7. Providing and installing graded aggregate base material complete.
 - 8. Complete surface restoration and cleanup.
 - 9. Furnish and install concrete/asphalt patch in accordance with detail on construction plans. This item does not include the final asphalt overlay.
- C. Measurement: Measurement will be made on the basis of each square yard of pavement removal and replacement installed in accordance the layout, grades and depths shown on plans and as specified.
- D. Payment: Payment will be made on the basis of each square yard of pavement removal and replacement completed in accordance with the lines grades and depths shown on the construction plans at the unit price bid. The unit price bid shall include, but not be limited to, all work as described, labor, equipment and materials necessary to complete the item of work.

2.05 DRAINAGE PIPE

- A. Measurement: Measurement will be made on the basis of each linear foot of drainage pipe installed at the elevation, grade and alignment as designated on the construction plans or directed by the Engineer.

- B. Payment: Payment will be on the basis of each linear foot of drainage pipe installed at the elevation, grade and alignment as designated on the construction plans at the unit price bid stated in the Contract. The unit price bid shall include all labor, equipment and labor necessary to complete the item of work. Work shall include, but not be limited to, all excavation, trenching, dewatering, necessary shoring and sheeting, all pipe bedding, furnishing and installing pipe, backfill, compaction, complete surface restoration and cleanup.

2.06 DRAINAGE STRUCTURES (Catch Basin, Yard Drain, Junction Box, Headwall, Concrete Flumes, Flared End Section, Pipe End Treatments)

- A. Measurement: Measurement will be made on the basis of each drainage structure installed at the elevation and location designated on the construction plans.
- B. Payment: Payment will be made on the basis of each structure installed at the unit price bid. The unit price bid shall include furnishing all labor, materials and equipment necessary to complete the item of work. Work shall include, but not be limited to, excavation, necessary shoring and sheeting, dewatering, forming, placement of concrete, bricks, or precast structure, form wrecking, foundations as required, furnishing and installing the structure, placement of grates and manhole rings and covers as applicable, grouting around pipe and lid, sealing of structure, backfill, compaction, grading, complete surface restoration and cleanup.

2.07 RAISE MANHOLES TO GRADE

- A. Measurement: Measurement will be made on the basis of each manhole ring and cover being raised to the elevation and location designated on the construction plans or as directed by the engineer.
- B. Payment: Payment will be made on the basis of each manhole ring and cover adjusted to the proper height as shown on the plans or as directed by the engineer at the unit price bid. The unit price bid shall include furnishing all labor, materials and necessary equipment to complete the item of work. Work shall include, but not be limited to, excavation, demolition, removal of existing pavement, necessary shoring and sheeting, dewatering, forming, placement of concrete, bricks, or precast concrete rings, adjusting frame or ring and cover to grade, waterproofing, sealing, form wrecking, grouting around pipe and lid, backfill, compaction, grading, complete surface restoration and cleanup.

2.08 RAISE JUNCTION BOXES TO GRADE

- A. Measurement: Measurement will be made on the basis of each junction box raise to grade as shown on the construction plans.
- B. Payment: Payment will be made on the basis of each structure repaired at the unit price bid. The unit price bid shall include furnishing all labor, materials and equipment necessary to complete the item of work. Work shall include, but not be limited to, excavation, necessary shoring and sheeting, dewatering, forming, placement of concrete, bricks, or precast structure, form wrecking, foundations as required, furnishing and installing the structure, placement of grates and manhole

rings and covers as applicable, grouting around pipe and lid, sealing of structure, backfill, compaction, grading, complete surface restoration and cleanup.

2.09 STRUCTURE RELOCATION

- A. Measurement: Measurement will be made on the basis of the completed item of work or percentage of completed work.
- B. Payment: Payment will be made on the basis of the percentage Complete. The price shall include all materials, labor and equipment necessary to complete the item of work. Work shall include, but is not limited to, the removal and replacement of signs, mailboxes and miscellaneous structures that interfere with the project.

2.10 SILT FENCE

- A. Measurement: Measurement will be made on the basis of each linear foot of silt fence installed in accordance with the construction drawings or as directed by the engineer.
- B. Payment: Payment will be made on the basis of each linear foot of silt fence installed in accordance with the construction drawings or as directed by the engineer at the unit price bid. The unit price shall include all labor, equipment and materials necessary to complete the item of work. The item of work shall include, but not be limited to necessary trenching, providing and placing silt fence, staking, maintenance for the life of the project, repair and/or replacement, removal, complete surface restoration and cleanup.

2.11 RIP RAP (Outlet Protection)

- A. Measurement: Measurement shall be made on the basis of the number of square yards of granite rip rap placed at the locations shown on the plans and in accordance with "The Manual for Erosion and Sediment Control in Georgia".
- B. Payment: Payment will be made on the number of square yards installed at the unit price bid. The unit price bid shall include all material, labor and equipment necessary to accomplish the task. Work shall include, but not be limited to, excavation, grading, furnishing and placing rip rap, gravel filler, geotextile filter blanket as shown on the plans to cover area entirely avoiding washouts in the future. Thickness of rip rap coverage will be at least the thickness shown on the plans for each location, but in no case shall be less than 1.5 times the rock diameter.

2.12 MULCHING

- A. Measurement: Measurement shall be made on the basis of the completed item in accordance with the construction plans and bid items.
- B. Payment: Payment will be made in accordance with the price stated in the bid. The unit price shall include, but is not limited to, furnishing all labor, materials and equipment necessary for the satisfactory mulching on all disturbed areas in

accordance with plans and specifications. Work shall include, but not be limited to, furnishing all materials, leveling, spreading, and maintenance of areas until final grassing is established. Mulching is to be completed daily to ensure no erosion of disturbed areas.

2.13 GRASSING

- A. Measurement: Measurement shall be made on the basis of the completed item in accordance with the construction plans and bid items.
- B. Payment: Payment will be made in accordance with the price stated in the bid. The unit price shall include, but is not limited to, furnishing all labor, materials and equipment necessary for the satisfactory growth of grass on all disturbed areas in accordance with plans and specifications. Work shall include, but not be limited to, furnishing all materials, fertilizer, soil samples, grass seed, raking, leveling, watering, maintenance and final surface restoration. Final payment will not occur until permanent grass is established.

2.14 ROADWAY STRIPING/MARKING

- A. Measurement: Linear measurements are made on the painted surface by a measuring device rolled along the painted surface. Traffic stripe and markings, complete in place, are measured and accepted for payment as follows:
 - 1. Solid Traffic Stripe: Solid traffic stripe is measured by the linear foot. Breaks or omissions in solid lines or stripes at street or road intersections are not measured.
 - 2. Skip Traffic Stripe: Skip traffic stripe is measured by the gross linear foot. Unpainted spaces between the stripes are included in the overall measurements if the Plan ratio of 1 to 3 remains uninterrupted. Measurement begins and ends on a stripe.
 - 3. Pavement Markings: Markings are words and symbols completed according to Plan dimensions. Markings are measured by the unit.
- B. Payment: Payment will be made on the basis of the unit price stated in the bid. The price shall include all materials, labor and equipment necessary to complete the item of work. Work shall include, but is not limited to, cleaning and preparing surfaces, furnishing materials, including paints, beads, and thinners, applying, curing, and protecting paints, protecting traffic, including providing and placing necessary warning signs, furnishing tools, machines, and other equipment necessary to complete the item or work.

2.15 MOBILIZATION

- A. Measurement: Measurement will be made on the basis of the completed item of work or percentage thereof.
- B. Payment will be made for the price as stated in the Contract once the Contractor has established his construction yard, and met the requirements established in the Contract Documents. Mobilization will be recognized complete once the Contractor

has provided a construction schedule and moved his equipment and a substantial amount of material to the job site. Construction must be underway and progressing. Payment for mobilization will be limited to a maximum amount not to exceed 3.0% of the bid price.

**SECTION 02100
CLEARING AND GRUBBING**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Clearing shall consist of the falling, trimming, cutting and disposal of trees and other vegetation designated for removal, including down timber, snags, brush and rubbish occurring within the area to be cleared. Grubbing shall consist of the removal and disposal of stumps, roots larger than 1.5 inches in diameter and matted roots.

PART 2 – EXECUTION

- 2.01 Trees, down timber, stumps, roots, brush and other vegetation in areas to be cleared shall be removed completely, except such trees and vegetation as may be indicated or directed to be left standing. Trees to be left standing within the cleared areas shall be trimmed of dead branches 1.5 inches or more in diameter.
- 2.02 Limbs and branches to be trimmed shall be neatly cut close to the bore of the tree or main branches.
- 2.03 All organic materials, masonry, concrete or metallic debris in the clearing and grubbing areas shall be excavated and removed to a depth of not less than 12 inches below grade where original grade is to remain level and two feet below finish grade, bottom of pavement base and bottom of footings.
- 2.04 Depressions made by grubbing shall be backfilled and compacted with fill material to meet the requirement for trenching and structural backfilling.
- 2.05 Machine grubbing shall not be done under trees left standing in the area covered by the branches, nor in any manner which might damage the trees or any new work.
- 2.06 Trees and vegetation to be left standing shall be protected from damage during clearing, grubbing and construction operations, by the erection of barriers.
- 2.07 Objects above or below grade interfering with construction shall be removed as directed by the Architect/Engineer.
- 2.08 **DISPOSAL OF MATERIALS**
 - A. Cleared and grubbed materials to be disposed of to an approved off-site disposal area. The disposal area shall be a state-approved landfill.
 - B. On site burning will not be allowed, without written permission of local authorities. The Forestry Department should be contacted for the permit.
 - C. The use of an air curtain destructor for on-site burning shall be part of the permit.

