To: Parties Interested In RFB2020-12
From: Misty Landers
Date: November 13, 2019
Re: RFB2020-12 – Parkway Extension-Phase 2 Improvements For The Park 53 Industrial and Technology Complex, Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Authority 2017 OneGeorgia #18gq-007-3-4886 project

RFB2020-12 is attached for your consideration. Anyone accessing this Request for Bid from the Barrow County web site, www.barrowga.org, is responsible to insure the latest documents are in their possession including any addenda. All addenda, questions and answers will be posted on this site. This site should be visited frequently to insure an awareness of any updates.

Please insure bids are submitted exactly as specified in the RFB. If you have any questions, please submit them in writing as called for in the RFB.

Thank you.
REQUEST FOR BID
RFB2020-12

PARKWAY EXTENSION–PHASE 2 IMPROVEMENTS
FOR THE PARK 53 INDUSTRIAL AND TECHNOLOGY
COMPLEX
Barrow County 2016 ARC #16-arc-007 and the
Winder-Barrow Industrial Building Authority 2017
OneGeorgia #18-gq-007-3-4886 project

BARROW COUNTY, GEORGIA

November 13, 2019
REQUEST FOR BID
RFB2020-12
PARKWAY EXTENSION – PHASE 2 IMPROVEMENTS
FOR THE PARK 53 INDUSTRIAL AND TECHNOLOGY COMPLEX
Barrow County 2016 ARC #16-arc-007 and the
Winder-Barrow Industrial Building Authority 2017
OneGeorgia #18-gq-007-3-4886 project
BARROW COUNTY, GEORGIA

Date: November 13, 2019

PURPOSE:
The purposes of this request are: 1) to provide interested contractors with sufficient information to enable them to submit a uniform bid for the County’s review; and 2) to set forth a systematic method that will be fair and impartial to all parties concerned and to generate a response that can be equally evaluated by the County. This RFB is complex and requires your immediate and careful attention. This bid shall be evaluated and governed according to the Barrow County Purchasing Policy.

GENERAL:
Barrow County, Georgia and the Winder-Barrow Industrial Authority (Owners) is in the process of securing sealed bids for Parkway Extension – Phase 2 Improvements for The Park 53 Industrial and Technology Complex, Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18-gq-007-3-4886 project. This project involves road construction to extend the public access road to Park 53. Special attention should be given to the Schedule and Conditions referenced below.

Regular and Uniform Proposal: Each contractor must comply with all requirements for a regular bid as directed or required by this notice. Notice is hereby given to all contractors that if their proposals are defective or irregular, the same may be rejected immediately. To facilitate comparative analysis and evaluation of bids, it is desired that a uniform format be employed in structuring each bid. The required format will coincide with specifications given later in this notice. The contractor’s degree of compliance with the requirements of this notice will be a factor in the subsequent evaluation and award of contract for the project. All instructions are to be considered an integral part of this RFB.

Firm Price: Prices quoted by contractor shall be firm prices, and not subject to increase during the schedule hereinafter set-forth and shall not include Federal or State Tax. All prices shall be for delivery, our destination, F.O.B. freight prepaid Winder, Georgia, unless otherwise shown. Firm prices shall include all associated costs as defined in the Specifications.

Liquidated Damages: PROJECT COMPLETION WILL BE 180 DAYS FROM DATE OF THE NOTICE TO PROCEED. Liquidated damages of One Hundred Fifty Dollars ($150.00) per day will be assessed for each day after completion date until project is completed.

Security: Accompany bid with a bid security in the amount of five percent (5%) of the bid. The successful bidder will be required to submit to Barrow County a performance bond and a payment bond in the amount equal to one hundred percent (100%) of the total contract amount. Surety companies executing Bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in Georgia. Only Barrow County bond forms will be accepted.
INQUIRIES: Contractors shall not contact any members, or employees, of the Barrow County Board of Commissioners or any Barrow County Elected Officer, or employees of Barrow County Elected Officers regarding this RFB, bid evaluation, or selection process from the time the RFB is issued until the time a notification of intent to award is announced. Questions relating to this RFB must be submitted in writing to: Misty Landers, Finance Department (email: mlanders@barrowga.org). The deadline for answering questions related to this RFB shall be 12:00 noon (local time) December 3, 2019. All questions submitted in writing, in a timely manner prior to the deadline will be compiled and answered in writing. All questions submitted in writing will be addressed and posted as an Addendum on the Barrow County website (www.barrowga.org).

SEALED BID: An original (un-bound) and four copies of the bid must be submitted in a sealed envelope/package, addressed to Owner. Each sealed envelope/package containing a bid must be plainly marked on the outside as “RFB2020-12 – Parkway Extension – Phase 2 Improvements For The Park 53 Industrial and Technology Complex, Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18gg-007-3-4886 project”. If the bid is forwarded by mail, the sealed envelope/package containing the bid must be enclosed in another envelope/package to the attention of the Owner at the address previously given and also marked on the outside as “RFB2020-12 – Parkway Extension – Phase 2 Improvements For The Park 53 Industrial and Technology Complex, Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18gg-007-3-4886 project”. The Owner will not be responsible for late mail deliveries, and no bid will be accepted if received after the time as stipulated by this RFB. No bid may be withdrawn or modified in any way after the deadline for the RFB opening. FAILURE TO COMPLY WITH THE ABOVE INSTRUCTIONS WILL RESULT IN DISQUALIFICATION.

EVENTS: Sealed bids will be accepted no later than 5:00 p.m. (local time) Monday, December 16, 2019. Any bid received after said time and date will not be considered by Owner. Bids will be opened in the Conference Room on the Main Floor at 30 North Broad Street at 2:00 p.m. (local time), Tuesday, December 17, 2019. Bids will be reviewed and a recommendation will be presented to the Barrow County Board of Commissioners within sixty (60) days of bid opening.

BIDS SHALL BE SUBMITTED TO:
Barrow County Board of Commissioners
County Clerk’s Office
30 North Broad Street
Winder, GA 30680

INSURANCE REQUIREMENTS: The contractor selected for this project will be required to meet the insurance requirements stipulated in the Barrow County Construction Agreement.

CONSTRUCTION AGREEMENT: All submitting contractors are required to execute the Construction Agreement included in this package to indicate the willingness to comply with all terms of the Construction Agreement and to submit the executed Construction Agreement with the bid. Upon award of the Project to the winning contractor, the County will execute the Construction Agreement. Please be advised that the contractor’s execution of the Construction Agreement prior to the award of the Project does not constitute the acceptance of an offer by the County or otherwise bind the County in any way until such time as the County executes the Construction Agreement. Exhibits E, G.1, G.2, J, and Q to the Construction Agreement must be executed and submitted with the Construction Services
Agreement and submitted with your bid (please leave date and amount of Agreement blank). Exhibits D.1 and D.2 will be executed after the project is awarded. Pursuant to O.C.G.A. § 13-10-91(b)(1), Exhibit G.1 must be fully executed and returned with the proposal. The County is unable to review the proposal without this Exhibit G.1.

**FORMAT:** An original (un-bound) and four (4) copies of the bid are to be submitted. Each should include a cover page which should identify the RFB number, title, and the name of the company submitting the bid.

It is the responsibility of each contractor to ensure that all information in the bid is easily readable by Owner. Owner, at its sole discretion, may reject any bid which is unclear in any way.

**DOCUMENTS:** The following are included in this Request for Bids:

- Memo (1 Page)
- Request for Bid (5 Pages)
- Contract Documents and Technical Specifications (303 pages)
- Construction Agreement (78 Pages)
- Bid Bond (Security) (2 pages)
- Barrow County Ethics Policy (30 Pages)

**DELIVERABLES:** The following are required in bid submittals:

- Bid Form/Bid Schedule (9 pages total) (Submit One Original and Four Copies)
- Bid Bond (Security) (Use Barrow County Form Only)
- Executed Construction Agreement (As Stated Earlier)

**RIGHT TO SUBMITTED MATERIALS:** All responses, inquires, or correspondence relating or in reference to this schedule, exhibit, and other documentation by the bidding contractor shall be properly identified with their name and will become the property of the Owner when received.

**EVALUATION AND SELECTION:** Bids will be reviewed and one bid will be selected that, in the opinion of the Owner, is the lowest responsive and responsible bidder. Barrow County reserves the right to reject any and all bids submitted, or where it may serve the best interest of the County, to request additional information or clarification from those submitting bids. The County, in its sole discretion, also reserves the right to waive any formalities or technicalities relative to any or all bids. Where two or more contractors are deemed equal, the County reserves the right to make the award to one of the contractors. At the County’s discretion, presentations may be requested as part of the evaluation process. Barrow County reserves the right to retain all bids submitted.

There is no expressed or implied obligation for Barrow County to reimburse any contractor for any expense incurred in preparing or presenting a bid in response to this RFB.

**ASSIGNMENT OF CONTRACTUAL RIGHTS:** It is agreed that the bidding contractor selected will not assign, transfer, convey, or otherwise dispose of a contract that results from this invitation or his right, title, or interest in or to the same, any part thereof, without written consent by the Owner.
**WARRANTY:**
The contractor selected for this project will be required to provide the warranty of goods and services stipulated in the Barrow County Construction Agreement attached hereto and incorporated herein by reference.

**FEDERAL AND STATE REQUIREMENT:**
Nondiscrimination: The County, in accordance with Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that they will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 23 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, sex, age, or handicap/disability in consideration for an award.

All contracts are subject to Federal and State contract provisions prescribed by the Appalachian Regional Commission and the Georgia Department of Community Affairs. This project is covered under the requirements of CFR 200 for Procurement. This project also abides by the following laws as they pertain to DCA Assisted Projects: Title VI of the Civil Rights Act of 1964; Section 109 of the Housing and Community Development Act of 1974, Title 1; Section 104(b)(2) of the Housing and Community Development Act of 1974; Section 504 of the Rehabilitation Act of 1973 as amended; Title II of the Americans with Disabilities Act of 1990 (ADA); and the Architectural Barriers Act of 1968.
CONTRACT DOCUMENTS & TECHNICAL SPECIFICATIONS

PARKWAY EXTENSION – PHASE 2 IMPROVEMENTS
FOR THE PARK 53 INDUSTRIAL AND TECHNOLOGY COMPLEX
FOR THE WINDER-BARROW INDUSTRIAL BUILDING AUTHORITY
AND BARROW COUNTY BOARD OF COMMISSIONERS

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BID FORM

Parkway Extension – Phase 2 Improvements
For The Park 53 Industrial and Technology Complex
for the
Barrow County Board of Commissioners
and the Winder-Barrow Industrial Building Authority

THIS BID IS SUBMITTED TO:

Winder-Barrow Industrial Building Authority
and Barrow County Board of Commissioners
30 North Broad Street
P. O. Box 456
Winder, GA 30680
(Hereinafter called "Owner"

THIS BID IS SUBMITTED BY:

(Name)
(Address)

(Telephone) (Hereinafter called "Bidder")

BIDDER, in compliance with the Advertisement for Bids for the construction of this project, having examined the Drawings and Specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials and supplies, and to construct the project in accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the price(s) stated below. This price(s) is to cover all expenses including overhead and profit incurred in performing the Work required under the CONTRACT DOCUMENTS, of which this proposal is a part.
The Contractor is directed to Section 01025 “Measurement and Payment” for the methods and limits for payments to the Contractor for the pay items listed below.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
<th>Est. No. of Units</th>
<th>Unit Price Bid</th>
<th>Total for Item</th>
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<td>163-0300</td>
<td>Construction Exit</td>
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<td>167-1000</td>
<td>Water Quality Monitoring and Sampling</td>
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<td>8</td>
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<td>210-0100</td>
<td>Grading Complete</td>
<td>LS</td>
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<td>310-5060</td>
<td>Graded Aggregate Base Course, 6 Inch, Including Material (Curb &amp; Gutter)</td>
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<td>Concrete Curb &amp; Gutter, 6 IN X 30 IN, Type 2</td>
<td>LF</td>
<td>2,500</td>
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</tbody>
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<th>Total for Item</th>
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<td>668-1100</td>
<td>Catch Basin, Group 1</td>
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<td>668-1110</td>
<td>Catch Basin, Group 1, Additional Depth</td>
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<td>668-4300</td>
<td>Storm Sewer Manhole, Type 1</td>
<td>EA</td>
<td>2</td>
<td>Dollars and Cents</td>
<td>(Unit Price in Words)</td>
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# BID SCHEDULE

Parkway Extension – Phase 2 Improvements  
for the Park 53 Industrial and Technology Complex  
for the  
Winder-Barrow Industrial Building Authority  
and Barrow County Board of Commissioners

The Contractor is directed to Section 01025 “Measurement and Payment” for the methods and limits for payments to the Contractor for the pay items listed below.

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<th>Unit Price Bid</th>
<th>Total for Item</th>
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<tr>
<td>700-6910</td>
<td>Permanent Grassing</td>
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<td>716-2000</td>
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<td>Water Distribution System</td>
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<td>02660.01</td>
<td>12” dia. DIP Waterline</td>
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<td>02660.04</td>
<td>12” dia. Restrained Joints, by field order only</td>
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</tbody>
</table>
BID SCHEDULE

Parkway Extension – Phase 2 Improvements
for the Park 53 Industrial and Technology Complex
for the
Winder-Barrow Industrial Building Authority
and Barrow County Board of Commissioners

The Contractor is directed to Section 01025 “Measurement and Payment” for the methods and limits for payments to the Contractor for the pay items listed below.

Total Amount Base Bid:  $___________________________________________

___________________________________________

(Price in Words)

NOTE: Amounts shall be shown in words and figures; the amount written in words shall take precedence.

MANDATORY ALTERNATE BID ITEMS

<table>
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<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
<th>Est. No. of Units</th>
<th>Unit Price Bid</th>
<th>Total for Item</th>
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BID SCHEDULE

Parkway Extension – Phase 2 Improvements for the Park 53 Industrial and Technology Complex for the Winder-Barrow Industrial Building Authority and Barrow County Board of Commissioners

The Contractor is directed to Section 01025 “Measurement and Payment” for the methods and limits for payments to the Contractor for the pay items listed below.

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" from the OWNER and to fully complete WORK within a total construction time of sixty (60) consecutive calendar days of the date specified in this "Notice to Proceed".

BIDDER acknowledges receipt of the following addenda:

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<th>Addendum No.</th>
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BIDDER agrees to perform all of the construction of the project complete with appurtenances and accessory work described in the Specifications and shown on the Drawings for the above scheduled price(s).

The above scheduled price(s) shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

BIDDER understands that OWNER reserves the right to reject any or all bids and to waive any informalities in the bidding.

BIDDER agrees that his bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving bids.
The Contractor is directed to Section 01025 “Measurement and Payment” for the methods and limits for payments to the Contractor for the pay items listed below.

Upon receipt of the written notice of the acceptance of this bid, BIDDER will execute the formal Contract attached within ten (10) days and deliver a surety bond or bonds, as required by the General Conditions. The bid security attached in the sum of five (5%) percent of the total bid is to become the property of the OWNER in the event the Contract and bond are not executed within the time set forth, as liquidated damages for the delay and additional expense to the OWNER caused thereby.

Respectfully Submitted:

Name: __________________________________________________________

Address: ________________________________________________________

Phone No.: ______________________________________________________

Fax No.: _________________________________________________________

Email Address.: __________________________________________________

Dun & Bradstreet Data Universal Numbering System (DUNS) No: _____________

FEDERAL TAX NO. OR SOCIAL SECURITY NO.: ____________________________

Signature of Principal: ______________________________________________

Title: _____________________________________________________________

Date: _____________________________________________________________

Telephone: _________________________________________________________

ATTEST:

Signature: _________________________________________________________

Corporate Secretary/Partner/Notary (SEAL)

Name: (Please type) _________________________________________________
BID SCHEDULE

Parkway Extension – Phase 2 Improvements
for the Park 53 Industrial and Technology Complex
for the
Winder-Barrow Industrial Building Authority
and Barrow County Board of Commissioners

The Contractor is directed to Section 01025 “Measurement and Payment” for the methods and limits for payments to the Contractor for the pay items listed below.

NOTE: Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a Notary.

END OF SECTION
SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes the methods by which measurement will be made of the quantities for which payment will be made for the PROJECT.

B. The project is to be bid as one (1) contract.

1.02 MEASUREMENT OF WORK

A. WORK shall be measured by the ENGINEER or his representative, with assistance from the CONTRACTOR prior to preparation of a payment request by the CONTRACTOR.

B. Unit quantities that are measured in place shall be measured monthly. The CONTRACTOR shall give the ENGINEER a minimum of two days notice for making all required measurements.

C. Materials that must be measured as delivered shall be measured at the time of delivery by the ENGINEER or his representative; the CONTRACTOR shall provide sufficient advance notice so that such measurements can be made.

D. WORK completed shall be measured for completion against the schedule of values provided by the CONTRACTOR in accordance with the General Conditions. Related work necessary for a complete and operational job, such as relocation of mail boxes, removal of trees, relocation of utilities, field engineering, clearing and grubbing, traffic control, etc., not specifically identified as a pay item shall be included in the unit price bid. No additional payments will be made for such activities.

1.03 PROGRESS PAYMENTS

A. Progress payments shall be based on the quantity of units installed.

B. All items of WORK not specifically listed in the Bid Schedule shall be considered incidental to the construction, and the cost of all such work and material shall be included in the prices bid for various items listed.

C. All items listed for measurement and payment shall include all machinery, plant, materials and labor, etc., to successfully and satisfactorily complete WORK specified.

D. Payment: The CONTRACTOR will receive payment only for the items listed in the Bid Schedule of his contract, and no separate payments will be made for the work under any section of the CONTRACT DOCUMENTS except as provided for in the Bid Form. Where measurements are required to be made by the ENGINEER, for the payment of a pay item, the failure of the CONTRACTOR to give the adequate notification or failure of
the CONTRACTOR to give the ENGINEER assistance for the measurement shall result in the forfeiture of payment for the work or item which was not measured.

E. WORK to be paid for as a "Lump Sum" shall be measured for completion against the "Schedule of Values" provided by the CONTRACTOR. The "Schedule of Values" shall be submitted at the preconstruction conference and shall include quantities and prices of items aggregating the total "Lump Sum" and will subdivide the work into component parts in sufficient detail to serve as the basis for progress payments during construction.

PART 2 PRODUCTS

2.01 STORED MATERIALS

Partial payment shall be made for approved materials stored at the project site, provided invoices for said materials are furnished in accordance with payment request submittal.

PART 3 EXECUTION

3.01 CONSTRUCTION EXIT (SECTION 163)

Construction exits are measured per each which will include all work necessary to construct the exit including the required geotextile fabric placed beneath the aggregate.

Construction exits are paid for per each. Payment is full compensation for all materials including the required geotextile, construction, and removal.

3.02 CONSTRUCT AND REMOVE TEMPORARY SEDIMENT TRAP (SECTION 163)

Sediment traps are measured for payment by the entire structure complete, including construction, maintenance, and removal. Measurement also includes: earthwork, drainage, spillways, baffles, rip rap, and final cleaning to remove the basin.

Sediment traps, measured according to the above, are paid for by the unit, per each, for the type specified on the Plans. Price and payment are full compensation for work and supervision to construct, and remove the sediment trap, including final clean-up.

3.03 CONSTRUCT AND REMOVE INLET SEDIMENT TRAP (SECTION 163)

Inlet sediment traps, regardless of the material selected, are measured per each which includes all work necessary to construct the trap including any incidentals and providing the excavated area for sediment storage.

Inlet sediment traps are paid for per each. Payment is full compensation for all materials, construction, and removal.

3.04 MAINTENANCE OF TEMPORARY SILT FENCE, TYPE S (SECTION 165)

Maintenance of temporary silt fence, Type NS or S, is the actual linear feet of silt fence, measured in place, where sediment is removed.
Maintenance of temporary silt fence, Type NS or S, is paid for at the contract unit price bid per linear foot.

3.05 MAINTENANCE OF CONSTRUCTION EXIT (SECTION 165)

Maintenance of construction exit at the location specified on the Plans, or as directed by the Engineer is measured per each.

Maintenance of the construction exit at the location specified on the Plans or as added by the Engineer is paid for at the contract unit price per each.

3.06 MAINTENANCE OF INLET SEDIMENT TRAP (SECTION 165)

Maintenance of inlet sediment trap at the location specified on the Plans, or as added by the Engineer is measured per each.

Maintenance of the inlet sediment trap at the location specified on the Plans or at the location specified by the Engineer is paid for at the contract unit price per each.

3.07 MAINTENANCE OF TEMPORARY SEDIMENT TRAP (SECTION 165)

Maintenance of temporary sediment traps as specified on the Plans, is measured as a single unit.

Maintenance of temporary sediment traps as specified on the Plans is paid for at the contract unit price bid per each.

3.08 WATER QUALITY MONITORING AND SAMPLING (SECTION 167)

Water Quality Monitoring and Sampling are measured per each. When the monitoring location is receiving water, the upstream and downstream samples constitute one sample. When the monitoring location is an outfall, a single outfall sample constitutes one sample.

Payment for Water Quality Monitoring and Sampling will be made as follows: Water Quality Monitoring and Sampling per each is full compensation for meeting the requirements of the monitoring sections of the NPDES permit and Specification Section 167, obtaining samples, analyzing samples, any and all necessary incidentals, and providing results of turbidity tests to the Engineer, within the time frame required by the NPDES Infrastructure permit, and Specification Section 167. This item is based on the rainfall events that require sampling as described in Part IV.D.5 of the permit. Barrow County will not pay for samples taken and analyzed for rainfall events that are not qualifying events as compared to the daily rainfall data supplied by the Worksite Erosion Control Supervisor.

3.09 WATER QUALITY INSPECTIONS (SECTION 167)

Water Quality Inspections in accordance with the inspection and reports sub-sections will be measured for payment by the month up to the time the Contract Time expires. Required inspections and reports after Contract Time has expired will not be measured for payment.

Water Quality Inspections will be paid at the Contract Price per month. This is full compensation for performing the requirements of the inspection section of the NPDES permit and Specification Section 167, any and all necessary incidentals, and providing results of inspections to the
Engineer, within the time frame required by the NPDES Infrastructure permit and Specification Section 167.

3.10 TEMPORARY SILT FENCE, TYPE S (SECTION 171)

The quantity of silt fence, silt fence ditch checks to be paid for is the actual number of linear feet of silt fence, measured in place from end post to end post of each separate installation. The silt fence must be complete and accepted.

Silt fence Type NS or S measured as defined above, is paid for at the Contract Unit Price bid per linear foot. Payment is full compensation for the following: furnishing materials, erecting the fence, dressing and grassing, when required, removing the fence, when required. Payment for this item is made as follows: Seventy-five percent of the Contract Price bid per linear foot is paid when each fence is complete in place. Twenty-five percent is paid at removal or acceptance. If the silt fence must be repaired or removed, as the result of neglect or damage, perform the work at no additional cost to Barrow County.

3.11 FOUNDATION BACKFILL MATERIAL, TYPE II (SECTION 207)

A. Excavation

The following considerations are not measured for payment: Excavation for minor structures, including undercut for backfill materials as shown on the Plans, Excavation for an imperfect trench which is required at locations specified in the Plans but which is not measured for payment, Removal of water, Removal of material from any area required to be reexcavated, Excavation and backfill of temporary drainage ditches. This Item will not be paid for separately except as provided in Subsection 207.4.B.

B. Extra Depth Excavation

The following extra depth excavations are not measured for payment:
1. Extra depth excavation because of Contractor negligence
2. Extra depth excavation (required by the Engineer) below the original Plan elevation of the bottom of the footing or the flow line of a culvert pipe that does not exceed 3 ft. If the Engineer relocates the structure or orders the elevation of the bottom of the footing or the flow line of the pipe to be lowered or undercut more than 3 ft., the Contractor will be compensated for the extra depth excavated below the 3 ft. limit according to Subsection 104.04 and Subsection 109.05. Calculate the width of extra depth excavation using the diameter of the pipe or the width of the footing plus 2 ft. The length of extra depth excavation is equal to the length of that portion of the structure that is lowered more than 3 ft. below Plan elevation. Sheeting and bracing will not be paid for separately unless these materials are left in place at the written direction of the Engineer. In this case, the Contractor will be paid at invoice cost plus 10 percent.

C. Backfill Materials Types I, II, and III
1. Types I and II

These materials (in place and accepted) are measured in cubic yards compacted. Lateral measurements are confined to an area bounded by vertical planes lying not more than 1 ft. outside of and parallel to the limits of the structure. Length and depth measurements are confined to the dimensions of compacted material in place as specified by the Engineer. Materials placed outside the above limitations are not measured for payment.
2. Type III
Barrow County measures Type III material (complete, in place, and accepted) in cubic yards. Lateral measurements of Type III material are confined to an area bounded by vertical planes lying directly above the outside walls of the structure. Longitudinal measurements are confined to the length of treatment installed as specified. Measurements of depth are the dimensions shown on the Plans or as directed. Backfill material Type I, (measured as shown in Subsection 207.4.C.1) will be paid for according to Section 205 or Section 206. Barrow County will pay for Types II and III separately at the Contract Unit Price per cubic yard. This payment is full compensation for furnishing the materials from sources inside or outside the right-of-way, loading, unloading, hauling, handling, placing, and compacting the material.

D. Normal Backfill
This Item is not measured separately, but is included in the measurement of the Items of excavation from which normal backfill materials are obtained. This Item will not be paid for directly but will be paid at the Unit Price for the applicable excavation item from which the normal backfill materials are obtained.

3.12 GRADING COMPLETE (SECTION 210)

A. Grading Complete
The Work under this Item is not measured separately for payment. This Item completed and accepted will be paid for at the Lump Sum Price bid. Payment is full compensation for all work and materials specified in this Section.

B. Grading Per Mile
This Item is measured in linear miles along the centerline of the road or the median, including ramps where shown on the Plans. This Item will be paid for at the Contract Unit Price per linear mile complete in place and accepted. This price is full compensation for furnishing the materials and performing the work specified in this Section.

C. Undercut Excavation
The amount of undercut excavation (when directed by the Engineer and not addressed in the Plans) measured for payment is the product of the length, width, and depth of excavation. Replacement material for undercut excavation is not measured for payment. There will be no separate payment for undercut excavation required by the Plans or rock excavation required under Subsection 205.3. Undercutting areas not shown in the Plans when directed by the Engineer will be paid for at the rate of $7.50 per cubic yard for quantities up to 750 yd³. Quantities exceeding 750 yd³ will be considered Extra Work as defined in Subsection 109.05, and will be paid for accordingly. Payment is full compensation for excavating and disposing of undesirable material and supplying, placing, and compacting replacement material.

3.13 GRADED AGGREGATE BASE COURSE (SECTION 310)

A. Graded Aggregate
Where specified for payment by the ton, graded aggregate base, subbase or shoulder materials are measured in tons, mixed and accepted. When hauling material to the roadway, the actual weight of each loaded vehicle is determined with an approved motor truck scale. Where specified for payment by the square yard for a certain thickness, the
surface length is measured along the centerline, and the width is specified on the Plans. Measure irregular areas, such as turnouts and intersections, by the square yard. Graded aggregate base, subbase, or shoulder course will be paid for at the Contract Unit Price per ton or per square yard, complete, in place, and accepted. This payment shall be full compensation for: Materials, Shaping and compacting the existing roadbed, Loading, hauling, and unloading, Crushing and processing, Mixing, Spreading, Watering, Compacting and shaping, Maintenance, Priming, when required, and All incidentals necessary to complete The Work.

B. Bituminous Prime
Bituminous prime is not measured for separate payment.

3.14 RECYCLED ASPHALTIC CONCRETE (SECTION SECTION 402)
Recycled asphaltic concrete mixture, complete in place and accepted, is measured in tons. The weight is determined by recorded weights if an approved recording device is used. Or, the weight is determined by weighing each loaded vehicle on an approved motor truck scale as the material is hauled to the roadway.

The work performed and the materials furnished as described in this Specification will be paid for at the Contract Unit Price per ton. Payment is full compensation for providing materials, hauling and necessary crushing, processing, placing, rolling and finishing the recycled mixture, and providing labor, tools, equipment, and incidentals necessary to complete the work, including hauling and stockpiling RAP or RAS material.

3.15 BITUMINOUS TACK COAT (SECTION 413)
Bituminous materials for tack coat applied and accepted are measured as outlined in Subsection 109.02, “Measurement of Bituminous Materials.” Diluting emulsified tack coat is not ordinarily allowed except when used underneath slurry seal and approved by the Engineer. The composition of diluted emulsified tack coat defined in Subsection 427.3.05, “Construction” is measured by the gallon of diluted mix.

The accepted volume of bituminous material will be paid for at the Contract Unit Price per gallon for bituminous tack coat of the type and grade approved by the Engineer, complete in place. Payment is full compensation for preparing, cleaning, furnishing, hauling, applying material, and providing incidentals to complete the work.

3.16 CONCRETE HEADWALL (SECTION 441)
Headwalls are measured for payment according to Subsection 500.4.01.B, “Payment per Cubic Yard” and Subsection 500.5.01.E, “Filler Concrete.” Filler concrete, where required, will be paid for at 60 percent of the Contract Unit Price for Class B concrete.

These Items, measured as specified above, will be paid for at the Contract Unit Price per cubic yard.
3.17 CONCRETE CURB & GUTTER (SECTION 441)

Concrete curb and gutter is measured by the linear foot (meter) along the face of the curb.

These Items, measured as specified above, will be paid for at the Contract Unit Price per linear foot.

3.18 BOX CULVERT AND WINGWALLS, TOEWALLS, & PARAPETS (SECTION 500)

This work is measured for payment per cubic yard.

This work will be paid for at the Contract Price per cubic yard, each complete in place and accepted. Payment is full compensation for all things, including incidentals, and direct and indirect costs, to complete the work.

3.19 BAR REINFORCEMENT STEEL (SECTION 511)

The work is measured for payment in pounds of accepted bar reinforcement steel. Barrow County reserves the right to revise bar reinforcement steel quantities to correct errors and reflect changes on the Plans.

The work will be paid for at the Contract Price per pound of bar reinforcement steel, each complete in place.

3.20 STORM DRAIN PIPE (SECTION 550)

A. Excavation and Backfill
   Backfill materials types II and III are measured according to Subsection 207.4, “Measurement.” There will be no separate payment for backfill material. Barrow County shall furnish G.A.B. backfill material for HDPE storm drain pipe bedding.

B. Flat Bottom and Circular Pipe (All Types)
   The overall length of pipe installed, excluding tapered inlets, is measured in linear feet, along the central axis of the diameter of the pipe. Wyes, tees, and bends are included in this measurement. Pipe installations complete in place and accepted will be paid for at the Contract Price for each item. This payment is full compensation for excavating, furnishing, and hauling materials; installing, cutting pipe where necessary; repairing or replacing damaged sections; post installation inspection, making necessary connections; strutting, elongating, providing temporary drainage; joining an extension to an existing structure where required; and removing, disposing of, or using excavated material as directed by the Engineer.
   1. Smooth Flow Pipe
      The quantity of each diameter and steel thickness of smooth flow pipe as measured will be paid for at the Contract Unit Price per linear foot bid for the various sizes. Payment is full compensation for furnishing labor, materials, tools, O-ring mechanical joints, equipment, and incidentals to complete this Item, including removing and disposing excavation material.
   2. Flared-End Sections
      Flared-end sections, measured as specified above, will be paid for at the Contract Unit Price for each section of the specified size. Payment will also
include sawing, removing, and replacing existing pavement removed to install a new drainage structure.

C. Pipe-Arches
The overall length of pipe-arch installed is measured in linear feet, along the bottom center line of the pipe.

D. Multiple Installations
In multiple installations, each single line of culvert structure is measured separately.

E. Tapered Pipe Inlets
Tapered pipe inlet sections are measured as a unit; do not include them in the overall length of the pipe.

F. Flared-End Sections
Flared-end sections are measured separately by the unit and not included in the overall pipe length.

G. Smooth-Flow Pipe
Smooth-flow pipe is measured by the linear foot along the pipe invert.

H. Elliptical Pipe
Elliptical pipe is measured in linear feet along the bottom center line of the pipe.

I. Post Installation Inspection
No measurement will be made for post installation inspection. No separate payment will be made for this work. Include the cost in the bid submitted for this pay item. Payment for this item is made as follows:
One hundred percent of the Contract Price bid per linear foot is paid when the pipe is installed per the specifications including the required material documentation. The Contract Price is paid before post installation inspection.

3.21 RIP RAP (SECTION 603)

This work is measured for payment in square yards of accepted material of the specified thickness. Area measurements are made parallel to the surface on which the material is placed. Plastic filter fabric will be measured as the area of rip rap placed and accepted. No separate measurement will be made for fabric overlap joints, seams, or vertical sections at toe of slopes. No separate measurement is made for grout or cushioning sand. Plan dimensions are figured by the use of filled bags 12 by 18 by 6 in. thick. When filled bags are less than Plan dimensions or are of varying lengths or width, Plan square yards will be used to determine pay quantities, if overall dimensions are equal to or greater than those shown on the Plans.

This work will be paid for at the Contract Price per square yard of material complete in place.

3.22 DRAINAGE STRUCTURES (SECTION 668)

Catch basins, drop inlets, manholes, junction boxes, drain inlets, special inlets, and safety grates, complete in place and accepted, are measured for payment according to the following:
A. Catch Basins and Drop Inlets
Each catch basin or drop inlet is grouped for measurement as follows:
Group 1: Structures connected to pipe 36 in or less in diameter, regardless of the pipe skew
Group 2: Structures connected to pipe over 36 in diameter regardless of the pipe skew

Catch basins or drop inlets, complete in place and accepted, are measured by the unit. In addition, each catch basin or drop inlet deeper than 6 ft is measured for additional payment. The extra depth is measured in linear feet.

B. Manholes
Manholes are measured for payment as follows:
1. Sanitary and Storm Sewer Manholes
Sanitary sewer manholes and storm sewer manholes are measured separately and divided into two types:
Type 1: Structures connected to pipe 42 in or less in diameter regardless of the pipe skew
Type 2: Structures connected to pipe 48 in to 84 in diameter regardless of the pipe skew
Each manhole is measured by the unit.
2. Manhole Additional Depth
In addition to Types 1 and 2 above, each Manhole deeper than 6 ft is measured for additional payment, termed “manhole additional depth.” This additional depth is measured in linear feet and does not include the upper 6 ft. Manhole additional depth is classed as follows:
Manhole Additional Depth, Class 1: Applies to each manhole deeper than 6 ft, but not deeper than 10 ft. Class 1 payment is for the manhole depth between 6 ft and 10 ft.
Manhole Additional Depth, Class 2: Applies to each manhole deeper than 10 ft, but not deeper than 20 ft. Class 2 payment is for the manhole depth between 6 ft and 20 ft.
Manhole Additional Depth, Class 3: Applies to each manhole deeper than 20 ft, but not deeper than 30 ft. Class 3 payment is for the manhole depth between 6 ft and 30 ft.
Manhole Additional Depth, Class 4: Applies to each manhole deeper than 30 ft, but not deeper than 45 ft. Class 4 payment is the manhole depth between 6 ft and 45 ft.
Manhole additional depth is measured for payment at the class that includes the greatest depth below the original 6 ft.
For example, a manhole 32 ft deep would be measured and paid for as follows:
Storm (or sanitary) sewer manhole, type____ Per each
Storm (or sanitary) sewer manhole, type____, additional Depth Class 4 26 linear feet

C. Junction Boxes, Spring Boxes, and Drain Inlets
Junction boxes, spring boxes, and drain inlets are measured by the unit.
1. Each junction box will be complete according to Plan details.
2. Each drain inlet will consist of a pipe elbow or tee, concrete collar, and casting of the required diameter.
3. Each spring box will be complete according to Plan details.

D. Safety Grates
Safety grates fabricated and installed according to Plan details are measured by the square foot, computed from the overall surface dimensions of each grate.

E. Special Inlets for Safety Grates
Special inlets, complete in place, are measured for payment in cubic yards according to Section 500.

F. Vertical Tee Sections (or Saddles)
Vertical tee sections are not measured for separate payment.
Payment for the various structures under this Section will be made as follows:

A. Catch Basins and Drop Inlets
   Catch basins or drop inlets will be paid for at the Contract Price per each. Depth in excess of 6 ft will be paid for at the Contract Price per linear foot. Payment is full compensation for the following:
   • Furnishing castings
   • Making pipe connections regardless of skew
   • Providing materials, making forms, and disposing of surplus material

B. Manholes
   Sanitary sewer and storm sewer manholes, complete in place, will be paid for at the Contract Price per each. Manhole additional depth of the appropriate class will be paid for at the Contract Price per linear foot. Payment is full compensation for the following:
   • Furnishing castings, fittings, and other appurtenances called for on the Plans to complete the Item
   • Making pipe connections regardless of skew
   • Providing materials, making forms, and disposing of surplus material
   NOTE: No additional payment will be made for connecting manholes to existing or new sewer lines. Include costs related to connections in the Contract Price for the structure.

C. Junction Boxes, Spring Boxes, and Drain Inlets
   Junction boxes, spring boxes, or drain inlets will be paid for at the Contract Price per each. Payment is full compensation for the following:
   • Furnishing castings, fittings, and other appurtenances called for on the Plans to complete the Item
   • Making pipe connections regardless of skew
   • Providing materials, making forms, and disposing of surplus material

D. Pipe
   Pipe entering or exiting catch basins, drop inlets, manholes, junction boxes, spring boxes, or drain inlets, will be paid for under the section of the Specifications governing the pipe.

E. Sand Bedding Material for Precast Structures
   No separate payment will be made for this material. Its cost is included in the Contract Price for the structure under which it is used.

F. Excavation and Normal Backfill
   No separate payment will be made for excavation and normal backfill. Their cost is included in the Contract Price for the structure being excavated.

G. Safety Grates
   Safety grates will be paid for at the Contract Price per square foot.

H. Inlets for Safety Grates
   Inlets for safety grates will be paid for at the Contract Price per cubic yard of Class “A” concrete, including reinforcing steel.
I. Vertical Tee Sections (or Saddles)
Vertical tee sections will be included in payment for the section of structure they are incorporated in. No separate payment will be made for excavation, backfill, and disposal of surplus material.

3.23 GRASSING (SECTION 700)

A. Permanent Grassing
Permanent Grassing will be measured for payment by the acre.

B. Mulches
Straw or hay mulch applied to permanent grassing areas will be measured by the ton. Wood fiber mulch furnished by the Contractor for permanent grassing is not measured for separate payment.

C. Quantity of Sod
Sod is measured for payment by the number of square yards, surface measure, completed and accepted.

D. Water
Water furnished and applied to promote a satisfactory growth is not measured for payment.

E. Quantity of Lime and Fertilizer Mixed Grade
Lime and fertilizer are measured by the ton. Lime used as a filler in fertilizer is measured by the ton.

F. Quantity of Nitrogen Used for Permanent Grassing
Nitrogen is measured in pounds based on the weight of fertilizer used and its nitrogen content.

G. Replanting and Plant Establishments
No measurement for payment is made for any materials or work required under Subsection 700.3.06 and Subsection 700.3.07.

H. Temporary Grass
Temporary grass is measured for payment by the acre according to Section 163.

I. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas
Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be measured by the acre and included under the pay item “Native Restoration and Riparian Seeding”.

As grassing and planting progress, the Contractor will receive full measurement and payment on regular monthly estimates provided the work complies with the Specifications.

A. Permanent Grassing
Permanent grassing will be paid for at the Contract Price per acre, complete and in place. Payment is full compensation for preparing the ground, seeding, wood fiber mulch, polyacrylamide, and providing plant establishment, soil tests and other incidentals.
B. Straw or Hay Mulch
Straw or hay mulch required for Permanent Grassing will be paid for according to Section 163.

C. Fertilizer Mixed Grade
Fertilizer mixed grade will be paid for at the Contract Price per ton. Payment is full compensation for furnishing and applying the material.

D. Lime
Lime will be paid for at the Contract Price per ton. Lime used as filler in fertilizer will be paid for per ton. Payment is full compensation for furnishing and applying the material.

E. Nitrogen
Nitrogen will be paid for at the Contract Price per pound of nitrogen content. Payment is full compensation for furnishing and applying the material.

F. Sod
Sod will be paid by the square yard in accordance with the following schedule of payments. Payment is full compensation for ground preparation, including addition of topsoil, furnishing and installing live sod, and for Plant Establishment.
1. 70% of the Contract Price per square yard will be paid at the satisfactory completion of the installation.
2. 20% of the Contract Price will be paid upon satisfactory review of sod which is healthy, weed free and viable at the inspection made at the end of the first spring after installation.
3. 10% of the contract price will be paid upon satisfactory review of sod that is healthy, weed free and viable at the Final Acceptance.

G. Temporary Grass
Temporary Grass will be paid for under Section 163.

H. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas
Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be paid for at the Contract Price per acre, complete and in place. Payment is full compensation for preparing the ground, seeding, and providing plant establishment and other incidentals included under the pay item “Native Restoration and Riparian Seeding”.

3.24 EROSION CONTROL MATS, SLOPES (SECTION 716)

Erosion control mats (Slopes) are measured according to the Specification sections referenced in Subsection 716.3.05.

Erosion control mats (Slopes), measured as specified in Section 712, Section 713, or Section 714 will be paid for at the Contract Unit Price per square yard. This payment is full compensation for constructing the mat (blanket) and providing materials, equipment, tools, labor, and incidentals needed to maintain mats (blankets) for the life of the Contract or until a stand of grass has developed enough to prevent erosion.
3.25 SITE PREPARATION (Section 02100)

No separate measurement or payment will be made for site preparation of water lines or other pipes, nor for any other appurtenance facilities such as valves, fire hydrants, etc. Payment for all work shall be included in the unit prices bid per linear foot of the various sizes and type of pipe laid or for the number of units installed for valves, fire hydrants, etc. as provided for in contract bid Schedule.

3.26 EARTHWORK FOR UTILITIES (Section 02225)

No separate measurement or payment will be made for trench earth excavation for sewers, waterlines or other pipes, nor for any other appurtenant facilities such as wet wells, manholes, valves, fire hydrants, piers and pipe protection or encasement. Payment for all such excavation shall be included in the unit prices bid per linear foot of the various sizes and type of pipe laid as provided for in contract Bid Schedule. Where special bedding or cradles are shown on Drawings, or required by ENGINEER, no allowance shall be made for extending earth excavation in trenches to the bottom of such bedding or cradles.

3.27 ROCK REMOVAL (Section 02227)

A. Quantities for rock removal shall be expressed in cubic yards, as defined below, in accordance with the plans and specifications.

B. If rock is encountered, the CONTRACTOR is to expose the rock for the length of the proposed trench. The OWNER or ENGINEER shall then attain sufficient topographic data to establish the limits of the rock to be excavated. CONTRACTOR is not entitled to payment for rock removal without allowing the Engineer to establish the limits of the rock to be excavated.

C. The quantity of rock to be paid for shall be calculated from the upper surface data obtained to one foot below the pipe invert multiplied by a maximum three foot trench width. No additional payment shall be made for manhole excavation or benching. The price for this work shall be included in the unit price bid for rock excavation.

3.28 FIRE HYDRANTS (Section 02645)

A. The quantity of the size and type of fire hydrants will be the actual number installed by the CONTRACTOR and approved by the ENGINEER.

B. The price bid shall include all related appurtenances to construct and install the fire hydrants from the in-line tee to the fire hydrant itself. This price shall include the fire hydrant, all labor, necessary equipment, valve fittings, restrained hydrant couplings, blocking, valve box and collar, hydrant valve and tee, and all other related appurtenances. Fire hydrants shall be paid for at the unit price bid.

3.29 WATERLINES (Section 02660)

A. The quantities of the various sizes and types of watermain will be measured along the centerline of the pipe from center of fitting to center of fitting or to the end of the pipeline. No deduction will be made for fittings or valves.
B. The price bid shall include, but not be limited to, the pipe material indicated, all fittings, gaskets, bolts, glands, concrete blocking, detection tape and wire, all labor, equipment, clearing and removal and disposal of clearing debris, stripping, storing, and replacement of top soil in lawn and garden areas, excavation, dewatering of trenches, removal and replacement of signs and mailboxes in the path of construction activities, replacement of mailbox approaches, fences, curb and gutter, etc., protection of existing utilities (both overhead and underground), storm pipes, culverts, drainage ditches, all benching, sheeting and bracing, crushed stone bedding, tamping and compaction and backfilling, traffic maintenance and protection, dressing and final grading, testing, cleanup, and all other work incidental to place the water line as shown or indicated in the CONTRACT DOCUMENTS.

3.30 VALVES (Section 02660)

A. The quantities of the various sizes and types of valves will be the actual number installed by the CONTRACTOR and approved by the ENGINEER.

B. The price bid shall include, but not be limited to, the valve, all labor, necessary equipment, fittings, joint restraints, blocking, concrete pad, valve box or manhole. Valves shall be paid for at the unit price bid.

3.31 FITTINGS (Section 02660)

No separate measurement or payment will be made for fittings. Fittings shall be included in the cost of the pipe line.

3.32 CONCRETE RESTRAINT ANCHORS (Section 02660)

No separate measurement or payment will be made for concrete restraint anchors. Concrete restraint anchors shall be included in the cost of the waterline, abandonment, valves, hydrants, etc.

3.33 RESTRAINED JOINTS (Section 02660)

A. Payment for restrained joints shall be the actual number installed by the CONTRACTOR and approved by the ENGINEER.

B. The price bid shall include all labor, equipment, and materials necessary to complete the installation as per the contract drawings and specifications.

C. This item refers to restraining gaskets for ductile iron pipe or PVC as specified in Section 02660 and called for at specific locations on contract drawings, or approved or recommended elsewhere by ENGINEER at his discretion only.

D. The CONTRACTOR shall not charge any fees to the OWNER for unused restrained joints.
3.34 PROTECTION, RELOCATION AND RESTORATION OF EXISTING UTILITIES  
(Section 02750)

No separate measurement or payment will be made for protection, relocation and restoration of existing utilities for water lines or other pipes, nor for any other appurtenant facilities such as valves, fire hydrants, etc. Payment for all such work shall be included in the unit prices bid per linear foot of the various sizes and type of pipe laid as provided for in contract Bid Schedule.

3.35 SITE RESTORATION (Section 02905)

No separate measurement or payment will be made for site restoration. Payment for all such work shall be included in the unit prices bid per linear foot of the various sizes and types of pipe laid as provided for in the contract Bid Schedule.

END OF SECTION
Technical Specifications

The following technical specifications are from the Georgia Department of Transportation Construction of Transportation Systems, 2013 edition. All general provisions, sections, and subsections referenced in these specifications are from this edition. This project shall be constructed in accordance with the contract documents and the Georgia Department of Transportation Construction of Transportation Systems, latest edition.
Section 163—Miscellaneous Erosion Control Items

163.1 General Description
This work includes constructing and removing:
- Silt control gates
- Temporary erosion control slope drains shown on the Plans or as directed
- Sediment basins
- Baled straw sediment barrier and check dams
- Rock filter dams
- Stone filter berms
- Stone filter rings
- Other temporary erosion control structures shown on the Plans or directed by the Engineer
This work also includes applying mulch (straw or hay, erosion control compost), and temporary grass.

163.1.01 Related References
A. Standard Specifications
   Section 109—Measurement and Payment
   Section 161—Control of Soil Erosion and Sedimentation
   Section 171—Temporary Silt Fence
   Section 500—Concrete Structures
   Section 603—Rip Rap
   Section 700—Grassing
   Section 715—Bituminous Treated Roving
   Section 720 – Triangular Silt Barrier
   Section 800—Coarse Aggregate
   Section 801—Fabrics
   Section 822—Emulsified Asphalt
   Section 860—Lumber and Timber
   Section 863—Preservative Treatment of Timber Products
   Section 890—Seed and Sod
   Section 893—Miscellaneous Planting Materials

B. Referenced Documents
   AASHTO M252
   AASHTO M294

163.1.02 Submittals
Provide written documentation to the Engineer as to the average weight of the bales of mulch.

163.2 Materials
Provide materials shown on the Plans, such as pipe, spillways, wood baffles, and other accessories including an anti-seep collar, when necessary. The materials shall remain the Contractor’s property after removal, unless otherwise shown on the Plans.
Materials may be new or used; however, the Engineer shall approve previously used materials before use. Materials shall meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>
### Mulch

<table>
<thead>
<tr>
<th>Temporary Silt Fence</th>
<th>893.2.02</th>
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<tr>
<td>Concrete Aprons and Footings shall be Class A</td>
<td>500</td>
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<tr>
<td>Rip Rap</td>
<td>603</td>
</tr>
<tr>
<td>Temporary Grass</td>
<td>700</td>
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<tr>
<td>Bituminous Treated Roving</td>
<td>715</td>
</tr>
<tr>
<td>Triangular Silt Barrier</td>
<td>720</td>
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<tr>
<td>Lumber and Timber</td>
<td>860.2.01</td>
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<tr>
<td>Preservative Treatment of Timber Products</td>
<td>863.1</td>
</tr>
<tr>
<td>Corrugated Polyethylene Temporary Slope Drain Pipe</td>
<td>AASHTO M252 or M294</td>
</tr>
</tbody>
</table>

### 163.2.01 Delivery, Storage, and Handling

#### General Provisions 101 through 150.

### 163.3 Construction Requirements

#### 163.3.01 Personnel

#### General Provisions 101 through 150.

#### 163.3.02 Equipment

#### General Provisions 101 through 150.

#### 163.3.03 Preparation

#### General Provisions 101 through 150.

#### 163.3.04 Fabrication

#### General Provisions 101 through 150.

#### 163.3.05 Construction

**A. Silt Control Gates**

If silt control gates are required or are directed by the Engineer, follow these guidelines to construct them:

1. Clear and grade only that portion of the roadway within the affected drainage area where the drainage structure will be constructed.
2. Construct or install the drainage structure and backfill as required for stability.
3. Install the silt control gate at the inlet of the structure. Use the type indicated on the Plans.
4. Vary the height of the gate as required or as shown on the Plans.
5. Finish grading the roadway in the affected drainage area. Grass and mulch slopes and ditches that will not be paved.

Construct the ditch paving required in the affected area.
6. Keep the gate in place until the work in the affected drainage area is complete and the erodible area is stabilized.

7. Remove the Type 1 silt gate assembly by sawing off the wood posts flush with the concrete apron. Leave the concrete apron between the gate and the structure inlet in place. The gate shall remain the property of the Contractor.

B. Temporary Slope Drains

If temporary slope drains are required, conduct the roadway grading operation according to Section 161 and follow these guidelines:

1. Place temporary pipe slope drains with inlets and velocity dissipaters (straw bales, silt fence, or aprons) according to the Plans.

2. Securely anchor the inlet into the slope to provide a watertight connection to the earth berm. Ensure that all connections in the pipe are leak proof.

3. Place temporary slope drains at a spacing of 350 ft. maximum on a 0% to 2% grade and at a spacing of 200 ft. maximum on steeper grades, or more frequently as directed by the Engineer. Keep the slope drains in place until the permanent grass has grown enough to control erosion.

4. Remove the slope drains and grass the disturbed area with permanent grass. However, the temporary slope drains may remain in place to help establish permanent grass if approved by the Engineer.

C. Sediment Basins

Construct sediment basins according to the Plans at the required location, or as modified by the Engineer.

1. Construct the unit complete as shown, including:
   - Grading
   - Drainage
   - Rip rap
   - Spillways
   - Anti-seep collar
   - Temporary mulching and grassing on internal and external slopes
   - Accessories to complete the basin

2. When the sediment basin is no longer needed, remove and dispose of the remaining sediment.

3. Remove the sediment basin. Grade to drain and restore the area to blend with the adjacent landscape.

4. Mulch and permanently grass the disturbed areas according to Section 700.

D. Sediment Barrier (baled straw)

Construct sediment barrier (baled straw) according to the Plan details. Use rectangular, standard size baled straw in mechanically produced bales.

The following items may be substituted for sediment barrier (baled straw):

1. Type B Silt Fence.

2. Triangular Silt Barrier.

3. Synthetic Fiber: Use synthetic fiber bales of circular cross section at least 18 in. in diameter. Use synthetic bales of 3 ft or 6 ft in length that are capable of being linked together to form a continuous roll of the desired total length. Use bales that are enclosed in a geotextile fabric and that contain a pre-made stake hole for anchoring.

4. Coir: Use coir fiber bales of circular cross section at least 16” in diameter. Use coir bales of 10 ft, 15 ft, or 20 ft in length. Use coir baled with coir twine netting with 2 in. X 2 in. openings. Use coir bales with a dry density of at least 7 lb/ft³. Anchor in place with 2 in. X 4 in. wooden wedges with a 6 in. nail at the top. Place wedges no more than 36 in. apart.

5. Excelsior: Use curled aspen excelsior fiber with barbed edges in circular bales of at least 18 in. in diameter and nominally 10 ft in length. Use excelsior baled with polyester netting with 1 in. X 1 in.
triangular openings. Use excelsior bales with a dry density of at least 1.4 lb/ft$^3$. Anchor in place with 1 in. diameter wooden stakes driven through the netting at intervals of no more than 2 ft.

6. Compost Filter Sock: Use general use compost (see Subsection 893.2.02.A.5.b) in circular bales at least 18 in. diameter. Use compost baled with photo-degradable plastic mesh 3 mils thick with a maximum 0.25 in. X 0.25 in. openings. Anchor in place with 1 in. diameter wooden stakes driven through the netting at intervals of no more than 2 ft. The sock shall be dispersed on site when no longer required, as determined by the Engineer. Do not use Compost Filter Socks in areas where the use of fertilizer is restricted.

7. Compost Filter Berm: Use erosion control compost (see Subsection 893.2.02) to construct an uncompacted 1.5 ft to 2 ft high trapezoidal berm which is approximately 2 ft to 3 ft wide at the top and minimum 4 ft wide at the base. Do not use Compost Filter Berms in areas where the use of fertilizer is restricted.

The construction of the compost filter berm includes the following:
   a. Keeping the berm in a functional condition.
   b. Installing additional berm material when necessary.
   c. Removing the berm when no longer required, as determined by the Engineer. At the Engineer’s discretion, berm material may be left to decompose naturally, or distributed over the adjacent area.

E. Other Temporary Structures

When special conditions occur during the design stage, the Plans may show other temporary structures for erosion control with required materials and construction methods.

F. Temporary Grass

Use a quick growing species of temporary grass such as rye grass, millet, or a cereal grass suitable to the area and season.

Use temporary grass in the following situations:
   a. When required by the Specifications or directed by the Engineer to control erosion where permanent grassing cannot be planted.
   b. To protect an area for longer than mulch is expected to last (60 calendar days).

Plant temporary grass as follows:
   1. Use seeds that conform to Subsection 890.2.01, “Seed.” Perform seeding according to Section 700; except use the minimum ground preparation necessary to provide a seed bed if further grading is required.
   2. Prepare areas that require no further grading according to Subsection 700.3.05.A, “Ground Preparation.” Omit the lime unless the area will be planted with permanent grass without further grading. In this case, apply the lime according to Section 700.
   3. Apply mixed grade fertilizer at 400 lbs/acre. Omit the nitrogen. Mulch (with straw or hay) temporary grass according to Section 700. (Erosion control compost Mulch will not be allowed with grassing.)
   4. Before planting permanent grass, thoroughly plow and prepare areas where temporary grass has been planted according to Subsection 700.3.05.A, “Ground Preparation”.
   5. Apply Polyacrylamide (PAM) to all areas that receive temporary grassing.
   6. Apply PAM (powder) before grassing or PAM (emulsion) to the hydroseeding operation.
   7. Apply PAM according to manufacturer specifications.
   8. Use only anionic PAM.

For projects that consist of shoulder reconstruction and/or shoulder widening, refer to Section 161.3.05H for Wood Fiber Blanket requirements.

G. Mulch

When stage construction or other conditions prevent completing a roadway section continuously, apply mulch (straw or hay or erosion control compost) to control erosion. Mulch may be used without
temporary grassing for 60 calendar days or less. Areas stabilized with only mulch (straw/hay) shall be planted with temporary grass after 60 calendar days.

Apply mulch as follows:

1. Mulch (Hay or Straw) - Without Grass Seed
   a. Uniformly spread the mulch over the designated areas from 2 in. to 4 in. thick.
   b. After spreading the mulch, walk in the mulch by using a tracked vehicle (preferred method), empty sheep foot roller, light disk ing, or other means that preserves the finished cross section of the prepared areas. The Engineer will approve of the method.
   c. Place temporary mulch on slopes as steep as 2:1 by using a tracked vehicle to imbed the mulch into the slope.
   d. When grassing operations begin, leave the mulch in place and plow the mulch into the soil during seed bed preparation. The mulch will become beneficial plant food for the newly planted grass.

2. Erosion control compost - Without Grass Seed
   a. Uniformly spread the mulch (erosion control compost) over the designated areas 2 in. thick.
   b. When rolling is necessary, or directed by the Engineer, use a light corrugated drum roller.
   c. When grassing operations begin, leave the mulch in place and plow the mulch into the soil during seed bed preparation. The mulch will become beneficial plant food for the newly planted grass.
   d. Plant temporary grass on area stabilized with mulch (erosion control compost) after 60 calendar days.
   e. Do not use Erosion Control Compost in areas where the use of fertilizer is restricted.

H. Miscellaneous Erosion Control Not Shown on the Plans
When conditions develop during construction that were unforeseen in the design stage, the Engineer may direct the Contractor to construct temporary devices such as but not limited to:

- Bulkheads
- Sump holes
- Half round pipe for use as ditch liners
- U-V resistant plastic sheets to cover critical cut slopes

The Engineer and the Contractor will determine the placement to ensure erosion control in the affected area.

I. Diversion Channels
When constructing a culvert or other drainage structure in a live stream that requires diverting a stream, construct a diversion channel.

J. Temporary Check Dams
Temporary check dams are constructed of the following materials:

- Stone plain rip rap according to Section 603 or of sand bags as in Section 603 without Portland cement. (Place plastic filter fabric on ditch section before placing rip rap.)
- Fabric (Type S silt fence)
- Hay Bales

Temporary check dams shall be constructed according to plan details and shall remain in place until the permanent ditch protection is in place or being installed and the removal is approved by the Engineer.

K. Construction Exits
Locate construction exits at any point where vehicles will be leaving the project onto a public roadway. Install construction exits at the locations shown in the plans and in accordance with plan details.

L. Retrofit
Add the retrofit device to the permanent outlet structure as shown on the Plan details. When all land disturbing activities that would contribute sediment-laden runoff to the basin are complete, clean the basin of sediment and stabilize the basin area with vegetation.
When the basin is stabilized, remove the retrofit device from the permanent outlet structure of the detention pond.

**M. Inlet Sediment Trap**

Inlet sediment traps consist of a temporary device placed around a storm drain inlet to trap sediment. An excavated area adjacent to the sediment trap will provide additional sediment storage. Inlet sediment traps may be constructed of Type C silt fence, plastic frame and filter, hay bales, baffle box, or other filtering materials approved by the Engineer. Construct inlet sediment traps according to the appropriate specification for the material selected for the trap. Place inlet sediment traps as shown on the Plans or as directed by the Engineer.

**N. Rock Filter Dams**

Construct rock filter dams of the material selected as shown in the approved erosion and sediment control plan. Construct and place this item in accordance with the approved erosion control construction detail(s) and Standard Specification Section 603. Rock filter dams shall remain in place until the permanent ditch protection is in place or is being installed and their removal is approved by the Engineer.

**O. Stone Filter Berms**

Construct stone filter berms of the material selected as shown in the approved erosion and sediment control plan. Construct and place this item in accordance with the approved erosion control construction detail(s) and Standard Specification Section 603. Stone filter berms shall remain in place until the permanent slope protection is in place or is being installed and their removal is approved by the Engineer.

**P. Stone Filter Rings**

Construct stone filter rings of the material selected as shown in the approved erosion and sediment control plan. Construct and place this item in accordance with the approved erosion control construction detail(s) and Standard Specification Section 603. A stone filter ring shall remain in place until final stabilization of the area which drains toward it is achieved and its removal is approved by the Engineer.

**163.3.06 Quality Acceptance**

General Provisions 101 through 150.

**163.3.07 Contractor Warranty and Maintenance**

General Provisions 101 through 150.

**163.4 Measurement**

**A. Silt Control Gates**

Silt control gates are measured for payment by the entire structure constructed at each location complete in place and accepted. Silt control gates constructed at the inlet of multiple lines of drainage structures are measured for payment as a single unit.

**B. Temporary Slope Drains**

Temporary slope drains are measured for payment by the linear foot (meter) of pipe placed. When required, the inlet spillway and outlet apron and/or other dissipation devices are incidental and not measured separately.
C. Sediment Basins
Sediment basins are measured for payment by the entire structure complete, including construction, maintenance, and removal. Measurement also includes:
- Earthwork
- Drainage
- Spillways
- Baffles
- Rip rap
- Final cleaning to remove the basin
Permanent and temporary grassing for sediment basins is measured separately for payment.

D. Diversion Channels
Diversion channels are not measured for payment. Costs for the entire structure complete, including materials, construction (including earthwork), and removal is included in the price bid for the drainage structure or for other Contract items.

E. Temporary Grass
No separate payment shall be made for temporary grass.

F. Mulch
No separate payment shall be made for mulch (straw or hay, or erosion control compost).

G. Baled Straw Sediment Barrier, Baled Straw Check Dam and Fabric Check Dams
Baled straw sediment barrier, baled straw check dams, and fabric check dams are measured by the linear foot.
When the Contractor substitutes a product allowed in Subsection 163.3.05.D for baled straw sediment barrier or when the Engineer directs this substitution, the product will be measured by the linear foot.

H. Rip Rap Check Dams
Rip Rap Check Dams are measured per each which will include all work necessary to construct the check dam including plastic filter fabric placed beneath the rip rap or sand bags.

I. Construction Exits
Construction exits are measured per each which will include all work necessary to construct the exit including the required geotextile fabric placed beneath the aggregate.

J. Retrofit
Retrofit will be measured for payment per each. The construction of the detention pond and permanent outlet structure will be measured separately under the appropriate items.

K. Inlet Sediment Trap
Inlet sediment traps, regardless of the material selected, are measured per each which includes all work necessary to construct the trap including any incidentals and providing the excavated area for sediment storage.

L. Rock Filter Dams
Rock filter dams are measured for payment per each required. This includes the entire structure at each location and all the work necessary for construction.

M. Stone Filter Berms
Stone filter berms are measured for payment per each required. This includes the entire structure at each location and all the work necessary for construction.

N. Stone Filter Rings
Stone filter rings are measured for payment per each required. This includes the entire structure at each location and all the work necessary for construction.

163.4.01 Limits
General Provisions 101 through 150.
163.5 Payment

A. Silt Control Gates
The specified silt control gates are paid for at the Contract Unit Price per each. Payment is full compensation for:
- Furnishing the material and labor
- Constructing the concrete apron as shown on the Plans
- Excavating and backfilling to place the apron
- Removing the gate

B. Temporary Slope Drains
Temporary slope drains are paid for by the linear foot (meter). Payment is full compensation for materials, construction, removal (if required), inlet spillways, velocity dissipaters, and outlet aprons. When temporary drain inlets and pipe slope drains are removed, they remain the Contractor’s property and may be reused or removed from the Project as the Contractor desires. Reused pipe or inlets are paid for the same as new pipe or inlets.

C. Sediment Basin
Sediment basins, measured according to Subsection 163.4,C “Measurement,” are paid for by the unit, per each, for the type specified on the Plans. Price and payment are full compensation for work and supervision to construct, and remove the sediment basin, including final clean-up.

D. Diversion Channel
Diversion channels are not paid for separately; they are included in the price bid for the drainage structure or for other Contract Items.

E. Temporary Grass
Temporary grass is paid for by the acre. Payment is full compensation for all equipment, labor, ground preparation, materials, wood fiber mulch, polyacrylamide, and other incidentals. Lime (when required) is paid for by the ton. Mulch and fertilizer are paid for separately.

F. Mulch
Mulch is paid for by the ton. Payment is full compensation for all materials, labor, maintenance, equipment and other incidentals.
The weight for payment of straw or hay mulch will be the product of the number of bales used and the average weight per bale as determined on certified scales provided by the contractor or state certified scales. Provide written documentation to the Engineer stating the average weight of the bales.
The weight of erosion control compost mulch will be determined by weighing each loaded vehicle on the required motor truck scale as the material is hauled to the roadway, or by using recorded weights if a digital recording device is used.
The contractor may propose other methods of providing the weight of the mulch to Engineer for approval.

G. Baled Straw Sediment barrier, Baled Straw Check Dams and Fabric Check Dams (Type S Silt Fence)
Baled straw sediment barrier, baled straw check dams and fabric check dams (type S silt fence), complete in place and accepted are paid for at the Contract Unit Price bid per linear foot. Payment is full compensation for constructing, and removing (when directed) the baled straw sediment barrier or either check dam.
When the Contractor substitutes any product allowed in Subsection 163.3.05.D for baled straw sediment barrier or when the Engineer directs this substitution, payment is made at the bid price per linear foot for baled straw sediment barrier.

H. Rip Rap Check Dams
Rip Rap Check Dams are paid for per each. Payment is full compensation for all materials, construction, and removal. Reused stone plain rip rap or sandbags are paid for on the same basis as new items. Filter fabric required under rip rap check dams is included in the price bid for each check dam.

I. Construction Exits
Construction exits are paid for per each. Payment is full compensation for all materials including the required geotextile, construction, and removal.

J. Retrofit
This item is paid for at the Contract Unit Price per each. Payment is full compensation for all work, supervision, materials (including the stone filter), labor and equipment necessary to construct and remove the retrofit device from an existing or proposed detention pond outlet structure.

K. Inlet Sediment Trap
Inlet sediment traps are paid for per each. Payment is full compensation for all materials, construction, and removal.

L. Rock Filter Dams
Rock filter dams are paid for per each. Payment is full compensation for all materials, construction, and removal for each. Clean reused stone Type 3 riprap and #57 stone are paid for on the same basis as new items. Plastic woven filter fabric is required under rock filter dams and is included in the price bid for each.

M. Stone Filter Berms
Stone filter berms are paid for per each. Payment is full compensation for all materials, construction, and removal for each. Clean reused stone Type 3 riprap and #57 stone are paid for on the same basis as new items. Plastic woven filter fabric is required under rock filter berms and is included in the price bid for each.

N. Stone Filter Rings
Stone filter rings are paid for per each. Payment is full compensation for all materials, construction, and removal for each. Clean reused stone Type 3 riprap and #57 stone are paid for on the same basis as new items. Plastic woven filter fabric is required under stone filter rings and is included in the price bid for each.

The Items in this Section (except temporary grass and mulch) are made as partial payments as follows: When the item is installed and put into operation the Contractor will be paid 75 percent of the Contract price. When the Engineer instructs the Contractor that the Item is no longer required and is to remain in place or is removed, whichever applies, the remaining 25 percent will be paid. Temporary devices may be left in place at the Engineer’s discretion at no change in cost. Payment for temporary grass will be made based on the number of acres (hectares) grassed. Mulch will be based on the number of tons used.

Payment is made under:

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<thead>
<tr>
<th>Item No. 163</th>
<th>Construct and remove silt control gate, type__</th>
<th>Per each</th>
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<tbody>
<tr>
<td>Item No. 163</td>
<td>Construct and remove temporary pipe slope drains</td>
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<td>Item No. 163</td>
<td>Construct and remove temporary sediment barrier or baled straw check dam</td>
<td>Per linear foot</td>
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<td>Construct and remove sediment basin type__, Sta. No.____</td>
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<td>Item No. 163</td>
<td>Construct and remove Fabric Check Dam - type S silt fence</td>
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<td>Item No. 163</td>
<td>Construct and remove Rip Rap Check Dams ,Stone Plain Rip Rap/Sand Bags</td>
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<td>Item No. 163</td>
<td>Construction exit</td>
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<tr>
<td>Item No. 163</td>
<td>Construct and remove retrofit, Sta. No.____</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 163</td>
<td>Construct and remove rock filter dam</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 163</td>
<td>Construct and remove stone filter berm</td>
<td>Per linear foot</td>
</tr>
<tr>
<td>Item No. 163</td>
<td>Construct and remove stone filter ring</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 163</td>
<td>Construct and remove inlet sediment trap</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 163</td>
<td>Temporary grass</td>
<td>Per acre</td>
</tr>
<tr>
<td>Item No. 163</td>
<td>Mulch</td>
<td>Per ton</td>
</tr>
</tbody>
</table>

**163.5.01 Adjustments**

General Provisions 101 through 150.
Section 165—Maintenance of Temporary Erosion and Sedimentation Control Devices

165.1 General Description
This work consists of providing maintenance on temporary erosion and sediment control devices, including but not limited to the following:
- Silt fence
- Sediment basins
- Silt control gates
- Check dams
- Silt retention barriers
- Rock filter dams
- Stone filter berms
- Stone filter rings
It also consists of removing sediment that has accumulated at the temporary erosion and sediment control devices.

165.1.01 Definitions
General Provisions 101 through 150.

165.1.02 Related References
A. Standard Specifications
   General Provisions 101 through 150.
B. Referenced Documents
   General Provisions 101 through 150.

165.1.03 Submittals
General Provisions 101 through 150

165.2 Materials
General Provisions 101 through 150.

165.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

165.3 Construction Requirements

165.3.01 Personnel
General Provisions 101 through 150.

165.3.02 Equipment
General Provisions 101 through 150.

165.3.03 Preparation
General Provisions 101 through 150.

165.3.04 Fabrication
165.3.05 Construction

A. General

As a minimum, clean the sediment from all temporary erosion control devices (except sediment basins) installed on the project when one half the capacity, by height, depth or volume has been reached. Clean the sediment from all temporary sediment basins installed on a project when one third the capacity of the storage volume has been filled.

Handle sediment excavated from any erosion or sediment control device in one of the following ways:

- Remove sediment from the immediate area and immediately stabilize it to prevent the material from refilling any erosion or sediment control device.
- Place and mix it in the roadway embankment, or waste it in an area approved by the Engineer.
- Repair or replace at no cost to the County any erosion or sediment control devices that are not functioning properly or are damaged due to negligence or abuse.

B. Temporary Silt Fence

Maintenance of Temporary Silt Fence consists of furnishing all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled). Also included is the removal of sediment accumulations (“filtercake”) on the fabric by tapping the fabric on the downstream side.

C. Silt Control Gates

Maintenance of Temporary Silt Control Gates consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled). When applicable, this item will include the removal of sediment accumulations on the fabric by tapping the fabric on the downstream side.

D. Check Dams (all types)

Maintenance of Temporary Erosion Control Check Dams shall consist of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled). This item also includes the removal of any material deposited in sump holes. When applicable, this item will include the removal of sediment accumulations on the fabric by tapping the fabric on the downstream side, or from the baled straw by similar means.

E. Silt Retention Barrier

Maintenance of Temporary Silt Retention Barrier consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).

F. Temporary Sediment Basins

Maintenance of Temporary Sediment Basins consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original bottom of the basin. This also includes removing accumulated sediment from the rock filter and restoring the rock filter to its original specified condition and any work necessary to restore all other components to the pre-maintenance conditions.

G. Sediment Barrier (baled straw)

Maintenance of sediment barrier (baled straw) consists of furnishing all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled). Also included is the removal of sediment accumulations on the bales by tapping.

H. Triangular Silt Barrier
Maintenance of Triangular Silt Barrier consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).

I. Retrofit:
Maintenance of the retrofit device consists of all labor, tools, materials, equipment and necessary incidentals to remove and properly dispose of accumulated sediment in the permanent detention pond being utilized as a temporary sediment basin. This item also includes any maintenance that is required to ensure the retrofit device is maintained per Plan details and any maintenance of the stone filter to maintain its filtering ability, including cleaning and replacement.

J. Construction Exit:
Maintenance of the construction exit consists of all labor, tools, materials, equipment and incidentals, including additional stone and geotextile fabric as required to prevent the tracking or flow of soil onto public roadways. This includes, scarifying existing stone, cleaning existing stone, or placement of additional stone.
Cleaning of the construction exit by scraping and/or brooming only will not be measured for payment.

K. Inlet Sediment Trap
Maintenance of inlet sediment traps consists of all labor, tools, materials, equipment, and necessary incidentals to remove and properly dispose of accumulated sediment in the trap and/or the excavated area adjacent to the trap. It also includes any maintenance that is required to remove sediment accumulations (“filtercake”) from the material selected to construct the inlet sediment trap.

L. Rock Filter Dams
Maintenance of rock filter dams consists of all labor, tools, materials, equipment, and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).
This item also includes the removal of any material deposited in sump holes.

M. Stone Filter Berms
Maintenance of stone filter berms consists of all labor, tools, materials, equipment, and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).
This item also includes the removal of any material deposited in sump holes.

N. Stone Filter Rings
Maintenance of stone filter rings consists of all labor, tools, materials, equipment, and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).
This item also includes the removal of any material deposited in sump holes.

165.3.06 Quality Acceptance
General Provisions 101 through 150.

165.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

165.4 Measurement
A. Temporary Silt Fence:
Maintenance of temporary silt fence, Type NS or S, is the actual linear feet of silt fence, measured in place, where sediment is removed.

B. Silt Control Gates:
Maintenance of temporary silt control gates, type I, II, III or IV, as specified on the Plans, is measured as a single unit.

C. Check Dams (All Types):
Maintenance of temporary erosion control check dams as specified on the Plans is the actual linear feet of baled straw, type c silt fence or rip rap, measured in place, where sediment is removed.

D. Silt Retention Barrier:
Maintenance of temporary silt retention barrier as specified on the Plans, is measured by the linear foot where sediment is removed.

E. Temporary Sediment Basins:
Maintenance of temporary sediment basins as specified on the Plans, is measured as a single unit.

F. Sediment Barrier (baled straw)
Maintenance of sediment barrier (baled straw), is the actual linear feet of baled straw measured in place, where sediment is removed.

G. Triangular Silt Barrier:
Maintenance of triangular silt barrier as specified on the plans, is measured by the linear foot where sediment is removed.

H. Retrofit:
Maintenance of retrofit device at the location specified on the Plans is measured per each.

I. Construction Exit:
Maintenance of construction exit at the location specified on the Plans, or as directed by the Engineer is measured per each.

J. Inlet Sediment Trap
Maintenance of inlet sediment trap at the location specified on the Plans, or as added by the Engineer is measured per each.

K. Rock Filter Dams
Maintenance of rock filter dams as specified on the plans is measured as a single unit.

L. Stone Filter Berms
Maintenance of stone filter berms as specified on the plans is measured as a single unit.

M. Stone Filter Rings
Maintenance of stone filter rings as specified on the plans is measured as a single unit.

165.4.01 Limits
General Provisions 101 through 150.

165.5 Payment
A. Temporary Silt Fence:
Maintenance of temporary silt fence, Type NS or S, is paid for at the contract unit price bid per linear foot.

B. Silt Control Gates:
Maintenance of temporary silt control gates, Type I, II, III, or IV as specified on the Plans is paid for at the contract unit price bid per each.

C. Check Dams (All Types):
Maintenance of Check Dams as specified on the Plans is paid for at the contract unit price bid per linear foot.

D. Silt Retention Barrier:
Maintenance of temporary silt retention barrier as specified on the Plans is paid for at the contract unit price bid per linear foot.

E. Temporary Sediment Basins:
Maintenance of temporary sediment basins as specified on the Plans is paid for at the contract unit price bid per each.
F. Sediment Barrier (baled straw):
  Maintenance of sediment barrier (baled straw) as specified on the Plans is paid for at the contract unit price bid per linear foot.

G. Triangular Silt Barrier:
  Maintenance of triangular silt barrier as specified on the Plans is paid for at the contract unit price bid per linear foot.

H. Retrofit:
  Maintenance of the retrofit device at the location specified on the Plans is paid for at the contract unit price bid per each.

I. Construction Exit:
  Maintenance of the construction exit at the location specified on the Plans or as added by the Engineer is paid for at the contract unit price per each.

J. Inlet Sediment Trap
  Maintenance of the inlet sediment trap at the location specified on the Plans or at the location specified by the Engineer is paid for at the contract unit price per each.

K. Rock Filter Dams
  Maintenance of rock filter dams as specified on the plans is paid for at the contract unit price bid per each.