**SECTION 02210
SITE GRADING**

PART I – GENERAL

1.01 QUALITY ASSURANCE

A. Reference Standards:

1. Standards of American Society for Testing and Materials:
ASTM-D-698 Moisture-Density Relations of Soils Using 5.5 lb. (2.5 KG) Hammer and 12 inch (304.8 mm) Drop
2. Methods of Sampling and Testing of American Association of State Highway and Transportation Officials (AASHTO), latest edition.

1.02 TESTING

- A. All soil testing shall be performed by an Independent Testing Laboratory selected by the Engineer and paid for by the Contractor.

1.03 EXCESS EXCAVATED MATERIALS

- A. Excess excavated materials shall be wasted off site by the Contractor at no expense to Owner, or as directed by the Engineer.

1.04 BORROW MATERIAL

- A. Any borrow material required to accomplish all levels, lines and grades indicated shall be furnished by the Contractor at no expense to the Owner.
- B. Borrow material shall be obtained from borrow pits off site
- C. The Contractor shall pay for all soil analysis for borrow material

1.05 EXCAVATED MATERIAL

- A. All material to be excavated shall be classified as earth.

1.06 UNSUITABLE BEARING MATERIALS

- A. Should unsuitable bearing materials be encountered at levels indicated and found to have insufficient bearing values the Engineer may order the excavation carried to lower depths.
- B. Compensation for the removal and/or replacement of unsuitable materials shall be in accordance with the General Conditions.
- C. Excavation of unsuitable bearing materials shall not proceed until the conditions have been observed by the Engineer and written approval has been given by the Owner.

PART 2 – EXECUTION

TOP SOIL

- A. Areas to be stripped shall first be scraped clean of all brush, weeds, grass, roots and other material.
- B. Remove topsoil from areas to be graded and stockpile in locations where it will not interfere with structures, roads or utility operations.
- C. Topsoil shall be free from subsoil, debris and stones larger than 2 inches in diameter. The stored topsoil shall be left in piles to be used for finished grading.
- D. Stockpiles shall be protected from contamination by undesirable foreign matter and shall be graded to shed water.

EXCAVATION

- A. Excavations shall be accomplished to bring surface to the levels, lines and grades as indicated.
- B. Excavated material to be used for fill or backfill material shall be stockpiled on the site as directed by the Engineer. Stockpiles shall be graded to shed water.

FILLING

- A. All fill material required to bring areas to the levels, lines and grades indicated shall be selected and approved materials from approved borrow areas.
- B. Sub-grades on which fill material is to be placed shall be scarified to a depth of not less than 4 inches by plowing or disking. A layer of suitable fill material, approximately 3 inches in depth, shall be spread over the scarified surface and compacted.
- C. Fill material shall be spread and compacted in successive uniform layers not exceeding 8 inches in depth (loose measure) until the total thickness of fill is completed.

2.04 COMPACTION

- A. Compaction required for material fill shall be 95% of Standard Proctor, maximum dry density as determined by the procedures of ASTM D-698. Fill areas shall be crowned and sloped to drainage ditches or as required to prevent ponding of surface water.
- B. Compaction by flooding of any material is not acceptable. In the event that any flooding takes place, the material and all adjacent softened material shall be removed and replaced with compacted fill at no cost to the Owner.

**SECTION 02220
DEMOLITION**

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PART 1 – GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR-CONDITIONING AND REFRIGERATION INSTITUTE (ARI)

ARI Guideline K (1997) Containers for Recovered Fluorocarbon Refrigerants

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.6 (1990; R 1998) Safety Requirements for Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (1996) Safety and Health Requirements Manual

1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Engineer. Do not allow accumulations inside or outside the building. The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Engineer. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1. Asbestos removal will be performed by others under a separate contract. All asbestos will be removed prior to the issuance of a notice to proceed.

1.3 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," safety requirements shall conform to ANSI A10.6.

1.3.1 Notifications

1.3.1.1 General Requirements

Furnish timely notification of demolition project to Federal, State, regional, and local authorities as required.

1.4 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable

conditions such as, but not limited to, ice, flooding, or pollution. Vacuum and dust the work area daily or as necessary. Sweep pavements as often as necessary to control the spread of debris.

1.5 PROTECTION

1.5.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Engineer prior to beginning such work.

1.5.2 Existing Work

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Owner; any damaged items shall be repaired or replaced as approved by the Engineer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement must have Engineer's approval.

1.5.3 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas so as to ensure effectiveness and to prevent displacement.

1.5.4 Trees

Trees within the project site which might be damaged during demolition, and which are indicated to be left in place, shall be protected by a 1.8 m (6 foot) 6 foot high fence. The fence shall be securely erected a minimum of 1.5 m 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the work under this contract shall be replaced in kind or as approved by the Engineer.

1.5.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved

barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, shall remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the Engineer. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.6 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.6 BURNING

The use of burning at the project site for the disposal of refuse and debris **will not** be permitted.

1.7 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by the Engineer.

1.8 ENVIRONMENTAL PROTECTION

The work shall comply with all federal, state, and local laws and regulations.

1.9 USE OF EXPLOSIVES

Use of explosives **will not** be permitted.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

3.1.1 Structures

Existing structures indicated shall be removed to grade. Interior walls, other than retaining walls and partitions, shall be completely removed to grade. Basement slabs shall be broken up and completely remove. Sidewalks, curbs, gutters and street light bases shall be removed as indicated.

3.1.2 Utilities and Related Equipment

Remove existing utilities to limit of the property and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Engineer. When utility lines are encountered that are not indicated on the drawings, the Engineer shall be notified prior to further work in that area. Remove meters and related equipment.

3.1.3 Paving and Slabs

Remove concrete and asphaltic concrete paving and slabs including aggregate base as indicated to natural grade. Provide neat saw cuts at limits of pavement removal as indicated.

3.1.4 Masonry

Saw cut and remove masonry so as to prevent damage to surfaces to remain. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as specified for the new work.

3.1.5 Concrete

Saw concrete along straight lines to a depth of not less than 50 mm 2 inches. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.6 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

- a. Holes and depressions left as a result of removals in existing masonry walls to remain shall be completely filled with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

b. Where existing partitions have been removed leaving damaged or missing resilient tile flooring, patch to match the existing floor tile.

c. Patch acoustic lay-in ceiling where partitions have been removed. The transition between the different ceiling heights shall be effected by continuing the higher ceiling level over to the first runner on the lower ceiling and closing the vertical opening with a painted sheet metal strip.

3.1.7 Air Conditioning Equipment

Remove air conditioning equipment without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990. Recover all refrigerants prior to removing air conditioning equipment and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.8 Cylinders and Canisters

Remove all fire suppression system cylinders and canisters and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.9 Locksets on Swinging Doors

The Contractor shall remove all locksets from all swinging doors indicated to be removed and disposed of. Contractor shall give the locksets to the County after their removal.

3.2 FILLING

Holes, open basements and other hazardous openings shall be filled in accordance with the construction drawings. The finished grade shall match the adjacent grades and shall be properly drained as directed by the Engineer.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except where specified in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from County property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the County of the Contractor's demolition and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

3.3.2 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting ARI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be [put back into the existing equipment] [turned over to the Contracting Officer] [remove from Government property and dispose of in accordance with 40 CFR 82]. Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82.

3.3.2.1 Special Instructions

Each container shall have in it no more than one type of ODS. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

- a. Activity name and unit identification code
- b. Activity point of contact and phone number
- c. Type of ODS and pounds of ODS contained
- d. Date of shipment

3.3.2.2 Fire Suppression Containers

Fire suppression system cylinders and canisters with electrical charges or initiators shall be deactivated prior to shipment. Also, safety caps shall be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.3 Unsalvageable Material

Concrete, masonry, and other noncombustible material, except concrete permitted to remain in place, shall be disposed of by the Contractor.

3.4 CLEANUP

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

3.4.1 Debris and Rubbish

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

SECTION 02221
TRENCH EXCAVATION, BACKFILL AND COMPACTION

PART 1 – GENERAL

1.01 SCOPE

- A. Work under this section shall consist of furnishing all materials, equipment and labor for excavation, trenching and backfilling for utility systems. "Utility systems" shall include underground piping and appurtenances for gas, gasoline, oil, and water distribution systems, storm water drains, and sewage collection systems.

1.02 EXISTING UTILITIES

- A. Before opening trenches, the Contractor shall examine all available records and explore for the location of all sub-surface pipes, valves or other structures and reference such locations on the surface. It shall be the responsibility of the contractor to contact the utility clearinghouses as required by law.
- B. In opening trenches, every effort shall be made not to interfere with these utilities structures. Expose existing piping by hand before excavating by machine. Excavate existing utilities sufficiently in advance of pipe laying to determine crossing arrangement. Slight deviations may be permitted in order to clear such structures. The Contractor shall be entirely responsible for the preservation of all underground or overhead utility lines and structures, such as gas, water, sewer lines, telephone conduit, power lines, etc., and shall replace, adjust or repair, without additional compensation, any such lines damaged or interfered with as a result of this construction.
- C. Schedule work to keep roads and utilities in usable condition; coordinating all operation with the Governing Authority to avoid inconvenience insofar as practicable.

1.03 BORROW MATERIAL

- A. Any borrow material required to accomplish all levels, lines and grades indicated shall be furnished from an approved site.
- B. The OWNER or his agent shall pay for all soils analysis for borrow material.

1.04 TESTING

- A. All soil testing shall be performed by an Independent Testing Laboratory selected by the Governing Authority and the design engineer.