L. Stone Filter Berms
  Maintenance of stone filter berms as specified on the plans is paid for at the contract unit price bid per each.

M. Stone Filter Rings
  Maintenance of stone filter rings as specified on the plans is paid for at the contract unit price bid per each.

Payment will be made under:

| Item No. 165 | Maintenance of temporary silt fence Type _____ | Per linear foot |
| Item No. 165 | Maintenance of silt control gate Type _____ | Per each |
| Item No. 165 | Maintenance of check dams (all types) | Per linear foot |
| Item No. 165 | Maintenance of silt retention barrier | Per linear foot |
| Item No. 165 | Maintenance of temporary sediment basin, Sta. No. _____ | Per each |
| Item No. 165 | Maintenance of sediment barrier (baled straw) | Per linear foot |
| Item No. 165 | Maintenance of triangular silt barrier | Per linear foot |
| Item No. 165 | Maintenance of retrofit, Sta. No. _____ | Per each |
| Item No. 165 | Maintenance of construction exit | Per each |
| Item No. 165 | Maintenance of inlet sediment trap | Per each |
| Item No. 165 | Maintenance of rock filter dam | Per each |
| Item No. 165 | Maintenance of stone filter berm | Per linear foot |
| Item No. 165 | Maintenance of rock filter dam | Per each |

165.5.01 Adjustments
General Provisions 101 through 150.
Section 167—Water Quality Monitoring

167.1 General Description
This Specification establishes the Contractor’s responsibility to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) Infrastructure Permit No. GAR 100002 as it pertains to Part IV. Erosion, Sedimentation and Pollution Control Plan.

167.1.01 Definitions
Certified Personnel—certified personnel are defined as persons who have successfully completed the appropriate certification course approved by the Georgia Soil and Water Conservation Commission.

167.1.02 Related References
A. Standard Specifications
   Section 161—Control of Soil Erosion and Sedimentation

B. Referenced Documents
   NPDES Infrastructure Permit No. GAR 100002.
   Environmental Protection Divisions Rules and Regulations (Chapter 391-3-26) Georgia Soil and Water Conservation Commission Certification Level 1A course. OCGA 12-7

167.1.03 Submittals
General Provisions 101 through 150

167.2 Materials
General Provisions 101 through 150.

167.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

167.3 Construction Requirements
167.3.01 Personnel
Use certified personnel to perform all monitoring, sampling, inspections, and rainfall data collection. Ensure that monitoring consultants’ employees who perform monitoring, sampling, inspections, and rainfall data collection are GASWCC Certified.

167.3.02 Equipment
Provide equipment necessary to complete the Work or as directed.

167.3.03 Preparation
General Provisions 101 through 150.

167.3.04 Fabrication
General Provisions 101 through 150.

167.3.05 Construction
A. General
Perform inspections, rainfall data collection, testing of samples, and reporting the test results on the project according to the requirements in Part IV of the NPDES Infrastructure permit and this Specification.

Take samples manually or with the use of automatic samplers, according to the permit. Analyze all according to the permit, regardless of the method used to collect the samples.

If samples are analyzed in the field using portable turbidimeters, the monitoring results shall state that they are being used and a digital readout of NTUs is what is provided.

Submit bench sheets, work sheets, etc., when using portable turbidimeters. There are no exceptions to this requirement. Perform required inspections and submit all reports required by this Specification within the time frames specified.

Failure to perform the inspections within the time specified will result in the cessation of all construction activities with the exception of traffic control and erosion control. Failure to submit the required reports within the times specified will result in non-refundable deductions as specified in Subsection 161.5.01.B.

B. Inspections

Barrow County will provide one copy of required inspection forms for use and duplication. Inspection forms may change during the contract to reflect regulatory agency needs or the need of Barrow County. Any costs associated with the change of inspection forms shall be considered incidental. Alternate formats of the provided forms may be created, used and submitted by the Contractor provided the required content and/or data fields and verbatim certification statements from Barrow County’s current forms are included.

The Engineer shall inspect the installation and condition of each erosion control device required by the erosion control plan within seven days after initial installation. This inspection is performed for each stage of construction when new devices are installed. The WORKSITE EROSION CONTROL SUPERVISOR shall ensure all installation deficiencies reported by the Engineer are corrected within two business days.

Ensure that the inspections of the areas listed below are conducted by certified personnel and at the frequencies listed. Document all inspections on the appropriate form provided by Barrow County.

1. Daily:
   a. Petroleum product storage, usage and handling areas
   b. All locations where vehicles enter/exit the site.

   Continue these inspections until all entry and exit sites are stabilized and fuel is not stored or transferred on the site. Utilize the Daily inspection form.

2. Weekly and after Rainfall Events:

   Conduct inspections on these areas every seven calendar days and within twenty-four hours after the end of a rainfall event that is 0.5 in. greater:
   a. Disturbed areas not permanently stabilized
   b. Material storage areas
   c. Structural control measures, Best Management Practices (BMPs)
   d. Water quality monitoring locations and equipment
Continue these inspections until all BMPs have been removed.

3. Monthly:
   Once per month, inspect all areas where final stabilization has been completed. Look for evidence of sediments or pollutants entering the drainage system and or receiving waters. Inspect all permanent erosion control devices that remain in place to verify the maintenance status and that the devices are functioning properly.
   Continue these inspections until the Notice of Termination is submitted. Utilize the Monthly inspection form.

C. Reports:
1. Inspection Reports:
   Summarize the results of inspections noted above in writing on the appropriate form.
   Include the following information:
   - Date(s) of inspection
   - Name of personnel performing inspection
   - Status of devices
   - Observations
   - Action taken
   - Signature of personnel performing the inspection
   - Any incidents of non-compliance
   The inspection form certification sheet shall be signed by the project WORKSITE EROSION CONTROL SUPERVISOR and the inspector performing inspections on behalf of the WORKSITE EROSION CONTROL SUPERVISOR (if not the same person).
   Submit all inspection reports to the Engineer within twenty-four hours of the inspection.
   The Engineer will review the submitted reports and inspect the project to determine their accuracy.
   The Engineer will notify the certified personnel of any additional items that should be added to the inspection report. Correct any items listed in the inspection report requiring routine maintenance within 72 (seventy–two) hours of notification.
   Assume responsibility for all costs associated with additional sampling as specified in Part IV.D.6.d.3.(c) of the NPDES GAR 100002 permit if either of these conditions arise:
   - BMPs shown in the Plans are not properly installed and maintained, or
   - BMPs designed by the Contractor are not properly designed, installed and maintained.

2. Monitoring Reports
   a. Report Requirements

      Include in all reports, the following certification statement, signed by the WORKSITE EROSION CONTROL SUPERVISOR or consultant providing monitoring on the project:
      “I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that certified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”
b. When a rainfall event requires a sample to be taken, submit a report of the monitoring results to the Engineer within seven working days of the date the sample was obtained. Include the following information:
1.) Date of sampling
2.) Rainfall amount on sample date (sample date only)
3.) NTU of sample & analysis method
4.) Location where sample was taken (station number, etc.)
5.) Receiving water or outfall sample
6.) Project number and county
7.) Whether the sample was taken by automatic sampler or manually (grab sample)
3. Rainfall Data Reports
   Record the measurement of rainfall once each twenty-four hour period. Measure rainfall data at the active phase of construction on the site.
   Project rain gauges and those used to trigger the automatic samplers are to be emptied after every rainfall event. This will prevent a cumulative effect and prevent automatic samplers from taking samples even though the rainfall event was not a qualifying event.
   The daily rainfall data supplied by the WORKSITE EROSION CONTROL SUPERVISOR to the Engineer will be the official rainfall data for the project.

167.3.06 Quality Acceptance
General Provisions 101 through 150.

167.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

167.4 Measurement
Water Quality Inspections in accordance with the inspection and reports sub-sections will be measured for payment by the month up to the time the Contract Time expires. Required inspections and reports after Contract Time has expired will not be measured for payment.
Water Quality Monitoring and Sampling are measured per each. When the monitoring location is receiving water, the upstream and downstream samples constitute one sample. When the monitoring location is an outfall, a single outfall sample constitutes one sample.

167.4.01 Limits
General Provisions 101 through 150. Submit the monitoring summary report to the Engineer within 7 working days

167.5 Payment
Payment for Water Quality Monitoring and Sampling will be made as follows:
Water Quality Monitoring and Sampling per each is full compensation for meeting the requirements of the monitoring sections of the NPDES permit and this Specification, obtaining samples, analyzing samples, any and all necessary incidentals, and providing results of turbidity tests to the Engineer, within the time frame required by the NPDES Infrastructure permit, and this Specification.
This item is based on the rainfall events that require sampling as described in Part IV.D.5 of the permit.
Barrow County will not pay for samples taken and analyzed for rainfall events that are not qualifying events as compared to the daily rainfall data supplied by the WORKSITE EROSION CONTROL SUPERVISOR. Water Quality Inspections will be paid at the Contract Price per month. This is full compensation for performing the requirements of the inspection section of the NPDES permit and this Specification, any and all necessary incidentals, and providing results of inspections to the Engineer, within the time frame required by the NPDES Infrastructure permit, and this Specification.

Payment will be made under:

| Item No. 167 | Water quality inspections | Per month |

Payment will be made under:

| Item No. 167 | Water quality monitoring and sampling | Per each |

167.5.01 Adjustments

General Provisions 101 through 150.
Section 171—Silt Fence

171.1 General Description
This work includes furnishing, installing, and removing a water permeable filter fabric fence to remove suspended particles from drainage water.

171.1.01 Definitions
General Provisions 101 through 150.

171.1.02 Related References
A. Standard Specifications
Section 163—Miscellaneous Erosion Control Items
Section 700—Grassing
Section 862—Wood Posts and Bracing
Section 881—Fabrics
Section 894—Fencing
B. Referenced Documents
ASTM D 3786
ASTM D 4355
ASTM D 4632
ASTM D 4751
GDT 87
QPL 36

171.1.03 Submittals
General Provisions 101 through 150.

171.2 Materials
Materials shall meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter Fabrics</td>
<td>881</td>
</tr>
<tr>
<td>Fencing</td>
<td>894</td>
</tr>
<tr>
<td>Wood Posts and Bracing</td>
<td>862</td>
</tr>
</tbody>
</table>

Conditions during Project construction will affect the quantity of the silt fence to be installed. The Engineer may increase, decrease, or eliminate the quantity at his or her direction. Variations in quantity are not changes in details of construction or in the character of the work. For Type NS and S fences, use fabric as specified in Subsection 881.2.07, “Silt Fence Filter Fabric.”

171.2.01 Delivery, Storage, and Handling
During shipment and storage, wrap the fabric in a heavy-duty covering that will protect the cloth from sunlight, mud, dust, dirt, and debris. Do not expose the fabric to temperatures greater than 140 °F. When installed, the Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.
171.3 Construction Requirements

171.3.01 Personnel
General Provisions 101 through 150.

171.3.02 Equipment
General Provisions 101 through 150.

171.3.03 Preparation
General Provisions 101 through 150.

171.3.04 Fabrication
General Provisions 101 through 150.

171.3.05 Construction
Install the silt fence according to this Specification, as shown on the Plans, or as directed by the Engineer as; perimeter, ditch check or similar protection.

A. Install Silt Fence
1. Install silt fence by either of the following methods:
   a. Excavated Trench Method
      Excavate a trench 4 to 6 in. deep using equipment such as a trenching machine or motor grader.
      If equipment cannot be operated on the site, excavate the trench by hand.
   b. Soil Slicing Method
      Create a mechanical slice in the soil 8 to 12 in. deep to receive the silt fence. Ensure that the width of the slice is not more than 3 in. Mechanically insert the silt fence fabric into the slice in a simultaneous operation with the slicing that ensures consistent depth and placement.
2. Install the first post at the center of the low point (if applicable). Space the remaining posts a maximum of 6 ft apart for Type NS fence and 4 ft apart for Type S fence.
3. Bury the posts at least 18 in. into the ground. If this depth cannot be attained, secure the posts enough to prevent the fence from overturning from sediment loading.
4. Attach the filter fabric to the post using wire, cord, staples, nails, pockets, or other acceptable means.
   a. **Staples and Nails (Wood Posts):** Evenly space staples or nails with at least five per post for Type NS fence.
   b. **Pockets:** If using pockets and they are not closed at the top, attach the fabric to a wood post using at least one additional staple or nail, or to a steel post using wire. Ensure that the additional attachment is within the top 6 in. of the fabric.
   c. Install the filter fabric so that 6 to 8 in. of fabric is left at the bottom to be buried. Provide a minimum overlap of 18 in. at all splice joints.
   d. For Type S fence:
      1. **Woven Wire Supported**
         Steel Post: Use wire to attach the fabric to the top of the woven wire support fence at the midpoint between posts. Also, use wire to attach the fabric to the post.
      2. **Polypropylene Mesh Supported**
         Wood Post: Use at least six staples per post. Use two staples in a crisscross or parallel pattern to secure the top portion of the fence. Evenly space the remaining staples down the post.
         Steel Post: Use wire to attach the fabric and polypropylene mesh to the post.
5. Install the fabric in the trench so that 4 to 6 in. of fabric is against the side of the trench with 2 to 4 in. of fabric across the bottom in the upstream direction.

6. Backfill and compact the trench to ensure that flow cannot pass under the barrier. When the slice method is used, compact the soil disturbed by the slice on the upstream side of the silt fence first, and then compact the downstream side.

7. When installing a silt fence across a waterway that produces significant runoff, place a settling basin in front of the fence to handle the sediment load, if required. Construct a suitable sump hole or storage area according to Section 163.

B. Install silt fence ditch checks

1. Temporary Silt Fence Ditch Checks
   Temporary silt fence ditch checks shall be constructed of the material type selected and shown on the approved erosion and sediment control plan. Item installation shall be constructed and placed according to approved Plan details. Temporary ditch checks shall remain in place until the permanent ditch protection is in place or being installed and the removal is approved by the Engineer.

C. Remove the Silt Fence

1. Keep all silt fences in place unless or until the Engineer directs it to be removed. A removed silt fence may be used at other locations if the Engineer approves of its condition.

2. After removing the silt fence, dress the area to natural ground, grass and mulch the area according to Section 700.

3. The silt fence shall remain until the Project is accepted or until the fence is removed. Also, remove and dispose of the silt accumulations at the silt fence.

4. Remove and replace any deteriorated filter fabric that reduces the effectiveness of the silt fence.

5. Repair or replace any undermined silt fence at no additional cost to Barrow County.

171.3.06 Quality Acceptance
Approved silt fence is listed in QPL 36. Approved fabrics must consistently exceed the minimum requirements of this Specification as verified by the Georgia Department of Transportation Office of Materials. The Office of Materials will remove fabric that fails to meet the minimum requirements of this specification from the QPL until the products’ acceptability has been reestablished to Barrow County of Transportation’s satisfaction.

At the time of installation, the Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

171.3.07 Contractor Warranty
The silt fence shall remain until the Project is accepted or until the fence is removed. Also, remove and dispose of the silt accumulations at the silt fence.

Remove and replace any deteriorated filter fabric that reduces the effectiveness of the silt fence.

Repair or replace any undermined silt fence at no additional cost to Barrow County.

171.4 Measurement
The quantity of silt fence, silt fence ditch checks to be paid for is the actual number of linear feet of silt fence, measured in place from end post to end post of each separate installation. The silt fence must be complete and accepted.

171.4.01 Limits
General Provisions 101 through 150.
171.5 Payment
Silt fence Type NS or S measured as defined in Subsection 171.4, “Measurement,” is paid for at the Contract Unit Price bid per linear foot.
- Payment is full compensation for the following:
  - Furnishing materials
  - Erecting the fence
  - Dressing and grassing, when required
  - Removing the fence, when required
Payment for this Item is made as follows:
Seventy-five percent of the Contract Price bid per linear foot is paid when each fence is complete in place. Twenty-five percent is paid at removal or acceptance.
If the silt fence must be repaired or removed, as the result of neglect or damage, perform the work at no additional cost to Barrow County.

Payment will be made under:

| Item No. 171 | Silt fence, type__ | Per linear foot |

171.5.01 Adjustments
General Provisions 101 through 150.
Section 201—Clearing and Grubbing Right of Way

201.1 General Description
This work includes clearing, grubbing, removing and disposing of vegetation, buildings and debris within the entire Right-of-Way and areas adjacent to the Right-of-Way or as designated by the Engineer. Except, do not remove objects designated to remain or removed according to other sections of these Specifications. This work also includes preserving (from injury and defacement) vegetation and objects designated to remain in place.

201.1.01 Definitions
Clearing: Removing and disposing trees, brush, stumps, logs, grass, weeds, roots, decayed vegetable matter, poles, stubs, rubbish, refuse dumps, sawdust piles, and loose boulders of 1 yd³ or less existing outside of the construction limits, debris resting on or protruding through the ground surface, or appearing on the Right-of-Way before final acceptance of the work. Clearing also includes removing and disposing of obstructions, such as fences, bridges, buildings, and other incidental structures within the Right-of-Way unless the work or a portion of the work is:
• Removed as excavation
• Shown in the Proposal as a separate Pay Item
• Performed by others
Grubbing: Removal from the Right-of-Way and proper disposal of all objectionable matter defined above under clearing, which is embedded in the underlying soil. Grubbing also includes removing and properly disposing of parking lots, abandoned pavements, sidewalks, driveways, catch basins, drop inlets, pipes, manholes, curbing, retaining walls, utilities, foundations, paved floors, underground tanks (for removal of underground tanks see Section 217), and other structures within the Right-of-Way unless the work or portions of the work are:
• Obstructions removed as one of the excavation items
• Shown in the Proposal as separate Pay Items
• Removed by others
• To be incorporated in the project.

Objectionable Roots: Any of the following types of roots:
• Matted trees and brush roots (regardless of the size of the roots)
• Individual roots more than 0.75 in. diameter
• Individual roots more than 3 ft. long regardless of size
• Large quantities of smaller roots present in the top 1 ft. of the finished subgrade or road surface when detrimental to the work as determined by the Engineer.

Stumps: The butt of a tree with a diameter of 4 in. or more.

201.1.02 Related References
A. Standard Specifications
Section 107—Legal Regulations and Responsibility to the Public
Section 109—Measurement and Payment
Section 160—Reclamation of Material Pits and Waste Areas
Section 161—Control of Erosion and Sedimentation
Section 208—Embankments
Section 215 – Removal of Solid Waste
Section 217—Removal of Underground Storage Tanks

B. Referenced Documents
   General Provisions 101 through 150.

201.1.03 Submittals
   General Provisions 101 through 150.

201.2 Materials
   General Provisions 101 through 150.

201.2.01 Delivery, Storage, and Handling
   General Provisions 101 through 150.

201.3 Construction Requirements
   201.3.01 Personnel
   General Provisions 101 through 150.

   201.3.02 Equipment
   General Provisions 101 through 150.

   201.3.03 Preparation
   General Provisions 101 through 150.

   201.3.04 Fabrication
   General Provisions 101 through 150.

   201.3.05 Construction
   A. General
      Establish Right-of-Way and construction lines. The Engineer will designate which trees, shrubs, and
      plants will remain in the ground. Preserve things designated to remain.
      Apply the requirements of Subsection 107.22, Subsection 107.23, and Section 161 to clearing and
      grubbing operations. Strip grass immediately ahead of grading.

      To prevent the spread of “Introduced Invasive Pest Species”, do the following:
      1. Adhere to the restrictions of Section 155.3.05.A for moving soil, mulch, sod or plants, stump wood or
         timber with soil attached.
      2. Adhere to the requirements of Section 155.3.05.B for cleaning of equipment, except that the USDA
         inspection will not be required for vegetative matter.
      3. Dispose of vegetative parts of plants that may reproduce (roots and aboveground parts that bear fruit)
         by burning on site (where permitted) or bury with a minimum cover of 3 feet at an approved site.
         Obtain the Engineer’s approval for any other methods of disposal.

   B. Clearing
      Clear objects within the Right-of-Way and easement areas as follows:
1. Choose a method of clearing that prevents damage to property, trees, or retained shrubbery in or outside of the Right- of-W ay.

2. Remove stumps that are part of the clearing operations as specified under Subsection 201.3.05.C, “Grubbing”.

3. Cut the stumps not grubbed as specified in this section.

4. Dispose of cleared materials as specified in Subsection 201.3.05.E.

C. Grubbing
Grubbing consists of removing and disposing objectionable matter embedded in the underlying soil (defined in Subsection 201.3.05.B, “Clearing”) from the Right-of-W ay and easement areas.

1. Grubbing Operations
   When grubbing, remove abandoned obstructions referenced in Subsection 201.1.01 “Definitions” to the following depths:
   a. Under Pavements: Remove to a depth of at least 3 ft. below the finished subgrade.
   b. Underneath Other Structures: Remove to at least 3 ft. below the foundations of any proposed structure, including installations such as guard rail posts and utility poles.
   c. Elsewhere in the Right-of-W ay and easement areas: Remove as follows:
      1) Remove to at least 3 ft. below the finished surface of slopes and shoulders and 1 ft. below natural ground outside construction lines.
      2) Thoroughly crack or break abandoned structures that may impound water. These structures include concrete floors, basements, and catch basins within 10 ft. of finished grade.
      3) Break floors so that no section greater than 10 ft² remains intact.

2. Except as modified under Subsection 201.3.05.D, use the following procedure to perform grubbing:
   a. Remove stumps and other matter that cannot be removed by a root rake. Remove stumps to a minimum depth of 2 ft. below the ground line.
   b. Rake areas containing objectionable roots to a depth of at least 6 in. below the surface.
   c. Remove remaining objectionable matter by hand or other suitable means. When necessary, remove small roots (see Subsection 201.1.01 “Objectionable Roots”) detrimental to the work.
   d. Backfill stump holes and compact backfill to the approximate density of the surrounding soil.
   e. Harrow the area with a heavy-duty disc harrow that penetrates and turns the ground to at least 6 in. deep.
   f. Remove objectionable matter exposed by the harrowing.
   g. Level the harrowed areas with blading equipment. Leave the grubbed areas smooth enough for a power mower.

D. Modifications of Clearing and Grubbing
Modify clearing and grubbing as follows:

1. In Excavation Areas
   Modify clearing and grubbing in excavation areas as follows:
   a. Harrowing and leveling may be omitted.
   b. Do not fill stump holes except when the bottom of any stump hole extends below the elevation of the finished subgrade. In this case, fill the portion of each hole below subgrade elevation with suitable material compacted to at least the density of the surrounding soil.

2. In Embankment Areas
   Modify clearing and grubbing in embankment areas as follows:
a. Under 4.5 ft.
Clear and grub areas without modification where the original ground and finished grade differ in elevation 4.5 ft. or less.
b. Over 4.5 ft.
Clear, but do not grub areas covered by embankments exceeding the 4.5 ft. elevation difference specified in step (a) above. Except the removal of unsound or decayed stumps.
Remove and backfill stumps according to Subsection 201.3.05.C.2. When leaving sound stumps in place, cut them off to no more than 6 in. above the original ground line.
c. Embankment Areas Over Old Roads
Clear and grub without modification ditches and slopes of old roads to a depth that removes all objectionable matter to provide a firm foundation.

3. Areas Outside of Roadway
Except as specified in this section, clear and grub the entire Right-of-Way and easement areas outside construction limits and leave it smooth and free from loose boulders and debris that would interfere with power mowers. Exceptions to the above requirements are as follows:
a. Selective Clearing
When the Engineer directs to preserve certain trees and plants, protect them from injury. Trees to be removed shall be felled to prevent injury to standing trees, plants, and improvements to be preserved.
Cut off tree branches overhanging the roadway within 20 ft. of the finished grade close to the boles. Also, remove other branches to create a balanced appearance. Grub areas adjacent to selected trees and shrubs without damage to living roots of the selected trees or shrubs.
b. Special Treatment Areas
Clear special treatment areas according to the Plan notes.
c. Steep Slopes
Clear or selectively clear slopes that are too steep for power mowers (slopes steeper than 3 horizontal to 1 vertical) and clear or selectively clear slopes that are subject to excessive erosion.
Do not grub in these areas.
d. Grassed Areas
Do not grub (if the Engineer approves) reasonably large areas outside construction limits covered with grasses and smooth enough for power mowers. Remove stumps, trees, and other objectionable matter.

4. Bridge Sites
Modify clearing and grubbing at bridge sites as follows:
a. Stream Bridges
Clear the Right-of-Way for stream bridges for the full length of the proposed structure. Cut stumps and brush flush with the ground line.
The Engineer will require a second cutting if high water prevents cutting stumps flush with the ground.
Remove drift and stumps where necessary to permit installation of rip rap, piling, piers, abutments, wing walls, and bents. Properly backfill the holes.
Preserve stump and brush root systems at river and stream banks when they have been cut flush with the ground line.
b. Other Bridges
Clear and grub bridges (other than stream bridges) as specified within this specification for roadway areas and areas outside of the roadway.

E. Removal and Disposal of Materials

1. Merchantable Timber and Buildings

Barrow County may dispose of merchantable timber and buildings, or may allow a property owner to remove them from the land granted for Right-of-Way before the Contractor begins operation. Therefore, Barrow County does not guarantee that merchantable timber or buildings will be on the Right-of-Way when the work begins.

Material salvaged from removing timber or buildings becomes the property of the Contractor.

Demolish, remove, and dispose of all building structures within the right of way and easement areas including concrete slabs, footings, foundations, etc. except building structures designated to remain in place. Grade to drain all disturbed ground to a reasonably smooth and pleasing appearance, free from loose boulders and other debris that would interfere with the use of power mowers. Grass all disturbed areas.

Prior to demolition or removal:

a. Inspect all building structures for the presence of asbestos. The inspection shall be done by an EPA Asbestos Hazard Emergency Response Act (AHERA) accredited inspector whose certification is current.

b. Provide a copy of all inspection reports including the inspector’s credentials to the Engineer.

c. Provide written notice of intent to demolish to the Georgia Environmental Protection Division (EPD) of the Georgia Department of Natural Resources in accordance with EPD regulations with a copy to the engineer. This notice is required even if there is no asbestos present.

If there is asbestos present, its removal shall be done by a contractor licensed with the EPD in accordance with the Rules of Georgia Department of Natural Resource Environmental Protection Division chapter 391-3-14-04. All asbestos removal and disposal shall be done in accordance with EPD regulations. All asbestos removal shall be considered as Extra Work and payment will be made in accordance with Subsection 109.05.

2. Combustible Material

Abide by Federal, State, and local codes when the Right-of-Way (or any portion of the Right-of-Way) lies within an area where burning is restricted. All combustible material except sawdust piles may be burned on the Right-of-Way except where prohibited by Federal, State, or local air pollution control regulations.

a. Prevent fire from spreading to adjacent areas and damaging living trees and shrubs designated to remain on the Right-of-Way and easement areas.

b. Prevent damage to public and private installations either within or adjacent to the Right-of-Way and prevent damage to traveling public.

c. Obtain suitable areas for burning the combustible material when necessary (at the Contractor’s expense).

Burning area are subject to the approval of the Engineer.

d. Dispose of unburned combustible material according to Subsection 201.3.05.E.3. If the disposal area is located on private property, present written authority to the Engineer (signed by the property owner) granting the Contractor and Barrow County permission to use the area for the purpose intended. Reclaim the disposal area according to Section 160 except that the reclamation is at the Contractor’s expense.
e. Completely remove sawdust within the construction limits. Haul the sawdust to approved disposal areas, or deposit it on the Right-of-Way in a layer less than 3 in. deep. Immediately mix the sawdust with the underlying soil by discing and harrowing. Leave the harrowed surface smooth.

3. Solid Waste Material
Place solid waste material either in the embankment (provided the material is satisfactory for embankment construction) or in a Barrow County approved solid waste disposal site. The classification of non-regulated and regulated solid waste materials are defined by the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources (GDNR) rules and regulations. Dispose of these materials using the following procedures.

a. Non-regulated Solid Waste Material
   1) Excess material such as soil, rock, brick, concrete (with and without reinforcement), and cured asphalt may be placed within the Right-of-Way, provided there is available room. Place these materials according to Section 208 and as directed by the Engineer.
   2) Common fill such as soil, rock, brick, and concrete (with and without reinforcement) may be placed outside the Right-of-Way. Place the material in uniform layers 3 ft. thick or less and distributed to avoid pockets. Fill voids with finer material. Cover the last layer of fill with at least 2 ft. of soil. Construct the fill according to Section 208, except compact it to at least 90 percent of the maximum laboratory dry density.
   3) Materials that may be recycled or reused such as asphaltic concrete, Portland cement concrete, plastic, metal, and materials that qualify under EPD regulations for sale or use may be reclaimed by the Contractor.

b. Regulated Material
   1) Obtain an inert landfill permit according to GDNR/EPD rules for the following material deposited off the R/W: Inert waste items listed in Subsection 201.3.05.E.3.a if not properly layered and compacted, and organic debris such as stumps, limbs and leaves, cured asphalt. Or, take the material to a permitted solid waste landfill.
   2) Take other regulated construction/demolition and non-hazardous solid waste, such as forms, barrels, plastic, and other by-products of construction to a construction/demolition landfill or to a municipal solid waste landfill.
   3) Dispose of oils, solvents, fuels, untreated lead paint residue, and other solid hazardous waste through a properly licensed hazardous waste disposal facility. Remove municipal solid waste discovered during construction or shown on the Plans according to Section 215.

201.3.06 Quality Acceptance
General Provisions 101 through 150.

201.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

201.4 Measurement
Barrow County does not measure clearing and grubbing separately for payment. The area is considered the full Right-of-Way width for the length of the Project including slope and construction areas beyond the Right-of-Way shown on the Plans.

201.4.01 Limits
General Provisions 101 through 150.

201.5 Payment
No separate payment will be made for clearing and grubbing or the disposal of solid waste materials.

201.5.01 Adjustments
General Provisions 101 through 150.
Section 205—Roadway Excavation

205.1 General Description
Roadway excavation shall conform to the lines, grades, and cross-sections shown on the Plans or established by the Engineer. If artifacts of historical or archaeological significance are encountered, temporarily stop excavation operations until directed by the Engineer. See Subsection 107.13.A. Roadway excavation includes the following:
Excavating, hauling, and placing or disposing of materials (not removed under another Contract Item) from within the limits of areas designated in the Contract.
Excavating ditches (except channel excavation) and filling and/or plugging abandoned wells (both dug and drilled) located within the Right-of-Way and construction easements according to Georgia Standard 9031H.
Removing paving, aggregates, and ballast not incorporated into the new work as a result of alignment shifts, grade changes, or reasons that may or may not be shown on the Plans.
Salvaging aggregates, paving, (only if designated on the Plans) and removed railroad ballast.
Barrow County claims salvaged materials unless the Engineer directs that materials be wasted. Dispose of materials not salvaged. Stockpile salvaged materials on the Project unless other sites for stockpiling are shown on the Plans.

205.1.01 Definitions
General Provisions 101 through 150.

205.1.02 Related References
A. Related Specifications
   Section 107—Legal Regulations and Responsibility to the Public
   Section 109—Measurement and Payment
   Section 201—Clearing and Grubbing Right-of-Way
   Section 202—Random Clearing and Grubbing
   Section 209—Subgrade Construction
   Section 411—Asphaltic Concrete Pavement, Partial Removal
   Section 610—Removal of Miscellaneous Roadway Items
B. Related Documents
   General Provisions 101 through 150.

205.1.03 Submittals
General Provisions 101 through 150.

205.2 Materials
Define excavated material, regardless of its nature or composition, as “unclassified excavation” unless otherwise specified in the Plans.
The Engineer will designate materials that are unsuitable.

205.2.01 Delivery, Storage, and Handling
A. Disposal of Surplus Material
   Unless directed by the Engineer, do not waste excavated material until satisfying embankment and backfill requirements, unless material is designated on the Plans as “Unsuitable for embankment or backfill construction.”
   Dispose of materials to be wasted according to Subsection 201.3.05.E and the following information:
Use suitable surplus material to widen embankments uniformly or to flatten fill slopes, or deposit the material in places on the Right-of-Way as directed by the Engineer. Do not leave an unsightly pile of material that will damage abutting property or deposit material above the grade of the adjacent roadway unless so directed by the Engineer. Do not place the edge of a waste bank nearer than 10 ft. from the top of a cut slope. Dispose of unsuitable and surplus materials unless they are used as fill for slopes, abandoned ditches, or other areas shown on the Plans. Deposit unsuitable material excavated from ditches and do not allow it to remain within 3 ft. of the ditch edge. Spread material neatly in level, uniform layers. Use suitable materials from ditches for constructing roadway embankments unless otherwise directed by the Engineer.

B. Waste Disposal Areas

When unable to dispose of unsuitable or surplus excavation material on the Right-of-Way, dispose of it in the following areas:

1. Disposal Areas Shown on Plans
   Check disposal areas shown on the Plans. They may or may not be adjacent to the Right-of-Way. When shown on the Plans, Barrow County will obtain Right-of-Way or easement to permit disposal of material. The Plans contain the amounts of royalties and the conditions for the acquiring of the waste easement.
   When Barrow County furnishes the waste areas, and the Engineer provides measurements of the area used, do the following:
   a. Promptly pay royalties to the owners of waste pits.
   b. Meet other conditions agreed to with the owners.
   c. Submit to the Engineer a written statement signed by the owner stating that the owner has been paid in full and the agreed conditions, including proper draining and final clean-up, have been fulfilled to the owner’s satisfaction before receiving final payment from Barrow County.
   Barrow County will not make separate payment for these costs of acquisition.
   If the property owner is not paid within 60 days after the Engineer has furnished the measurement, Barrow County may pay the property owner directly any amounts due, and deduct it from funds due the Contractor.
   This provision does not affect the obligation of the Contractor under his bond or the rights of the property owner or Barrow County under the bond.
   In case of dispute between the Contractor and Barrow County, the Chief Engineer will make the final and conclusive decision.
   When disposal areas are shown on the Plans and are elected to be used, comply with the terms of the option before resorting to other areas.

2. Disposal Areas Not Shown on Plans
   When waste disposal areas are not shown on the Plans, obtain suitable disposal areas at no expense to Barrow County.
   Exercise the right to sell or otherwise dispose of the surplus material in these cases. (See Subsection 107.22 and Subsection 107.23.)

3. Reclamation
   Reclaim disposal areas according to Section 160.

205.3 Construction Requirements

205.3.01 Personnel
General Provisions 101 through 150.
205.3.02 Equipment
General Provisions 101 through 150.

205.3.03 Preparation
General Provisions 101 through 150.

205.3.04 Fabrication
General Provisions 101 through 150.

205.3.05 Construction
Perform roadway excavation according to the Plans, and all of the requirements of this Subsection.
1. Provide adequate openings in spoil banks to allow the adjacent land surface to drain.
2. To carry water from the side hill, cut surface ditches at the top of cut slopes that extend to each end of the cuts.
3. Turn side ditches or gutters that empty from cuts to embankments outward to avoid embankment erosion.
4. Discharge water from surface ditches at terraces or in tail ditches cut along contour lines (wherever possible).
5. Provide outlets or flumes for roadway ditches where necessary according to the Plans.
   Surface ditches, outlets, and other such ditches will be paid for as “unclassified excavation.”
6. Uniformly round the intersection of cut slopes with natural ground surfaces, including the beginning and end of cut slopes.
7. Bring cut slopes to the grade and cross-section shown on the Plans or established by the Engineer.
8. Finish to reasonably uniform surfaces acceptable for seeding and mulching operations.
9. Dispose of material from slides and overbreaks that occur before Final Acceptance as directed by the Engineer.

A. Constructing Serrated Slopes
   Construct serrated slopes as follows:
   1. Grade the backslope according to the Construction Detail.
   2. Start the first serration (step) as designated on the Construction Detail. Ensure that it is level instead of parallel to the roadway grade.
   3. Use the tilt-control blade bulldozer to cut steps in alternate directions.

B. Constructing Non-serrated Slopes
   Construct non-serrated slopes by leaving the front and back slopes in a roughened condition to provide a seed bed for temporary or permanent grassing operations.

C. Erosion and Siltation Control
   Take the measures necessary throughout the Project to control erosion and to prevent silting of rivers, streams, and impoundments. Construct drainage facilities and perform all other construction work that contributes to erosion and siltation control in conjunction with earthwork operations as required by Section 161.

D. Rock Excavation
   Remove rock and dispose of it as shown on the Plans or as directed by the Engineer. Transition any flattening of a cut slope already begun when rock is encountered to ensure the cut has a pleasing appearance.
   Use the presplitting technique to reduce overbreakage and to establish a free surface or shear plane in the rock along the cut periphery or proposed break lines.
   Presplit a periphery plane to the excavation depth before blasting within the plane.
Conduct the presplitting process by drilling appropriately sized holes at intervals that will ensure a neat break, to the desired depth, along the plane of the proposed cut. Load and stem the holes with an appropriate light charge explosive, and detonate the explosives simultaneously.

Allow an 18 in. offset in the slope to begin succeeding drilling operations when the depth of the cut is more than can be drilled from the top.

Create a relatively smooth shear plane as indicated in the Plans with localized irregularities that do not exceed 2 ft. behind or 1 ft. in front (roadway side) of the plane surface.

Do not presplit slopes flatter than 1:1.

1. **Overbreakage**
   - Material that is excavated beyond or below the cross-section shown on the Plans or designated will be at the Contractor’s expense, except unavoidable overbreakage in solid rock. The allowable overbreakage is a maximum of 2 ft. below or outside the original template lines. Backfill to replace material removed below the limits specified at no expense to Barrow County.

2. **Precautions**
   - See Use of Explosives in Subsection 107.12.

3. **Rock and Boulders**
   - Handle rock and boulder excavation as follows:
     a. Excavate solid rock and boulders in the roadbed to at least 1 ft. below the finished subgrade elevation and backfill the space to the correct grade with suitable subgrade material.
     b. Leave the side slopes of rock cuts with uniform faces whether or not the excavation is carried beyond the specified side slope.
     c. Remove loose rock on cut slopes immediately after blasting.
     d. Place stones, broken rock, and boulders found within the construction limits and not required for other construction, into embankment slopes when possible.

4. **Ensure that sloped surfaces conform to the typical section shown on the Plans or to natural cleavage planes compatible with the typical section. Leave sloped surfaces safe and natural looking.**

**E. Unsuitable Material Excavation**

The Engineer may require unsuitable material be removed from its location.