1.05 QUALITY ASSURANCE

- A. All excavation within the rights of way of city streets and county, State or Federal roadways, shall be backfilled in accordance with the then prevailing requirements of the Georgia Department of Transportation, Highway Division.

- B. Reference Standards: Methods of Sampling and Testing of American Association of State Highway and Transportation Officials (AASHTO).

1.06 SAFETY

- A. The Contractor is responsible for maintaining a safe job environment. He is responsible for meeting all OSHA requirements and conditions as part of the project.

PART 2 – EXECUTION

2.01 GENERAL EXCAVATION

- A. The Contractor shall do all excavation of whatever substances encountered to depth shown on plans. Excavated materials not required for fill or backfill shall be removed from site as directed by the Engineer.
- B. Contractor is to excavate to provide 36 inch minimum cover over utility.
- C. Excavation for manholes and other accessories to have 12 inches minimum and 24 inch maximum clearance on all sides.
- D. Excavation shall not be carried below the required level.
- E. Where excavation is carried below grades indicated, the Contractor shall refill same to the proper grade with compacted earth or stone, or as directed by the Engineer.
- F. Width of trench shall be as shown on the plans. The bottom of trench for sewers and culverts shall be rounded so that an arc of the circumference equal to 0.6 of the outside diameter of the pipe rests on undisturbed soil.
- G. Bell holes shall be excavated accurately to size by hand.

2.02 UNSUITABLE BEARING MATERIALS

- A. Should unsuitable bearing materials be encountered at levels indicated and found to have insufficient bearing values the Engineer may order the excavation carried to lower depth.
- B. Excavation of unsuitable bearing materials shall not proceed until the conditions have been observed by the Engineer and written approval is given by the Owner.

2.03 PIPE BEDDING

- A. The contact between a pipe and the foundation on which it rests is the pipe bedding.
- B. Classes of Bedding: Four typical classes of bedding to be used for pipes in trenches are described as follows:

1. Class A - Concrete Cradle or Concrete Arch Bedding: This class of bedding may take either of two forms.
 - a. Concrete Cradle- The pipe shall be bedded in a monolithic cradle of plain or reinforced concrete having a minimum thickness of $\frac{1}{4}$ the inside pipe diameter of a minimum of 4 inches under the barrel and extending up the sides for a height equal to $\frac{1}{4}$ the outside diameter. The cradle shall have width at least equal to the outside diameter of the pipe barrel plus 8 inches. Backfill above the cradle and extending to 12 inches above the crown of the pipe shall be compacted carefully.
 - b. Concrete Arch- The pipe shall be embedded in a carefully compacted granular material having a minimum thickness of $\frac{1}{4}$ the outside diameter between barrel and bottom of trench excavation and extending halfway up the sides of the pipe. The top half of the pipe shall be covered with monolithic plain or reinforced concrete arch having a minimum thickness of $\frac{1}{4}$ the inside diameter at the crown and having a minimum width equal to the outside pipe diameter plus 8 inches.
2. Class B- First -Class Bedding - Class B bedding may be achieved by either of two construction methods.
 - a. Shaped Bottom with Tamped Backfill. The bottom of the trench excavation shall be shaped to conform to a cylindrical surface with a radius at least 2 inches greater than the radius to the outside of the pipe and with a width sufficient to allow $\frac{6}{10}$ of the width of the pipe barrel to be bedded in fine granular fill placed in the shaped excavation. Carefully compacted backfill shall be placed at the sides of the pipe to a thickness of at least 12 inches above the top of the pipe. Shaped trench bottoms shall be used only with the approval of the Engineer.
 - b. Compacted Granular Bedding with Tamped Backfill. The pipe shall be bedded in compacted granular material placed on a flat trench bottom. The granular bedding shall have a minimum thickness of $\frac{1}{4}$ the outside pipe diameter and shall extend halfway up the pipe barrel at the sides. The remainder of the side fills and minimum depth of 12 inches over the top of the pipe shall be filled with carefully compacted, select material.
3. Class C - Ordinary Bedding: Class C ordinary bedding may be achieved by either of two construction methods:
 - a. Shaped Bottom. The pipe shall be bedded with "ordinary" care in an earth foundation formed in the trench bottom by a shaped excavation which will fit the pipe barrel with reasonable closeness for a width of at least 50% of the outside pipe diameter. The side

fills and area over the pipe to a minimum depth of 6 inches above the top of the pipe shall be filled with lightly compacted fill. The shaped bottom bedding shall be used only with the approval of the Engineer.

- b. Compacted Granular Bedding with a Tamped Backfill. The pipe shall be bedded in compacted granular material placed on a flat trench bottom. The granular bedding shall have a minimum thickness of 4 inches under the barrel and shall extend 1/10 to 1/6 of the outside diameter up the pipe barrel at the sides. The remainder of the side fills and to a minimum depth of 6 inches over the top of the pipe shall be filled with lightly compacted backfill.
4. Class D - Class D bedding is not permissible. Flat bottom trench. In this class of bedding the bottom is left flat, and no care is taken to secure compaction of backfill at the sides immediately over the pipe.
- C. Granular pipe bedding material shall be well graded crushed stone or crushed gravel meeting the requirements of ASTM C33, Gradation 67 (3/4 inch to No. 4). A well-graded gravel meeting these same requirements can also be used.
 - D. Where ledge rock, compact rocky or gravelly soil, or other unyielding foundation material is encountered, the pipes shall be bedded in accordance with the requirements of the foregoing classes of bedding, but with the following additions: The hard unyielding material shall be excavated to the elevation of the bottom of the concrete cradle (Class A bedding) or below the bottom of the pipe and the pipe bell (Class B or C bedding), to depth of at least 6 inches (15cm). The width of the excavation shall be at least 5/4 the outside diameter of the pipe and it shall be refilled with granular material as identified above.

2.04 BRACING AND SHORING

- A. The Contractor shall do all bracing, sheeting and shoring necessary to perform and protect all excavations as required for safety.
- B. Sheeting driven alongside the pipe should be cut off and left in place to an elevation 1.5 feet above the top of the pipe.
- C. All other sheeting shall be removed as directed by the Engineer.

2.05 DEWATERING FOR EXCAVATION

- A. The Contractor shall pump or remove any water accumulated in any excavated area and shall perform all work necessary to keep excavations clear of water while foundations, structures or any masonry are being constructed or while pipe is being laid, or during demolition.
- B. No structure or pipe shall be laid in water, and water shall not be allowed to flow over or rise upon any concrete or masonry or piping until same has been inspected and the mortar or joint material has cured.

- C. All water pumped or bailed from the trenches or other excavation shall be conveyed in a manner to a point of discharge where it will neither cause a hazard to the public health, nor damage to the public or private property, or to work completed or in progress.

2.06 BACKFILL

- A. The soil at the sides of a pipe and above it is the backfill.
- B. Prior to backfilling any excavation, all piping and structures, the Engineer and Governing Authority's Inspector shall be notified for observation.
- C. After pipes have been tested and approved, backfilling shall be done with approved material free from large clods or stones.
- D. Backfill shall be placed in uniform layers, four inches thick, on both sides of the pipe and thoroughly compacted with pneumatic or hand tampers. The backfill shall be brought up uniformly on both sides of the pipe and compacted to an elevation of one foot above the top of the pipe, after which the fill shall be placed in eight inch lifts. No rock will be allowed in the backfill within a distance of one foot from the pipe, and rock larger than six inches in the greatest dimension will not be permitted in any part of the trench or backfill.
 - 1. Backfill shall be compacted to not less than 95% of the maximum dry weight per cubic foot as determined by AASHTO Method T-99 (Standard Proctor Test).
 - 2. The top 18 inches of backfill under any paved area shall be compacted to 100% Standard Proctor.
 - 3. Water settling will not be permitted in clay soils. It may be allowed at the option of the Governing Authority's Inspector and design engineer in sandy soils.

2.07 REPLACING PAVEMENTS

- A. Subgrades shall be compacted with a mechanical tamper.
- B. The minimum width of replaced concrete pavements shall be 4 feet at interiors and 6 feet at joints and constructed as shown on Standard Details. Avoid cutting pavements at joints; if unavoidable, reconstruct same as original joint. Depth shall be equal to the original thickness. Existing pavements edges shall be cut vertical.
- C. Use high-early-strength cement if road is to be opened in less than 24 hours.
- D. The minimum width of replaced bituminous pavements shall be 3 feet with 8 inch concrete patch. The existing pavement shall be cut vertically and horizontally to a straight line. The 8-inch concrete patch shall be minimum 3,000-psi concrete containing black dye and shall be flush with the existing pavement.

- E. The minimum width of replaced bituminous pavement with asphalt shall be 3 feet with 6 inches of concrete and 2 inches of asphalt after the existing pavement is cut vertically and horizontally to a straight line.

**SECTION 02540
EROSION CONTROL**

PART 1 – GENERAL

1.01 SCOPE

- A. The work specified in this Section consists of furnishing, installing and maintaining temporary erosion controls and temporary sedimentation controls.
- B. All erosion and sediment control measures shall be in accordance with the existing Erosion and Sedimentation Control Ordinance of The City of Port Wentworth, Georgia or other ordinances.

1.02 DEFINITIONS

- A. Temporary erosion controls shall include grassing, mulching, watering and reseeding on-site sloped surfaces, providing berms at the top of the slopes and providing interceptor ditches at the ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or minimized.
- B. Temporary sedimentation controls shall include silt dams, traps, barriers and appurtenances at the toe slopes and in drainage ways.

PART 2 – MATERIALS

- 2.01 Hay bales shall be clean, seed free cereal hay type, securely bound with wire or mylar cord.
- 2.02 Netting shall be 1/2 inch, galvanized steel chicken wire mesh.
- 2.03 Filter stone shall be crushed stone conforming to the Department of Transportation State of Georgia-Standard Specifications-Construction of Roads and Bridges-1983 or latest edition - Table 800.01 H, Size Number 3.

PART 3 – EXECUTION

3.01 SEDIMENTATION CONTROL

- A. Silt dams, traps, barriers, and appurtenances shall be installed and shall be maintained in-place for duration of construction.
- B. Hay bales shall be staked with two (2) 1X4 wood stakes per bale driven eighteen (18) inches into the ground and finishing flush with the top of the bale.
 - 1. Install two (2) stakes per bale with the long dimension of the stakes parallel to the long dimension of the bale.
 - 2. Where bales are installed in multiple layers the bales shall be installed with vertical joints staggered and two (2) 1 x 4 wood stakes per bale driven through all layers, full from top of bale to eighteen inches into the ground.

3. Hay bales that have deteriorated shall be replaced with new materials.
- C. Silt Fence
 1. Silt fence shall be installed in accordance with manufacture instructions. The bottom 2" should be installed beneath the ground surface.
 2. A small trench should be dug before installation. The silt fence should then be installed and the trench back filled.
 - D. Erosion and sedimentation controls shall be maintained in a condition that will retain unfiltered water.
 - E. The Contractor shall construct the sedimentation ponds and control devices prior to clearing and grubbing the site to insure complete silt control. When the silt or the debris level is greater than 1 foot above the bottom of the pond, the Contractor shall remove the silt or debris to restore the proper elevation for the bottom of the pond.
 - F. The Contractor shall have all erosion and sedimentation control devices in service and operating properly prior to completion and final acceptance of the contract.

3.02 RESPONSIBILITY

- A. The Contractor shall be solely responsible for insuring that no silt or debris leaves the immediate construction site. Any silt or debris that does leave the immediate site shall be cleaned up and the area disturbed shall be returned to its natural state as directed by the City Inspector at the Contractor's expense.
- B. The Contractor has the option to submit additional control measures in the form of shop drawings.

**SECTION 02821
GRASSING**

PART 1 – GENERAL

1.01 APPLICABLE STANDARDS

- A. Conform to Section 700 and other applicable articles of the "Standard Specifications Construction of Roads and Bridges", of the Department of Transportation, State of Georgia, dated September 15, 1977. Omit all references to measurement and payment.

1.02 SOIL SAMPLES

- A. The Contractor shall take soil samples from several areas of the site to be grassed and have them analyzed by the Georgia Extension Service. The results of the analysis shall determine the best fertilizer mixture to use on the site.

PART 2 – MATERIALS

2.01 FERTILIZER

- A. Commercial Fertilizer: Fertilizer for lawns shall be a complete fertilizer, the nitrogen content of which shall be derived from either organic or inorganic sources and meeting the following minimum requirements of plant food by weight, unless the soil analysis and report indicates a need for a different fertilizer mixture in which case the recommended mixture shall be furnished and applied. All State and Federal laws relative to fertilizer must be complied with.

10% Nitrogen - 12% Phosphoric Acid - 12% Potash

- B. Ground Limestone: Lime shall be ground dolomitic limestone containing not less than 85% of total carbonates and shall be ground to such fineness that 50% will pass through a 20-mesh sieve. Coarser material will be acceptable, provided the specified rates of application are increased proportionately on the basis of quantities passing the 100-mesh sieve.
- C. Sodium Nitrate shall be a commercial product in dry powder form and shall be delivered in the original, unopened containers each bearing the manufacturer's guaranteed statement of analysis. It shall contain not less than 16% Nitrogen.

2.02 LAWN MATERIALS

- A. Kentucky 31 Fescue (Fescue elatior: var. arundinacea): Seed shall be 98% min. purity and 85% germination.
- B. Bermuda Grass (Cyanodon Dactylon): Seed shall be 98% min. purity and 85% germination.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Prepare the seed bed by thoroughly cultivating, discing and hand raking as necessary to produce a smooth even grade free from hollows or other inequalities. Before any seeding is attempted the soil must be in a well pulverized, smooth, friable condition of uniformly fine texture.

3.02 FERTILIZING AND LIMING

- A. Approximately two (2) days prior to the start of seeding operations, apply ground limestone at the rate of 20 pounds per 1000 sq. ft. of lawn area. Either in conjunction with the above operation or immediately afterwards apply the specified Commercial Fertilizer over all lawn areas at the rate of 30 pounds per 1000 sq. ft. of lawn area. Work limestone into the top 6 inches of ground and the fertilizer into the top 2 inches of ground.

- 3.03 When the grass has started to cover well (approximately 4 weeks after sowing seed) apply 1-1/2 pounds of Ammonium Nitrate to all lawn areas and immediately water using a fine spray. At the end of the maintenance period and prior to the final inspection apply 10 pounds of the specified Commercial Fertilizer per 1000 sq. ft. of lawn area and immediately water.

3.04 SEEDING

- A. Before any seeding is attempted the soil must be in a well pulverized, smooth, friable condition of uniformly fine texture. Lawn areas shall be seeded evenly with a mechanical spreader at the rate of 2 lbs. of seed per 1000 sq. ft., 50% in one direction and the remainder sown at right angles to first sowing. The seeded areas shall be lightly raked, rolled with a suitable weight roller and watered with a fine spray.

3.05 WATERING

- A. Soak soil to a minimum depth of 6 inches immediately after seeding. Do not wash away soil or seed. Keep all surfaces continuously moist thereafter until 30 days after the lawn has been seeded. Use fine spray nozzles only.

- 3.06 Fescue planting season shall be as approved by Engineer.

- 3.07 Bermuda Grass seeding shall be planted only between May 1 to September 1.

- 3.08 Maintenance of grass areas shall consist of watering, weeding, cutting, repair of any erosion and reseeding or resodding as necessary to establish a uniform stand of the specified grasses, and shall continue until final acceptance.

- 3.09 All grassed areas that do not show satisfactory growth within 15 days after sowing shall be re-sown and re-fertilized as directed until a satisfactory blanket is established. Approximately 3 weeks after sowing the last seed, but not before the seed has taken

hold and the grass is growing well, apply sulfate of ammonia or sodium nitrate at the rate of 300 pounds to the acre and water immediately. The lawns shall be considered established when they are reasonably free from weed, green in appearance and the specified grass is vigorous and growing well on each square foot of lawn area. Full coverage is required in 60 days.

- 3.10 All grassed areas shall be protected until accepted. All eroded and damaged areas, regardless of cause, shall be immediately repaired and reseeded. Protect lawn areas against traffic.
- 3.11 Grassed areas shall be covered evenly with a loose layer of clean wheat, rye, oats, Serecia Lespedeza or Coastal Bermuda Hay. Two tons of dry mulch shall be applied to each acre seeded. Hay shall be placed during calm weather with no wind.
- 3.12 As soon as the grass becomes established, a final inspection of the work will be made, provided a written request for such inspection is given to the Engineer. Satisfactory coverage is defined as coverage of the areas seeded with grass that is alive and growing, leaving no bare spots larger than one (1) square foot with 98% coverage.
- 3.13 When grassing is required between curbs and sidewalks, behind sidewalks in areas adjacent to private property, the Engineer may change the type of seeding to that required to match any type of grass which may be planted and growing on the adjacent lawn. No increase in the Contract Sum will be made for this substitution.
- 3.14 All temporary valves, cutoffs and piping shall be removed by the Contractor at final acceptance of the grassing.

**SECTION 03300
CONCRETE GENERAL**

PART 1 - GENERAL

1.01 QUALITY STANDARDS

A. Any procedure and material operation specified by reference to the following publications shall comply with the requirements of the current specification or standard:

1. American Society for Testing Materials (ASTM):

A185 Welded Steel Wire Fabric for Concrete Reinforcement.

A615 Deformed Billet-Steel Bars for Concrete Reinforcement.

C31 Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field.

C33 Specification for Concrete Aggregate.

C39 Compressive Strength of Molded Concrete Cylinders.

C94 Specification for Ready-Mixed Concrete.

C143 Slump of Portland Cement Concrete.

C150 Portland Cement

C172 Sampling Fresh Concrete

C192 Making and Curing Concrete Test Specimens in the Laboratory.

D1751 Preformed Expansion Joint Fillers for Concrete Paving.

2. American Concrete Institute:

ACI 301 Specification for Structural Concrete for Buildings.

ACI 305 Recommended Practice for Hot Weather Concreting.

ACI 318 Building Code Requirements for Reinforced Concrete.

ACI 350 Sanitary and Water Holding Structure.