1. Remove material and backfill with properly compacted approved material.
2. Undercut material to the depth shown on the Plans or established by the Engineer in cut areas where the material is not suitable for subgrades or shoulders. Backfill the area with suitable material.
3. Excavate unsuitable material in roadway cuts and dispose of the material as directed by the Engineer. Barrow County will not designate the unsuitable material excavation as a separate Pay Item unless specifically designated on the Plans.

**F. Obliteration of Old Roads**

Obliterate old roads or other areas by completing the following work as directed by the Engineer:

1. Obliterate discontinued roads or other areas inside or outside the Project construction limits.
2. Grade, scarify, plow, and harrow obliterated areas.

Follow this procedure to obliterate the road:

1. Fill old ditches and grade the roadway after the old road is no longer needed for traffic. Restore the original contour of the ground and produce a surface of naturally rounded slopes.
2. Use borrow required for the new roadway from fills in the old road (where feasible).
3. Place surplus and waste material from the new roadway in cuts in the old road (where feasible).
4. Break down and remove or bury old structures not required to maintain drainage flow. Remove and store material with salvage value, or use it in the new construction.
5. Scarify, harrow, and smooth the old surface. Re-grass disturbed areas or establish a vegetative cover according to Section 160 or Section 700 as applicable.
G. Surcharge Removal
   Remove and properly dispose of materials placed as surcharge for consolidation or other purposes.
   1. Waste the material removed or use it for other purposes as specified on the Plans or in the Special
      Provisions.
   2. Provide other areas for disposal if adequate areas are not available for disposing of excess surcharge
      within the Right-of-Way.

H. Use of Select Materials
   Conserve and use excavated materials suitable for subgrade, shoulder construction, plant topsoil, blanket
   for fill slopes, or other purposes as directed by the Engineer according to Subsection 104.06.
   1. Reserve suitable material by either leaving it in its original position or stockpiling it as directed by
      the Engineer.
   2. Haul select materials directly from the excavation area to the final placement area whenever possible.
      Do not stockpile materials unless specifically directed.

I. Final Finishing of Roadway
   After excavation has been completed use the following procedure to finish the roadway:
   1. Shape the surface of the roadbed and slopes to reasonably true grade alignment and cross-section
      shown on the Plans or established by the Engineer. Finish according to Section 209.
   2. Leave cut slope surfaces in rock reasonably uniform and remove loose overhanging rock.
   3. Open all ditches, drains, and culverts constructed to effectively drain the roadway.
      Barrow County will make no separate payment for finishing done under this Section.
   4. Maintain the excavated areas until final acceptance of the Project.

205.3.06 Quality Acceptance
General Provisions 101 through 150.

205.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

205.4 Measurement
Barrow County will make no separate measurement for payment for the work described in this Section.

205.4.01 Limits
General Provisions 101 through 150.

205.5 Payment
Barrow County will make no separate payment for the work described in this Section.

205.5.01 Adjustments
General Provisions 101 through 150.
Section 206—Borrow Excavation

206.1 General Description
This work includes:
Excavating material from borrow areas or pits outside the Project Right-of-Way
Hauling and using the material as required on the Plans or directed by the Engineer
Stripping, excavating, and disposing of unsuitable material from borrow areas. See Subsection 107.22 and Subsection 107.23

206.1.01 Definitions
General Provisions 101 through 150.

206.1.02 Related References
A. Standard Specifications
   Section 106—Control of Materials
   Section 107—Legal Regulations and Responsibility to the Public
   Section 160—Reclamation of Material Pits and Waste Areas
   Section 201—Clearing and Grubbing Right-of-Way
   Section 202—Random Clearing and Grubbing
   Section 208—Embankments
   Section 209—Subgrade Construction
B. Referenced Documents
   Section 106 of the National Historical Preservation Act

206.1.03 Submittals
The Engineer’s approval of borrow pits will be subject to the requirements of Section 106 of the National Historical Preservation Act being fulfilled.
Give the Engineer sufficient notice to perform necessary investigations, measurements, staking, and actions required in Subsection 206.3.05.A.
Working in the pit before receiving the following approvals may result in rejection of the borrow pit:
  • Approval for environmental considerations and material acceptability
  • Approval from pit investigation, cross sectioning, and staking

206.2 Materials
Perform work using embankment materials that meet the requirements in Section 208. Do not use material that contains roots or stumps. The Engineer will approve borrow excavation materials.
Use selected borrow of Class IIB3 or better when specified for subgrade construction or other uses (unless otherwise stated in the Plans or the Proposal).

206.2.01 Delivery, Storage, and Handling
Before obtaining material from borrow areas, use material to construct the embankment that is excavated from within the slope stakes, or stockpile the material for topping out the roadbed (unless otherwise directed by the Engineer).

206.3 Construction Requirements

206.3.01 Personnel
General Provisions 101 through 150.
206.3.02 Equipment
Ensure that equipment and methods used in borrow pits produce the following results:
Various strata, pockets, or accumulations of different types of material are excavated and used in the
correct proportions and sequence.
Material is used to produce borrow or selected borrow with the best possible gradation and stability within
the specified range.
Material is excavated uniformly to facilitate measurement.

206.3.03 Preparation
General Provisions 101 through 150.

206.3.04 Fabrication
General Provisions 101 through 150.

206.3.05 Construction
A. General
   Barrow County will investigate and take necessary actions to satisfy requirements of Section 106 of the
   National Historical Preservation Act.
B. Clearing and Grubbing
   Clear and grub borrow pits as necessary before removing borrow material as specified in Section 106
   and Section 202.
C. Draining Pits
   Prevent water from standing in the pits unless the Engineer determines not to drain the pit.
   Leave slopes presentable. Machine slope the bottom of the excavated area to smooth the surfaces
   suitable for revegetation.
   Barrow County will not measure for payment ditch excavation for draining borrow pits.
D. Disposing of Waste Material
   Dispose of material unsuitable for embankments such as stone, broken rock, boulders, and other material
   found in the borrow pits.
   1. Dispose of the material in a manner satisfactory to the Engineer and at no expense to Barrow County.
   2. Do not leave piles of unsightly material in pits with or without the consent of the property owner.
   3. Dispose of waste materials according to Subsection 201.3.05.E.
E. Reclamation
   Leave borrow pits or waste disposal areas presentable. Reclaim them according to Section 160 unless
   exempted by Subsection 160.1.
   Develop boundary slopes of reclaimed areas and grade them to 3:1 slopes or flatter.

206.3.06 Quality Acceptance
General Provisions 101 through 150.

206.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

206.4 Measurement
Barrow County will make no separate measurement for payment for the work described in this Section.

206.4.01 Limits
General Provisions 101 through 150.
206.5 Payment
Barrow County will make no separate payment for the work described in this Section.

206.5.01 Adjustments
General Provisions 101 through 150.
Section 207—Excavation and Backfill for Minor Structures

207.1 General Description
This work includes excavating, backfilling, or disposing of materials required to install a bridge culvert, box culvert, pipe, arch culvert, headwall and retaining wall according to the Specifications, the Plans, and the Engineer.

207.1.01 Definitions
General Provisions 101 through 150.

207.1.02 Related References
A. Standard Specifications
   Section 104—Scope of Work
   Section 109—Measurement and Payment
   Section 205—Roadway Excavation
   Section 206—Borrow Excavation
   Section 208—Embankments
   Section 810—Roadway Materials
   Section 812—Backfill Materials
B. Referenced Documents
   GDT 7

207.1.03 Submittals
General Provisions 101 through 150.

207.2 Materials
Ensure that materials meet the requirements of the following Specifications:

Material Section
Foundation Backfill Material—Type I Subsection 812.2.01
Foundation Backfill Material—Type II Subsection 812.2.02
Imperfect Trench Backfill Material—Type III Subsection 812.2.03

207.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

207.3 Construction Requirements
207.3.01 Personnel
General Provisions 101 through 150.

207.3.02 Equipment
General Provisions 101 through 150.

207.3.03 Preparation
General Provisions 101 through 150.
207.3.04 Fabrication
General Provisions 101 through 150.

207.3.05 Construction
A. Locations and Elevations
   The Engineer will determine final locations and elevations of the structure. The locations and elevations shown on the Plans are approximate.

B. Excavation
   The Engineer will determine the minimum requirements for length and depth of excavation for each structure. Assume the responsibility for the cost of installing necessary sheeting and bracing.
   When excavating, follow these requirements:
   Excavate through rock or boulder formations to at least 1 ft. below the bottom of the structure, except for where the entire concrete or masonry structure rests on solid rock.
   Backfill with Type I or Type II material to the proper subgrade elevation.
   As the embankment is constructed, excavate and place pipe on the new embankment. Pipe may be placed incrementally on steep gradients.
   Cut surfaces at structure trenches to prevent damage to the adjacent pavement when existing paved areas will be retained.
   Saw pavements deep enough to cause the edges to break in straight lines.
   Ensure that the width, depth, and vertical walls of an excavated imperfect trench conform to Plan details and dimensions within 2 in.
   Dispose of surplus and unsuitable materials as directed by the Engineer.
   Consider excavated material as unclassified excavation according to Section 205, except that Barrow County will not pay for excavation for minor structures.
   Include the cost of fulfilling these requirements in the price bid for the pipe.

C. Backfill
   Obtain backfill materials that meet the Specifications from sources approved by the Engineer.
   1. Foundation Backfill Materials, Types I and II
      Use the following materials as shown on the Plans or as directed by the Engineer:
      a. Use Type I material in dry structure trenches and Type II material in wet trenches.
      b. Use Type I material as a finishing course for Type II material when permitted by the Engineer.
      c. Backfill excavations beyond the specified limits with the same type of material required for the adjacent area; however, Barrow County will not measure excess backfill material for payment.
      d. Place Type I and Type II backfill material in layers of no more than 6 in. loose.
      e. Compact each layer as follows:
         1) Type I Backfill Material: Compact to 95 percent of the theoretical dry density determined by GDT 7.
         2) Type II Backfill Material: Compact to a satisfactory uniform density as directed by the Engineer.
   2. Imperfect Trench Backfill Material, Type III
      Place this material as loose uncompacted backfill over pipe structures as shown on the Plans where imperfect trench backfill is specified.
   3. Normal Backfill
      Ensure that normal backfill material meets the requirements of Subsection 810.2.01, Class I or II.
      Place and compact according to Section 208 except as follows:
      a. Do not place rock more than 4 inches in diameter within 2 ft. of any drainage structure.
      b. For backfill behind retaining walls, use a pervious material that meets the requirements of Case I or Case II as follows:
1) Case I. Case I refers to backfills for retaining walls that support roadbeds and parking areas. Ensure that the backfill conforms to Section 208. Do not place rock more than 4 in. in diameter within 2 ft. of the retaining wall or finished surface.

2) Case II. Case II refers to backfills for retaining walls that do not support roadbeds or parking areas. Ensure that the backfill conforms to the requirements of Case I above, except compact the backfill to the density of the adjacent soil.

D. Pavement Replaced
Replace pavement removed at structure trenches in kind where adjacent pavements will be retained. An equal or better material may be used when approved by the Engineer. Backfill and maintain a smooth riding surface until repaving is complete.

207.3.06 Quality Acceptance
General Provisions 101 through 150.

207.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

207.4 Measurement
A. Excavation
The following considerations are not measured for payment:
- Excavation for minor structures, including undercut for backfill materials as shown on the Plans
- Excavation for an imperfect trench which is required at locations specified in the Plans but which is not measured for payment
- Removal of water
- Removal of material from any area required to be reexcavated
- Excavation and backfill of temporary drainage ditches

B. Extra Depth Excavation
The following extra depth excavations are not measured for payment:
1. Extra depth excavation because of Contractor negligence
2. Extra depth excavation (required by the Engineer) below the original Plan elevation of the bottom of the footing or the flow line of a culvert pipe that does not exceed 3 ft.
   If the Engineer relocates the structure or orders the elevation of the bottom of the footing or the flow line of the pipe to be lowered or undercut more than 3 ft., the Contractor will be compensated for the extra depth excavated below the 3 ft. limit according to Subsection 104.04 and Subsection 109.05.
   Calculate the width of extra depth excavation using the diameter of the pipe or the width of the footing plus 2 ft.
   The length of extra depth excavation is equal to the length of that portion of the structure that is lowered more than 3 ft. below Plan elevation.

C. Backfill Materials Types I, II, and III
1. Types I and II
   These materials (in place and accepted) are measured in cubic yards compacted.
   Lateral measurements are confined to an area bounded by vertical planes lying not more than 1 ft. outside of and parallel to the limits of the structure.
   Length and depth measurements are confined to the dimensions of compacted material in place as specified by the Engineer. Materials placed outside the above limitations are not measured for payment.
2. Type III
   Barrow County measures Type III material (complete, in place, and accepted) in cubic yards.
   Lateral measurements of Type III material are confined to an area bounded by vertical planes lying
directly above the outside walls of the structure.
   Longitudinal measurements are confined to the length of treatment installed as specified.
   Measurements of depth are the dimensions shown on the Plans or as directed.

D. Normal Backfill
   This Item is not measured separately, but is included in the measurement of the Items of excavation
   from which normal backfill materials are obtained.

207.4.01 Limits
   General Provisions 101 through 150.

207.5 Payment
A. Excavation for Minor Structures
   This Item will not be paid for separately except as provided in Subsection 207.4.B.

B. Sheeting and Bracing
   Sheeting and bracing will not be paid for separately unless these materials are left in place at the written
direction of the Engineer. In this case, the Contractor will be paid at invoice cost plus 10 percent.

C. Backfill Materials
   Backfill material Type I, (measured as shown in Subsection 207.4.C.1) will be paid for according to
   Section 205 or Section 206.
   Barrow County will pay for Types II and III separately at the Contract Unit Price per cubic yard. This
   payment is full compensation for furnishing the materials from sources inside or outside the right-of-
   way, loading, unloading, hauling, handling, placing, and compacting the material.

D. Normal Backfill
   This Item will not be paid for directly but will be paid at the Unit Price for the applicable excavation
   item from which the normal backfill materials are obtained.

   Payment will be made under:

   | Item No. 207 | Foundation backfill material, type II | Per cubic yard |
   | Item No. 207 | Imperfect trench backfill material, type III | Per cubic yard |

207.5.01 Adjustments
   General Provisions 101 through 150.
Section 209—Subgrade Construction

209.1 General Description
This work includes placing, mixing, compacting, and shaping the top 6 in. or the Plan-indicated thickness of the roadbed in both excavation and embankment areas.

This work also includes subgrade stabilization, select material subgrade, and shoulder stabilization.

209.1.01 Definitions
General Provisions 101 through 150.

209.1.02 Related References
A. Standard Specifications
   Section 109—Measurement and Payment
   Section 412—Bituminous Prime
   Section 803—Stabilizer Aggregate
   Section 810—Roadway Materials
   Section 815—Graded Aggregate

B. Referenced Documents
   GDT 7
   GDT 20
   GDT 21
   GDT 24a
   GDT 24b
   GDT 59
   GDT 67

209.1.03 Submittals
General Provisions 101 through 150.

209.2 Materials
A. Subgrade Materials
   If the Plans do not show the source of material for subgrade, the Engineer will direct the Contractor according to the Specifications, or implement a Supplemental Agreement to ensure a satisfactory subgrade.
   If the existing roadway excavation or borrow materials are not suitable or available for stabilizing the subgrade, use the quantity of stabilizer materials defined below in Subsection 209.2.B.

B. Subgrade Stabilizer Materials

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<thead>
<tr>
<th>Material</th>
<th>Section</th>
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<tr>
<td>Type I Stabilizer Aggregate</td>
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<tr>
<td>Material</td>
<td>Section</td>
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<tr>
<td>-------------------------------------</td>
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</tr>
<tr>
<td>Type II Stabilizer Aggregate</td>
<td>803.2.02</td>
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<tr>
<td>Class IIIB or Better Soil</td>
<td>810.2.01.A.1</td>
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<tr>
<td>Type III Stabilizer Aggregate</td>
<td>803.2.03</td>
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<tr>
<td>Type IV Stabilizer Sand</td>
<td>803.2.04</td>
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C. Select Material Subgrade

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<tr>
<th>Material</th>
<th>Section</th>
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</thead>
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<tr>
<td>Class IIIB or Better Soil</td>
<td>810.2.01.A.1</td>
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<tr>
<td>Graded Aggregate</td>
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D. Shoulder Stabilization

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<tr>
<th>Material</th>
<th>Section</th>
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<td>803.2.02, Type II</td>
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</table>

209.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

209.3 Construction Requirements

209.3.01 Personnel
General Provisions 101 through 150.

209.3.02 Equipment
General Provisions 101 through 150.

209.3.03 Preparation
General Provisions 101 through 150.

209.3.04 Fabrication
General Provisions 101 through 150.

209.3.05 Construction

A. Subgrade Construction

Construct subgrade as follows:
1. Plow, harrow, and mix the entire surface of the in-place subgrade to a depth of at least 6 in.
2. After thoroughly mixing the material, bring the subgrade to Plan line and grade and compact it to 100 percent of the maximum laboratory dry density.
3. If the subgrade needs to be stabilized, or if a subsequent contract provides for base construction, do not apply density requirement at this stage.
   If a subsequent Contract provides for base construction, eliminate mixing and compact the in-place subgrade to 95 percent of the laboratory maximum dry density.
4. Ensure that the subgrade can firmly support construction equipment before placing subsequent layers of base and paving materials. The subgrade must support construction equipment without excessive movement regardless of compaction.
5. Rework unstable areas of subgrade to a moisture content that will provide stability and compaction. The Engineer may direct the Contractor to proof roll the subgrade with a loaded dump truck.
6. Compact the subgrade using a sheepsfoot roller. The Engineer may permit the use of vibratory rollers whenever the subgrade soils consist of Class Ia1, IA2, or IA3 materials.
7. Ensure that subgrade material used underneath soil-cement base meets the requirements of Subsection 301.3.03.A.

B. Subgrade Stabilization
Construct a stabilized subgrade according to Plans or as directed:
1. Undercut and dispose of the amount of subgrade material that will be displaced with the aggregate or selected material according to the Engineer’s direction.
2. Leave material off the subgrade in fill sections requiring stabilization.
3. Place the amount of material specified in Subsection 209.2.B. on the subgrade as specified on the Plans or established by the Engineer.
4. Thoroughly incorporate the material into the existing subgrade to a depth of 6 in (150 mm), or as indicated on the Plans. Plow, disk, harrow, blade, and then mix with rotary tillers until the mixture is uniform and homogeneous throughout the depth to be stabilized.
5. Finish the stabilized subgrade to the Plan line, grade, and cross-section. Compact it to 100 percent of the maximum laboratory dry density as defined in Subsection 209.3.06. Plant mixing is permitted as an alternative to the mixed-in-place method.
6. Eliminate the mixing and scarifying method before compaction in undercut areas where Type III Stabilizer Aggregates are specified, unless otherwise specified by the Engineer.

C. Select Materials Subgrade
Place select materials as follows:
1. Construct the subgrade with a uniform blanket of select material consisting of Class I or II soil or graded aggregate (according to Plan dimensions or as directed by the Engineer). Class IIIC1 soils may be used within the top 12 in. of subgrade if approved by the Engineer. Do not use Class IIIC2, IIIC3 or IIIC4 soils within the top 12 in. of subgrade unless a stabilizing agent approved by the Engineer is added.
2. Use the select material reserved from the grading or borrow operations. If material is not available through this source, obtain it from other sources.
3. Finish and compact the material according to Subsection 209.3.05.A.

D. Shoulder Stabilization
Stabilize the shoulder as follows:
1. Spread the stabilizer aggregate at the rate and to the dimensions indicated on the Plans.
2. Mix the aggregate with the in-place shoulder material thoroughly to the Plan depth.
3. Compact the area thoroughly and finish it to Plan dimensions.
4. Prime the stabilized area according to Section 412 when a paving course is required on the shoulders.

E. Finishing Subgrade

When finishing subgrade use the following procedure:
1. Leave the underlying subgrade in cuts and fills low enough to accommodate the additional material when the work requires either subgrade stabilization, select material subgrade, or stabilization for shoulders.
2. Test short sections in curb and gutter areas might be necessary to obtain the proper elevation.
3. Blade the surface of the completed subgrade to a smooth and uniform texture.

209.3.06 Quality Acceptance

Barrow County will test representative samples of compacted material to determine the laboratory maximum dry density using GDT 7, GDT 24a, or GDT 67 as applicable. Barrow County will determine in-place density of the compacted subgrade according to GDT 20, GDT 21, or GDT 59, as applicable. Ensure that the centerline profile conforms to the established elevations with an acceptable tolerance of ±0.5 in. The acceptable tolerance under a template conforming to the designated cross section shall be ±0.25 in).

Have Barrow County test the maximum dry density using methods according to Subsection 209.3.05.A. When base construction is not in the same Contract, the tolerances may be 1 in., 0.5 in., and 95 percent respectively.

209.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

209.4 Measurement

A. Subgrade Construction and Finishing Subgrade

Barrow County will make no separate measurement for payment for the work described in this Section.

B. Subgrade Stabilization

Subgrade stabilization materials, as defined in Subsection 209.3.05.B is measured by the ton, cubic yard, or square yard of the specified thickness if none of the existing Roadway Excavation and/or Borrow Materials are suitable and available for stabilizing the subgrade.

C. Select Material Subgrade

Select materials, conforming to Subsection 209.3.05.C are measured by the cubic yard in the hauling vehicle, per ton according to Subsection 109.01, or by the square yard of the specified thickness when roadway excavation and/or borrow materials are not available or suitable for this Item.

D. Shoulder Stabilization

Shoulder stabilization is measured by the cubic yard or ton as specified in Subsection 209.4.B.

209.4.01 Limits

General Provisions 101 through 150.

209.5 Payment

A. Subgrade Construction
Barrow County will make no separate payment for subgrade construction or for finishing subgrade.

**B. Subgrade Stabilization**
Subgrade stabilization complete and accepted according to Subsection 209.3.05.B will be paid for at the Contract Unit Price per cubic yard, per ton, or per square yard. This price is full compensation for furnishing the materials, hauling, placing, mixing, compacting, and finishing the stabilized subgrade.

**C. Select Material Subgrade**
Select material complete, accepted, and measured according to Subsection 209.4.C will be paid for at the Contract Unit Price per cubic yard, per ton, or per square yard. This price is full compensation for furnishing the material where required, hauling, placing, mixing, compacting and finishing the select material subgrade.

**D. Shoulder Stabilization**
This Item will be measured by Subsection 209.4.B. and paid for according to Subsection 209.5.B. This Item also includes furnishing and applying bituminous prime.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 209</th>
<th>Description</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 209</td>
<td>Stabilizer materials (class), (type), (thickness)</td>
<td>Per ton, cubic yard, or square yard</td>
</tr>
<tr>
<td>Item No. 209</td>
<td>Select material subgrade (class), (type), (thickness)</td>
<td>Per ton, cubic yard, or square yard</td>
</tr>
<tr>
<td>Item No. 209</td>
<td>Stabilizer aggregate for shoulders</td>
<td>Per ton or cubic yard</td>
</tr>
</tbody>
</table>

**209.5.01 Adjustments**
General Provisions 101 through 150.
Section 210—Grading Complete

210.1 General Description
This work includes:
- Excavating of all materials including ditches, undesirable material (including removal and replacement), and borrow (if required)
- Hauling
- Forming embankments
- Constructing shoulders and subgrades
- Finishing, dressing, and disposing of undesirable or surplus material
- Clearing and grubbing according to Section 201 and Section 202 unless these items are established as Pay Items in the Contract
- Removing and disposing of miscellaneous roadway items, including but not limited to curbs, drainage structures, and pavements (unless established as separate contract items)
- Ensure that the completed grading work conforms to the horizontal and vertical alignment and typical cross-sections shown on the Plans or as directed by the Engineer.

210.1.01 Definitions
General Provisions 101 through 150.

210.1.02 Related References
A. Standard Specifications
   Section 109—Measurement and Payment
   Section 201—Clearing and Grubbing Right-of-Way
   Section 202—Random Clearing and Grubbing
   Section 204—Channel Excavation
   Section 205—Roadway Excavation
   Section 206—Borrow Excavation
   Section 207—Excavation and Backfill for Minor Structures
   Section 208—Embankments
   Section 209—Subgrade Construction
B. Referenced Documents
General Provisions 101 through 150.

210.1.03 Submittals
General Provisions 101 through 150.

210.2 Materials
Use materials required for grading construction that conform to the requirements of Section 204, Section 205, Section 206, Section 207, Section 208, and Section 209.

210.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

210.3 Construction Requirements
210.3.01 Personnel
General Provisions 101 through 150.

210.3.02 Equipment
Use equipment approved by the Engineer that will not damage base, pavement, or other appurtenances to be retained.

210.3.03 Preparation
Before placing base material, finish the subgrade according to Subsection 209.3.05.E.

210.3.04 Fabrication
General Provisions 101 through 150.

210.3.05 Construction
Perform The Work according to the appropriate portions of Section 201, Section 202, Section 204, Section 205, Section 206, Section 207, Section 208, and Section 209 of the Specifications. Measurement and payment shall be according to the provisions of this Section. See Subsection 210.4 and Subsection 210.5, below.

210.3.06 Quality Acceptance
When the Engineer determines that the existing material in areas where fills are to be placed is undesirable, the Engineer may require the Contractor to remove the undesirable material and replace it with suitable material. Compact the replacement materials according to the applicable portions of Section 208. In cut areas, where the material below the template line is undesirable for subgrade or shoulders, undercut it to a depth established by the Engineer and replace it with suitable material. Compact the replacement materials as specified herein.

210.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

210.4 Measurement
A. Grading Complete
The Work under this Item is not measured separately for payment.

B. Grading Per Mile
This Item is measured in linear miles along the centerline of the road or the median, including ramps where shown on the Plans.

C. Undercut Excavation
The amount of undercut excavation (when directed by the Engineer and not addressed in the Plans) measured for payment is the product of the length, width, and depth of excavation. Replacement material for undercut excavation is not measured for payment. There will be no separate payment for undercut excavation required by the Plans or rock excavation required under Subsection 205.3.

210.4.01 Limits
General Provisions 101 through 150.

210.5 Payment
A. Grading Complete
This Item completed and accepted will be paid for at the Lump Sum Price bid. Payment is full compensation for all work and materials specified in this Section.

B. Grading Per Mile
This Item will be paid for at the Contract Unit Price per linear mile complete in place and accepted. This price is full compensation for furnishing the materials and performing the work specified in this Section.

C. Undercut Excavation
Undercutting areas not shown in the Plans when directed by the Engineer will be paid for at the rate of $7.50 per cubic yard for quantities up to 750 yd³. Quantities exceeding 750 yd³ will be considered Extra Work as defined in Subsection 109.05, and will be paid for accordingly. Payment is full compensation for excavating and disposing of undesirable material and supplying, placing, and compacting replacement material.

Payment will be made under:

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<thead>
<tr>
<th>Item No. 210</th>
<th>Grading complete</th>
<th>Per lump sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 210</td>
<td>Grading per mile</td>
<td>Per mile</td>
</tr>
<tr>
<td>Item No. 210</td>
<td>Undercut excavation</td>
<td>Per cubic yard</td>
</tr>
</tbody>
</table>

210.5.01 Adjustments
General Provisions 101 through 150.
Section 310—Graded Aggregate Construction

310.1 General Description
This work includes constructing a base, subbase or shoulder course composed of mineral aggregates. Construct according to these Specifications and to the lines, grades, thickness, and typical cross-sections shown on the Plans or established by the Engineer. The provisions of Section 300 apply to this work.

310.1.01 Definitions
General Provisions 101 through 150.

310.1.02 Related References
A. Standard Specifications
Section 105—Control of Work
Section 300—General Specifications for Base and Subbase Courses
Section 412—Bituminous Prime
Section 815—Graded Aggregate
Section 821—Cutback Asphalt
Section 823—Cutback Asphalt Emulsion

B. Referenced Documents
AASHTO T 180
GDT 21
GDT 59

310.1.03 Submittals
General Provisions 101 through 150.

310.2 Materials
Ensure that materials meet the requirements of the following Specifications:

Material Section
Graded aggregate 815
Cutback asphalt, RC-30, RC-70, RC-250 or MC-30, MC-70, MC-250 821.2.01
Cutback Asphalt Emulsion, CBAE-2 823.2.01
Blotter material (sand) 412.3.05.G.3

310.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

310.3 Construction Requirements

310.3.01 Personnel
General Provisions 101 through 150.

310.3.02 Equipment
Provide equipment in satisfactory condition for proper construction of the base, subbase or shoulder course. Use any applicable equipment specified in Subsection 412.3.02, “Equipment” for Bituminous Prime.
310.3.03 Preparation
Prepare the subgrade or subbase as specified in Subsection 300.3.03.C, “Preparing the Subgrade” or Subsection 300.3.03.D, “Preparing the Subbase.” Place graded aggregate materials only on dry, thawed subgrade or subbase.

310.3.04 Fabrication
General Provisions 101 through 150.

310.3.05 Construction
A. Placing Material
Use the central plant mix method unless producing aggregates (from an approved source or deposit) that conform to the requirements of Section 815.
Use the following steps to mix base and spread subbase or shoulder course.
1. Mixing
When blending two sizes of aggregate, proportion the aggregate and water, if needed, into the central plant. Mix until producing a homogeneous and uniform mixture.
2. Spreading
To obtain the specified thickness, uniformly spread materials to the proper depth with a mixture spreader. Do not use materials containing frost or frozen particles.
   a. One-Course Construction
      Lay one course to a maximum thickness of 8 in. compacted.
   b. Multiple-Course Construction
      If the thickness of the base, subbase or shoulder course exceeds 8 in., construct it in 2 or more courses of equal thickness.

B. Compacting Material
Use the following steps to compact and finish a base, subbase, or shoulder course.
1. Moisture Content
   Ensure that the moisture content of materials is uniformly distributed and allows compaction to the specified density.
   Unless approved by the Office of Materials, no graded aggregate will be shipped to a project when the moisture content of the material exceeds two percent of optimum moisture.
2. Compaction
   After shaping the spread material to line, grade, and cross-section, roll to uniformly compact the course. If using Group 1 aggregate, roll to at least 98 percent of maximum dry density. If using Group 2 aggregate, roll to at least 100 percent of the maximum dry density.
   If using graded aggregate mixtures composed of either group as base for paved shoulders 6 ft. wide or less, compact to at least 96 percent of the maximum dry density.
   Regardless of compaction, ensure that the compacted base is sufficiently stable to support construction equipment without pumping. If the base material is unstable from too much moisture, dry and rework the base material. Dry and rework the underlying subgrade, if necessary.
   a. One-Course Construction
      1) After compaction, shape to the required grade, line, and cross-section.
      2) Add water as necessary to develop the proper moisture content.
      3) Roll until the surface is smooth, closely knit, and free of cracks.
      4) Correct all defects according to Subsection 300.3.06.B, “Repairing Defects.”
   b. Multiple-Course Construction
      1) After compacting the first course, shape the surface again to line, grade, and cross section.
2) Add water as necessary to develop the proper moisture content.
3) Spread and compact the second and any succeeding courses without rolling the first course again.
4) Finish the surface according to the procedure specified for one-course construction.

c. Irregular Areas
In places inaccessible to the roller, obtain the required compaction with mechanical tampers approved by the Engineer. Apply the same density requirements as stated above in Subsection 310.3.05.B.

C. Finishing
Finish the surface of the subbase for Portland cement concrete pavement or the base of asphaltic concrete pavement with automatically controlled screed equipment when required by Subsection 300.3.02.H, “Fine Grading Machine” of the Specifications. Furnish, install, and maintain the sensing wires needed to control the finish operation as a part of the Pay Item. When automatically controlled screed equipment is not required, fine grading with motor graders is permitted. Finish immediately after the placing and compacting operations. After finishing, compact the subbase again, according to Subsection 310.3.05.B, “Compacting Material.”

D. Protecting the Base, Subbase or Shoulders
Maintain the course until the Engineer determines that it has cured sufficiently and is ready to prime. Maintain by additional wetting, rolling, and blading as necessary. Repair any defects according to Subsection 300.3.06.B, “Repairing Defects.”
These protection measures do not relieve the Contractor of maintaining the Work until final acceptance as specified in Section 105.

E. Priming the Base
Apply bituminous prime according to Section 412 unless using:
Graded aggregate base under Portland cement concrete pavement
Graded aggregate base under asphaltic concrete 5 in. or more in total thickness

310.3.06 Quality Acceptance
A. Compaction Tests
1. Determine the maximum dry density from representative samples of compacted material, according to AASHTO T180, Method D.
2. Determine the in-place density of finished courses according to GDT 21 or GDT 59, where applicable.

B. Finished Surface
Check the finished surface of the base, subbase, or shoulder course as follows:
1. Check the longitudinal surface using a 15 ft. straightedge parallel to the centerline.
2. Check the transverse surface by using one of the following tools:
   A template, cut true to the required cross-section and set with a spirit level on non-superelevated sections
   A system of ordinates, measured from a stringline
   A surveyor’s level
3. Ensure that ordinates measured from the bottom of the template, stringline, or straightedge, to the surface do not exceed 1/4 in. at any point. Rod readings shall not deviate more than 0.02 ft. from required readings.
4. Correct any variations from these requirements immediately according to Subsection 300.3.06.B, “Repairing Defects.”

C. Thickness Tolerances
1. Thickness Measurements
a. Thickness requirements apply to shoulder construction where the Plans specify a uniform thickness, or where the shoulders will be surfaced.
b. Determine the thickness of the base, subbase, or shoulder course, by making as many checks as necessary to determine the average thickness.

2. Deficient Thickness
   a. If any measurement is deficient in thickness more than 1/2 in., make additional measurements to determine the deficient area.
   b. Correct any area deficient between 1/2 in. and 1 in. to the design thickness by using one of the following methods according to these Specifications:
      Add additional quantities of the same materials and reconstruct to the required thickness
      Leave in place and accept payment for the materials and area at ½ the Contract Unit Price for the deficient area.
   c. Correct any area deficient in thickness by more than 1 inch by adding additional quantities of the same material and reconstructing to the required thickness in accordance with these Specifications.
   d. If payment is made by the ton, payment for additional material to correct deficiencies will be made at the Contract Unit Price with no additional cost to Barrow County for scarification, mixing or compaction.
   e. If payment is made by the square yard, no payment will be made for additional material required to correct deficiencies or for reconstructing deficient work.

3. Average Thickness
   a. The average thickness per linear mile is determined from all measurements within the mile increments except the areas deficient by more than 1/2 in. and not corrected.
   b. The average thickness shall not exceed the specified thickness by more than 1/2 in.
   c. If the basis of payment is per ton, and the average thickness for any mile increment exceeds the allowable 1/2 in. tolerance, the excess quantity in that increment will be deducted from the Contractor’s payments.
   d. The excess quantity is calculated by multiplying the average thickness that exceeds the allowable 1/2 in. tolerance by the surface area of the base, subbase, or shoulder.
   e. If the basis of payment is per square yard, no deduction will be made for excess thickness.

310.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

310.4 Measurement
A. Graded Aggregate
   Where specified for payment by the ton, graded aggregate base, subbase or shoulder materials are measured in tons, mixed and accepted. When hauling material to the roadway, the actual weight of each loaded vehicle is determined with an approved motor truck scale.
   Where specified for payment by the square yard for a certain thickness, the surface length is measured along the centerline, and the width is specified on the Plans. Measure irregular areas, such as turnouts and intersections, by the square yard.

B. Bituminous Prime
   Bituminous prime is not measured for separate payment.

310.4.01 Limits
General Provisions 101 through 150.

310.5 Payment
A. Graded Aggregate
Graded aggregate base, subbase, or shoulder course will be paid for at the Contract Unit Price per ton or per square yard, complete, in place, and accepted. This payment shall be full compensation for:
Materials
Shaping and compacting the existing roadbed
Loading, hauling, and unloading
Crushing and processing
Mixing
Spreading
Watering
Compacting and shaping
Maintenance
 Priming, when required
 All incidentals necessary to complete The Work

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Payment Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>310</td>
<td>Graded aggregate (base, subbase, shoulder course) - including material</td>
<td>Per ton or square yard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>310</td>
<td>Graded aggregate base and shoulder course - including material</td>
<td>Per ton or square yard</td>
</tr>
</tbody>
</table>

310.0.01 Adjustments
General Provisions 101 through 150.
Section 400—Hot Mix Asphaltic Concrete Construction

400.1 General Description
This work includes constructing one or more courses of bituminous plant mixture on the prepared foundation or existing roadway surface. The mixture shall conform with lines, grades, thicknesses, and typical cross sections shown on the Plans or established by the Engineer.
This section includes the requirements for all bituminous plant mixtures regardless of the gradation of the aggregates, type and amount of bituminous material, or pavement use.
Acceptance of work is on a lot-to-lot basis according to the requirements of this Section and Section 106.

400.1.01 Definitions
Segregated Mixture: Mixture lacking homogeneity in HMA constituents of such a magnitude that there is a reasonable expectation of accelerated pavement distress or performance problems. May be quantified by measurable changes in temperature, gradation, asphalt content, air voids, or surface texture.
New Construction: A roadway section more than 0.5 mile long that is not longitudinally adjacent to the existing roadway. If one or more lanes are added longitudinally adjacent to the existing lane, the lane(s) shall be tested under the criteria for a resurfacing project. If work is performed on the existing roadway including leveling, grade changes, widening and/or resurfacing then that lane shall be tested under the criteria for a resurfacing project.
Trench Widening: Widening no more than 4 ft. in width.
Comparison sample: Opposite quarters of material sampled by the Contractor.
Independent Sample (Quality Assurance Sample): A sample taken by Barrow County to verify an acceptance decision without regard to any other sample that may also have been taken to represent the material in question.
Referee sample: A sample of the material retained during the quartering process which is used for evaluation if a comparison of Contractor and Barrow Countyal split sample test results is outside allowable tolerances.