1.02 QUALITY CONTROL

- A. The Contractor shall submit to the Engineer, for review a design mix for each class of concrete listed under CLASSES OF CONCRETE, prior to placing any concrete.
- B. Verification tests of design mixes and aggregates are required by the Engineer. Verification test specimens shall be made in accordance with ASTM C39 by an Independent Test Laboratory. Compressive strength shown by verification tests shall be at least fifteen percent in excess of the strengths listed under CLASSES OF CONCRETE. The Independent Testing Laboratory shall report the test results to the Engineer, in writing and shall note any failure to meet the specification.
- C. Verification tests of design mixes made not more than one year prior to the date of submittal will be acceptable provided they were made from materials identical to those to be used in the project.
- D. Mill Test: Conducted in accordance with ASTM A615 recommendations on each 15 tons, or less reinforcing shipped to the job. Two (2) copies of test to be sent to the Engineer.
- E. Inspection and Testing of Concrete:
 - 1. The cost of slump tests and sampling, molding, storing, materials, transporting concrete test specimens shall be paid by the Contractor. The laboratory or inspection agency shall be selected by the Owner. Costs of all laboratory testing services required because of failure to meet the requirements of these specifications shall be paid by the Contractor.
 - 2. One set of four (4) acceptance cylinders shall be prepared for each day's placing of each strength of concrete and if more than 50 cubic yards of concrete is placed in any day, there shall be an additional set of cylinders prepared for each 50 cubic yards placed or for any fraction thereof. One cylinder shall be broken at seven days and two at twenty-eight days, with one cylinder held in reserve.
 - 3. Responsibilities in Inspection:
 - a. Laboratory's Duties
 - 1. The reception and marking of specimens in the laboratory, laboratory curing, preparation for breaking and testing of cylinders shall be the responsibility of the laboratory and shall be performed by qualified laboratory personnel, observing all requirements of applicable ASTM Standards. Compression test specimens shall be tested in accordance with ASTM C39.
 - 2. Prior to the commencement of concrete work, the

laboratory shall provide initial instruction in the performance of sampling and testing duties for an employee designated by the Contractor and shall provide him with copies of all ASTM Standards pertinent to his duties.

b. Contractor's Duties:

1. The Contractor shall deliver to the laboratory all materials to be used in required testing. He shall supply wheelbarrows, shovels, mixing boards, shaded work space and similar equipment required for molding test cylinders. He shall provide stable, insulated storage boxes, equipped with thermostatically controlled heat, for storage of cylinders in the first 24 hours after molding.
2. He shall designate an employee, who alone shall perform all operations of sampling concrete, molding test specimens, protecting test specimens for the first 24 hours after molding, and packing and shipping of test specimens. The employee shall make a record of a slump test in connection with each truckload of concrete. The designated employee shall receive initial instruction in the performance of his sampling and testing duties from a representative of the testing laboratory and shall have available copies of all ASTM Standards pertinent to his duties. Sampling shall conform to ASTM C172. Slump tests shall conform to ASTM C143. Compression test specimens shall be made and cured in accordance with ASTM C31.
3. Each set of test cylinders shipped to the laboratory shall be accompanied by a report giving information as to location in the structure of concrete sampled, time and date of sampling, air temperature, slump, class designated nominal strength, air content if applicable, temperature of concrete, truck number, and time batched. Each report shall be signed by the employee making the test and by the Contractor or his representative, certifying that the test specimens have been made by the one designated, fully instructed employee and have been made in accordance with applicable standard specifications.
4. Should any concrete fail to meet the specified strength, have a slump in excess of that required by the design mix for each class of concrete listed under CLASSES OF CONCRETE, or result in voids, honeycombs or otherwise fail to meet the requirements, the Engineer may order the concrete removed, further tests made, or

other remedial measures taken, all at the Contractor's expense.

1.03 SHOP DRAWINGS

- A. After making his check the Contractor shall submit to the Engineer one (1) blue line copy of each of placing plans, bending details and bar lists covering all reinforcing steel.
- B. Full information for checking and for proper installation without reference to other drawings shall be included. At splices the amount of lap shall be shown. Location and arrangement of accessories shall be clearly shown. Elevations shall be drawn for all reinforced masonry and reinforced concrete walls to a scale no smaller than 1/4 inch = 1 foot.
- C. Work shall not proceed before the Contractor has received shop drawings approved by the Engineer. The Contractor shall be responsible for the conformation of all typical and special reinforcing steel details.
- D. Engineer's review is for conformance to the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for selecting fabrication processes, for techniques of assembly, and for performing his work in a safe manner.
- E. Proposed construction joint shall be clearly indicated on shop drawings and subject to approval of the Engineer.

1.04 INSPECTION

- A. The Contractor shall give the City and Design Engineer 24 hours advance notice before starting to place concrete in any portion of the structure to permit observation. An authorization of the Engineer shall be secured before concrete is placed. Any concrete placed in violation to this provision shall be replaced by new concrete if required by the Engineer.
- B. Prior to notification of the Engineer, the Superintendent shall personally inspect the work and verify that it is ready for observation.
- C. At the time of observation, all reinforcing in the area where concrete is to be poured shall be in place, tied and ready for the placement of concrete. All anchors, sleeves, inserts, etc., shall be securely held in position.

1.05 STORAGE

- A. Reinforcing steel delivered to the job and not immediately placed in forms shall be placed in racks or other supports at least eighteen (18) inches above ground.

PART 2 - MATERIALS

- 2.01 CEMENT: Portland cement shall conform to ASTM C150, Type I.
- 2.02 AGGREGATES
- A. Aggregates for standard weight concrete shall conform to ASTM C33, maximum size: 3/4 inch
- 2.03 WATER
- A. Mixing water shall be potable
- 2.04 REINFORCING STEEL
- A. Reinforcing bars shall be American manufactured conforming to the requirements of ASTM A615 "Deformed Billet Steel Bars for Concrete Reinforcement", Grade 60.
- B. Welded wire-fabric or cold-drawn wire for concrete reinforcement shall be of American manufacture and shall conform to the requirements of the ASTM A185 "Welded Steel Fabric for Concrete Reinforcement."
- C. Accessories shall conform to the requirements of C.R.S.I. Manual.
- 2.05 READY MIXED STRUCTURAL CONCRETE:
- A. Ready mix concrete shall be mixed and delivered in accordance with these specifications and requirements set forth in ASTM C94. In addition, these following conditions must be met:
1. Concrete shall be normal weight with an ultimate compressive strength at 28 days, and slump as follows:
 2. Air entrained concrete shall be used for all structural concrete with the air content not less than 3 percent and no more than 5 percent.
- B. Classes of Concrete:
- Class A f'c = 3000 psi Slump 4 inches ±1 inch
Class AA f'c= 4000 psi Slump 3 inches ±1 inch
Class B f'c = 5000 psi Slump 5 inches ±1 inch
- 2.06 EXPANSION JOINT MATERIAL
- A. Expansion joint material at slabs on grade shall be premolded asphalt saturated cellulose fiber or mineral strips conforming to ASTM D1751.
- 2.07 WALL TIES
- A. Ties shall be made with breakback ends or other means of removing the tie end to a depth of at least 1 inch from the concrete surface after the forms are

removed.

2.08 LIQUID FORM SEALER

- A. Form sealer shall be a standard product compatible with the finish required for exposed concrete and shall contain no paraffin oil or mineral oil.

PART 3 - FORMWORK

- A. Forms shall conform to the shapes, lines and dimensions of the members as indicated, and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be braced or tied together so as to maintain position and shape.
- B. Formwork shall be observed by the City and Design Engineer before pouring concrete. Before placing the reinforcement, surfaces of wood forms in contact with the concrete, unless lined, shall receive a thorough coating of form sealer. The Engineer shall have the right to reject any forms that do not appear to him to be sufficient as to alignment and of producing the required finished surface. Should misalignment of forms or screed, excessive deflection of forms or displacement of reinforcing occur during concrete placing, corrective measures shall be immediately made to the extent, if necessary, that placing operations shall be stopped and concrete removed from within forms. The surfaces to required dimensions and cross section. Exposed lines and surfaces shall not vary from dimensions shown on plans by more than 1/4 inch in twenty feet.
- C. Forms may be constructed of wood or metal. Earth forms for footings may be permitted if local conditions are favorable, and approved by the Engineer. Form work for exposed concrete shall be form grade plywood.
- D. Studs, waler, and ties shall be so spaced that the load of wet concrete will not stress ties beyond the printed working load recommended by the manufacturer not cause spans of form material to deflect from a true surface.
- E. The Contractor shall maintain a continuous check upon formwork during the placing of concrete. An instrument check shall be periodically made or "Tattle Tail" rods or other devices shall be used to detect any settlement in forms.
- F. Conduits in Concrete: Conduits shall not displace reinforcing steel from its intended position, nor impair the strength of the structure and should be isolated.
- G. The Contractor shall assume all responsibility for removal of formwork. Elevated concrete slabs shall attain 70% of the specified ultimate strength before removing the forms. After removing forms, slabs shall be reshored at mid-span and at all points under shores supporting forms for the work above. No floor shall be loaded in excess of the live load for which designed unless adequate shores are place beneath members supporting the concrete of load.

3.02 PLACING REINFORCING STEEL

- A. Reinforcement shall be shop fabricated, accurately positioned and secured with not less than 16 gauge annealed wire or suitable clips.
- B. No bars, partially embedded in concrete shall be field bent, unless noted otherwise.
- C. Reinforcing bars shall be accurately placed and secured in position by approved chairs, spacers or ties to maintain the position of the reinforcing steel prior to and during placing of concrete.
- D. Reinforcing steel support chairs and bolsters for use in concrete to be exposed shall have galvanized steel leg.
- E. No splices shall be made, except as shown on approved Shop Drawings or approved in writing by the Engineer.
- F. The placement of reinforcement shall be observed by the City and Design Engineer before pouring of concrete. Should there be any delay in the work, reinforcement previously placed shall be reinspected and cleaned if necessary before concrete placement is resumed.
- G. Metal reinforcement shall be protected by concrete cover. Where not otherwise shown, the thickness of concrete over the reinforcement shall be as follows:

| | |
|-----------------|----------------------------|
| Footings | 3" clear sides and bottom |
| Slabs | 3/4" clear, top and bottom |
| Beams | 2" clear, all around |
| Walls | 2" clear, both faces |
| Columns & Piers | 2" clear |
- H. All splicing or reinforcement not shown shall be approved by the Engineer. Splices shall not be made a point of maximum stress and shall provide sufficient lap to transfer the stress between bars by bond. Hook and bending details, column tie arrangements, etc., shall be as shown by the S.R.A.I. Manual or the ACI Detail Engineering Manual.
- I. Wire mesh reinforcing shall be placed one inch from top of concrete slabs on ground. Lap all joints 12 inches and extend mesh to within 1 inch of sides and ends of slabs.
- J. Wire brush all steel prior to placing concrete.

3.03 CONCRETE MIXING AND PLACING

- A. Ready-mix concrete shall conform to ASTM C94. Not more than one hour shall elapse between the time mixing water is added to the batch and the concrete is poured. No water shall be added on the job.

- B. No concrete shall be placed until all embedded items and reinforcing have been placed in the forms and observed by the Engineer. At least 24 hour notice shall be given the Engineer of an impending pour, so that he may observe the work, prior to placing.
- C. Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent segregation or loss of materials.
- D. Concrete shall be deposited in its final position to avoid segregations and separation do to rehandling or flowing. The placing shall be carried on at such a rate that concrete is at all times plastic and flows readily into the spaces between bars. When placing is once started, it shall be carried on as a continuous operation, until placement of that section is completed.
- E. Concrete shall be worked into and around bars and embedded items with spades, rods, trowels and vibrators, so as to produce a solid homogeneous mass, free of voids, pockets or honeycombs.
- F. Construction joints shall be installed and located as indicated. Where a joint occurs, the surface of the concrete shall be thoroughly cleaned and all laitance removed and shall be left rough or mechanically roughened, thoroughly wetted and slushed with a coat of neat cement grout immediately before placement of new concrete.
- G. All embedded items, including anchor bolts and dowels, shall be in place, preset and held in position, before any concrete is placed.
- H. No concreting shall be performed when ambient temperatures are below 40° F or if the temperature is predicted by the local U.S. Weather Bureau will fall below 40°F within 24 hours after the time of installation.
- I. No concrete shall be installed against frozen ground. All foundation cavities and slab areas that have frozen, shall be thoroughly clean of all loose earth prior to pouring concrete.
- J. All newly poured concrete shall be protected from freezing or near freezing weather during the cure period.
- K. Hot weather precautions shall be taken whenever the maximum air temperature exceeds 80°F during the day. Hot weather concreting shall be performed in accordance with ACI 305.

3.04 ANCHORAGE

- A. Slots, inserts, and connections elements for anchoring items to concrete shall be built into forms before placing concrete.

3.05 SLABS ON GRADE

- A. Concrete shall be compacted, screeded to grade, and prepared for the

specified finish. Slabs shall be placed in panels in alternate checkerboard pattern or in alternate lanes divided into panels. Each panel shall be approximately square terminated by slab joints.

- B. Contraction joints shall be true to line 1/8 inch wide, and of depth equal to approximately 1/4 of the slab thickness. Joints shall be sawed or formed.

3.06 CURING

- A. Provisions shall be made for maintaining concrete in a moist condition for at least 10 days after the placement of the concrete, or by one of the following methods:
 - 1. Spraying with water or ponding
 - 2. Using moisture retaining covers
 - 3. Concrete curing compound, W.R. Meadows CS-309 or Guardian Chemical Co., Master Builders or Triple-Cure by Cobra Chemicals.
- B. The spraying water shall be applied on unformed surfaces within one hour after the forms are stripped and the spraying shall be continuous. The moisture retaining cover shall be applied on unformed surfaces immediately after the concrete is finished. If there is any delay, the concrete shall be kept moist until the application is made. If the surfaces are formed, the forms shall be removed and the concrete sprayed lightly with water before the cover is applied.
- C. When concrete surfaces are to receive applied finishes of materials, all curing compounds shall be checked for compatibility with other material to be applied to the concrete surfaces before application.

3.07 CONCRETE FINISHES

- A. All poured joints, voids, honeycombs and other imperfections shall be patched within the same working day that forms are removed.
- B. Troweled Finish:
 - 1. Troweled finish shall be applied to the surface of all floors unless ceramic tile, quarry tile or pavers are called for on finish schedule.
 - 2. Floor slabs shall be screeded to an even surface by the use of straight-edge and screeding strips accurately set to the proper grade. The concrete shall be floated with a wood float in a manner which will compact it and produce a surface free from depressions or inequalities of any kind. Floors shall be level with a tolerance of 1/8 inch in 10 feet except where drains are indicated. After the concrete has hardened sufficiently to prevent fine materials from working to the top and has been allowed to stand until all water sheen has disappeared, it shall be steel troweled. Final troweling shall be done after the concrete is hard enough that no mortar accumulates on the

trowel and a ringing sound is produced as the trowel is drawn over the surface. The drying of the surface moisture before troweling shall proceed naturally and shall not be hastened by the dusting on of dry sand or cement.

- C. Non-slip Finish: All exterior platforms and step treads shall be made non-slippery by application at not less than 1/4 lb. per sq. ft. of aluminum oxide or emery aggregate graded from particles retained on a #50 mesh screen to particles passing an 1/8 inch screen placed during the finishing process. Abrasive aggregate shall be sprinkled by hand as soon as the freshly placed cement will support the weight of workmen and floated into the surface.
- D. Unfinished Slabs: Depressed slab areas to receive ceramic quarry tile or pavers shall be finished to remove all laitance and to leave a slightly roughened, surface to insure bond. The surface of the slab shall not vary in any direction more than 1/8 inch when tested with a ten foot straight edge. The straight edge shall be lapped one half its length as the test is being made.

3.08 CONCRETE FLOOR HARDENER

- A. All concrete floor slabs shall be cured with concrete floor hardener, "Clear Bond", as manufactured by Guardian Chemical, "Triple-Cure" by Cobra Chemicals, or "Seal tight Cs-309 by W.R. Meadows. The floor hardener shall be applied in strict accordance with the manufacturer's recommendations.
- B. Walks shall be tooled, full 1 inch deep into separate slabs as indicated. Surface edges of each slab shall be rounded to approximately 1/4 inch radius.
- C. Final finish shall be a medium or light broom finish and all tool marks completely removed.
- D. Expansion joints shall be placed a maximum 20 ft. intervals and at all intersections with steps, curbs other walks or abutting structures. Joints shall extend from the surface to the subgrade at right angles to the sidewalk.
- E. Expansion joint filler shall be 1/2 inch thick and as wide as the full width and depth of the sidewalk.

Section 653—Thermoplastic Traffic Stripe

653.1 General Description

This work includes furnishing and applying thermoplastic reflectorized pavement marking compound. Ensure that markings conform to Plan details and locations, these Specifications, and the Manual on Uniform Traffic Control Devices.

Thermoplastic traffic stripe consists of solid or broken (skip) lines, words, and symbols according to Plan color, type, and location.

653.1.01 Definitions

Thermoplastic Marking Compound: A compound extruded or mechanically sprayed on the pavement that cools to pavement temperature. When combined with glass spheres it produces a reflectorized pavement marking.

Short Lines: Crosswalks, stop bars, arrows, symbols, and crosshatching. Extrude short lines rather than spraying them on. Unless otherwise specified, spray all other lines.

653.1.02 Related References

A. Standard Specifications

[Section 652—Painting Traffic Stripe](#)

B. Referenced Documents

[QPL 46](#)

Federal Test Method Standard 141, Method 4252

ASTM D 1155

ASTM D 620

ASTM D 570

ASTM D 256

ASTM D 2240

ASTM E 28

ASTM 121

653.1.03 Submittals

Ensure that the producers of the thermoplastic compound and glass spheres furnish to the Department copies of certified test reports showing results of all tests specified in this Section. Also ensure that producers certify that the materials meet the other requirements of this Section by submitting copies of certification at the time of sampling. Final Acceptance, however, will be based on satisfactory test results from samples obtained by the Department before delivery.

653.2 Materials

A. General Characteristics of Thermoplastic

1. Deterioration

Use thermoplastic material with the following characteristics:

- a. Does not deteriorate upon contact with:
 - Pavement materials
 - Petroleum droppings from traffic
 - Chemicals, such as sodium chloride or calcium chloride, used to prevent formation of ice on roadways or streets
- b. Does not scorch, discolor, or deteriorate if kept at the manufacturer's recommended application temperature, or at least 375 °F (190 °C), for up to 4 hours.
- c. Has a temperature versus viscosity characteristic that remains constant from batch to batch through four re-heatings.

Section 653—Thermoplastic Traffic Stripe

2. Fumes

Use material that in the plastic state does not give off fumes that are toxic or harmful to persons or property.

B. Detailed Characteristics of Thermoplastic

1. Material Composition

Use material binder with the following characteristics:

- A mixture of synthetic resins, with at least one resin that is solid at room temperature, and high boiling point plasticizers
- A total binder content of 18 percent to 35 percent by weight
- A pigmented binder that is well-dispersed and free of dirt, foreign objects, or ingredients that cause bleeding, staining, or discoloration

The binder shall be Type A—alkyd. Ensure that at least 33% of the binder composition or at least 8% by weight of the entire material formulation is a maleic-modified glycerol ester of resin. Ensure that the finished thermoplastic pavement marking material is not adversely altered by contact with oily pavement materials or by contact from oil dropping onto the pavement surface from traffic.