400.1.02 Related References
A. Standard Specifications
   Section 106—Control of Materials
   Section 109—Measurement and Payment
   Section 152—Field Laboratory Building
   Section 413—Bituminous Tack Coat
   Section 424—Bituminous Surface Treatment
   Section 802—Coarse Aggregate for Asphaltic Concrete
   Section 828—Hot Mix Asphaltic Concrete Mixtures
B. Referenced Documents
   AASHTO T 315
   AASHTO T 209
   AASHTO T 202
   AASHTO T 49
   Department of Transportation Standard Operating Procedure (SOP) 15
   Department of Transportation Standard Operating Procedure (SOP) 27
   Department of Transportation Standard Operating Procedure (SOP) 40
   GDT 38
   GDT 73
400.1.03 Submittals

A. Invoices
Furnish formal written invoices from a supplier for all materials used in production of HMA when requested by Barrow County. Show the following on the Bill of Lading:
- Date shipped
- Quantity in tons
- Included with or without additives (for asphalt cement)

Purchase asphaltic cement directly from a supplier listed on Qualified Products List 7 and provide copies of Bill of Lading at Barrow County’s request.

B. Paving Plan
Before starting asphaltic concrete construction, submit a written paving plan to the Engineer for approval. Include the following on the paving plan:
- Proposed starting date
- Location of plant(s)
- Rate of production
- Average haul distance(s)
- Number of haul trucks
- Paver speed feet (meter)/minute for each placement operation
- Mat width for each placement operation
- Number and type of rollers for each placement operation
- Sketch of the typical section showing the paving sequence for each placement operation
- Electronic controls used for each placement operation
- Temporary pavement marking plan

If staged construction is designated in the Plans or contract, provide a paving plan for each construction stage.
If segregation is detected, submit a written plan of measures and actions to prevent segregation. Work will not continue until the plan is submitted to and approved by Barrow County.
C. Job Mix Formula
Submit to the Engineer a written job mix formula proposed for each mixture type to be used based on an approved mix design. Furnish the following information for each mix:

- Specific project for which the mixture will be used
- Source and description of the materials to be used
- Mixture I.D. Number
- Proportions of the raw materials to be combined in the paving mixture
- Single percentage of the combined mineral aggregates passing each specified sieve
- Single percentage of asphalt by weight of the total mix to be incorporated in the completed mixture
- Single temperature at which to discharge the mixture from the plant
- Theoretical specific gravity of the mixture at the designated asphalt content
- Name of the person or agency responsible for quality control of the mixture during production

Do the following to have the formulas approved in accordance with SOP 40 “Approval of Contractor Job Mix Formulas” and to ensure their quality:
1. Submit proposed job mix formulas for review at least two weeks before beginning the mixing operations.
2. Do not start hot mix asphaltic concrete work until the Engineer has approved a job mix formula for the mixture to be used. No mixture will be accepted until the Engineer has given approval.
3. Provide mix designs for all SMA, Superpave and 4.75 mm mixes to be used. Barrow County will provide mix design results for other mixes to be used.
4. After a job mix formula has been approved, assume responsibility for the quality control of the mixtures supplied to Barrow County according to Subsection 106.01, “Source of Supply and Quantity of Materials.”

D. Quality Control Program
Submit a Quality Control Plan to the Office of Materials for approval. The Quality Control Program will be included as part of the certification in the annual plant inspection report.

400.2 Materials
Ensure materials comply with the specifications listed in Table 1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Subsection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Cement, Grade Specified</td>
<td>820.2</td>
</tr>
<tr>
<td>Coarse Aggregates for Asphaltic Concrete</td>
<td>802.2.02</td>
</tr>
<tr>
<td>Fine Aggregates for Asphaltic Concrete</td>
<td>802.2.01</td>
</tr>
<tr>
<td>Mineral Filler</td>
<td>883.1</td>
</tr>
<tr>
<td>Heat Stable Anti-Stripping Additive</td>
<td>831.2.04</td>
</tr>
<tr>
<td>Hydrated Lime</td>
<td>882.2.03</td>
</tr>
<tr>
<td>Silicone Fluid</td>
<td>831.2.05</td>
</tr>
<tr>
<td>Bituminous Tack Coat: PG 58-22, PG 64-22, PG 67-22</td>
<td>820.2</td>
</tr>
<tr>
<td>Hot Mix Asphalitic Concrete Mixtures</td>
<td>828</td>
</tr>
</tbody>
</table>
When approved by the Office of Materials and required in the Contract, provide Uintaite material, hereafter referred to by the common trade name Gilsonite, as a reinforcing agent for bituminous mixtures. Supply a manufacturer’s certification that the Gilsonite is a granular solid which meets the following requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Softening Point (AASHTO: T-53)</td>
<td>300-350 F (150-175 C)</td>
</tr>
<tr>
<td>Specific Gravity, 77 F (AASHTO: T-228)</td>
<td>1.04 ± 0.02</td>
</tr>
<tr>
<td>Flash Point, COC (AASHTO: T-48)</td>
<td>550 F (290 C) Min.</td>
</tr>
<tr>
<td>Ash Content (AASHTO: T-111)</td>
<td>1.0% Max.</td>
</tr>
<tr>
<td>Penetration, 77 F, 100 gm., 5 sec. (AASHTO: T-49)</td>
<td>0</td>
</tr>
</tbody>
</table>

400.2.01 Delivery, Storage, and Handling

Storage of material is allowed in a properly sealed and insulated system for up to 24 hours except that Stone Matrix Asphalt (SMA), Open-Graded Friction Course (OGFC), or Porous European Mix (PEM) mixtures shall not be stored more than 12 hours. Mixtures other than SMA, OGFC, or PEM may be stored up to 72 hours in a sealed and insulated system, equipped with an auxiliary inert gas system, with the Engineer’s approval. Segregation, lumpiness, drain-down, or stiffness of stored mixture is cause for rejection of the mixture. The Engineer will not approve using a storage or surge bin if the mixture segregates, loses excessive heat, or oxidizes during storage. The Engineer may obtain mixture samples or recover asphalt cement according to GDT 119. AASHTO T315, AASHTO T 202 and AASHTO T 49 will be used to perform viscosity and penetration tests to determine how much asphalt hardening has occurred.

A. Vehicles for Transporting and Delivering Mixtures

Ensure trucks used for hauling bituminous mixtures have tight, clean, smooth beds.

Follow these guidelines when preparing vehicles to transport bituminous mixtures:

1. Use an approved releasing agent from QPL 39 in the transporting vehicle beds, if necessary, to prevent the mixture from sticking to the bed. Ensure that the releasing agent is not detrimental to the mixture. When applying the agent, drain the excess agent from the bed before loading. Remove from the project any transporting vehicles determined to contain unapproved releasing agents.
2. Protect the mixture with a waterproof cover large enough to extend over the sides and ends of the bed. Securely fasten the waterproof cover before the vehicle begins moving.
3. Insulate the front end and sides of each bed with an insulating material with the following specifications:
   Consists of builders insulating board or equivalent
   Has a minimum “R” value of 4.0
   Can withstand approximately 400 °F (200 C) temperatures
   Install the insulating material so it is protected from loss and contamination. A “Heat Dump Body” may be used in lieu of insulation of the bed. “Heat Dump Body” refers to any approved transport vehicle that is capable of diverting engine exhaust and transmitting heat evenly throughout the dump body to keep asphalt at required temperature. Mark the “Heat Dump Body” clearly with “OPEN” and “CLOSE” position at the exhaust diverter. Install a padlock and lock it in the “OPEN” position when the “Heat Dump Body” is used to transport bituminous mixtures.
4. Mark each transporting vehicle with a clearly visible identification number.
5. Create a hole in each side of the bed so that the temperature of the loaded mixture can be checked. The placement of these holes shall be located to assure that the thermometer is being placed in the hot mix asphaltic concrete.

Ensure the mixture is delivered to the roadway at a temperature within ± 20 °F (± 11 °C) of the temperature on the job mix formula.

If the Engineer determines that a truck may be hazardous to the Project or adversely affect the quality of the work, remove the truck from the project.

B. Containers for Transporting, Conveying, and Storing Bituminous Material

To transport, convey, and store bituminous material, use containers free of foreign material and equipped with sample valves. Bituminous material will not be accepted from conveying vehicles if material has leaked or spilled from the containers.

400.3 Construction Requirements

400.3.01 Personnel

General Provisions 101 through 150.

400.3.02 Equipment

Hot mix asphaltic concrete plants producing mix for Barrow County use are governed by Quality Assurance for Asphaltic Concrete Plants in Georgia, Laboratory Standard Operating Procedure No. 27. The Engineer will approve the equipment used to transport and construct hot mix asphaltic concrete. Ensure the equipment is in satisfactory mechanical condition and can function properly during production and placement operations. Place the following equipment at the plant or project site:

A. Field Laboratory

Provide a field laboratory according to Section 152.

B. Plant Equipment

1. Scales

   a. Furnish (at the Contractor’s expense) scales to weigh bituminous plant mixtures, regardless of the measurement method for payment.

   b. Ensure the weight measuring devices that provide documentation comply with Subsection 109.01, “Measurement and Quantities.”

   c. Provide weight devices recording the mixture net weights delivered to the truck when not using platform scales.

      A net weight system will include, but is not limited to:

      Hopper or batcher-type weight systems delivering asphaltic mixture directly to the truck

      Fully automatic batching equipment with a digital recording device

   d. Use a net weight printing system only with automatic batching and mixing systems approved by the Engineer.

   e. Ensure the net weight scale mechanism or device manufacturer, installation, performance, and operation meets the requirements in Subsection 109.01, “Measurement and Quantities”

   f. Provide information on the Project tickets according to Barrow County of Transportation SOP-15.

   g. Provide scale equipment as follows:

      i. Hopper or batcher-type weight systems delivering asphaltic mixture directly to the truck

      ii. Fully automatic batching equipment with a digital recording device

      iii. Use a net weight printing system only with automatic batching and mixing systems approved by the Engineer.

   h. Ensure the net weight scale mechanism or device manufacturer, installation, performance, and operation meets the requirements in Subsection 109.01, “Measurement and Quantities”

   i. Provide information on the Project tickets according to Barrow County of Transportation SOP-15.

2. Time-Locking Devices

   Furnish batch type asphalt plants with automatic time-locking devices controlling the mixing time automatically.

   Construct these devices to ensure the operator cannot shorten or eliminate any portion of the mixing cycle.
3. Surge- and Storage-Systems
   Provide surge and storage bins as follows:
   a. Ensure bins for mixture storage are insulated and have a working seal, top and bottom, to
      prevent outside air infiltration and to maintain an inert atmosphere during storage. Bins not
      intended as storage bins may be used as surge bins to hold hot mixtures for part of the working
      day. However, empty these surge bins completely at the end of the working day.
   b. Ensure surge and storage bins can retain a predetermined minimum level of mixture in the bin
      when the trucks are loaded.
   c. Ensure surge and storage systems do not contribute to mix segregation, lumpiness, drain-down,
      or stiffness.
   d. Ensure the sale mechanism or device manufacture, installation, performance, and operation
      meets the requirements in subsection 109.01”Measurement and Quantities”.

4. Controls for Dust Collector Fines
   Control dust collection as follows:
   a. When collecting airborne aggregate particles and returning them to the mixture, have the return
      system meter all or part of the collected dust uniformly into the aggregate mixture and waste
      the excess. The collected dust percentage returned to the mixture is subject to the Engineer’s
      approval.
   b. When the collected dust is returned directly to the hot aggregate flow, interlock the dust feeder
      with the hot aggregate flow and meter the flow to maintain a flow that is constant,
      proportioned, and uniform.

5. Mineral Filler Supply System
   When mineral filler is required as a mixture ingredient:
   a. Use a separate bin and feed system to store and proportion the required quantity into the
      mixture with uniform distribution.
   b. Control the feeder system with a proportioning device meeting these specifications:
      Is accurate to within ± 10 percent of the filler required
      Has a convenient and accurate means of calibration
      Interlocks with the aggregate feed or weigh system to maintain the correct proportions for all
      rates of production and batch sizes
   c. Provide flow indicators or sensing devices for the mineral filler system and interlock them with
      the plant controls to interrupt the mixture production if mineral filler introduction fails to meet
      the required target value after no longer than 60 seconds.
   d. Add mineral filler to the mixture as follows, according to the plant type:
      Batch Type Asphalt Plant. Add mineral filler to the mixture in the weigh hopper.
      Continuous Plant Using Pugmill Mixers. Feed the mineral filler into the hot aggregate before it
      is introduced into the mixer to ensure dry mixing is accomplished before the bituminous
      material is added.
      Continuous Plants Using the Drier-Drum Mixers. Add the mineral filler to ensure dry mixing is
      accomplished before the bituminous material is added and ensure the filler does not become
      entrained into the air stream of the drier.

6. Hydrated Lime Treatment System
   When hydrated lime is required as a mixture ingredient:
   a. Use a separate bin and feed system to store and proportion the required quantity into the
      mixture.
   b. Ensure the aggregate is uniformly coated with hydrated lime aggregate before adding the
      bituminous material to the mixture. Ensure the addition of hydrated lime will not become
      entrained in the exhaust system of the drier or plant.
   c. Control the feeder system with a proportioning device meeting these specifications:
Is accurate to within ± 10 percent of the amount required
Has a convenient and accurate means of calibration
Interlocks with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes and to ensure that mixture produced is properly treated with lime
d. Provide flow indicators or sensing devices for the hydrated lime system and interlock them with the plant controls to interrupt mixture production if hydrated lime introduction fails to meet the required target value after no longer than 60 seconds.

7. Net Weight Weighing Mechanisms
Certify the accuracy of the net weight weighing mechanisms by an approved registered scale serviceperson at least once every 6 months. Check the accuracy of net weight weighing mechanisms at the beginning of Project production and thereafter as directed by the Engineer. Check mechanism accuracy as follows:
a. Weigh a load on a set of certified commercial truck scales. Ensure that the difference between the printed total net weight and that obtained from the commercial scales is no greater than 4 lbs/1,000 lbs of load.
   Check the accuracy of the bitumen scales as follows:
   Use standard test weights.
   If the checks indicate printed weights are out of tolerance, have a registered scale serviceperson check the batch scales and certify the accuracy of the printer.
   While the printer system is out of tolerance and before its adjustment, continue production only if using a set of certified truck scales to determine the truck weights.
b. Ensure plants using batch scales maintain ten 50 lb (25 kg) standard test weights at the plant site to check batching scale accuracy.
c. Ensure plant scales that are used only to proportion mixture ingredients, and not to determine pay quantities, are within two percent throughout the range.

8. Fiber Supply System
When stabilizing fiber is required as a mixture ingredient:
a. Use a separate feed system to store and proportion by weight the required quantity into the mixture with uniform distribution.
b. Control the feeder system with a proportioning device that meets these Specifications:
   Is accurate to within ± 10 percent of the amount required. Automatically adjusts the feed rate to maintain the material within this tolerance at all times
   Has a convenient and accurate means of calibration
   Provide in-process monitoring, consisting of either a digital display of output or a printout of feed rate, in pounds per minute, to verify feed rate
   Interlocks with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes
c. Provide flow indicators or sensing devices for the fiber system and interlock them with the plant controls to interrupt the mixture production if fiber introduction fails or if the output rate is not within the tolerances given above.
d. Introduce the fiber as follows:
   When a batch type plant is used, add the fiber to the aggregate in the weigh hopper. Increase the batch dry mixing time by 8 to 12 seconds from the time the aggregate is completely emptied into the mixer to ensure the fibers are uniformly distributed prior to the injection of asphalt cement into the mixer.
   When a continuous or drier-drum type plant is used, add the fiber to the aggregate and uniformly disperse prior to the injection of asphalt cement. Ensure the fibers will not become entrained in the exhaust system of the drier or plant.
9. Crumb Rubber Modifier Supply System
   When specified, crumb rubber modifier may be substituted at the Contractor’s discretion to
   produce a PG 76-22 asphaltic cement at the production facility in accordance with Section 820:
   a. Use a separate feed system to store and proportion by weight of the total asphaltic cement, the
      required percentage of crumb rubber into the mixture.
   b. Control the feeder system with a proportioning device meeting these Specifications:
      Is accurate to within ± 6 percent of the amount required. Automatically adjusts the feed rate to
      maintain the material within this tolerance at all times.
      Has a convenient and accurate means of calibration.
      Provide in-process monitoring, consisting of either a digital display of output or a printout of
      feed rate, in pounds per minute, to verify feed rate. The supply system shall report the feed in 1
      lb. increments using load cells that will enable the user to monitor the depletion of the modifier.
      Monitoring the system volumetrically will not be allowed.
      Interlocks with the aggregate weigh system and asphaltic cement
      Has a convenient and accurate means of calibration.
      Has a convenient and accurate means of calibration.
      Provide in-process monitoring, consisting of either a digital display of output or a printout of
      feed rate, in pounds per minute, to verify feed rate. The supply system shall report the feed in 1
      lb. increments using load cells that will enable the user to monitor the depletion of the modifier.
      Monitoring the system volumetrically will not be allowed.
      Interlocks with the aggregate weigh system and asphaltic cement
   c. Provide flow indicators or sensing devices for the system and interlock them with the plant
      controls to interrupt the mixture production if the crumb rubber introduction output rate is not
      within the ± 6 percent tolerance given above. This interlock will immediately notify the
      operator if the targeted rate exceeds introduction tolerances.
      All plant production will cease if the introduction rate is not brought back within tolerance after
      30 seconds.
      When the interlock system interrupts production and the plant has to be restarted, upon
      restarting operations; the modifier system shall run until a uniform feed can be observed on the
      output display. All mix produced prior to obtaining a uniform feed shall be rejected.
   d. Introduce the crumb rubber modifier as follows:
      When a batch type plant is used, add the rubber to the aggregate in the weigh hopper. Increase
      the batch dry mixing time by 15 to 20 seconds from the time the aggregate is completely
      emptied into the mixer to ensure the modifiers are uniformly distributed prior to the injection of
      asphalt cement into the mixer. Increase the batch wet mix time by 15 to 20 seconds to ensure
      the crumb rubber modifier is uniformly blended with the asphaltic cement.
      When a continuous or drier-drum type plant is used, add the rubber to the aggregate and
      uniformly disperse prior to the injection of asphalt cement. The point of introduction in the
      drum mixer will be approved by the Engineer prior to production. Ensure the crumb rubber
      modifier will not become entrained in the exhaust system of the drier or plant and will not be
      exposed to the drier flame at any point after induction.
   e. No separate measurement and payment will be made if Contractor elects to utilize crumb
      rubber.

C. Equipment at Project Site
   1. Cleaning Equipment
      Provide sufficient hand tools and power equipment to clean the roadway surface before placing the
      bituminous tack coat. Use power equipment that complies with Subsection 424.3.02.F, “Power
      Broom and Power Blower.”
   2. Pressure Distributor
      To apply the bituminous tack coat, use a pressure distributor complying with
      Subsection 424.3.02.B, “Pressure Distributor.”
   3. Bituminous Pavers
      To place hot mix asphaltic concrete, use bituminous pavers that can spread and finish courses that
      are:
      As wide and deep as indicated on the Plans
True to line, grade, and cross section
Smooth
Uniform in density and texture
a. Continuous Line and Grade Reference Control. Furnish, place, and maintain the supports, wires, devices, and materials required to provide continuous line and grade reference control to the automatic paver control system.
b. Automatic Screed Control System. Equip the bituminous pavers with an automatic screed control system actuated from sensor-directed mechanisms or devices that will maintain the paver screed at a pre-determined transverse slope and elevation to obtain the required surface.
c. Transverse Slope Controller. Use a transverse slope controller capable of maintaining the screed at the desired slope within ± 0.1 percent. Do not use continuous paving set-ups resulting in unbalanced screed widths or off center breaks in the main screed cross section unless approved by the Engineer.
d. Screed Control. Equip the paver to permit the following four modes of screed control. The method used shall be approved by the Engineer.
Automatic grade sensing and slope control
Automatic dual grade sensing
Combination automatic and manual control
Total manual control
Ensure the controls are referenced with a taut string or wire set to grade, or with a ski-type device or mobile reference at least 30 ft. long when using a conventional ski. Approved non-contacting laser or sonar-type skis listed on QPL 91 “Georgia’s List of Approved Non-contacting Laser and Sonar-type Electronic Grade and Slope Controls” may be used in lieu of conventional 30 ft. skis. Under limited conditions, a short ski or shoe may be substituted for a long ski on the second paver operating in tandem, or when the reference plane is a newly placed adjacent lane.
Automatic screed control is required on all Projects; however, when the Engineer determines that Project conditions prohibit the use of such controls, the Engineer may waive the grade control, or slope control requirements, or both.
e. Paver Screed Extension. When the laydown width requires a paver screed extension, use bolt-on screed extensions to extend the screeds, or use an approved mechanical screed extension device. When the screed is extended, add auger extensions to assure a length of no more than 18 inches from the auger to the end gate of the paver. Auger extensions may be omitted when paving variable widths. Ensure the paver is equipped with tunnel extensions when the screed and augers are extended.
NOTE: Do not use extendible strike-off devices instead of approved screed extensions.
Only use a strike-off device in areas that would normally be luted in by hand labor.

4. Compaction Equipment
Ensure that the compaction equipment is in good mechanical condition and can compact the mixture to the required density. The compaction equipment number, type, size, operation, and condition is subject to the Engineer’s approval

5. Materials Transfer Vehicle (MTV)
a. Use a Materials Transfer Vehicle (MTV) when placing asphaltic concrete mixtures on Projects on the state route system with the following conditions. If a project fails to meet any one of the following conditions, the MTV’s use is not required.
   1) When to use:
      The ADT is equal to or greater than 6000,
      The project length is equal to or greater than 3000 linear feet,
The total tonnage of all asphaltic concrete mixtures is greater than 2000 tons.

2) Where to use:
   Mainline of the traveled way
   Collector/distributor (C/D) lanes on Interstates and limited access roadways
   Leveling courses at the Engineer’s discretion

3) Do not use the MTV for the following conditions:
   A resurfacing project that only 9.5 mm mix is required.
   A project with lane width that is equal or less than 11 feet.
   A passing lane only project.
   When noted on the plans.

b. Ensure the MTV and conventional paving equipment meet the following requirements:
   1) MTV
      Has a truck unloading system which receives mixture from the hauling equipment and
      independently deliver mixtures from the hauling equipment to the paving equipment.
      Has mixture remixing capability approved by the Office of Materials and is listed on QPL
      88 “Georgia’s List of Approved Materials Transfer Vehicles”.
      Provides to the paver a homogeneous, non-segregated mixture of uniform temperature with
      no more than 20 °F difference between the highest and lowest temperatures when measured
      transversely across the width of the mat in a straight line at a distance of one foot to twenty-five
      feet from the screed while the paver is operating. Ensure that the MTV is capable of
      providing the paver a consistent material flow that is sufficient to prevent the paver from
      stopping between truck exchanges.

   2) Conventional Paving Equipment
      Has a paver hopper insert with a minimum capacity of 14 tons installed in the hopper
      of conventional paving equipment when an MTV is used.

c. If the MTV malfunctions during spreading operations, discontinue placement of hot mix
   asphaltic concrete after there is sufficient hot mix placed to maintain traffic in a safe manner.
   However, placement of hot mix asphaltic concrete in a lift not exceeding 2 in. may continue
   until any additional hot mix in transit at the time of the malfunction has been placed. Cease
   spreading operations thereafter until the MTV is operational.

d. Ensure the MTV is empty when crossing a bridge and is moved across without any other
   Contractor vehicles or equipment on the bridge. Move the MTV across a bridge in a travel lane
   and not on the shoulder. Ensure the speed of the MTV is no greater than 5 mph without any
   acceleration or deceleration while crossing a bridge.

400.3.03 Preparation
A. Prepare Existing Surface

Prepare the existing surface as follows:
1. Clean the Existing Surface. Before applying hot mix asphaltic concrete pavement, clean the
   existing surface to the Engineer’s satisfaction.

2. Patch and Repair Minor Defects
   Before placing leveling course:
   a. Correct potholes and broken areas requiring patching in the existing surface and base as
      directed by the Engineer.
   b. Cut out, trim to vertical sides, and remove loose material from the areas to be patched.
   c. Prime or tack coat the area after being cleaned. Compact patches to the Engineer’s satisfaction.
      Material for patches does not require a job mix formula, but shall meet the gradation range
      shown in Section 828. The Engineer must approve the asphalt content to be used.

3. Apply Bituminous Tack Coat
Apply the tack coat according to Section 413. The Engineer will determine the application rate, which must be within the limitations Table 2.

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under OGFC and PEM Mixes</td>
<td>0.06</td>
</tr>
<tr>
<td>All Other Mixes</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*On thin leveling courses and freshly placed asphaltic concrete mixes, reduce the application rate to 0.02 to 0.04 gal/yd².

Table 2—Application Rates for Bituminous Tack, gal/yd²

B. Place Patching and Leveling Course
1. When the existing surface is irregular, bring the surface area to the proper cross section and grade with a leveling course of hot mix asphaltic concrete materials.
2. Place leveling at the locations and in the amounts directed by the Engineer.
3. Use leveling course mixtures meeting the requirements of the job mix formulas defined in:
   - Subsection 400.3.05.A, “Observe Composition of Mixtures”
   - Section 828
   - Leveling acceptance schedules in Subsection 400.3.06.A, “Acceptance Plans for Gradation and Asphalt Cement Content”
4. If the leveling and patching mix type is undesignated, determine the mix type by the thickness or spread rate according to Table 3, but do not use 4.75 mm mix on interstate projects.

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Rate of Spread</th>
<th>Type of Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 0.75 in</td>
<td>Up to 85 lbs/yd²</td>
<td>4.75 mm Mix or 9.5 mm Superpave Type 1</td>
</tr>
<tr>
<td>0.75 to 1.5 in</td>
<td>85 to 165 lbs/yd²</td>
<td>9.5 mm Superpave Type 2</td>
</tr>
<tr>
<td>1.5 to 2 in</td>
<td>165 to 220 lbs/yd²</td>
<td>12.5 mm Superpave *</td>
</tr>
<tr>
<td>2 to 2.5 in</td>
<td>220 to 275 lbs/yd²</td>
<td>19 mm Superpave *</td>
</tr>
<tr>
<td>Over 2.5 in</td>
<td>Over 275 lbs/yd²</td>
<td>25 mm Superpave</td>
</tr>
</tbody>
</table>

* These mixtures may be used for isolated patches no more than 6 in. deep and no more than 4 ft. in diameter or length.

400.3.04 Fabrication
General Provisions 101 through 150.

400.3.05 Construction
Provide the Engineer at least one day’s notice prior to beginning construction, or prior to resuming production if operations have been temporarily suspended.

A. Observe Composition of Mixtures
1. Calibration of plant equipment
   - If the material changes, or if a component affecting the ingredient proportions has been repaired, replaced, or adjusted, check and recalibrate the proportions.
Calibrate as follows:

a. Before producing mixture for the Project, calibrate by scale weight the electronic sensors or settings for proportioning mixture ingredients.

b. Calibrate ingredient proportioning for all rates of production.

2. Mixture control

Compose hot mix asphaltic concrete from a uniform mixture of aggregates, bituminous material, and if required, hydrated lime, mineral filler, or other approved additive.

Ensure the constituents proportional to produce mixtures meeting the requirements in Section 828. The general composition limits prescribed are extreme ranges within which the job mix formula must be established. Base mixtures on a design analysis that meets the requirements of Section 828.

Ensure the field performance of the in-place mixtures meet the requirements of Subsection 828.2B for Permeability, Moisture Susceptibility, Rutting Susceptibility and Fatigue. In-place mix may be evaluated for compliance with Subsection 828.2.B at the discretion of the State Bituminous Construction Engineer under the following conditions:

Deviates greater than 10 percent on gradation for mixture control sieves from the approved Job Mix Formula based on Acceptance or Independent Samples.

Deviates greater than 0.7 percent in asphalt cement content from the approved Job Mix Formula based on Acceptance or Independent Samples.

The calculated mean pavement air voids result in an adjusted pay factor less than 0.80 or any single sub lot result in mean pavement air voids exceeding 10.5 percent.

Mix produced not using an approved mix design and/or job mix formula.

Remove and replace any material determined to not meet the requirements established in Section 828.2.B at the Contractor’s expense.

If control test results show the characteristic tested does not conform to the job mix formula control tolerances given in Section 828, take immediate action to ensure that the quality control methods are effective.

Control the materials to ensure extreme variations do not occur. Maintain the gradation within the composition limits in Section 828.

B. Prepare Bituminous Material

Uniformly heat the bituminous material to the temperature specified in the job mix formula with a tolerance of ± 20 °F.

C. Prepare the Aggregate

Prepare the aggregate as follows:

1. Heat the aggregate for the mixture, and ensure a mix temperature within the limits of the job mix formula.

2. Do not contaminate the aggregate with fuel during heating.

3. Reduce the absorbed moisture in the aggregate until the asphalt does not separate from the aggregate in the prepared mixture. If this problem occurs, the Engineer will establish a maximum limit for moisture content in the aggregates.

   When this limit is established, maintain the moisture content below this limit.

D. Prepare the Mixture

Proportion the mixture ingredients as necessary to meet the required job mix formula. Mix until a homogenous mixture is produced.

1. Add Mineral Filler

   When mineral filler is used, introduce it in the proper proportions and as specified in Subsection 400.3.02.B.5, “Mineral Filler Supply System.”

2. Add Hydrated Lime
When hydrated lime is included in the mixture, add it at a rate specified in Section 828 and the job mix formula. Use methods and equipment for adding hydrated lime according to Subsection 400.3.02.B.6, “Hydrated Lime Treatment System.”

Add hydrated lime to the aggregate by using Method A or B as follows:

Method A—Dry Form—Add hydrated lime in its dry form to the mixture as follows, according to the type of plant:

a. Batch Type Asphalt Plant: Add hydrated lime to the mixture in the weigh hopper or as approved and directed by the Engineer.

b. Continuous Plant Using Pugmill Mixer: Feed hydrated lime into the hot aggregate before it is introduced into the mixer to ensure drying is complete before the bituminous material is added.

c. Continuous Plant Using Drier-Drum Mixer: Add hydrated lime so to ensure the lime will not become entrained into the air stream of the drier and to ensure thorough drying will be complete before the bituminous material is added.

Method B—Lime/Water Slurry—Add the required quantity of hydrated lime (based on dry weight) in lime/water slurry form to the aggregate. This solution consists of lime and water in concentrations as directed by the Engineer.

Equip the plant to blend and maintain the hydrated lime in suspension and to mix the hydrated lime with the aggregates uniformly in the proportions specified.

3. Add Stabilizing Fiber

When stabilizing fiber is included in the mixture, add stabilizing fiber at a rate specified in Section 819 and the Job Mix Formula. Introduce it as specified in Subsection 400.3.02.B.8, “Fiber Supply System.”

4. Add Gilsonite Modifier

When approved by the Office of Materials and required by the Contract, add the Gilsonite modifier to the mixture at a rate to ensure eight percent by weight of the asphalt cement is replaced by Gilsonite. Use either PG 64-22 or PG 67-22 asphalt cement as specified in Subsection 820.2.01. Provide suitable means to calibrate and check the rate of Gilsonite being added.

Introduce Gilsonite modifier by either of the following methods.

a. For batch type plants, incorporate Gilsonite into the pugmill at the beginning of the dry mixing cycle. Increase the dry mix cycle by a minimum of 10 seconds after the Gilsonite is added and prior to introduction of the asphalt cement. For this method, supply Gilsonite in plastic bags to protect the material during shipment and handling and store the modifier in a waterproof environment. The bags shall be capable of being completely melted and uniformly blended into the combined mixture.

Gilsonite may also be added through a mineral filler supply system as described in Subsection 400.3.02.B.5, “Mineral Filler Supply System.” The system shall be capable of injecting the modifier into the weigh hopper near the center of the aggregate batching cycle so the material can be accurately weighed.

b. For drum drier plants, add Gilsonite through the recycle ring or through an acceptable means which will introduce the Gilsonite prior to the asphalt cement injection point. The modifier shall be proportionately fed into the drum mixer at the required rate by a proportioning device which shall be accurate within 10 percent of the amount required. The entry point shall be away from flames and ensure the Gilsonite will not be caught up in the air stream and exhaust system.

5. Materials from Different Sources

Do not use mixtures prepared from aggregates from different sources intermittently. This will cause the color of the finished pavement to vary.

E. Observe Weather Limitations
Do not mix and place asphaltic concrete if the existing surface is wet or frozen. Do not lay asphaltic concrete OGFC mix or PEM at air temperatures below 60 °F. When using a MTV, OGFC mix or PEM may be placed at 55 °F when approved by the Engineer. For other courses, follow the temperature guidelines in the following table:

Table 4—Lift Thickness Table

<table>
<thead>
<tr>
<th>Lift Thickness</th>
<th>Minimum Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in or less</td>
<td>55 °F</td>
</tr>
<tr>
<td>1.1 to 2 in</td>
<td>45 °F</td>
</tr>
<tr>
<td>2.1 to 3 in</td>
<td>40 °F</td>
</tr>
<tr>
<td>3.1 to 4 in</td>
<td>35 °F</td>
</tr>
<tr>
<td>4.1 to 8 in</td>
<td>32 °F and rising. Base Material must not be frozen.</td>
</tr>
</tbody>
</table>

F. Perform Spreading and Finishing

Spread and finish the course as follows:
1. Determine the course’s maximum compacted layer thickness by the type mix being used according to Table 5.

Table 5—Maximum Layer Thickness

<table>
<thead>
<tr>
<th>Mix Type</th>
<th>Minimum Layer Thickness</th>
<th>Maximum Layer Thickness</th>
<th>Maximum Total Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm Superpave</td>
<td>2 1/2 in</td>
<td>4 in *</td>
<td>—</td>
</tr>
<tr>
<td>19 mm Superpave</td>
<td>1 3/4 in</td>
<td>3 in *</td>
<td>—</td>
</tr>
<tr>
<td>12.5 mm Superpave</td>
<td>1 3/8 in</td>
<td>2 1/2 in**</td>
<td>8 in</td>
</tr>
<tr>
<td>9.5 mm Superpave  Type 2</td>
<td>1 1/8 in</td>
<td>1 1/2 in**</td>
<td>4 in</td>
</tr>
<tr>
<td>9.5 mm Superpave  Type 1</td>
<td>7/8 in</td>
<td>1 1/4 in</td>
<td>4 in</td>
</tr>
<tr>
<td>4.75 mm Mix</td>
<td>3/4 in</td>
<td>1 1/8 in</td>
<td>2 in</td>
</tr>
<tr>
<td>9.5 mm OGFC</td>
<td>55 lbs/yd²</td>
<td>65 lbs/yd²</td>
<td>—</td>
</tr>
<tr>
<td>12.5 mm OGFC</td>
<td>85 lbs/yd²</td>
<td>95 lbs/yd²</td>
<td>—</td>
</tr>
<tr>
<td>12.5 mm PEM</td>
<td>110 lbs/yd²</td>
<td>165 lbs/yd²</td>
<td>—</td>
</tr>
<tr>
<td>9.5 mm SMA</td>
<td>1 1/8 in</td>
<td>1 1/2 in</td>
<td>4 in</td>
</tr>
<tr>
<td>12.5 mm SMA</td>
<td>1 3/8 in</td>
<td>3 in</td>
<td>6 in</td>
</tr>
<tr>
<td>19 mm SMA</td>
<td>1 3/4 in</td>
<td>3 in</td>
<td>—</td>
</tr>
</tbody>
</table>

* Allow up to 6 in per lift on trench widening. **Place 9.5 mm Superpave and 12.5 mm Superpave up to 4 in thick for driveway and side road transition.

2. Unload the mixture into the paver hopper or into a device designed to receive the mixture from delivery vehicles.
3. Except for leveling courses, spread the mixture to the loose depth for the compacted thickness or the spread rate. Use a mechanical spreader true to the line, grade, and cross section specified.

4. For leveling courses, use a motor grader equipped with a spreader box and smooth tires to spread the material or use a mechanical spreader meeting the requirements in Subsection 400.3.02.C, “Equipment at Project Site.”

5. Obtain the Engineer’s approval for the sequence of paving operations, including paving the adjoining lanes.

6. Ensure the outside edges of the pavement being laid are aligned and parallel to the roadway center line.

7. For New Construction or Resurfacing Contracts containing multiple lifts or courses, arrange the width of the individual lifts so the longitudinal joints of each successive lift are offset from the previous lift at least 1 ft.

This requirement does not apply to the lift immediately over thin lift leveling courses.

Ensure the longitudinal joint(s) in the surface course and the mix immediately underneath asphaltic concrete OGFC or PEM are at the lane line(s).

**NOTE:** Perform night work with artificial light provided by the Contractor and approved by the Engineer.

8. Where mechanical equipment cannot be used, spread and rake the mixture by hand. Obtain the Engineer’s approval of the operation sequence, including compactive methods, in these areas.

9. Keep small hand raking tools clean and free from asphalt build up. Do not use fuel oil or other harmful solvents to clean tools during the work.

10. Do not use mixture with any of these characteristics:

    Segregated
    Nonconforming temperature
    Deficient or excessive asphalt cement content
    Otherwise unsuitable to place on the roadway in the work.

11. Remove and replace mixture placed on the roadway that the Engineer determines has unacceptable blemish levels from segregation, raveling, streaking, pulling and tearing, or other deficient characteristics. Replace with acceptable mixture at the Contractor’s expense. Do not continually place mixtures with deficiencies.

    Do not place subsequent course lifts over another lift or course placed on the same day while the temperature of the previously placed mix is 140 °F or greater.

12. Obtain the Engineer’s approval of the material compaction equipment. Perform the rolling as follows:

    a. Begin the rolling as close behind the spreader as possible without causing excessive distortion of the asphaltic concrete surface.
    b. Continue rolling until roller marks are no longer visible.
    c. Use pneumatic-tired rollers with breakdown rollers on all courses except asphaltic concrete OGFC, PEM and SMA or other mixes designated by the Engineer.

13. If applicable, taper or “feather” asphaltic concrete from full depth to a depth no greater than 0.5 in along curbs, gutters, raised pavement edges, and areas where drainage characteristics of the road must be retained. The Engineer will determine the location and extent of tapering.

**G. Maintain Continuity of Operations**

    Coordinate plant production, transportation, and paving operations to maintain a continuous operation. If the spreading operations are interrupted, construct a transverse joint if the mixture immediately behind the paver screed cools to less than 250 °F.

**H. Construct the Joints**

1. Construct Transverse Joints
a. Construct transverse joints to facilitate full depth exposure of the course before resuming placement of the affected course.
b. Properly clean and tack the vertical face of the transverse joint before placing additional material.