Ensure that the filler has the following characteristics:

- White calcium carbonate or equivalent
- Compressive strength of 5,000 psi (34.5 MPa)

2. Suitability for Markings

Use thermoplastic material that is especially compounded for traffic markings and has the following characteristics:

- Prevents markings from smearing or spreading under normal traffic conditions at temperatures below 120 °F (49 °C)
- Gives a uniform cross section, with pigment evenly dispersed throughout the material
- Has a uniform material density and character throughout its thickness
- Allows the stripe to maintain its original dimensions and placement
- Ensures that the exposed surface is free from tack and is not slippery when wet
- Does not lift from the pavement in freezing weather
- Has cold ductility properties that permit normal movement with the road surface without chipping or cracking

3. Drying Time

When applied at a temperature range of 400 °F to 425 °F (204 °C – 218 °C) and a thickness of 1/8 in. to 3/16 in. (3 mm to 5 mm), the material shall set to bear traffic in a maximum of 2 minutes when the air temperature is 50 °F ± 3 °F (10 °C ± 2 °C) and shall set to bear traffic in a maximum of 10 minutes when the air temperature is 90 °F ± 3 °F (32 °C ± 2 °C).

4. Reflectorization

Ensure that during manufacturing, reflectorizing glass spheres were mixed into the compound to the following specifications:

- At least 16 percent by weight using glass spheres with a minimum refractive index of 1.65
- At least 25 percent by weight using glass spheres with a minimum refractive index of 1.50

C. Physical Requirements of Thermoplastic

1. Color

Confirm the color of thermoplastic as follows:

- a. White thermoplastic material contains at least 8 percent by weight titanium dioxide that meets the requirements of ASTM D 476, Type II, Rutile. The white thermoplastic material shall be pure white and free from dirt or tint. The material, when compared to the magnesium oxide standard using a standard color spectrophotometer according to ASTM D 4960, shall meet the following:

| Scale | Definition | Magnesium Oxide Standard | Sample |
|-------|-------------|--------------------------|---------|
| Rd | Reflectance | 100 | 75 min. |

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| | | | |
|---|---------------------|---|-------------|
| a | Redness-Greenness | 0 | -5 to + 5 |
| b | Yellowness-Blueness | 0 | -10 to + 10 |

Compare yellow material to match Federal Test Standard Number 595, Color 13538.

2. Color Retention

Use thermoplastic stripe tested for color retention as follows:

- a. Test specimens prepared from samples submitted according to ASTM D 620 by the Department Inspector.
- b. Use an ultraviolet light source as specified in the test procedure, or use a 275 watt sunlamp with a built-in reflector.
- c. Ensure that after 100 hours of exposure to the light source, the test specimens show no color change when compared to an unexposed specimen.

3. Water Absorption

Ensure that materials have no more than 0.5 percent by weight of retained water when tested by ASTM D 570, procedure (a).

4. Softening Point

Ensure that materials have a softening point of at least 175 °F (79 °C) as determined by ASTM E 28.

5. Specific Gravity

Ensure that the specific gravity of the thermoplastic compound at 77 °F (25 °C) is between 1.9 to 2.5.

6. Impact Resistance

Use material with an impact resistance of at least 10 in-lbs at 77 °F (1.13 N·m at 25 °C), tested as follows:

- a. Heat for 4 hours at 400 °F (204 °C).
- b. Cast into bars of 1 in² (625 mm²) cross sectional area, 3 in (75 mm) long.
- c. Place with 1 in (25 mm) extending above the vise in a cantilever beam (Izod type) tester using the 25 in-lbs (2.82 N·m) scale. This instrument is described in ASTM D 256.

7. Indentation Resistance

Measure the hardness by a Shore Durometer, Type A2, as described in ASTM D 2240. Maintain the temperature of the Durometer, 4.4 lb. (2 kg) load and the specimen at 115 °F (45 °C). Apply the Durometer and 4.4 lb. (2 kg) load to the specimen and the reading shall be between 50 to 75 units, after 15 seconds.

8. Low Temperature Stress Resistance

- a. Furnish sample test blocks as follows:
 - 1) Coat the samples using the same method as the planned installation of the compound.
 - 2) Coat the samples with at least 32 in² (206 mm²) of the compound.
- b. Have the samples tested as follows:
 - 1) Immerse a sample in cold water for one hour.
 - 2) Immediately place the sample in a freezer chest or other insulated cold compartment and maintain at a temperature of -20 °F (-29 °C) for 24 hours.
 - 3) After 24 hours, remove the sample and bring it to normal room temperature.

Following the test, confirm that the sample does not crack, flake, or fail to adhere to the substrate.

9. Reheating

Ensure that the compound does not break down, deteriorate, scorch, or discolor if held for 6 hours at the plastic temperature of 425 °F (218 °C); or if reheated up to the plastic temperature 4 times.

10. Abrasion Resistance

Have the material tested for abrasion resistance as follows:

- a. Ensure that the maximum loss of the material does not exceed 0.4 grams when subjected to 200 revolutions on a Taber Abraser at 77 °F (25 °C), using H-22 Calibrade wheels that are weighted to 500 grams.
- b. Keep the wearing surface wet with distilled water throughout the test.

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- c. Prepare the panel by forming a representative lot of material at a thickness of 0.125 in. (3.18 mm) on a 4 in (100 mm) square steel plate with a thickness of 0.050 ± 0.001 in ($1.27 \text{ mm} \pm 0.03 \text{ mm}$), on which a primer has been previously applied.

11. Yellowness Index

The white thermoplastic material shall not exceed a yellowness index of 0.12 according to AASHTO T 250.

12. Flowability

After heating the thermoplastic material for 240 ± 5 minutes at $425 \text{ }^\circ\text{F} \pm 3 \text{ }^\circ\text{F}$ ($218 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$) and testing the flowability, ensure that the white thermoplastic has a maximum of 21 percent residue according to AASHTO T 250.

13. Flowability-Extended Heating

After heating the thermoplastic material for 8.0 ± 0.5 hours at $425 \text{ }^\circ\text{F} \pm 3 \text{ }^\circ\text{F}$ ($218 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$), while stirring the last 6 hours and testing for flowability, ensure that the thermoplastic has a maximum percent residue of 28 according to AASHTO T 250.

14. Storage Life

The material shall meet the requirements of this specification for 1 year. Ensure that the thermoplastic melts uniformly with no evidence of skins or unmelted particles during the 1-year period.

D. Physical Requirements of Glass Spheres

1. Premixed Glass Spheres

Ensure that the compound has been manufactured with glass spheres in the proportion specified in [Subsection 653.2.B.4, "Reflectorization."](#) The glass spheres contained in the material shall meet the following requirements:

- a. Index of Refraction. Determine the index of refraction of the premixed glass spheres by the liquid immersion method at $77 \text{ }^\circ\text{F}$ ($25 \text{ }^\circ\text{C}$).
- b. Roundness. Ensure that the minimum percentages of premixed glass spheres are true spheres according to the following table:

| Percent of Premixed Glass Spheres That are True Spheres (when tested according to ASTM D 1155) | | |
|---|---------------------------------|---|
| Minimum Index of Refraction | Percent of Overall Beads | Percent of Beads Retained on any Sieve |
| 1.65 | At least 75% | At least 70% |
| 1.50 | At least 70% | At least 60% |

- c. Imperfections. Ensure that no more than 5 percent of the spheres show air inclusions, bubbles, lap lines, chill wrinkles, or other imperfections when viewed through a 60-power microscope in the refractive index liquid.
- d. Foreign Matter. Ensure that the quantity of foreign matter does not exceed 1 percent.
- e. Gradation. Have the beads tested using ASTM: D 1214 to ensure they have the following gradations:

| U.S. Sieve Standard Sieve Size | Percent Passing |
|---------------------------------------|------------------------|
| No. 16 (1.18 mm) | 100 |
| No. 30 (600 μm^*) | 60 to 90 |
| No. 50 (300 μm) | 15 to 40 |
| No. 80 (180 μm) | 0 to 10 |
| No. 100 (150 μm) | 0 to 5 |
| * μ = micro meter | |

- f. Chemical Resistance. Use material manufactured with glass spheres that withstand immersion in water and acids without corroding or etching, and withstand sulfides without darkening or decomposing.

Have the chemical resistance tested by placing a 3 g to 5 g sample in each of three glass beakers or porcelain dishes and immersing as follows:

- Cover the first with distilled water.

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- Cover the second with a 3N solution of sulfuric acid.
- Cover the third with a solution of 50 percent sodium sulfide, 48 percent distilled water, and 2 percent Aerosol 1B or similar wetting agent.

Ensure that after one hour no darkening, hazing, or other evidence of instability is evident when examined microscopically.

2. Drop-On Glass Spheres

Ensure that these spheres meet the requirements of [Subsection 652.2](#).

E. Requirements of Sealing Primer

Place the particular type of two-part epoxy binder-sealer at the application rate as recommended in writing by the thermoplastic material manufacturer.

653.2.01 Delivery, Storage, and Handling

Use material delivered in 50 lb (22.7 kg) unit cardboard containers or bags strong enough for normal handling during shipment and on-the-job transportation without loss of material.

Ensure that each unit container is clearly marked to indicate the following:

- Color of the material
- Process batch number or similar manufacturer's identification
- Manufacturer's name
- Address of the plant
- Date of manufacture

653.3 Construction Requirements

653.3.01 Personnel

General Provisions 101 through 150.

653.3.02 Equipment

Depending on the marking required, use hand equipment or truck-mounted application units on roadway installations.

A. Spray Application Machine

Ensure that each spray application machine is equipped with the following features:

- Parts continuously mix and agitate the material.
- Truck-mounted units for lane, edge, and center lines can operate at a minimum of 5 mph (8 kph) while installing striping.
- Conveying parts between the main material reservoir and the shaping die or gun prevent accumulation and clogging.
- Parts that contact the material are easily accessible and exposable for cleaning and maintenance.
- Mixing and conveying parts, including the shaping die or gun, maintain the material at the plastic temperature with heat transfer oil or electrical element controlled heat. Do not use an external source of direct heat.
- Parts provide continuously uniform stripe dimensions.
- Applicator cleanly and squarely cuts off stripe ends and applies skip lines. Do not use pans, aprons, or similar appliances that the die overruns.
- Parts produce varying widths of traffic markings.
- Applicator is mobile and maneuverable enough to follow straight lines and make normal curves in a true arc.