**NOTE:** Never burn or heat the joint by applying fuel oil or other volatile materials.
c. Straightedge transverse joints immediately after forming the joint.
d. Immediately correct any irregularity that exceeds 3/16 in. in 10 ft.

2. Construct Longitudinal Joints

Clean and tack the vertical face of the longitudinal joint before placing adjoining material. Construct longitudinal joints so that the joint is smooth, well sealed, and bonded.

3. Construction Joint Detail for OGFC and PEM Mixtures

In addition to meeting joint requirements described above, construct joints and transition areas for 12.5 mm OGFC and 12.5 mm PEM mixtures as follows:

a. For projects which do not have milling included as a pay item:
   1) Place OGFC mixture meeting gradation requirements of 9.5 mm OGFC as specified in Section 828 on entrance and exit ramp gore areas and end of project construction joints. Taper mixture from 3/8 in at end of project to full plan depth within maximum distance of spread for one load of mixture
      Taper mixture placed on gore areas from thickness of the edge of the mainline to 3/8 in at the point of the ramp transverse joint.
   2) Construct the ramp transverse joint at the point specified in the plans or as directed by the Engineer.
   3) Mixture placed in the transition and gore areas will be paid for at the contract unit price for 12.5 mm OGFC or 12.5 mm PEM as applicable.

b. For projects which have milling included as a pay item:
   1) Taper milling for a distance of no less than 50 ft to a depth of 2 1/4 in at the point of the transverse joint
   2) Taper thickness, if needed, of the dense-graded surface mix within the 50 ft distance to 1 1/2 in at the point of the transverse joint
   3) Taper thickness of the 12.5 mm OGFC or 12.5 mm PEM to 3/4 in to ensure the material ties in at grade level with the existing surface at the point of the transverse joint

I. Protect the Pavement

Protect sections of the newly finished pavement from traffic until the traffic will not mar the surface or alter the surface texture. If directed by the Engineer, use artificial methods to cool the newly finished pavement to open the pavement to traffic more quickly.

J. Modify the Job Mix Formula

If the Engineer determines that undesirable mixture or mat characteristics are being obtained, the job mix formula may require immediate adjustment.

400.3.06 Quality Acceptance

A. Acceptance Plans for Gradation and Asphalt Cement Content

The Contractor will randomly sample and test mixtures for acceptance on a lot basis. Barrow County will monitor the Contractor testing program and perform comparison and quality assurance testing. The Contractor’s Quality Control Technicians shall participate in the Georgia Department of Transportation’s Independent Assurance Systems Basis Program.

1. Determine Lot Amount

A lot consists of the tons of asphaltic concrete produced and placed each production day. If this production is less than 500 tons, or its square yard equivalent, production may be incorporated into the next working day. The Engineer may terminate a lot when a pay adjustment is imminent if a
plant or materials adjustment resulting in a probable correction has been made. Terminate all open lots at the end of the month, except for materials produced and placed during the adjustment period. The lot will be terminated as described in Subsection 400.5.01, “Adjustments.” If the final day’s production does not constitute a lot, the production may be included in the lot for the previous day’s run; or, the Engineer may treat the production as a separate lot with a corresponding lower number of tests.

2. Determine Lot Acceptance
Determine lot acceptance as found in Subsection 400.5.01, “Adjustments.”
Barrow County representative will perform the following task:
Determine the pay factor by using the mean of the deviations from the job mix formula of the tests in each lot and apply it to Table 9—Mixture Acceptance Schedule for Surface Mixes or Table 10—Mixture Acceptance Schedule for Subsurface Mixes, whichever is appropriate. This mean will be determined by averaging the actual numeric value of the individual deviations from the job mix formula, disregarding whether the deviations are positive or negative amounts. Do not calculate lot acceptance using test results for materials not used in the Work. Determine the pay factor for each lot by multiplying the contract unit price by the appropriate pay factor from the Mixture Acceptance Schedule - Table 9 or Table 10. When two or more pay factors for a specific lot are less than 1.0, determine the adjusted payment by multiplying the contract unit price by the lowest pay factor. If the mean of the deviations from the job mix formula of the lot acceptance tests for a control sieve or for asphalt cement content exceeds the tolerances established in the appropriate Mixture Acceptance Schedule, and if the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer. If the Engineer determines that the material is not acceptable to leave in place, the materials shall be removed and replaced at the Contractor’s expense.

3. Provide Quality Control Program
Provide a Quality Control Program as established in SOP 27 which includes:
Assignment of quality control responsibilities to specifically named individuals who have been certified by the Georgia Department of Transportation Office of Materials
Provisions for prompt implementation of control and corrective measures
Provisions for communication with Project Manager, Bituminous Technical Services Engineer, and Testing Management Operations Supervisor at all times
Provisions for reporting all test results daily through the Office of Materials computerized Field Data Collection System; other checks, calibrations and records will be reported on a form developed by the Contractor and will be included as part of the project records
Notification in writing of any change in quality control personnel

a. Certification Requirements:
Use laboratory and testing equipment certified by the Georgia Department of Transportation. (Laboratories which participate in and maintain AASHTO accreditation for testing asphaltic concrete mixtures will be acceptable in lieu of Departmental certification.)
Provide certified quality control personnel to perform the sampling and testing. A Quality Control Technician (QCT) may be certified at three levels:
1) Temporary Certification – must be a technician trainee who shall be given direct oversight by a certified Level 1 or Level 2 QCT while performing acceptance testing duties during the first 5 days of training. The trainee must complete qualification requirements within 30 Georgia Department of Transportation funded production days after being granted temporary Georgia Department of Transportation funded production days will not be re-eligible for temporary certification. A certified Level 1 or Level 2 QCT shall be at the plant
2) Level 1 – must demonstrate they are competent in performing the process control and acceptance tests and procedures related to hot mix asphalt production and successfully pass a written exam.

3) Level 2 – must meet Level 1 requirements and must be capable of and responsible for making process control adjustments, and successfully pass a written exam.

Technician certification is valid for 3 years from the date on the technician’s certificate unless revoked or suspended. Eligible technicians may become certified through special training and testing approved by the Office of Materials. Technicians who lose their certification due to falsification of test data will not be eligible for recertification in the future unless approved by the State Materials Engineer.

b. Quality Control Management

1) Designate at least one Level 2 QCT as manager of the quality control operation. The Quality Control Manager shall meet the following requirements:
   - Be accountable for actions of other QCT personnel
   - Ensure all applicable sampling requirements and frequencies, test procedures, and Standard Operating Procedures are adhered to
   - Ensure all reports, charts, and other documentation is completed as required

2) Provide QCT personnel at the plant as follows:
   - If daily production for all mix types is to be greater than 250 tons, have a QCT person at the plant at all times during production and shipment of mixture until all required acceptance tests have been completed.
   - If daily production for all mix types will not be greater than 250 tons a QCT may be responsible for conducting tests at up to two plants, subject to random number sample selection.
   - Have available at the plant or within immediate contact by phone or radio a Level 2 QCT responsible for making prompt process control adjustments as necessary to correct the mix.

3) Sampling, Testing, and Inspection Requirements.
   - Provide all sample containers, extractants, forms, diaries, and other supplies subject to approval of the Engineer.
   - Perform daily sampling, testing, and inspection of mixture production that meets the following requirements:
     - Randomly sample mixtures according to GSP 15, and GDT 73 (Method C) and test on a lot basis.
       - In the event less than the specified number of samples are taken, obtain representative 6 in cores from the roadway at a location where the load not sampled was placed. Take enough cores to ensure minimum sample size requirements are met for each sample needed.
     - Maintain a printed copy of the computer generated random sampling data as a part of the project records.
     - Perform sampling, testing, and inspection duties of GSP 21.
     - Perform extraction or ignition test (GDT 83 or GDT 125) and extraction analysis (GDT 38). If the ignition oven is used, a printout of sample data including weights shall become a part of the project records. For asphalt cement content only, digital printouts of liquid asphalt cement weights may be substituted in lieu of an extraction test for plants with digital recorders. Calculate the asphalt content from the ticket representing the mixture tested for gradation.
Save extracted aggregate, opposite quarters, and remaining material (for possible referee testing) of each sample as follows:
- Store in properly labeled, suitable containers
- Secure in a protected environment
- Store for three working days. If not obtained by Barrow County representative, within three days they may be discarded in accordance with GSP 21.

(f) Add the following information on load tickets from which a sample or temperature check is taken:
- Mixture temperature
- Signature of the QCT person performing the testing

(g) Calibrate the lime system when hydrated lime is included in the mixture:
- Perform a minimum of twice weekly during production
- Post results at the plant for review
- Provide records of materials invoices upon request (including asphalt cement, aggregate, hydrated lime, etc.)

(h) Take action if acceptance test results are outside Mixture Control Tolerances of Section 828.

One sample out of tolerance
1) Contact Level 2 - QCT to determine if a plant adjustment is needed
2) Immediately run a process control sample. Make immediate plant adjustments if this sample is also out of tolerance
   
   **NOTE: Determine mixture temperature at least once per hour of production for OGFC and PEM mixes.**

3) Test additional process control samples as needed to ensure corrective action taken appropriately controls the mixture
- Two consecutive acceptance samples of the same mix type out of tolerance regardless of Lot or mix design level, or three consecutive acceptance samples out of tolerance regardless of mix type
1) Stop plant production immediately
2) Reject any mixture in storage:
   - Deviating more than 10 percent in gradation from the job mix formula based on the acceptance sample
   - Deviating more than 0.7 percent in asphalt content from the job mix formula based on the acceptance sample
3) Make a plant correction to any mix type out of tolerance prior to resuming production
   - Do not send any mixture to the project before test results of a process control sample meets Mixture Control Tolerances
   - Reject any mixture produced at initial restarting that does not meet Mixture Control Tolerances

4) Comparison Testing and Quality Assurance Program
   Periodic comparison testing by Barrow County will be required of each QCT to monitor consistency of equipment and test procedures. Barrow County will take independent samples to monitor the Contractor's quality control program.
   a) Comparison Sampling and Testing
   - Retain samples for comparison testing and referee testing if needed as described in Subsection 400.3.06.A.3.b.3. Discard these samples only if the Contractor's acceptance test results meet a 1.00 pay factor and Barrow County does not procure the samples within three working days.
Barrow County will test comparison samples on a random basis. Results will be compared to the respective contractor acceptance tests and the maximum difference shall be as follows:

<table>
<thead>
<tr>
<th>SIEVE SIZE</th>
<th>SURFACE</th>
<th>SUB-SURFACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 in.</td>
<td>3.5%</td>
<td>4.0%</td>
</tr>
<tr>
<td>3/8 in.</td>
<td>3.5%</td>
<td>3.5%</td>
</tr>
<tr>
<td>No. 4</td>
<td>2.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>No. 8</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>No. 200</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

NOTE: Pavement courses to be overlaid with OGFC or PEM mixes are considered surface mixes.

1) If test comparisons are within these tolerances:
   - Continue production
   - Use the Contractor's tests for acceptance of the lot

2) If test comparisons are not within these tolerances:
   - Another Barrow County technician will test the corresponding referee sample
   - Results of the referee sample will be compared to the respective contractor and Barrow County tests using the tolerance for comparison samples given above.
   a. If referee test results are within the above tolerances when compared to the Contractor acceptance test, use the Contractor's test for acceptance of the effected lot.
   b. If referee test results are not within the above tolerances when compared to the Contractor acceptance test, Barrow County will review the Contractor's quality control methods and determine if a thorough investigation is needed.

b) Independent Verification Sampling and Testing

1) Randomly take a minimum of two independent samples from the lesser of five days or five lots of production regardless of mix type or number of projects.

2) Compare test deviation from job mix formula to Mixture Control Tolerances in Section 828. If results are outside these tolerances, another sample from the respective mix may be taken.

If test results of the additional sample are not within Mixture Control Tolerances, Barrow County will take the following action:

Take random samples from throughout the subject lot(s) as established in Subsection 400.3.06.A.3.b.3 and use these test results for acceptance and in calculations for the monthly plant rating. Applicable pay factors will apply and the contractor QCT test results will not be included in pay factor calculations nor in the monthly plant rating.

Determine if the Contractor's quality control program is satisfactory and require prompt corrective action by the Contractor if specification requirements are not being met.

Determine if the QCT has not followed Barrow County procedures or has provided erroneous information.
Take samples of any in-place mixture represented by unacceptable QCT tests and use the additional sample results for acceptance and in calculations for the monthly plant rating and apply applicable pay factors. The Contractor QCT tests will not be included in the pay factor calculations nor in the monthly plant rating.

B. Compaction
Determine the mixture compaction using either GDT 39, GDT 59 or AASHTO T 331. The method of GDT 39 for “Uncoated Specimens, Dense Graded Mixtures Only” shall not apply when the water absorption of a sample exceeds 2.0 percent, as measured according to AASHTO T 166. In this case, either AASHTO T 331 or the paraffin method of GDT 39 shall apply. The compaction is accepted in lots defined in Subsection 400.3.06. A “Acceptance Plans for Gradation and Asphalt Cement Content” and is within the same lot boundaries as the mixture acceptance.

1. Calculate Pavement Mean Air Voids
Barrow County will calculate the pavement air voids placed within each lot as follows:
   a. One test per sub-lot.
      - Lots ≥ 500 ton of mix shall be divided into 5 sub-lots of equal distance
      - Lots < 500 tons of mix shall be divided into a sub-lot or equal sub-lots consisting up to 100 tons mix each. There may be less than 5 sub-lots.
   b. Average the results of all tests run on randomly selected sites in that lot.
      NOTE: For leveling courses less than 110 lb/yd² having quality assurance test results outside the Mixture Control Tolerances of Section 828, use Barrow County's test results only and applicable pay factors will apply.
   c. Select the random sites using GDT 73.
      Density tests are not required for asphaltic concrete placed at 90 lbs/yd² or less, 4.75 mm mix, and asphaltic concrete OGFC, PEM and mixes placed as variable depth or width leveling. Compact these courses to the Engineer’s satisfaction. Density tests will not be performed on turn-outs and driveways.
      The targeted maximum Pavement Mean Air Void content for all Superpave and Stone Matrix Asphalt mixtures is 5.0 percent. Ensure that the maximum Pavement Mean Air Voids for all Superpave and Stone Matrix Asphalt mixtures does not exceed 7.0 percent. The maximum Pavement Mean Air Voids for 2 foot shoulder widening is 9.0 percent. The adjustment period for density shall be four lots or four production days, whichever is less, in order for the contractor to ensure maximum compactive effort has been achieved which will yield no more than the specified maximum allowed Mean Air Voids. If the contractor needs to adjust the mixture to improve density results, a change in the job mix formula may be requested for approval during the adjustment period so long as the following values are not exceeded:
         Coarse pay sieve 4%
         No. 8 sieve 2%
         No. 200 sieve 1%
         Asphalt Content 0.2%
      All value changes must still be within specification limits.
      If the Office of Materials is satisfied that the contractor has exerted the maximum compactive effort and is not able to maintain Pavement Mean Air Voids at no more than 7.0%, the Engineer may establish a maximum target for Pavement Mean Air Voids.
      Mixture placed during the adjustment period for density shall meet the requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01.C, “Calculate Mean Pavement Air Voids.” Mixture not meeting these density requirements shall be paid for using the applicable pay factor.
If the mean air voids of the pavement placed within a lot exceeds 100% of the maximum target air voids, if established and the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer.

2. Obtain Uniform Compaction
For a lot to receive a pay factor of 1.00 for compaction acceptance, the air void range cannot exceed 4 percent for new construction or 5 percent for resurfacing projects. The range is the difference between the highest and lowest acceptance test results within the affected lot. If the air void range exceeds these tolerances, apply a Pay Factor of 95%.

The 5% reduced pay factor for the compaction range does not apply in these instances:
- The mixture is placed during the adjustment period as defined in Subsection 400.5.01.A, “Materials Produced and Placed During the Adjustment Period.”
- All air void results within a given lot are less than 7.0%.
- A lot containing two sublot or less.
- On two foot trench widening.

C. Surface Tolerance
In this Specification, pavement courses to be overlaid with an Open-Graded Friction Course or PEM are considered surface courses. All Open-Graded Friction Courses or PEM are to be evaluated after the roadway has been opened to traffic for a minimum of 5 days and a maximum of 15 days. Asphalt paving is subject to straightedge and visual inspection and irregularity correction as shown below:

1. Visual and Straightedge Inspection
   Paving is subject to visual and straightedge inspection during and after construction operations until Final Acceptance. Locate surface irregularities as follows:
   a. Keep a 10 ft straightedge near the paving operation to measure surface irregularities on courses. Provide the straightedge and the labor for its use.
   b. Inspect the base, intermediate, and surface course surfaces with the straightedge to detect irregularities.
   c. Correct irregularities that exceed 3/16 in. in 10 ft for base and intermediate courses, and 1/8 in. in 10 ft for surface courses.
      Mixture or operating techniques will be stopped if irregularities such as rippling, tearing, or pulling occur and the Engineer suspects a continuing equipment problem. Stop the paving operation and correct the problem. Correct surface course evaluations on individual Laser Road Profiler test sections, normally 1 mile long.

2. Target Surface Smoothness
   Barrow County will use the Laser Road Profiler method to conduct acceptance testing for surface course tolerance according to GDT 126. This testing will be performed only on:
   - Surface courses on Projects with mainline traveled way measuring a minimum distance of 1 mile
   - Ramps more than 0.5 mile long
   **Combine partial sections measuring less than 0.5 mile with the previous full mile for acceptance.**
   Achieve the smoothest possible ride during construction. Do not exceed the target Laser Road Profiler smoothness index as shown below:

<table>
<thead>
<tr>
<th>Construction Description</th>
<th>Smoothness Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Asphaltic Concrete OGFC and PEM on interstate resurfacing and new construction.</td>
<td>750</td>
</tr>
<tr>
<td>Asphaltic Concrete OGFC and PEM placed on state route new construction.</td>
<td></td>
</tr>
</tbody>
</table>
Asphaltic Concrete SMA and other resurfacing on interstates. Asphaltic Concrete OGFC and PEM placed on state route resurfacing. All new construction on state routes with exception of OGFC and PEM as stated above.

825

All other resurfacing on state routes (excluding LARP, PR, airports, etc.)

900

All Urban new construction and resurfacing on state routes within curb and gutter sections located in posted 35 miles per hour (MPH) or less speed zones.

1175

If the target values are not achieved, immediately adjust the operations to meet the target values. Placement operations may be suspended until a remedial plan to comply with target smoothness requirements is submitted and approved by the Engineer if adjustments do not satisfy target smoothness values.

### Table 8—Pavement Smoothness Corrective Work Requirement

<table>
<thead>
<tr>
<th>Construction Description</th>
<th>Smoothness Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Asphaltic Concrete OGFC and PEM on interstate resurfacing and new construction. Asphaltic Concrete OGFC and PEM placed on state route new construction.</td>
<td>825</td>
</tr>
<tr>
<td>Asphaltic Concrete SMA and other resurfacing on interstates. Asphaltic Concrete OGFC and PEM placed on state route resurfacing. All new construction on state routes with exception of OGFC and PEM as stated above.</td>
<td>900</td>
</tr>
<tr>
<td>All other resurfacing on state routes (excluding LARP, PR, airports, etc.)</td>
<td>1025</td>
</tr>
<tr>
<td>All Urban new construction and resurfacing on state routes within curb and gutter sections located in posted 35 miles per hour (MPH) or less speed zones.</td>
<td>1250</td>
</tr>
</tbody>
</table>

If surface tolerance deficiencies need correction, obtain the Engineer’s approval of the methods and type mix used.

3. Bridge Approach Ride Quality
   The following are subject to a ride quality test by Barrow County for 100 ft. of roadway approaching each end of a bridge using the Lightweight Profiler:
   A state road with 4 lanes or more
   A 2-lane state road with a current traffic count of 2,000 vpd or more
   Locations designated on the Plans
   All other bridge approaches not meeting the above criteria shall meet the 1/8 in. in 10 ft straightedge requirement. When the distance between the ends of two bridges is less than 200 ft, the bridge approaches will meet the straightedge requirements.
   Test ride quality as follows:
   a. Barrow County will determine a profile index value according to test method GDT 134.
b. Barrow County will average the profile index value from the right and left wheelpath for each 100 ft section for each lane
   Resurfacing Projects – Keep the profile index value under 35 in/mile, correct individual bumps or depression exceeding 0.2 in. from the blanking band on the profilograph trace.
   All Other Projects – Keep the profile index value under 30 in/mile, correct individual bumps or depressions exceeding 0.2 in. from blanking band on the profilograph trace.

c. Meet the profile index value for the 100 ft section of roadway up to the joint with the approach slab.

d. Schedule the ride quality testing 5 days before needed by contacting the Office of Materials. Clean and clear obstructions from the test area.

e. Correct the sections that do not meet the ride quality criteria of this Specification. After correction, these sections are subject to retesting with the Lightweight Profiler. The Engineer shall direct the type of correction method, which may include:
   - Milling
   - Grinding
   - Removing and replacing the roadway
   No additional compensation will be made.
   Additional profilograph testing will cost the Contractor $500 per test.

4. Surface Smoothness Acceptance
   When recommended by the Office of Materials, a pay reduction may be accepted in lieu of correction for roadways and bridge approaches that fail to achieve specified smoothness indexes.

D. Reevaluation of Lots
   When lots are reevaluated as shown in Subsection 106.03, “Samples, Tests, Cited Specifications,” sampling and testing is according to GDT 73. Request for reevaluation shall be made within 5 working days of notification of the lot results.
   The following procedures apply:
   1. Mixture Acceptance
      Barrow County will take the same number of new tests on cores taken at the locations where the loads sampled were placed and will use only those cores results for acceptance. If the location of the sampled loads cannot be isolated and documented to the approval of the Engineer, the lot will not be re-evaluated and the original test results will be used for acceptance. Barrow County will use the absolute average deviations from the job mix formula for these tests to determine acceptance based on the appropriate column in the Asphalt Cement Content and Aggregate Gradation of Asphalt Concrete Mixture Acceptance Schedule—Table 9 or 10.
   2. Compaction Acceptance
      Barrow County will reevaluate the lot through additional testing by cutting the same number of cores originally obtained and averaging these results with the results from the original density tests. Barrow County will use the average to determine acceptance according to the Compaction Acceptance Schedule in Subsection 400.5.01.C, “Calculate Pavement Mean Air Voids”.

<table>
<thead>
<tr>
<th>Mixture Characteristics</th>
<th>Pay Factor</th>
<th>Mean of the Deviations from the Job Mix Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 Test</td>
</tr>
<tr>
<td>Asphalt Cement Content</td>
<td>1.00</td>
<td>0.00 -</td>
</tr>
<tr>
<td>Mixture Characteristics</td>
<td>Pay Factor</td>
<td>Mean of the Deviations from the Job Mix Formula</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>1 Test</td>
<td>2 Tests</td>
</tr>
<tr>
<td>(Extraction, Ignition)</td>
<td>0.95</td>
<td>0.71 - 0.80</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>0.81 - 0.90</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>0.91 - 1.00</td>
</tr>
<tr>
<td></td>
<td>0.70</td>
<td>1.01 - 1.19</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>1.20 - 1.40</td>
</tr>
<tr>
<td>3/8 in. Sieve</td>
<td>1.00</td>
<td>0.00 - 9.0</td>
</tr>
<tr>
<td>(12.5 mm OGFC,</td>
<td>0.98</td>
<td>9.1 - 10.0</td>
</tr>
<tr>
<td>12.5 mm PEM,</td>
<td>0.95</td>
<td>10.1 - 11.9</td>
</tr>
<tr>
<td>12.5 mm Superpave)</td>
<td>0.90</td>
<td>12.0 - 13.0</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>13.1 - 14.0</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>14.1 - 14.5</td>
</tr>
<tr>
<td>3/8 in. Sieve</td>
<td>1.00</td>
<td>0.00 - 6.8</td>
</tr>
<tr>
<td>(12.5 mm SMA)</td>
<td>0.98</td>
<td>6.9 - 7.5</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>7.6 - 8.9</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>9.0 - 9.8</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>9.9 - 10.5</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>10.6 - 10.9</td>
</tr>
<tr>
<td>No. 4 Sieve</td>
<td>1.00</td>
<td>0.00 - 9.0</td>
</tr>
<tr>
<td>Mixture Characteristics</td>
<td>Pay Factor</td>
<td>Mean of the Deviations from the Job Mix Formula</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Test</td>
</tr>
<tr>
<td>9.5 mm Superpave)</td>
<td>0.98</td>
<td>9.1 - 10.0</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>10.1 - 11.9</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>12.0 - 13.0</td>
</tr>
<tr>
<td>No. 4 Sieve (9.5 mm SMA)</td>
<td>0.98</td>
<td>13.1 - 14.0</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>14.1 - 14.5</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>9.9 - 10.6</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>9.0 - 10.6</td>
</tr>
<tr>
<td>No. 8 Sieve (OGFC, PEM, Superpave and 4.75 mm mixes)</td>
<td>0.98</td>
<td>1.00 - 0.80</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>8.1 - 9.1</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>9.1 - 11.0</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>11.0 - 12.0</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>12.1 - 12.5</td>
</tr>
<tr>
<td>No. 8 Sieve (12.5 mm SMA, 9.5 mm SMA)</td>
<td>0.98</td>
<td>1.00 - 0.80</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>5.4 - 6.1</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>6.2 - 6.9</td>
</tr>
</tbody>
</table>
### Mixture Characteristics

<table>
<thead>
<tr>
<th>Pay Factor</th>
<th>Mean of the Deviations from the Job Mix Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Test</td>
</tr>
<tr>
<td>0.85</td>
<td>8.3 - 9.0</td>
</tr>
<tr>
<td>0.75</td>
<td>9.1 - 9.4</td>
</tr>
</tbody>
</table>

No. 8 Sieve for OGFC and PEM mixes: When the mean of the deviations from the Job Mix Formula for a particular lot exceeds the tolerance for a 1.00 pay factor in the appropriate column, the lot will be paid for at 0.50 of the Contract Price.

**Table 10—Mixture Acceptance Schedule—Subsurface Mixes**

<table>
<thead>
<tr>
<th>Mixture Characteristics</th>
<th>Pay Factor</th>
<th>Mean of the Deviations from the Job Mix Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Test</td>
<td>2 Tests</td>
</tr>
<tr>
<td>Asphalt Cement Content</td>
<td>1.00</td>
<td>0.00 - 0.61</td>
</tr>
<tr>
<td>(Extraction, Ignition)</td>
<td>0.95</td>
<td>0.62 - 0.68</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>0.69 - 0.75</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>0.76 - 0.82</td>
</tr>
<tr>
<td></td>
<td>0.70</td>
<td>0.83 - 0.85</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.86 - 0.88</td>
</tr>
<tr>
<td>1/2 in. Sieve</td>
<td>1.00</td>
<td>0.00 - 0.91</td>
</tr>
<tr>
<td>(25 mm Superpave)</td>
<td>0.98</td>
<td>13.0 - 14.0</td>
</tr>
<tr>
<td>Mixture Characteristics</td>
<td>Pay Factor</td>
<td>Mean of the Deviations from the Job Mix Formula</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Test</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>14.1 - 15.0</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>15.1 - 16.0</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>16.1 - 17.0</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>17.1 - 18.0</td>
</tr>
<tr>
<td>3/8 in. Sieve (19 mm Superpave, 12.5 mm Superpave)</td>
<td>1.00</td>
<td>0.00 - 10.0</td>
</tr>
<tr>
<td></td>
<td>0.98</td>
<td>10.1 - 11.9</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>12.0 - 13.0</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>13.1 - 14.0</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>14.1 - 14.5</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>14.6 - 15.0</td>
</tr>
<tr>
<td>No. 4 Sieve (9.5 mm Superpave)</td>
<td>1.00</td>
<td>0.00 - 10.0</td>
</tr>
<tr>
<td>Mixture Characteristics</td>
<td>Pay Factor</td>
<td>Mean of the Deviations from the Job Mix Formula</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>1 Test 2 Tests</td>
<td>3 Tests</td>
</tr>
<tr>
<td>0.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>No. 8 Sieve</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>(All mixes except SMA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td></td>
</tr>
</tbody>
</table>
E. Segregated Mixture

Prevent mixture placement yielding a segregated mat by following production, storage, loading, placing, and handling procedures. Ensure needed plant modifications and provide necessary auxiliary equipment. (See Subsection 400.1.01, “Definitions.”) If the mixture is segregated in the finished mat, Barrow County will take actions based on the degree of segregation. The actions are described below.

1. Unquestionably Unacceptable Segregation
   When the Engineer determines the segregation in the finished mat is unquestionably unacceptable, follow these measures:
   a. Suspend Work and require the Contractor to take positive corrective action. Barrow County will evaluate the segregated areas to determine the extent of the corrective work to the in-place mat as follows:
      Perform extraction and gradation analysis by taking 6 in cores from typical, visually unacceptable segregated areas.
      Determine the corrective work according to Subsection 400.3.06.E.3.
   b. Require the Contractor to submit a written plan of measures and actions to prevent further segregation. Work will not continue until the plan is submitted to and approved by Barrow County.
   c. When work resumes, place a test section not to exceed 500 tons of the affected mixture for Barrow County to evaluate. If a few loads show that corrective actions were not adequate, follow the measures above beginning with step 1.a. above. If the problem is solved, Work may continue.

2. Unacceptable Segregation Suspected
   When the Engineer observes segregation in the finished mat and the work may be unacceptable, follow these measures:
   a. Allow work to continue at Contractor’s risk.
   b. Require Contractor to immediately and continually adjust operation until the visually apparent segregated areas are eliminated from the finished mat. Barrow County will immediately investigate to determine the severity of the apparent segregation as follows:
      Take 6 in cores from typical areas of suspect segregation.
      Test the cores for compliance with the mixture control tolerances in Section 828. When these tolerances are exceeded, suspend work for corrective action as outlined in Subsection 400.3.06.E.3.

3. Corrective Work
   a. Remove and replace (at the Contractor’s expense) any segregated area where the gradation on the control sieves is found to vary 10 percent or more from the approved job mix formula, the asphalt cement varies 1.0% or more from the approved job mix formula, or if in-place air voids exceed 13.5% based on GDT 39. The control sieves for each mix type are shown in Subsection 400.5.01.B “Determine Lot Acceptance.”
   b. Subsurface mixes. For subsurface mixes, limit removal and replacement to the full lane width and no less than 10 ft. long and as approved by the Engineer.
   c. Surface Mixes. For surface mixes, ensure that removal and replacement is not less than the full width of the affected lane and no less than the length of the affected areas as determined by the Engineer.
Surface tolerance requirements apply to the corrected areas for both subsurface and surface mixes.

400.3.07 Contractor Warranty and Maintenance
A. Contractor’s Record
Maintain a dated, written record of the most recent plant calibration. Keep this record available for the Engineer’s inspection at all times. Maintain records in the form of:
- Graphs
- Tables
- Charts
- Mechanically prepared data

400.4 Measurement
Thickness and spread rate tolerances for the various mixtures are specified in Subsection 400.4.A.2.b, Table 11, Thickness and Spread Rate Tolerance at Any Given Location. These tolerances are applied as outlined below:
A. Hot Mix Asphaltic Concrete Paid for by Weight
1. Plans Designate a Spread Rate
   a. Thickness Determinations. Thickness determinations are not required when the Plans designate a spread rate per square yard.
      If the spread rate exceeds the upper limits outlined in the Subsection 400.4.A.2.b, Table 11, “Thickness and Spread Rate Tolerance at Any Given Location”, the mix in excess will not be paid for.
      If the rate of spread is less than the lower limit, correct the deficient course by overlaying the entire lot.
      The mixture used for correcting deficient areas is paid for at the Contract Unit Price of the course being corrected and is subject to the Mixture Acceptance Schedule—Table 9 or 10.
   b. Recalculate the Total Spread Rate. After the deficient hot mix course has been corrected, the total spread rate for that lot is recalculated, and mix in excess of the upper tolerance limit as outlined in the Subsection 400.4.A.2.b, Table 11, “Thickness and Spread Rate Tolerance at Any Given Location” is not paid for.
      The quantity of material placed on irregular areas such as driveways, turnouts, intersections, feather edge section, etc., is deducted from the final spread determination for each lot.
2. Plans Designate Thickness
   If the average thickness exceeds the tolerances specified in the Subsection 400.4.A.2.b, Table 11, “Thickness and Spread Rate Tolerance at Any Given Location”, the Engineer shall take cores to determine the area of excess thickness. Excess quantity will not be paid for.
   If the average thickness is deficient by more than the tolerances specified in the Thickness and Spread Rate Tolerance at Any Given Location table below, the Engineer shall take additional cores to determine the area of deficient thickness. Correct areas with thickness deficiencies as follows:
a. Overlay the deficient area with the same mixture type being corrected or with an approved surface mixture. The overlay shall extend for a minimum of 300 ft for the full width of the course.
b. Ensure that the corrected surface course complies with Subsection 400.3.06.C.1, “Visual and Straightedge Inspection.” The mixture required to correct a deficient area is paid for at the Contract Unit Price of the course being corrected. The mixture is subject to the Mixture Acceptance Schedule—Table 9 or 10. The quantity of the additional mixture shall not exceed the required calculated quantity used to increase the average thickness of the overlaid section to the maximum tolerance allowed under the following table.

**Table 11—Thickness and Spread Rate Tolerance at Any Given Location**

<table>
<thead>
<tr>
<th>Course</th>
<th>Thickness Specified</th>
<th>Spread Rate Specified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphaltic concrete base course</td>
<td>± 0.5 in</td>
<td>+40 lbs, -50 lbs</td>
</tr>
<tr>
<td>Intermediate and/or wearing course</td>
<td>± 0.25 in</td>
<td>+20 lbs, -25 lbs</td>
</tr>
<tr>
<td>Overall of any combination of 1 and 2</td>
<td>± 0.5 in</td>
<td>+40 lbs, -50 lbs</td>
</tr>
</tbody>
</table>

Note 1: For asphaltic concrete 9.5 mm OGFC and 12.5 mm OGFC, control the spread rate per lot within 5 lbs/yd² of the designated spread rate. For asphaltic concrete 12.5 mm PEM, control the spread rate per lot within 10 lbs/yd² of the designated spread rate.

Note 2: Thickness and spread rate tolerances are provided to allow normal variations within a given lot. Do not continuously operate at a thickness of spread rate not specified.

When the Plans specify a thickness, the Engineer may take as many cores as necessary to determine the average thickness of the intermediate or surface course. The Engineer shall take a minimum of one core per 1,000 ft per two lanes of roadway. Thickness will be determined by average measurements of each core according to GDT 42.

If the average exceeds the tolerances specified in the Subsection 400.4.A.2.b, Table 11, “Thickness and Spread Rate Tolerance at Any Given Location”, additional cores will be taken to determine the area of excess thickness and excess tonnage will not be paid for.

**B. Hot Mix Asphaltic Concrete Paid for by Square Yard**

1. The thickness of the base course or the intermediate or surface course will be determined by Barrow County by cutting cores and the thickness will be determined by averaging the measurements of each core.
2. If any measurement is deficient in thickness more than the tolerances given in the table above, additional cores will be taken by Barrow County to determine the area of thickness deficiency. Correct thickness deficiency areas as follows:
   a. Overlay the deficient area with the same type mixtures being corrected or with surface mixture. Extend the overlay at least 300 ft for the full width of the course.
   b. Ensure the corrected surface course complies with Subsection 400.3.06.C.1, Visual and Straightedge Inspection”
   c. The mixture is subject to the Mixture Acceptance Schedule—Table 9 or 10.
3. No extra payment is made for mixtures used for correction.
4. No extra payment is made for thickness in excess of that specified. 
   **NOTE**: Thickness tolerances are provided to allow normal variations within a given lot. Do not continuously operate at a thickness not specified.

**C. Asphaltic Concrete**
Hot mix asphaltic concrete, complete in place and accepted, is measured in tons or square yards as indicated in the Proposal. If payment is by the ton, the actual weight is determined by weighing each loaded vehicle on the required motor truck scale as the material is hauled to the roadway, or by using recorded weights if a digital recording device is used. The weight measured includes all materials. No deductions are made for the weight of the individual ingredients. The actual weight is the pay weight except when the aggregates used have a combined bulk specific gravity greater than 2.75. In this case the pay weight is determined according to the following formula:

\[
T = \frac{T_1 \cdot AC \cdot Aggregate \cdot Combined\ Bulk\ Sp.\ Gr. - Y}{100}
\]

Where:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Pay weight, tonnage</td>
</tr>
<tr>
<td>T</td>
<td>Actual weight</td>
</tr>
<tr>
<td>% AC</td>
<td>Percent asphalt cement by weight of total mixture</td>
</tr>
<tr>
<td>% Aggregate</td>
<td>Percent aggregate by weight of total mixture</td>
</tr>
<tr>
<td>Combined Bulk Sp. Gr.</td>
<td>Calculated combined bulk specific gravity of various mineral aggregates used in the mixture</td>
</tr>
<tr>
<td>% Y</td>
<td>Percent hydrated lime by weight of mineral aggregate</td>
</tr>
</tbody>
</table>

**D. Bituminous Material**
Bituminous material is not measured for separate payment.

**E. Hydrated Lime**
When hydrated lime is used as an anti-stripping additive, it is not measured for separate payment.

**F. Field Laboratory**
The field laboratory required in this Specification is not measured for separate payment.

**G. Asphaltic Concrete Leveling**
Payment of hot mix asphaltic concrete leveling, regardless of the type mix, is full compensation for furnishing materials, bituminous materials, and hydrated lime (when required) for patching and repair of minor defects, surface preparation, cleaning, hauling, mixing, spreading, and rolling. Mixture for leveling courses is subject to the acceptance schedule as stated in Subsection 400.3.06.A and Subsection 400.3.06.B.

**H. Asphaltic Concrete Patching**
Hot mix asphaltic concrete patching, regardless of the type mix, is paid for at the Contract Unit Price per ton, complete in place and accepted. Payment is full compensation for:
Furnishing materials such as bituminous material and hydrated lime (when required)
Preparing surface to be patched
Cutting areas to be patched, trimmed, and cleaned
Hauling, mixing, placing, and compacting the materials

400.4.01 Limits
When the asphaltic concrete is paid for by the square yard and multiple lifts are used, the number and thickness of the lifts are subject to the Engineer’s approval and are used to prorate the pay factor for the affected roadway section.

400.5 Payment
When materials or construction are not within the tolerances in this Specification, the Contract Price will be adjusted according to Subsection 106.03, “Samples, Tests, Cited Specifications” and Subsection 400.3.06, “Quality Acceptance.”
Hot mix asphaltic concrete of the various types are paid for at the Contract Unit Price per ton or per square yard. Payment is full compensation for furnishing and placing materials including asphalt cement, hydrated lime when required, approved additives, and for cleaning and repairing, preparing surfaces, hauling, mixing, spreading, rolling, and performing other operations to complete the Contract Item.

Payment will be made under:

| Item No. 400 | Asphaltic concrete 12.5 mm Superpave, group-blend, including bituminous material and hydrated lime | Per ton |

400.5.01 Adjustments
A. Materials Produced and Placed During the Adjustment Period
An adjustment period is allowed at the start of mixing operations for each type of mix placed on the Contract. Asphaltic Concrete OGFC or PEM shall be granted an adjustment period for the first 500 tons produced for the Contract.
A new adjustment period shall not be granted for a change of producer, mix design or asphalt plant location. The adjustment period is provided to adjust or correct the mix and to establish the construction procedures and sequence of operations.
The adjustment period consists of the tons of the affected mix produced and placed on the first day of operation. If this quantity is less than 500 tons, the Engineer may combine the tons produced and placed on the first day of operation with the tons produced and placed on the next production day of the affected mix for the adjustment period.
The material produced and placed during the mixture adjustment period is one lot. If the mix is adjusted during this period, a new lot may be necessary, but a new adjustment period will not be permitted.
This material shall be paid for at 100 percent of the Contract Unit Price provided it meets the minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the Mixture Acceptance Schedule—Table 9 or 10.
If the material placed during the adjustment period fails to meet the above requirements, it will be paid for using the applicable acceptance schedule. However, when mixture used for leveling at a spread rate of 90 lbs/yd² or less is also used for the surface mix at a spread rate greater than 90 lbs/yd², an additional adjustment period will be allowed for compaction only. This material will be paid for at a 1.00 pay factor provided it:

Meets the minimum requirements for a 1.00 pay factor in the Mixture Acceptance Schedule—Table 9 or 10 for both asphalt content and gradation.

Meets the minimum requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01C, “Calculate Mean Pavement Air Voids.

Mixture which does not meet these requirements shall be paid for using the applicable acceptance schedule.

B. Determine Lot Acceptance

Pay factor adjustments are based on control sieves and asphalt cement content. The control sieves used in the mixture acceptance schedule for the various types of mix are indicated below:

<table>
<thead>
<tr>
<th>Control Sieves Used in the Mixture Acceptance Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphaltic concrete 25 mm Superpave     1/2 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 19 mm SMA           1/2 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 19 mm Superpave     3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 12.5 mm Superpave   3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 12.5 mm SMA         3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 12.5 mm PEM         3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 12.5 mm OGFC        3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 9.5 mm Superpave    No. 4, No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 9.5 mm SMA          No. 4, No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 9.5 mm OGFC         No. 4, No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 4.75 mm Mix         No. 8 sieve and asphalt cement</td>
</tr>
</tbody>
</table>

For projects which do not have milling quantities established as a Pay Item, Barrow County will pay for 12.5 mm OGFC and PEM placed on ramps and end of project transitions under the appropriate mixture pay item, but the mix shall be subject to the same gradation and control sieve requirements as asphaltic concrete 9.5 mm OGFC. Add polymer-modified bituminous material, hydrated lime, and stabilizing fiber to this mix.

Barrow County will perform the following tasks:

1. Using the Mixture Acceptance Schedule—Table 9 or 10, determine the mean of the deviations from the job mix formula per test results per lot.

2. Determine this mean by averaging the actual numeric value of the individual deviations from the job mix formula; disregard whether the deviations are positive or negative amounts.

3. Use the Asphalt Cement Content and Aggregate Gradation of Asphalt Concrete Mixture Acceptance Schedule—Table 9 to determine acceptance of surface mixes and the Mixture Acceptance Schedule—Table 10 to determine acceptance of subsurface mixes.
On Contracts involving 1,000 tons (1000 Mg) or less of asphaltic concrete, the mixture is accepted for 100 percent payment of the asphaltic concrete Unit Price provided it meets the following:

1. Minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the applicable Mixture Acceptance Schedule—Table 9 or 10.
2. Minimum requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01C, “Calculate Pavement Mean Air Voids.

If the material placed on Contracts involving 1,000 tons or less of asphaltic concrete does not meet the above requirements, the material will be paid for using the applicable acceptance schedule.

C. Calculate Pavement Mean Air Voids
Barrow County will determine the percent of maximum air voids for each lot by dividing the pavement mean air voids by the maximum pavement mean air voids acceptable. Barrow County will determine the payment for each lot by multiplying the Contract Unit Price by the adjusted pay factor shown in the following Air Voids Acceptance schedule:

<table>
<thead>
<tr>
<th>Pay Factor</th>
<th>Percent of Maximum Air Voids (Lot Average of Tests)</th>
<th>Percent of Maximum Air Voids (Lot Average all Tests) (for Reevaluations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>≤100</td>
<td>≤100</td>
</tr>
<tr>
<td>0.97</td>
<td>100.1 — 105</td>
<td>100.1 — 104</td>
</tr>
<tr>
<td>0.95</td>
<td>105.1 — 112</td>
<td>104.1 — 109</td>
</tr>
<tr>
<td>0.90</td>
<td>112.1 — 124</td>
<td>109.1 — 118</td>
</tr>
<tr>
<td>0.80</td>
<td>124.1 — 149</td>
<td>118.1 — 136</td>
</tr>
<tr>
<td>0.70</td>
<td>149.1 — 172</td>
<td>136.1 — 153</td>
</tr>
<tr>
<td>0.50</td>
<td>172.1 — 191</td>
<td>153.1 — 166</td>
</tr>
</tbody>
</table>

When recommended by the Office of Materials, Lots receiving less than 0.5 pay factor shall be removed and replaced at the Contractor’s expense. When the range tolerance is exceeded, Barrow County will apply a pay factor of 0.95 as described in Subsection 400.3.06.B.2.

D. Asphaltic Concrete for Temporary Detours
Hot mix asphaltic concrete placed on temporary detours not to remain in place as part of the permanent pavement does not require hydrated lime. Hot mix used for this purpose is paid for at an adjusted Contract Price. The payment for this item shall cover all cost of construction, maintenance and removal of all temporary mix. Hot mix asphaltic concrete placed as temporary mix shall meet requirements established in Subsection 400.3.05.F. Where the Contract Price of the asphaltic concrete for permanent pavement is let by the ton, the Contract Price for the asphaltic concrete placed on temporary detours is adjusted by subtracting $0.75/ton of mix used.
Where the Contract price of the mix in the permanent pavement is based on the square yard, obtain the adjusted price for the same mix used on the temporary detour by subtracting $0.04/yd² per 1-in plan depth. Further price adjustments required in Subsection 400.3.06, “Quality Acceptance,” which are based on the appropriate adjusted Contract Price for mix used in the temporary detour work shall apply should temporary mix be left in place. Hot mix asphalt produced as temporary mix containing no hydrated lime shall be removed and replaced with permanent mix containing hydrated lime.

E. Determine Lot Payment
Determine the lot payment as follows:
1. When one of the pay factors for a specific acceptance lot is less than 1.0, determine the payment for the lot by multiplying the Contract Unit Price by the adjusted pay factor.
2. When two or more pay factors for a specific acceptance lot are less than 1.0, determine the adjusted payment by multiplying the Contract Unit Price by the lowest pay factor.

If the mean of the deviations from the job mix formula of the tests for a sieve or asphalt cement content exceeds the tolerances established in the Mixture Acceptance Schedule—Table 9 or 10 and if the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer. If the pavement mean air voids exceed the tolerances established in the Air Voids Acceptance Schedule—Table 12, remove and replace the materials at the Contractor’s expense. If the Engineer determines the material is not acceptable to leave in place, remove and replace the materials at the Contractor’s expense.
Section 402—Hot Mix Recycled Asphaltic Concrete

402.1 General Description
This work includes producing and placing hot mix recycled asphaltic concrete that incorporates reclaimed asphalt pavement (RAP), reclaimed asphalt shingles (RAS), virgin aggregate, hydrated lime, and neat asphalt cement.

402.1.01 Definitions
General Provisions 101 through 150.

402.1.02 Related References
A. Standard Specifications
   Section 400—Hot Mix Asphaltic Concrete Construction
   Section 800—Coarse Aggregate
   Section 828—Hot Mix Asphaltic Concrete Mixtures
B. Referenced Documents
   SOP 41 “Guidelines for RAP Stockpile Approval”

402.1.03 Submittals
A. Certified Weight Tickets
   Notify the Engineer before removing RAP from a stockpile that belongs to Barrow County. Submit to the Engineer the certified weight tickets of materials removed from the stockpile.
B. Affidavit
   Submit to the laboratory an affidavit stating the sources of stockpiled materials to be used on a State project. Include the following information in the letter:
   • State project number
   • Location from which the material was removed
   • Approximate removal dates
   • Mix types removed and the estimated quantity of each type in the stockpiles
   • Other available information about the stockpiled material such as percentage of local sand in the RAP
   Obtain specific approval from the laboratory to use RAP or RAS stockpiles. Adhere to Guidelines for RAP Stockpile Approval.

402.2 Materials
A. RAP Material Composition
   Use RAP materials from any of the following:
   • Existing roadway
   • Contractor’s RAP stockpile that has been approved by Barrow County
   • Barrow County stockpile
   NOTE: The location of Barrow County RAP material stockpiles will be given on the Plans.
   Do not use RAP materials that contain alluvial gravel or local sand in any mixture placed on interstate projects except for mixtures used in shoulder construction. When used in shoulder
construction, limit RAP containing local sand or alluvial gravel so that the sand or gravel contributes no more than 20% of the total aggregate portion of the mix.

1. **RAP Percentage**
   For non-interstate projects, limit the percentage of RAP allowed in recycled mixes so that the overall amount of alluvial gravel does not exceed 5 percent of the total mix. The percentage of alluvial gravel, local sand, and Group I material in the RAP will be determined through petrographic analysis or available records.

2. **RAP furnished to the Contractor but not used in the work remains the Contractor’s property.**
   RAP used in the recycled mixtures for mainline or ramps (if applicable) may make up from 0 to 40 percent of the mixture depending on the amount of RAP available, the production facilities, and whether the mixture meets the requirements in Section 828. The maximum ratio of RAP material to the recycled mixtures other than SMA is 40 percent for continuous mix type plants and 25 percent for batch type plants. The maximum ratio of RAP material to the recycled mixture is 15 percent for Stone Matrix Asphalt (SMA) mixes.

3. **Process RAP Material**
   Process RAP material to be used in the recycled mixture so that 100 percent will pass the 2 in sieve.
   Additional crushing and sizing may be required if the RAP aggregate exceeds the maximum sieve size for the mix type as shown in Section 828. Obtain representative materials from the RAP stockpile for the mix design.

**B. RAS Material**

RAS materials are produced as a by-product of manufacturing roofing shingles and/or discarded shingle scrap from the reroofing of buildings.

1. Limit the amount of RAS material used in the recycled mixture to no greater than 5 percent of the total mixture weight.
2. Shred the RAS material before incorporating it into the mix to ensure that 100 percent of the shredded pieces are less than 1/2 in. in any dimension.
3. Remove all foreign materials such as paper, roofing nails, wood, or metal flashing.
4. Provide test results for Bulk Sample Analysis, known as Polarized Light Microscopy, if post-consumer shingles are used to certify the RAS material is free of asbestos. Test stockpiles at the rate of one test per 1000 tons prior to processing.

Other than as specifically stated in this Subsection, ensure that RAS material is used according to the same requirements as described for RAP material.

**C. Asphalitic Concrete Removed from an Existing Roadway**

Asphaltic concrete removed from an existing roadway becomes the Contractor’s property unless specified otherwise on the Plans. RAP material retained by Barrow County is designated on the Plans, and the RAP shall be stockpiled at the location specified on the Plans.

**D. Local Sand and Group I Material in RAP**

Use of local sand in recycled mixes is restricted as stipulated in Section 828 for the Project. However, RAP which contains local sand may be used in surface and intermediate layers of non-interstate projects so long as the RAP percentage used does not contribute more than 5% local sand to the total aggregate portion of the mix. The amount of local sand in the RAP material shall be considered when determining the percentage of local sand in the total mix.
Where Pay Items specify that Group II only aggregate is to be used, RAP which consists primarily of Group II aggregate, but contains some Group I aggregate, shall be limited such that the Group I aggregate makes up no more than 5% of the total aggregate portion of the mix. When a Blend I mix is specified, any Group I materials in the RAP will be considered when determining the Group I portion allowed in the total mix as specified in Subsection 828.2.A.2.

E. Asphalt Cement
Using laboratory evaluations, Barrow County will determine the asphalt cement grade to be used in the recycled mixture. The asphalt cement shall meet the requirements of Section 820. When the asphalt cement is blended with asphalt cement recovered from the RAP material and after tests on residue from thin film oven tests, the asphalt cement shall have a viscosity of 6,000 to 16,000 poises or as approved by the Engineer. Recover asphalt cement from the recycled mixture to verify that the specified viscosity is being met. If the Engineer determines during construction that the selected asphalt cement grade is not performing satisfactorily, Barrow County may change the asphalt cement grade in the mixture, with no change in the Contract Unit Price.

F. Recycled Mixture
The recycled mixture shall be a homogenous mixture of RAP or RAS material, virgin aggregate, hydrated lime, and neat asphalt cement. Ensure that the mixture conforms to an approved mixture design outlined in Section 828.

402.2.01 Delivery, Storage, and Handling
Separate the stockpiles by Project sources and by Group I and Group II aggregate types. Erect a sign on each stockpile to identify the source(s). If RAP material from different project sources becomes intermixed in a stockpile, only use those materials when approved by the laboratory. Barrow County may reject by visual inspection stockpiles that are not clean and free of foreign materials.

402.3 Construction Requirements

402.3.01 Personnel
General Provisions 101 through 150.

402.3.02 Equipment
A. Hot Mix Plant
Use a hot mix plant for the recycling process with necessary modifications approved by the Engineer to process recycled material. Design, equip, and operate the plant so that the proportioning, heating, and mixing yields a uniform final mixture within the job mix formula tolerances.

B. Cold Feed Bin
Proportion the RAP or RAS material using a separate cold feed bin. Ensure that the material meets the size requirements in Subsection 402.2, “Materials.” The ratio of the RAP or RAS to virgin aggregate shall be controlled gravimetrically.
C. Electronic Belt Weighing Devices
Use electronic belt weighing devices to monitor the flow of RAP or RAS and the flow of virgin aggregate. For batch-type plants, the RAP or RAS portion of the mix may be weighed in a weigh hopper before incorporating it into the pugmill. The RAP shall be screened through a 2-inch maximum sized screen prior to crossing the cold feed weigh. Ensure the amount of RAP material incorporated into the asphalt plant does not change after this final measurement is processed by the asphalt plant computer.

D. Feeders and Conveyors
Equip plants with an interlocking system of feeders and conveyors that synchronize the RAP or RAS material flow with the virgin aggregate flow. Ensure that the electronic controls track the flow rates indicated by the belt weighing devices and develop the signal to automatically maintain the desired ratio at varying production rates. Design the RAP or RAS feeder bins, conveyor system, and auxiliary bins (if used) to prevent RAP material from segregating and sticking.

402.3.03 Preparation
General Provisions 101 through 150.

402.3.04 Fabrication
General Provisions 101 through 150.

402.3.05 Construction
Follow the requirements in Section 400 for hot mix recycled asphaltic concrete production and placement, materials, equipment, and acceptance plans except as noted or modified in this Specification.

402.3.06 Quality Acceptance
Barrow County may require additional quality control tests to determine the RAP stockpile consistency and the RAP aggregate quality. In this case, conduct at least three extraction/gradation tests from each individual source. Ensure that aggregate meets the quality standards in Section 800.

402.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

402.4 Measurement
Recycled asphaltic concrete mixture, complete in place and accepted, is measured in tons. The weight is determined by recorded weights if an approved recording device is used. Or, the weight is determined by weighing each loaded vehicle on an approved motor truck scale as the material is hauled to the roadway.

402.4.01 Limits
General Provisions 101 through 150.
402.5 Payment

The work performed and the materials furnished as described in this Specification will be paid for at the Contract Unit Price per ton. Payment is full compensation for providing materials, hauling and necessary crushing, processing, placing, rolling and finishing the recycled mixture, and providing labor, tools, equipment, and incidentals necessary to complete the work, including hauling and stockpiling RAP or RAS material.

Payment will be made under:

| Item No. 402 | Recycled asphaltic concrete 12.5 mm Superpave, group-blend, including bituminous material and hydrated lime | Per ton |

A. Materials Produced and Placed During the Adjustment Period

An adjustment period is allowed at the start of mixing operations for each type of mix placed on the Contract. A new adjustment period shall not be granted for a change of producer, mix design or asphalt plant location. The adjustment period is provided to adjust or correct the mix and to establish the construction procedures and sequence of operations.

The adjustment period consists of the tons of the affected mix produced and placed on the first day of operation. If this quantity is less than 500 tons, the Engineer may combine the tons produced and placed on the first day of operation with the tons produced and placed on the next production day of the affected mix for the adjustment period.

The material produced and placed during the mixture adjustment period is one lot. If the mix is adjusted during this period, a new lot may be necessary, but a new adjustment period will not be permitted.

This material shall be paid for at 100 percent of the Contract Unit Price provided it meets the minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the Mixture Acceptance Schedule—Table 9 or 10.

If the material placed during the adjustment period fails to meet the above requirements, it will be paid for using the applicable acceptance schedule. However, when mixture used for leveling at a spread rate of 90 lbs/yd² (50 kg/m²) or less is also used for the surface mix at a spread rate greater than 90 lbs/yd² (50 kg/m²), an additional adjustment period will be allowed for compaction only. This material will be paid for at a 1.00 pay factor provided it:

Meets the minimum requirements for a 1.00 pay factor in the Mixture Acceptance Schedule—Table 9 or 10 for both asphalt content and gradation.

Meets the minimum requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01C, “Calculate Mean Pavement Air Voids.

Mixture which does not meet these requirements shall be paid for using the applicable acceptance schedule.

B. Determine Lot Acceptance

Pay factor adjustments are based on control sieves and asphalt cement content. The control sieves used in the mixture acceptance schedule for the various types of mix are indicated below:

<table>
<thead>
<tr>
<th>Control Sieves Used in the Mixture Acceptance Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphaltic concrete 25 mm Superpave 1/2 in., No. 8 sieves and asphalt cement</td>
</tr>
</tbody>
</table>
Control Sieves Used in the Mixture Acceptance Schedule

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphaltic concrete 19 mm SMA</td>
<td>1/2 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 19 mm Superpave</td>
<td>3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 12.5 mm Superpave</td>
<td>3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 12.5 mm SMA</td>
<td>3/8 in., No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 9.5 mm Superpave</td>
<td>No. 4, No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 9.5 mm SMA</td>
<td>No. 4, No. 8 sieves and asphalt cement</td>
</tr>
<tr>
<td>Asphaltic concrete 4.75 mm Mix</td>
<td>No. 8 sieve and asphalt cement</td>
</tr>
</tbody>
</table>

Barrow County will perform the following tasks:
1. Using the Mixture Acceptance Schedule—Table 9 or 10, of Subsection 400.3.06 to determine the mean of the deviations from the job mix formula per test results per lot.
2. Determine this mean by averaging the actual numeric value of the individual deviations from the job mix formula; disregard whether the deviations are positive or negative amounts.
3. Use the Asphalt Cement Content and Aggregate Gradation of Asphalt Concrete Mixture Acceptance Schedule—Table 9 or 10 of Subsection 400.3.06 to determine acceptance of surface mixes and the Mixture Acceptance Schedule—Table 10 of Subsection 400.3.06 to determine acceptance of subsurface mixes.

On Contracts involving 1,000 tons or less of asphaltic concrete, the mixture is accepted for 100 percent payment of the asphaltic concrete Unit Price provided it meets the following:
1. Minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the applicable Mixture Acceptance Schedule—Table 9 or 10 of Subsection 400.3.06.
2. Minimum requirements for a 0.90 pay factor in Table 12 of Subsection 402.5.01.C, “Calculate Pavement Mean Air Voids.

If the material placed on Contracts involving 1,000 tons or less of asphaltic concrete does not meet the above requirements, the material will be paid for using the applicable acceptance schedule.

C. Calculate Pavement Mean Air Voids
Barrow County will determine the percent of maximum air voids for each lot by dividing the pavement mean air voids by the maximum pavement mean air voids acceptable.

Barrow County will determine the payment for each lot by multiplying the Contract Unit Price by the adjusted pay factor shown in the following Air Voids Acceptance schedule:

<table>
<thead>
<tr>
<th>Pay Factor</th>
<th>Percent of Maximum Air Voids (Lot Average of Tests)</th>
<th>Percent of Maximum Air Voids (Lot Average all Tests) (for Reevaluations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>≤100</td>
<td>≤100</td>
</tr>
<tr>
<td>0.97</td>
<td>100.1 — 105</td>
<td>100.1 — 104</td>
</tr>
</tbody>
</table>
When the range tolerance is exceeded, Barrow County will apply a pay factor of 0.95 as described in Subsection 400.3.06.B.2.

D. Asphaltic Concrete for Temporary Detours

Hot mix asphaltic concrete placed on temporary detours that will not remain in place as part of the permanent pavement does not require hydrated lime. Hot mix used for this purpose is paid for at an adjusted Contract Price. The payment for this item shall cover all cost of construction, maintenance and removal of all temporary mix. Hot mix asphaltic concrete placed as temporary mix shall meet requirements established in Subsection 400.3.05.F. Where the Contract Price of the asphaltic concrete for permanent pavement is let by the ton, the Contract Price for the asphaltic concrete placed on temporary detours is adjusted by subtracting $0.75/ton of mix used.

Where the Contract price of the mix in the permanent pavement is based on the square yard, obtain the adjusted price for the same mix used on the temporary detour by subtracting $0.04/yd² per 1-in plan depth.

Further price adjustments required in Subsection 400.3.06, “Quality Acceptance,” which are based on the appropriate adjusted Contract Price for mix used in the temporary detour work shall apply should temporary mix be left in place. Hot mix asphalt produced as temporary mix containing no hydrated lime shall be removed and replaced with permanent mix containing hydrated lime.

E. Determine Lot Payment

Determine the lot payment as follows:

1. When one of the pay factors for a specific acceptance lot is less than 1.0, determine the payment for the lot by multiplying the Contract Unit Price by the adjusted pay factor.
2. When two or more pay factors for a specific acceptance lot are less than 1.0, determine the adjusted payment by multiplying the Contract Unit Price by the lowest pay factor.

If the mean of the deviations from the job mix formula of the tests for a sieve or asphalt cement content exceeds the tolerances established in the Mixture Acceptance Schedule—Table 9 or 10 and if the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer. If the pavement mean air voids exceed the tolerances established in the Air Voids Acceptance Schedule—Table 12, remove and replace the materials at the Contractor’s expense.

If the Engineer determines that the material is not acceptable to leave in place, remove and replace the materials at the Contractor’s expense.
Section 412—Bituminous Prime

412.1 General Description
This work includes preparing and treating an existing surface with bituminous material and blotter material, if required. Treat the surface according to these Specifications and conform to the lines shown on the Plans or established by the Engineer.

412.1.01 Definitions
General Provisions 101 through 150.

412.1.02 Related References
A. Standard Specifications
   Section 424—Bituminous Surface Treatment
   Section 821—Cutback Asphalt
B. Referenced Documents
   General Provisions 101 through 150.

412.1.03 Submittals
General Provisions 101 through 150.

412.2 Materials
Unless otherwise specified, select the types of bituminous materials. The Engineer will determine the grade of materials to be used. The Specifications for the bituminous materials include:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutback Asphalt, RC-30, RC-70, RC-250 or MC-250, MC-30, or MC-70</td>
<td>821.2.01</td>
</tr>
<tr>
<td>Blotter Material (Sand)</td>
<td>412.3.05.G.3</td>
</tr>
</tbody>
</table>

412.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

412.3 Construction Requirements

412.3.01 Personnel
General Provisions 101 through 150.

412.3.02 Equipment
Provide equipment that is in good repair, including at least the following units that meet the requirements of Subsection 424.3.02, “Equipment.”
Pressure distributor
Power broom and blower
Aggregation spreader (if required)
Pneumatic-tired roller

**412.3.03 Preparation**
See Subsection 412.3.05.B, “Condition of Surface.”

**412.3.04 Fabrication**
General Provisions 101 through 150.

**412.3.05 Construction**
Prime the following bases and other areas:
- Cement or lime stabilized bases or sub-bases, regardless of pavement thickness
- Soil or aggregate bases or sub-bases on which bituminous surface treatment will be placed
- Soil or aggregate bases or sub-bases on which less than 5 in. total thickness of hot mix asphaltic concrete will be placed
Prime is not required on driveway construction and paved shoulders.

**A. Weather Limitations**
- Do not apply bituminous prime under any of these conditions:
  - Surface is wet.
  - Air temperature is below 40 °F in the shade.
  - Rain is imminent.
  - Weather conditions may prevent proper prime coat construction.

**B. Condition of Surface**
- Ensure that the surface to which the prime is to be applied has been finished to the line, grade, and cross section specified.
- Ensure that the surface is uniformly compacted and bonded. Correct surface irregularities according to the Specifications for the construction being primed.

**C. Cleaning**
- Remove from the road loose material, dust, caked clay, and other material that may prevent bonding of the prime with the surface. Use power sweepers or blowers the full width of the prime and 2 ft. more on each side. Where necessary, sweep by hand.

**D. Moisture**
- Ensure that the surface is only slightly damp. If the surface is too wet, allow it to dry. If it is too dry, the Engineer may require that it be sprinkled lightly just before priming.

**E. Temperature and Surface Texture**
The surface texture and condition of the surface determine the bituminous material grades to be used.
The following table shows the bituminous material grades and application temperatures as they are applied to various surface textures.

<table>
<thead>
<tr>
<th>Base Texture</th>
<th>Tight</th>
<th>Average</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials and grade</td>
<td>MC-30 RC-30</td>
<td>RC-70 or MC-70</td>
<td>RC-250 or MC-250</td>
</tr>
<tr>
<td>Application temperature °F</td>
<td>80–120</td>
<td>105–180</td>
<td>145–220</td>
</tr>
</tbody>
</table>
The Engineer will determine the temperature for applying bituminous prime within the limits shown above. Heat and apply bituminous materials as specified in Subsection 424.3.05.D, “Heating Bituminous Material” and Subsection 424.3.05.E, “Applying Bituminous Material.”

F. Amount and Extent of Prime
The Engineer will determine the exact amount of bituminous material to be used within minimum and maximum rates of 0.15 to 0.30 gal/yd². Apply the specified amount as follows:
1. Apply the determined amount uniformly and accurately. Ensure that the amount applied to any 0.5-mile section is within 5 percent of the amount specified.
2. Apply the prime the full width of the proposed wearing surface that will be superimposed plus 6 in more on each side.

G. Protection, Curing, and Maintenance
Do the following after priming the surface:
1. Close to Traffic
   Do not allow traffic on the primed surface. Leave the surface undisturbed until the prime thoroughly cures and does not pick up under traffic.
2. Roll
   If the surface becomes soft after it is primed, roll the surface longitudinally with a pneumatic-tired roller at no more than 6 mph until the surface is firmly set.
3. Blot
   If necessary to prevent the prime from being picked up, spread clean, dry, sharp sand over the surface by hand or mechanically. Apply sand only to places that are tacky and use the least amount needed to prevent pick up. No extra payment for this work or material will be made.
4. Open to Traffic
   After rolling and sanding (if required), open the primed surface to ordinary traffic subject to the conditions in Subsection 412.3.05.G.1, “Close to Traffic.”
5. Curing and Maintenance
   The primed surface is properly cured when it has penetrated the base sufficiently to not be picked up or displaced by traffic. Temperature and weather conditions may increase curing time. Ensure the primed surface has cured to the satisfaction of the Engineer prior to its being covered by other construction. Maintain the prime coat and the primed surface course until it is covered by other construction. Repair potholes, scabs, and soft spots prior to covering with other construction. Remove excess bituminous material.

412.3.06 Quality Acceptance
General Provisions 101 through 150.

412.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

412.4 Measurement
Bituminous material for prime is not measured for separate payment.
412.4.01 Limits
General Provisions 101 through 150.

412.5 Payment
Bituminous material for prime is not paid for separately. The cost to clean the surface, furnish, haul and apply materials including water and sand, roll, and perform repairs and maintenance is included in the Unit Price bid for each individual Base Item.

412.5.01 Adjustments
General Provisions 101 through 150.
Section 413—Bituminous Tack Coat

413.1 General Description
This work includes furnishing and applying a bituminous tack coat on a prepared road surface including cleaning the road surface.

413.1.01 Definitions
General Provisions 101 through 150.

413.1.02 Related References
A. Standard Specifications
   Section 109—Measurement and Payment
   Section 400—Hot Mix Asphaltic Concrete Construction
   Section 424—Bituminous Surface Treatment
   Section 427—Emulsified Asphalt Slurry Seal
   Section 820—Asphalt Cement
   Section 822—Emulsified Asphalt
   Section 824—Cationic Asphalt Emulsion

B. Referenced Documents
   General Provisions 101 through 150.

413.1.03 Submittals
General Provisions 101 through 150.

413.2 Materials
Ensure materials meet the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt cement, performance grade PG 58-22, PG 64-22, or PG 67-22</td>
<td>820.2.01</td>
</tr>
<tr>
<td>Anionic emulsion asphalt NTSS-1HM</td>
<td>822.2.01</td>
</tr>
<tr>
<td>Cationic emulsified asphalt CRS-2h or CRS-3</td>
<td>824.2.01</td>
</tr>
</tbody>
</table>

Asphalt cement of performance grade PG 58-22, PG 64-22 or PG 67-22 is used for bituminous tack coat in work performed in Section 400. Use anionic emulsified asphalt as an option with the approval of the Engineer. Use cationic emulsified asphalt as a special application material only if directed by the Engineer.
Barrow County may change the grade or type of bituminous materials without a change in the Contract Unit Price if the Engineer determines the grade or type selected is not performing satisfactorily.

413.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.
Emulsified Asphalt
Maintain all equipment used for the delivery, storage, and handling of anionic emulsified asphalt or cationic emulsified asphalt to prevent contamination of the emulsion. Transfer anionic emulsified asphalt or cationic emulsified asphalt directly to the pressure distributor from the transport tanker.
Provide and maintain temperature measuring devices to continuously monitor the temperature of anionic emulsified asphalt or cationic emulsified asphalt in storage and in the pressure distributor. Do not allow anionic emulsified asphalt or cationic emulsified asphalt to freeze.

Note 1: Do not store anionic emulsified asphalt or cationic emulsified asphalt for a period longer than 30 days from the time of initial loading.
Note 2: Do not use anionic emulsified asphalt or cationic emulsified asphalt on GDOT funded Off System Projects after 30 days of initial loading.

413.3 Construction Requirements

413.3.01 Personnel
General Provisions 101 through 150.

413.3.02 Equipment
Provide equipment in good repair, including the following units that meet the requirements of Subsection 424.3.02, “Equipment”.
- Power broom and blower
- Pressure distributor
Provide a dedicated pressure distributor for anionic emulsified asphalt NTSS-1HM to avoid contamination with incompatible materials.

413.3.03 Preparation
General Provisions 101 through 150.

413.3.04 Fabrication
General Provisions 101 through 150.

413.3.05 Construction
A. Seasonal and Weather Limitation
   Do not apply tack coat if the existing surface is wet or frozen. Do not place emulsified asphalt if the air temperature in the shade is less than 40 °F.
B. Application
   Coat the entire areas to be paved with the tack coat unless directed otherwise by the Engineer. Apply tack coat with distributor spray bars instead of hand hoses, except in small areas inaccessible to spray bars.

   Application Rates for Anionic Emulsified Asphalt or Cationic Emulsified Asphalt, gal/yd²
<table>
<thead>
<tr>
<th>Type Mix</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Mixes except OGFC and PEM</td>
<td>0.06</td>
<td>0.10</td>
</tr>
</tbody>
</table>

- On thin leveling courses and freshly placed asphaltic concrete mixes, reduce the application rate to 0.04 to 0.06 gal/yd².
- Allow anionic emulsified asphalt or cationic emulsified asphalt to break for a minimum of 30 minutes after initial application. Proceed with paving only after the anionic emulsified asphalt NTSS-1HM has cured to the satisfaction of the Engineer.
- Do not use anionic emulsified asphalt or cationic emulsified asphalt under OGFC or PEM.

C. Temperature of Material
Apply bituminous materials within the temperature ranges specified below.

<table>
<thead>
<tr>
<th>Bituminous Materials</th>
<th>Temperature of Application °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt cement</td>
<td>350 - 400</td>
</tr>
<tr>
<td>Anionic Emulsified Asphalt NTSS-1HM</td>
<td>140 – 180</td>
</tr>
<tr>
<td>Cationic Emulsified Asphalt CRS-2h, CRS-3</td>
<td>140 - 180</td>
</tr>
</tbody>
</table>

D. Cleaning
Immediately before applying the tack coat, clean the entire area free of loose dirt, clay, and other foreign materials.

E. Application Rate
The Engineer will determine the application rate of the bituminous tack coat.

F. Limitations and Areas Coated
Apply only enough tack coat to the prepared road surface that can be covered with the new pavement course the same working day the tack coat is applied.

G. Maintenance and Protection
After applying the tack coat material, allow it to break until it is tacky enough to receive the surface course. Do not allow traffic on the tack.

413.3.06 Quality Acceptance
General Provisions 101 through 150.

413.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

413.4 Measurement
Bituminous materials for tack coat applied and accepted are measured as outlined in Subsection 109.02, “Measurement of Bituminous Materials.”
Diluting emulsified tack coat is not ordinarily allowed except when used underneath slurry seal and approved by the Engineer.
The composition of diluted emulsified tack coat defined in Subsection 427.3.05, “Construction” is measured by the gallon of diluted mix.

413.4.01 Limits
413.5 Payment
The accepted volume of bituminous material will be paid for at the Contract Unit Price per gallon for bituminous tack coat of the type and grade approved by the Engineer, complete in place. Payment is full compensation for preparing, cleaning, furnishing, hauling, applying material, and providing incidentals to complete the work.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 413</th>
<th>Bituminous tack coat</th>
<th>Per gallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 413</td>
<td>Diluted emulsified asphalt</td>
<td>Per gallon</td>
</tr>
</tbody>
</table>

413.5.01 Adjustments
General Provisions 101 through 150.
Section 441—Miscellaneous Concrete

441.1 General Description
This work includes placing Portland cement concrete as follows:
- As slope paving on end rolls, cut slopes, paved ditches, spillways, and ditch slopes
- In median pavement
- As sidewalks
- In concrete curbs, gutters, curb and gutters, and valley gutters
- As nonreinforced headwalls
- As velocity dissipators and concrete slope drains
- As concrete spillways
- Curb cut wheel chair ramps
- At other locations designated on the Plans or as directed

This work includes subgrade preparations including:
- Fine grading and backfilling
- Forming, furnishing, placing, and finishing concrete
- Constructing weep holes and furnishing and placing the coarse aggregate
- Furnishing and placing preformed joint fillers as shown on the Plans
- Placing driveway concrete as shown on the Plans. Nominal 4 in. or 6 in. thick as specified or to match existing pavement.

441.1.01 Definitions
General Provisions 101 through 150.

441.1.02 Related References
A. Standard Specifications
Section 209—Subgrade Construction
Section 430—Portland Cement Concrete Pavement
Section 500—Concrete Structures
Section 832—Curing Agents
Section 833—Joint Fillers and Sealers
Section 853—Reinforcement and Tensioning Steel
B. Referenced Documents
General Provisions 101 through 150.

441.1.03 Submittals
General Provisions 101 through 150.

441.2 Materials
Use concrete that conforms to the minimum requirements for Class “B,” as specified in Section 500, except that a one-bag mixer may be used. The requirements of Subsection 500.1.03.G, “Cold Weather Concrete Curing and Protection Plan” and Subsection 500.3.05.X, “Pour Concrete in Cold Weather” for cold weather concrete placement are deleted.
Place miscellaneous concrete only when the air temperature is 40 °F and rising. Protect concrete from freezing for the first 24 hours. Hand finishing is allowed. Other materials and their Specifications are as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Bars for Concrete Reinforcement</td>
<td>853.2.01</td>
</tr>
<tr>
<td>Membrane Curing Compound, Type 2</td>
<td>832.2.03</td>
</tr>
<tr>
<td>Dowel and Tie Bars and Reinforcing Steel</td>
<td>853.2.03</td>
</tr>
<tr>
<td>Joint Fillers and Sealers</td>
<td>833</td>
</tr>
<tr>
<td>Welded Steel Wire for Concrete Reinforcement</td>
<td>853.2.07</td>
</tr>
</tbody>
</table>

441.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

441.3 Construction Requirements

441.3.01 Personnel
General Provisions 101 through 150.

441.3.02 Equipment
A. Forms
Forms are subject to the Engineer’s approval. Use forms that are:
- Wood or metal that is readily available
- Straight and oiled before each use
Use metal divider plates and templates.
Use the slip form placement method when applicable. If the slip form method does not produce a product with the proper quality, shape, grade, or alignment, the Engineer may require using fixed forms.

B. Weep Holes
Provide weep hole drain pockets filled with coarse aggregate to use with weep hole drain pipe or formed openings according to the Plan details.

441.3.03 Preparation
Before placing the concrete, excavate for toe walls, edge walls, and weep hole drain pockets; place coarse aggregate in weep hole drain pockets; and grade, finish, and compact the subgrade surface. Use mechanical tamps for compaction if necessary.

441.3.04 Fabrication
General Provisions 101 through 150.

441.3.05 Construction
A. Extent and Thickness of Pavement
See the Plans to determine the areas to be paved and the dimensions. Thicknesses are subject to a minus tolerance of 0.5 in. Do not perform overlay pours.