B. Automatic Bead Dispenser

Apply glass spheres to the surface of the completed stripe using a dispenser attached to the striping machine to automatically dispense the beads instantaneously upon the installed line. Synchronize the glass sphere dispenser cutoff with the automatic cutoff of the thermoplastic material.

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C. Special Kettles

Use special kettles for melting and heating the thermoplastic material. Kettles equipped with automatic thermostatic control devices provide positive temperature control and prevent overheating. Ensure that the applicator and kettles are equipped and arranged according to the requirements of the National Fire Underwriters.

D. Hand Equipment

Use hand equipment for projects with small quantities of lane lines, edge lines, and center lines, or for conditions that require the equipment. Use hand equipment approved by the Engineer.

Ensure that hand equipment can hold 150 lbs (68 kg) of molten material and is maneuverable to install crosswalks, arrows, legends, lane, edge, and center lines.

E. Auxiliary Vehicles

Supply the necessary auxiliary vehicles for the operation.

653.3.03 Preparation

General Provisions 101 through 150.

653.3.04 Fabrication

General Provisions 101 through 150.

653.3.05 Construction

A. General Application

Thoroughly clean pavement areas to be striped. Use hand brooms, rotary brooms, air blasts, scrapers, or other approved methods that leave the pavement surface clean and undamaged. Take care to remove all vegetation and road film from the striping area. All new Portland Cement Concrete pavement surfaces shall be mechanically wire brushed or abrasive cleaned to remove all laitance and curing compound before being striped.

Lay stripe with continuous uniform dimensions.

Apply the type of stripe at each location according to the Plans, using one of the following methods:

- Spray techniques
 - Extrusion methods wherein one side of the shaping die is the pavement, and the other three sides are contained by or are part of the suitable equipment to heat and control the flow of material.
1. Temperature
Apply thermoplastic traffic stripe only when the pavement temperature in the shade is above 40 °F (4 °C).
To ensure optimum adhesion, install the thermoplastic material in a melted state at the manufacturer's recommended temperature but not at less than 375 °F (190 °C).
 2. Moisture
Do not apply when the surface is moist. When directed by the Engineer, perform a moisture test on the Portland cement concrete pavement surface. Perform the test as follows:
 - a. Place approximately 1 yd² (1m²) of roofing felt on the pavement surface.
 - b. Pour approximately 1/2 gallon (2 L) of molten thermoplastic onto the roofing felt.
 - c. After 2 minutes, lift the roofing felt and inspect to see if moisture is present on the pavement surface or underside of the roofing felt.
 - d. If moisture is present, do not proceed with the striping operation until the surface has dried sufficiently to be moisture free.
 3. Binder-Sealer
To ensure optimum adhesion, apply a binder-sealer material before installing the thermoplastic in each of the following cases:
 - Extruded thermoplastic
 - Where directed by the Engineer for sprayed thermoplastic
 - Old asphaltic concrete pavements with exposed aggregates

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- Portland cement concrete pavements as directed by the Engineer

Ensure that the binder-sealer material forms a continuous film that mechanically adheres to the pavement and dries rapidly. Use a binder-sealer currently in use and recommended by the thermoplastic material manufacturer according to [QPL 46](#).

To ensure optimum adhesion, apply a two-part epoxy binder-sealer on all Portland cement concrete pavements for either sprayed or extruded thermoplastic material.

Apply the epoxy binder-sealer immediately in advance of, but concurrent with, the application of the thermoplastic material. Apply in a continuous film over the pavement surface.

4. Bonding to Old Stripe

The old stripe may be renewed by overlaying with new material. Ensure the new material bonds to the old line without splitting or cracking.

5. Offset from Construction Joints

Off-set longitudinal lines at least 2 in (50 mm) from construction joints of Portland cement concrete pavements.

6. Crosswalks, Stop Bars, and Symbols

Make crosswalks, stop bars, and symbols at least 3/32 in (2.4 mm) thick at the edges and no more than 3/16 in (4.8 mm) thick at the center.

7. Film Thickness

a. Maintain the following minimum average film thicknesses on all open graded asphalt concrete friction courses:

- 0.120 in (3.0 mm)* for lane lines
- 0.090 in (2.3 mm)* for edge lines
- 0.150 in (3.8 mm)* for gore area lines

b. Maintain the following minimum average film thicknesses on all other pavement types:

- 0.090 in (2.3 mm)* for lane lines
- 0.060 in (1.5 mm)* for edge lines
- 0.120 in (3.0 mm)* for gore area lines

(See below for ‘*’ reference.)

Compute the minimums by the amount of material used each day, as follows:

| | |
|---------------------------------|--|
| (For 5 in wide stripe) | |
| * Average Film Thickness (in) = | $[(\text{lbs used}) \div (\text{total linear feet})] \times 0.236$ |
| (For 125 mm wide stripe) | |
| *Average Film Thickness (mm) = | $[(\text{kg used}) \div (\text{total linear meters})] \times 4.0$ |
| (For 10 in wide stripe) | |
| * Average Film Thickness (in) = | $[(\text{lbs used}) \div (\text{total linear feet})] \times 0.118$ |
| (For 250 mm wide stripe) | |
| * Average Film Thickness (mm) = | $[(\text{kg used}) \div (\text{total linear meters})] \times 2.0$ |

8. Glass Spheres

- Apply glass spheres to installed stripe surface at a minimum rate of 14 lbs of spheres to each 100 square feet ((700 g/m²) of thermoplastic material.
- Apply the glass sphere top-coating with a pressure-type gun specifically designed for applying glass spheres that will embed at least one-half of the sphere’s diameter into the thermoplastic immediately after the material has been applied to the pavement.

B. Removing Existing Stripe

Remove existing stripe according to [Section 656](#).

Remove 100 percent of existing traffic stripe from:

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- Portland cement concrete pavement where the new stripe will be placed at the same location as the existing marking
- Pavement where the new stripe will be placed at a different location from the existing markings

C. Tolerance and Appearance

No traffic stripe shall be less than the specified width and shall not exceed the specified width by more than 1/2 in (13mm). The length of the 10 ft (3 m) segment for skip stripe and the 30 ft (9 m) gap between segments may vary plus or minus 1 ft (300 mm). The alignment of the stripe shall not deviate from the intended alignment by more than 1 in (25 mm) on tangents and on curves up to and including 1 degree (radius of 1745 m or greater). On curves exceeding 1 degree (radius less than 1745 m), the alignment of the stripe shall not deviate from the intended alignment by more than 2 in (50 mm).

Stop work when deviation exceeds the above dimensions, and remove the nonconforming stripe.

653.3.06 Quality Acceptance

Segments of the thermoplastic traffic stripe that have been placed according to the Plans and Specifications may be accepted 30 days after the required work is complete in that segment.

If thermoplastic traffic stripe fails to meet Plan details or Specifications or deviates from stated dimensions, correct it at no additional cost to the Department. If removal of pavement markings is necessary, perform it according to Section 656 and place it according to this Specification. No additional payment will be made for removal and replacement of unsatisfactory striping.

653.3.07 Contractor Warranty and Maintenance

After segments are accepted, the Contractor will be relieved of maintenance on those segments.

653.4 Measurement

When stripe will be paid for by the square yard (meter), the actual number of square yards (meters) painted will be measured. The space between the stripes will be included in the overall measurement.

Linear measurements may be made by electronic measuring devices attached to a vehicle.

Thermoplastic traffic stripe, complete in place and accepted, is measured as follows:

A. Solid Traffic Stripe

Stripe is measured by the linear foot (meter), linear mile (kilometer), or square yard (meter). Breaks or omissions in solid lines or stripes at street or road intersections are not measured for payment.

B. Skip Traffic Stripe

Skip stripe is measured by the gross linear mile (kilometer) as specified. The unpainted space between the painted stripes is included in the overall measurement if the Plan ratio of one to three (10 ft [3 m] segment and 30 ft [9 m] gap or other patterns as designated on the Plans) remains uninterrupted. Measurement begins and ends on a stripe.

C. Words and Symbols

Each word or symbol complete according to Plan dimensions is measured by the Unit.

653.4.01 Limits

General Provisions 101 through 150.

653.5 Payment

Payment is full compensation for the Work under this section, including:

- Cleaning and preparing surfaces
- Furnishing all materials
- Applying, curing, and protecting stripe
- Protecting traffic, including providing necessary warning signs
- Furnishing tools, machines, and other equipment necessary to complete the Item

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Measurement and payment for removing pavement markings will be according to [Section 656](#) when shown in the Proposal as a payment Item. Otherwise, removal will not be paid for separately, but will be included in the payment for other Work under this section.

Payment will be made under:

| | | |
|--------------|--|-----------------------------------|
| Item No. 653 | Thermoplastic solid traffic stripe, __ in (mm), (color) | Per linear foot (meter) |
| Item No. 653 | Thermoplastic solid traffic stripe, __ in (mm), (color) | Per linear mile (kilometer) |
| Item No. 653 | Thermoplastic skip traffic stripe, __ in (mm), (color) | Per gross linear foot (meter) |
| Item No. 653 | Thermoplastic skip traffic stripe, __ in (mm), (color) | Per gross linear mile (kilometer) |
| Item No. 653 | Thermoplastic pavement markings, words, and symbols (color), type _____ | Per each |
| Item No. 653 | Thermoplastic traffic stripe | Per square yard (meter) |

653.5.01 Adjustments

General Provisions 101 through 150.