B. Preparation of Subgrade
Finish the subgrade for miscellaneous concrete to the line and grade on the Plans and the following:

1. Compact the subgrade to the same degree as the roadway on which it is placed. Compact the subgrade according to Section 209.
2. If a Contract involves a Roadway and a Bridge Contractor, the Roadway Contractor shall complete the grading for the slope paving. The Bridge Contractor shall complete final grading, compacting, dressing, placing, and maintenance to the structures until completion.
3. When placing paving on the front slopes of ditches and shoulders, place any required special materials during the roadway construction.
4. Do not excavate for velocity dissipators, spillways, and slope drains below the foundation elevation. Do not excavate wider than necessary to provide working space or to remove soft, unsuitable material. Backfill with selected material.
5. When fitting spillways to concrete pavement, set the specified dowel bars into the pavement when it is laid. Use metal parting strips to hold the ends of dowels bent into the grooves.

C. Concrete

1. Mixing
   Mix Class B concrete as specified in Section 500 with the following exceptions:
   a. Use of small capacity job-site batchers and one-bag mixers is allowed. The rate of concrete placement in Subsection 500.3.05.P, “Meet the Minimum Placement Rates” is waived for miscellaneous concrete.
   b. Proportion concrete ingredients volumetrically if the Engineer has approved equipment calibration and operation and the operator is certified by the Office of Materials.

2. Placing and Finishing
   Place and finish concrete as follows:
   a. Deposit concrete within forms or against other pavements on a compacted and wetted subgrade to the depth to produce the specified thickness.
      **NOTE: Do not place concrete on a muddy or frozen surface.**
   b. Vibrate the headwalls.
   c. Strike off the concrete to a plane surface and finish it with a Type IV or Type V finish as defined in Subsection 500.3.05.AB, “Finish Concrete” and complete the following:
      1) **Concrete Slope Paving.** Give a final finish with a stiff-bristle broom. With the Engineer’s approval, mechanically convey the concrete to the forms.
      2) **Concrete Sidewalks.** Give a Type V finish unless otherwise noted on the Plans. Test the surface with a 10 ft straightedge laid parallel to the center line. Eliminate irregularities greater than 0.25 in per 10 ft while the concrete is still plastic. Ensure that concrete sidewalk constructed as curb cut ramps has a rough or textured finish.
      3) **Concrete Paved Ditches.** Ensure that the surface of the bottom and sides of paved ditches are uniform and true to grade and cross section. Ensure that straight-grade tangents do not deviate more than 1 in within 10 ft when tested with a 10 ft straightedge. Do not allow deviation if it reduces the ditch paving thickness, causes water to pond, or alters the direction of flow. Finish the ditch paving by floating with wood or metal floats to bring mortar to the surface to cover the coarse aggregate.
Use reinforcing that conforms to Plan details if required.

4) **Concrete Curbs, Gutters, and Median.** Finish according to Subsection 441.3.05.C.2, “Placing and Finishing.” Remove face forms as soon as possible and finish the exposed surfaces with a wood float.

Use a straightedge to test the edge of the gutter and top of the curb and median to conform to the requirements for the adjacent pavement. Irregularities shall not exceed 0.25 in. in 10 ft.

Place the curb and gutter using a machine as long as the results are satisfactory.

5) **Curb Cut Wheel chair Ramps.** Construct a Type I, II, or III ramp according to Georgia Standard 9031W.

Tie ramps into adjacent paved or unpaved sidewalk and use a rough or textured finish.

3. Joints

Follow these procedures to construct joints on slopes, ditches, sidewalks, and curbs, gutters, and medians.

a. **Slope Paving**

   Place paving on slopes in horizontal or vertical courses, but not a mixture of both.

   1) Construct horizontal courses approximately level and at least 3 ft but no more than 6 ft wide measured along the slope.

   When needed, construct trapezoidal courses at the top and bottom to accommodate sloping berm and ditchline conditions.

   2) Edge the paving at construction joints between courses with a 0.25 in radius tool.

   3) Provide vertical contraction or construction joints spaced along the horizontal course at right angles to the horizontal construction joints at approximately 40 ft intervals, in line not staggered.

   No other vertical lines will be required in horizontal courses.

   When using vertical contraction joints, cut them with a tool one-third the depth of the paving during the finishing operation. Edge the contraction joints the same as construction joints.

   Vertical courses approximately equal and at least 3 ft but no more than 5 ft wide across the plane of the slope. The desired width is 4 ft. Horizontal lines are not required in vertical courses.

   Separate slope paving from the masonry of structures, sidewalks, curbs, and rigid-type roadway pavements of preformed joint filler that are 0.5 in thick.

b. **Concrete Paved Ditches**

   Form joints in concrete paved ditches as follows:

   1) Space contraction joints at 30 ft intervals.

   2) Place expansion joints only where the paved ditch joins the roadway pavement or some other structure.

   3) Do not use joint sealers for expansion or contraction joints.

c. **Concrete Sidewalk**

   Form transverse contraction joints using a tool designed to form a groove one-third the depth of the sidewalk at intervals shown on the Plans.

   Where sidewalks abut the curb and gutter, ensure that alternate joints coincide. Round the edges with a 0.25 in edger. Make expansion joints according to the materials, dimensions, and locations specified on the Plans.
d. Concrete Curbs, Gutters, and Medians
   Form contraction joints or expansion joints on curbs, gutters, and medians.
   1) **Contraction Joints.** Ensure that joints in curb, gutters, and medians are spaced the same as the joints in paving. Form joints by using metal divider plates or sawing them as in Section 430.
      Form joints at least one-fifth but not greater than one-fourth the depth of the concrete. Except for sawed joints, finish the joints with a 0.25 in edging tool.
      For curbs, gutters, and medians adjacent to pavement other than concrete, contraction joints shall be as follows:
      For header curb and combination curb and gutter, install contraction joints spaced no more than 20 ft apart.
      For gutter median, install a contraction joints spaced no more than 20 ft apart.
   2) **Expansion Joints.** Form expansion joints according to the Plan details or as directed. Ensure that they coincide with the expansion joints in the adjoining pavement or gutter.
      Cut the joint fillers to the same cross section as the construction. Trim flush the material that protrudes after the concrete is finished.
      When miscellaneous concrete items are not adjacent to concrete construction, provide expansion joints at an interval of at least 500 ft.

  e. Curb Cut Wheelchair Ramps
     Locate and form expansion joints for curb cut wheelchair ramps according to the Special Details for ramp Type A, B, C, or D.

  4. Curing
     Use curing methods specified in compound is Type 2, if used. Subsection 430.3.05.L, “Cure the Concrete.” Ensure that the membrane curing Pack honeycombed areas immediately after removing the forms.

D. Backfilling
   Backfill the areas as soon as possible without damaging the work.

E. Clean-Up
   When concrete work is complete, clean each surface. Protect the work from stains or other damage until Final Acceptance.

**441.3.06 Quality Acceptance**
General Provisions 101 through 150.

**441.3.07 Contractor Warranty and Maintenance**
General Provisions 101 through 150.

**441.4 Measurement**
A. **Concrete Slope Paving**
   Concrete slope paving is measured for payment in square yards of accepted surface area of paving of the specified thickness. Concrete in toe or edge walls, excavation, backfill, weep holes, and aggregates are not measured for separate payment.

B. **Concrete Sidewalks**
Concrete sidewalks are measured in square yards of the specified thickness, complete in place and accepted. The length is the actual measured length along the surface. The width is the Plan width or as directed. Excavation and backfill are not measured separately for payment.

C. Concrete Paved Ditches
The area measured for payment is the square yards of exposed surface area, exclusive of top edges, of the specified thickness placed according to the Plans or as directed. Reinforcing steel, excavation, preparation of subgrade including Type I backfill, forms, and concrete in toe or edge walls are not measured separately for payment. Type II backfill, when required, will be paid according to Section 207.

D. Concrete Curbs, Gutter, Median, Pavement, and Combination Curb and Gutter
The following are measured by the linear foot (meter) along the face of the curb:
- Concrete curb and gutter
- Concrete curb
- Concrete header curb

The following are measured by the square yard or by the linear foot, whichever is specified:
- Concrete gutter
- Concrete valley gutter
- Concrete valley gutter with curb
- Concrete median pavement
- Concrete gutter with raised edge

The length used to compute the square yards or linear foot is measured along the center line of the gutter. The width is the total width of the gutter including the curb or raised edge. Concrete doweled integral curb includes dowels.

E. Concrete Headwalls
Headwalls are measured for payment according to Subsection 500.4.01.B, “Payment per Cubic Yard” and Subsection 500.5.01.E, “Filler Concrete.” Filler concrete, where required, will be paid for at 60 percent of the Contract Unit Price for Class B concrete.

F. Concrete Spillways
Concrete spillways regardless of the type specified are measured by the actual number poured complete and accepted.

G. Concrete Slope Drains
Concrete slope drains are measured in square yards along the surface, complete and accepted.

H. Velocity Dissipators
Velocity dissipators are measured in square yards, surface measure, complete and accepted.

I. Concrete Driveways
Driveway pavement is measured along the surface from the paving edge or back of the curb to where old and new concrete join. The width is the average width constructed.

J. Curb Cut Wheelchair Ramps
For new construction, curb cut wheelchair ramps will not be measured. For new construction, linear feet of curb and gutter will include the transitioned curb in front of ramps and square yards of concrete sidewalk will include ramps. No additional payment will be made for curb cut ramps.

For existing sidewalks, curb cut wheelchair ramps are measured as the actual number formed and poured, complete and accepted. No additional payment will be made for sawing existing sidewalk and removal and disposal of removed material for new ramp construction.
### 441.4.01 Limits
General Provisions 101 through 150.

### 441.5 Payment
These Items, measured as specified above, will be paid for at the Contract Unit Price per each, per square yard, per linear foot, or per cubic yard.

Payment will be made under:

**A. Slope Paving**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete slope paving [thick] in.</td>
<td>Per square yard</td>
</tr>
</tbody>
</table>

**B. Sidewalks**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete sidewalk (thick) in.</td>
<td>Per square yard</td>
</tr>
</tbody>
</table>

**C. Concrete Ditches**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plain concrete ditch paving (thick) in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Reinforced concrete ditch paving (thick) in., including reinforcing steel</td>
<td>Per square yard</td>
</tr>
</tbody>
</table>

**D. Curbs, Gutters, Combination Curb and Gutter, Headers, and Medians**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete curb and gutter, (thick) in. x (width) in. type___</td>
<td>Per linear foot</td>
</tr>
<tr>
<td></td>
<td>Concrete header curb, [height] in., type___</td>
<td>Per linear foot</td>
</tr>
<tr>
<td></td>
<td>Concrete valley gutter, [thick] in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Concrete valley gutter with curb, [thick] in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Concrete gutter with raised edge, [thick] in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Concrete median [thick] in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Concrete median, corrugated [thick] in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Concrete doweled integral curb, type___ including dowels</td>
<td>Per linear foot</td>
</tr>
</tbody>
</table>

**E. Spillways, Drains and Velocity Dissipators**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete spillway type___</td>
<td>Per each</td>
</tr>
<tr>
<td></td>
<td>Concrete slope drain</td>
<td>Per square yard</td>
</tr>
<tr>
<td></td>
<td>Velocity dissipators</td>
<td>Per square yard</td>
</tr>
</tbody>
</table>

**F. Headwalls**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete headwalls</td>
<td>Per cubic yard</td>
</tr>
</tbody>
</table>

**G. Driveway Concrete**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Driveway concrete ___ in. thick</td>
<td>Per square yard</td>
</tr>
</tbody>
</table>

**H. Curb Cut Wheelchair Ramps**

<table>
<thead>
<tr>
<th>Item No. 441</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Curb cut wheelchair ramps, Type___</td>
<td>Per each</td>
</tr>
</tbody>
</table>

### 441.5.01 Adjustments
General Provisions 101 through 150.
Section 500—Concrete Structures

500.1 General Description
This work consists of manufacturing and using Portland cement concrete to construct structures. See the Contract Plans for the specified color and locations for placing integrally colored concrete.

500.1.01 Definitions
General Provisions 101 through 150.

500.1.02 Related References
A. Standard Specifications
   Section 104—Scope of Work
   Section 211—Bridge Excavation and Backfill
   Section 431—Grind Concrete Pavement
   Section 507—Prestressed Concrete Bridge Members
   Section 511—Reinforcement Steel
   Section 530—Waterproofing Fabrics
   Section 531—Dampproofing
   Section 621—Concrete Barrier
   Section 800—Coarse Aggregate
   Section 801—Fine Aggregate
   Section 830—Portland Cement
   Section 836—Special Surface Coating for Concrete
   Section 838—Graffiti-Proof Coating for Concrete
   Section 853—Reinforcement and Tensioning Steel
   Section 865—Manufacture of Prestressed Concrete Bridge Members

B. Referenced Documents
   ASTM A 653/653M
   ASTM A 924/924/M
   ASTM A 681
   ASTM C 685
   ASTM C 979
   ASTM D 260, Type I or Type II
   AASHTO Specifications
   AASHTO M 148 or C 309
   AASHTO M 171
   AASHTO M 194
   AASHTO T 22
   AASHTO T 126
   AWS D 2.0
   Laboratory Standard Operating Procedure, Quality Assurance for Ready Mix Concrete Plants in Georgia
   Standard Operating Procedure for Ready Mix Concrete
   American Iron and Steel Institute Specification for the Design of Cold Formed Steel Structural Members
Federal Specification TT-P-641d, Type II
Georgia Standards 4948 and 9031-L
QPL 10
QPL 17
QPL 23
GDT 134
DOT 525

500.1.03 Submittals
A. Concrete Mix Designs
The Contractor is responsible for all concrete mix designs. Ensure that concrete mixes contain enough cement to produce workability within the water-ratio specified in Table 1—Concrete Mix Table, below.
Design concrete mixes that meet the requirements of the Table 1—Concrete Mix Table, below. The Georgia Department of Transportation Office of Materials will determine the concrete properties using the applicable method in Section 500 of the Sampling, Testing, and Inspection Manual.

Table 1—Concrete Mix Table

<table>
<thead>
<tr>
<th>Class of Concrete</th>
<th>(2) Coarse Aggregate Size No.</th>
<th>(1 &amp; 6) Minimum Cement Factor lbs/yd³</th>
<th>Max Water/Cement ratio (lbs/lb)</th>
<th>(5) Slump acceptance Limits Lower-Upper</th>
<th>(3 &amp; 7) Entrained Air Acceptance Limits (%) Lower-Upper</th>
<th>Minimum Compressive Strength at 28 days (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“AAA”</td>
<td>67.68</td>
<td>675</td>
<td>.440</td>
<td>2-4</td>
<td>2.5</td>
<td>6.0</td>
</tr>
<tr>
<td>“AA1”</td>
<td>67.68</td>
<td>675</td>
<td>.440</td>
<td>2-4</td>
<td>2.5</td>
<td>6.0</td>
</tr>
<tr>
<td>“AA”</td>
<td>56,57,67</td>
<td>635</td>
<td>.445</td>
<td>2-4</td>
<td>3.5</td>
<td>7.0</td>
</tr>
<tr>
<td>“A”</td>
<td>56,57,67</td>
<td>611</td>
<td>.490</td>
<td>2-4</td>
<td>2.5 (3)</td>
<td>6.0</td>
</tr>
<tr>
<td>“B”</td>
<td>56,57,67</td>
<td>470</td>
<td>.660</td>
<td>2-4</td>
<td>0.0</td>
<td>6.0</td>
</tr>
<tr>
<td>“CS”</td>
<td>56,57,67</td>
<td>280</td>
<td>1.400</td>
<td>- 3½</td>
<td>3.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Graded Agg.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1. Portland cement may be partially replaced with fly ash as provided in Subsection 500.3.04.D.4 or with granulated iron blast furnace slag as provide for in Subsection 500.3.04.D.5.
2. Specific size of coarse aggregate may be specified.
3. Lower limit is waived when air entrained concrete is not required.
4. The mixture will be capable of demonstrating a laboratory compressive strength at 28 days of 1000 psi + 0.18 R*. Compressive strength will be determined based upon result of six cylinders prepared and tested in accordance with AASHTO T 22 and T 126.
   * Where R = Difference between the largest observed value and the smallest observed value for all compressive strength specimens at 28 days for a given combination of materials and mix proportions prepared together.
5. Designed slump may be altered by the Office of Materials when Type “F” water reducers are used.
6. Minimum cement factor shall be increased by 50 lbs/yt when size No. 7 coarse aggregate is used.
7. When Class A is specified for bridge deck concrete, the entrained air acceptance limits shall be 3.5% to 7.0%.

Submit all concrete mix designs to the Barrow County for review. Barrow County will approve mixes that contain materials from approved sources and produce concrete that meets these Specifications.

Submit concrete mix design proportions for approval by one of the following methods:
1. Request Approval of Specific Proportions
   When requesting approval of specific concrete mix design proportions for classes of concrete, include the following information:
   • Source of each material
   • Apparent specific gravity of the cement and the fly ash, if used
   • Bulk specific gravity (saturated surface dry) of each aggregate
   • Percent absorption of each aggregate
   • Amount of each material required to produce a cubic yard (meter) of concrete
   • Proportions of admixtures per cubic yard (meter) of concrete and any use limitations
   • Proposed slump and air content of the design
   • Evidence that the proposed mixture complies with Subsection 500.1.03

Concrete mix designs that do not have a proven performance record and have not been used by the Department of Transportation must meet minimum laboratory strength requirements.
2. Obtain Ready-Mix Design Proportions for commonly used materials
   Get approved concrete mix designs from authorized ready-mix concrete plants.
   Ready-mix concrete plants approved according to Laboratory Standard Operating Procedure “Quality Assurance for Ready Mix Concrete Plants in Georgia” are authorized to submit concrete mix designs for approval. See QPL 10 for a list of approved plants.
3. Use Laboratory-Designed Proportions for commonly used materials
   Use laboratory-designed concrete mix proportions from either of the following sources:
   a. Laboratory-designed proportions are available for commonly used combinations of materials. Request these mixes in writing from the State Materials Engineer. Request specific classes of concrete and specify the source of ingredients.
   b. Select a combination of materials from approved sources and request that the laboratory determine a mix that meets requirements in the Table 1—Concrete Mix Table above. The
laboratory will establish proportions for strength and workability under laboratory conditions.

B. Delivery Tickets
Have the concrete plant transmit delivery tickets (DOT Form 525) with each load of concrete delivered to the work site.
Give the Engineer one of these delivery tickets.
Ensure that the following information is on the delivery ticket:
• Project designation
• Date
• Time
• Class and quantity of concrete
• Actual batch proportions
• Free moisture content of aggregates
• Quantity of water withheld
• Concrete mixing revolutions
If available forms do not provide the required information, ask the Engineer to provide one.

C. Formwork Plans
The Engineer may require detailed formwork plans for review. If so prepare the formwork plans and submit them to the Engineer. In no case will the Contractor be relieved of responsibility for the formwork plans.
When constructing permanent steel bridge deck forms, submit bar support details and types to Barrow County for approval before placing the deck form reinforcement.

D. Falsework Plans
Submit, for review by the Engineer, detailed falsework plans for spans under which traffic flows.
The Engineer may require plans for spans that do not accommodate traffic.

E. Shop and Erection Drawings
Submit fabricators’ shop and erection drawings to the Engineer for review and approval.
Indicate the following in the drawings:
• Grade of steel
• Physical and section properties for permanent steel bridge deck form sheets
• Locations where the forms are supported by steel beam flanges subject to tensile stresses

F. Hauling Vehicle Information
Before hauling starts on new bridges, submit the following information for each vehicle:
• Weight on each axle, empty
• Weight on each axle, fully loaded
• Center-to-center distances of axles
• Center-to-center distances of wheels measured parallel to each axle

G. Cold Weather Concrete Curing and Protection Plan
Secure the Engineer’s approval of a “Cold Weather Concrete Curing and Protection Plan” for bridges and structures.
Emphasize protection for the underside of bridge decks when using metal forms and include the protection procedures to be used.
Protection procedures shall keep the concrete above 50 °F for 72 hours after placement and above freezing for 6 days after placement. Choose the protection method from Table 2 based on the expected temperature within 48 hours after concrete placement.
Table 2—Cold Weather Protection

<table>
<thead>
<tr>
<th>Protection Procedure</th>
<th>Expected Temperatures Within 48 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heated enclosures</td>
<td>Below 25 °F</td>
</tr>
<tr>
<td>Commercial blankets</td>
<td>Below 25 °F</td>
</tr>
<tr>
<td>Batt insulation</td>
<td>Below 25 °F</td>
</tr>
<tr>
<td>Heavy-duty polyethylene</td>
<td>25 °F or above</td>
</tr>
</tbody>
</table>

H. Color Additives
Submit to the Engineer the following:
1. Product Data: Manufacturer’s specifications and instructions for color additives.
2. Samples for Concrete Color Selection: Submit sample chip of specified color indicating color additive number and required dosage rate. Submittals are for general verification of color.

500.2 Materials
Ensure that materials meet the Specification requirements of Table 3:

Table 3—Materials Specifications

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse Aggregate (1)</td>
<td>800.2.01</td>
</tr>
<tr>
<td>Fine Aggregate Size No. 10</td>
<td>801.2.02</td>
</tr>
<tr>
<td>Dampproofing or Waterproofing Material (Bituminous)</td>
<td>826.2.01</td>
</tr>
<tr>
<td>Portland Cement (2)</td>
<td>830.2.01</td>
</tr>
<tr>
<td>Portland-Pozzolan Cement (2)</td>
<td>830.2.03</td>
</tr>
<tr>
<td>Admixtures:</td>
<td></td>
</tr>
<tr>
<td>Air-Entraining Admixtures</td>
<td>831.2.01</td>
</tr>
<tr>
<td>Retarding Admixtures</td>
<td>831.2.02</td>
</tr>
<tr>
<td>Water Reducing Admixtures</td>
<td>831.2.02</td>
</tr>
<tr>
<td>Granulated Iron Blast-Furnace Slag</td>
<td>831.2.03 A.3</td>
</tr>
<tr>
<td>Fly Ash</td>
<td>831.2.03 A</td>
</tr>
<tr>
<td>Curing Agents</td>
<td>832</td>
</tr>
<tr>
<td>Joint Fillers and Sealers</td>
<td>833</td>
</tr>
<tr>
<td>Special Surface Coating</td>
<td>836</td>
</tr>
<tr>
<td>Linseed Oil</td>
<td>870.2.06.A.</td>
</tr>
<tr>
<td>Mineral Spirits</td>
<td>870.2.06.A.4</td>
</tr>
<tr>
<td>Water</td>
<td>880.2.01</td>
</tr>
<tr>
<td>Graded Aggregate (3)</td>
<td>815.2.01</td>
</tr>
<tr>
<td>Graffiti Proof Coating</td>
<td>838.2.01</td>
</tr>
<tr>
<td>Concrete used in Bridge Construction</td>
<td>500.3.04.F</td>
</tr>
</tbody>
</table>

1. Use either Class A or Class B coarse aggregate of the designated size, except when using limestone or dolomite in bridge structures. When using limestone or dolomite, use Class A coarse aggregate.
2. Use Type I or Type II Portland cement or Type IP Portland-Pozzolan cement unless otherwise specified. Do not use air-entraining cement.

3. The gradation requirements of graded aggregate are modified to require 30% to 45% by weight passing the No. 10 sieve.

Construct bridge sections containing duct enclosures for stressing tendons using concrete with a maximum stone size of No. 7.

Use concrete manufactured at plants that qualify as approved sources according to the Standard Operating Procedure for Ready Mix Concrete. See QPL 10 for a list of approved plants.

For a list of approved deck oil protective surface treatment sources, see QPL 23.

Use colored concrete additive made with pure, concentrated mineral pigments especially processed for mixing into concrete and complying with ASTM C 979.

If adding color additives to the mix at the jobsite, furnish color additives in pre-measured Mix-Ready disintegrating bags to minimize jobsite waste.

Do not use accelerator admixtures containing calcium chloride in colored concrete mix.

500.2.01 Delivery, Storage, and Handling

A. Aggregate Stockpile
Stockpile aggregate as follows:
1. Keep stockpile areas firm, reasonably level, well-drained, clean, and free of sod or foreign matter.
2. Stockpile aggregate separately by type and source.
3. Form stockpiles using methods and equipment that do not cause the aggregate to segregate, become contaminated, or degrade. The Engineer may reject improperly formed stockpiles.
4. Stockpile aggregate long enough for the moisture content to stabilize.
5. Do not use aggregates stored in pits or silos that contain water.

B. Aggregate Handling
Operate aggregate handling equipment carefully to minimize segregation, breaks, spills, contamination, and mixing of the sizes and types of aggregates.

C. Cement Storage
Store cement as specified below. Reject all caked, lumpy, or contaminated cement.
1. Bulk Cement
   Use bulk cement unless the Engineer allows bag cement to be used.
   Store bulk cement in bins or silos designed for this purpose. Provide moisture-proof storage containers with a mechanism that allows cement to flow freely from the discharge opening.
2. Different Brands
   Store and use cement of different brands and types, or from different mills separately.

D. Admixture Storage and Handling
Carefully store and dispense admixtures as recommended by the manufacturer to prevent contamination.
E. Concrete Handling and Placing
Handle and place concrete according to the following:

1. Haul Time Limitations
   Ensure that concrete reaches its final position in the forms within one hour after adding the cement to the aggregates.
   If retarders or water reducers are used, the allowable time limit increases to 1-1/2 hours.
   Test concrete immediately for acceptance tolerances before placing in forms using limits established in Table 1—Concrete Mix Table.

2. Placement Limitations
   After delivering the concrete to the job site or the staging area at the site or after mixing the concrete at the site, transport it carefully to the placement point to prevent excessive slump loss or segregation. Use any of the following equipment:
   - Buckets
   - Buggies
   - Pumps
   - Other approved means

F. Form Storage
Store forms off the ground.

G. Precast Unit Handling
Except as noted below, the applicable portions of Subsections 507.2.01, “Delivery, Storage, and Handling,” 507.3.05.A, “Prepare Bearing Areas,” 507.3.05.B, “Erecting PSC Bridge Members,” and 507.3.05.D, “Concrete Finish,” shall govern.
Handle precast, nonprestressed units as follows:
1. Do not lift the units from the casting bed until the concrete reaches a strength of at least 1,500 psi.
2. Do not transport or erect the units until they reach a strength of at least 3,000 psi.
3. Restrict live loads (including erection equipment) on the units until they reach a minimum strength of 4,500 psi.

H. Color Additives
Comply with manufacturer’s instructions. Deliver to site or batch plant in original, unopened packaging. Store color additives in dry conditions.

500.3 Construction Requirements
500.3.01 Personnel
A. Supervision, Personnel, and Skilled Workers
   Provide enough supervision, personnel, and skilled workers to do the following:
   1. Properly produce, place, and finish concrete in each pour unit according to Subsection 500.3.05.P, Table 5—Minimum Placement Rates or as required by the Plans.
   2. Check screed clearances and tolerances before beginning deck pours.
   3. Place concrete without delays.

B. Plant Operator Certification
   Volumetric proportioning requires that the operator be certified by the Georgia Department of Transportation Office of Materials.

500.3.02 Equipment
A. Equipment Restrictions
Do not use delivery, conveyance, or vibratory units that leak grout, water, oil, or gas. Provide enough equipment, tools, and materials to properly produce, place, and finish concrete in each pour unit according to the Subsection 500.3.05.P, Table 5—Minimum Placement Rates or as required by the Plans. The Engineer may prohibit equipment that delays concrete placement.

B. Volumetric Proportioning Equipment

When concrete ingredients are proportioned volumetrically, obtain the Engineer’s approval for the equipment and its calibration and operation.

Ensure the following:

- The equipment meets the specifications in ASTM C 685.
- The concrete producer conducts calibration tests at least every 6 months.
- The equipment is calibrated for each new concrete mix before production.

C. Batching Plant Equipment

Ensure that batching plants have the following equipment and that the equipment meets the standards listed.

1. Bins
   Ensure that bins and bin compartments meet the following standards:
   - Adequate capacity for the required concrete production
   - Supported on a rigid framework on a stable foundation capable of holding the bins securely
   - Designed to discharge efficiently and freely into the weigh hopper
   - Positive means of control that slows down and shuts off the material flow when the weigh hopper has the correct quantity.
   - Discharging mechanisms that prevent material leaks when closed
   - Leak-free aggregate storage bins
   - Divided aggregate storage bins for fine aggregate and each size of coarse aggregate
   - Partitioned aggregate storage bin compartment that prevents the materials from mixing
   - Leak-proof, moisture-proof cement bins with a vibrator or other mechanism to discharge cement

2. Weigh Hoppers
   Ensure that weigh hoppers meet the following standards:
   - Have suitable containers freely suspended from scales
   - Have adequate capacity to maintain the Subsection 500.3.05.P, Table 5—Minimum Placement Rates
   - Have a discharge mechanism that prevents material leaks when closed
   - Have vents to permit air to escape
   - Have vibrators or other equipment that ensures complete and efficient discharge of materials
   - Have a dust seal and a port or valve for sampling cement

3. Scales
   Scales used for weighing concrete materials shall have accuracy within plus or minus one percent under operating conditions.
   Ensure the following:
   - When directed by the Engineer, the owner demonstrates the accuracy of the scales.
   - Scales are kept clean and in good operating condition.
• The scale operator can clearly see indicating devices.
• The scale operator can easily access controls.

### D. Mixers and Agitators

Ensure that mixers and agitators meet the following requirements:

1. **General Requirements for Mixers and Agitators**
   
   Provide mixers and agitators that meet these requirements:
   
   a. **Capacity Plates**
      
      Ensure that the mixer or agitator has a legible metal plate or plates attached in an easily visible location. The plates shall indicate the rated capacity in cubic yards for mixing and agitating.
   
   b. **Concrete Production**
      
      The mixer shall produce concrete that meets the requirements in the Table 1—Concrete Mix Table.
   
   c. **Mixer Performance Test**
      
      The mixer or agitator may be required to pass a mixer performance test. Mixer performance will be evaluated at the discretion of the Engineer.
      
      Mixer performance tests will include the following:
      
      1) Taking samples of concrete at the one-quarter and three-quarter points of the batch discharge
      2) Measuring the slumps of each concrete sample
         
         If the two slump values differ by more than 2 in., do not use the mixer or agitator until it meets the requirements of the test.
         
         The Engineer may permit the equipment to be used if the 2 in. tolerance can be met by using a longer mixing time or a smaller batch.

2. **Mixing Speed**

   Follow these guidelines for mixing speed:
   
   Do not exceed 150 revolutions at mixing speed.
   
   Discharge all concrete from truck mixers before drum or blades reach 300 revolutions, including revolutions at agitating speed.
   
   Use the mixing speed defined by the manufacturer for the mixing equipment.
   
   If the manufacturer’s definition of mixing speed is not available, use a mixing speed of 6 to 18 revolutions per minute.

3. **Mixer and Agitator Maintenance**

   Maintain mixers and agitators as follows:
   
   a. When mixers and agitators are discharged, remove the entire contents before adding materials for the next batch.
   
   b. Clean mixers and agitators often to prevent concrete and grout accumulation.
   
   c. Do not discharge cleaning water into any pipe, catch basin, or structure.
   
   d. If cement or aggregates accumulate in mixers and agitators when cleaning water is discharged, remove them immediately at no expense to Barrow County.

4. **Mixer Types**

   Use stationary mixers or truck mixers.

   a. **Stationary Mixers**
      
      Ensure that stationary mixers meet the following standards:
      
      1) Combine the concrete ingredients into a homogeneous, uniform mass within the specified time and when loaded to capacity.
2) Efficiently and uniformly discharge the concrete within the tolerances allowed in Subsection 500.3.02.D.1.c, “Mixer Performance Test.”
3) Permit discharge only after the specified mixing time has elapsed using a locking device.

b. Truck Mixers
   Ensure that truck mixers meet the following standards:
   Meets the requirements listed in Subsection 500.3.02.D.4.a, “Stationary Mixers”
   Has an approved revolution counting device in good operating condition
   Does not haul more than the rated capacity in cubic yards as shown on the attached capacity plates

5. Agitator Types
   Use truck agitators or truck mixers operating at agitating speed.
   Ensure that agitators meet the following requirements:
   a. Keeps the mixed concrete in a homogeneous, uniform mass
   b. Efficiently and uniformly discharges the concrete within the tolerances allowed in Subsection 500.3.02.D.1.c, “Mixer Performance Test”

E. Concrete Buckets
   Keep concrete buckets clean and in good working condition.

F. Concrete Buggies
   Keep concrete buggies clean and in good working condition.

G. Concrete Pumps
   Concrete pumping equipment is subject to the Engineer’s approval. Use pumping equipment that has adequate capacity and is suitable for the proposed work.

H. Chutes and Troughs
   Do not use chutes longer than 50 ft. without the Engineer’s permission.
   Flush chutes and troughs with water after each run. Do not discharge this water into freshly placed concrete or into conveyance unit.
   Promptly remove hardened concrete from chutes and troughs.
   Ensure that chutes and troughs meet the following requirements:
   1. Metal or metal lined
   2. Slope not exceeding one vertical to three horizontal
   3. Baffles or a series of short lengths placed to reverse the direction of the concrete flow, when used on steep slopes

I. Pipes or Tubes
   Use pipes or tubes to place concrete when the operation requires dropping the concrete more than 5 ft. Thoroughly clean the pipes or tubes after each pour.
   Use pipes made of metal or other approved material and long enough to deposit the concrete as close to its final position as possible.

J. Vibrators
   Provide enough vibratory units, including at least one additional stand-by unit in good working condition, to compact concrete immediately after it is placed. Have a stand-by unit at the site before each pour is started.
   On Projects consisting entirely of small pours (10 yd³ or less), the Engineer may waive the stand-by requirement.
   Ensure that vibrators meet the following conditions:
   • Approved internal rotation-type design
A power supply that constantly vibrates the concrete at frequencies of not less than 4500 impulses per minute
A vibration intensity that visibly affects a mass of concrete with a 1 in. slump through at least an 18 in. radius

K. Screeds
Do not use vibratory screeds (screeds that use a transverse strike-off motion) without the Engineer’s approval. Use screeds that are:
• Mechanically operated
• Designed and constructed to screed with the strike-off parallel to the center line
• Readily adjustable
• Capable of maintaining proper adjustment throughout the screeding operation

The two screed types are:
1. Longitudinal Screeds
   Unless otherwise noted on the Plans, use longitudinal screeds only on pour lengths of 70 ft. or less.

2. Transverse Screeds
   Use transverse screeds on any pour, unless otherwise noted on the Plans. However, transverse screeds are required on pour lengths above 70 ft.
   Support screeds outside the pour area that will receive a surface finish. Do not use intermediate supports or guides.
   Adjust screeds to the camber specified on the Plans. Check the camber as often as necessary.
   Have the Engineer approve the following for screeds and their supports:
   • Weight
   • Durability
   • Adjustability
   • Accuracy
   • Mechanical condition
   • Operational results
   Furnish the equipment necessary to check screed clearances and tolerances before pouring decks.

L. Underwater Placement Equipment
Place concrete under water using the following underwater placement equipment:
1. Tremie
   Use a tremie when depositing concrete in water above 10 ft. deep. Ensure that tremie is:
   • At least 8 inches in. diameter
   • Constructed in sections with watertight couplings

2. Bottom Dump Bucket
   Where the Engineer permits, use a bottom dump bucket in water up to 10 ft. deep.
   Ensure that the bottom of the bucket opens only when it touches the surface that receives the charge and that the top of the bucket has a lid or cover.

M. Fogging Equipment
To supply additional moisture to the concrete, use fogging equipment with the following characteristics:
• A heavy-duty pump capable of delivering 2 gal. of water per minute to a 0.062 in. diameter tip at an air pressure of 100 psi.
• An example of a suitable pump is the Alemite Pump 7878-A.
• The ability to consume approximately 22 ft³/min of compressed air
• A 3/8 in. inside diameter hose long enough to reach all areas of the deck
• An adjustable spray gun and tip to provide various patterns of atomized spray or fog for changing finishing conditions

An example of a suitable spray gun is the Gun Jet No. 43 with a 120-2 Multee Jet Nozzle. If necessary, substitute other equipment that is capable of equal performance.

500.3.03 Preparation
A. Pre-Pour Conference
Before beginning deck placement operations on each Project, and for individual deck pours of an unusual nature, the Engineer will schedule a pre-pour conference with Project supervisory personnel and a representative of the concrete supplier, if applicable.
Conference topics of discussion include the following:
• Reinforcing steel support method
• Final screed setting check
• Anticipated placement rate
• Personnel number
• Equipment type
• Curing methods
• Adverse weather placement procedures
• Emergency procedures
• Other Work-related details

500.3.04 Fabrication
A. Measure Materials
Measure materials as follows:
1. Cement. Weigh bulk cement on scales to plus or minus one percent of the designated weight. If the Engineer allows bag cement, proportion the batch to use only whole bags.
2. Aggregates. Weigh all aggregates on scales to plus or minus two percent of the designated weight. Apply the proper corrections for aggregate surface moisture.
3. Water. Measure water by volume or weight to within plus or minus one percent.
   a. Construct the measuring system to be independent of water pressure fluctuation.
   b. Ensure that measuring systems have outside taps and valves to facilitate plant calibrations.
   c. You may use recycled wash water provided that it meets the requirements of Subsection 880.2.02.
4. Admixtures. Measure admixtures by weight or volume within plus or minus three percent of the required amount.
B. Control Concrete Batching
Control batching as follows:
1. Mix batches of concrete according to the proportions of an approved mix design.
2. Ensure that concrete materials are from the designated sources.
3. Correct the batch weights to account for surface moisture in aggregates.
C. Prestressed Concrete Deck Panel Requirements
Do not use prestressed concrete deck panels unless approved by the Engineer.

D. Add Admixtures to Concrete
Additives are required when specified herein or as directed by the Engineer.

1. Air-Entraining Admixtures
   a. All bridge structure concrete uses air-entraining additives, except for seal concrete and non-exposed footings.
   b. The Contractor may use air-entraining additives in other concrete to improve workability when job or material conditions dictate.
      When using air-entraining additives as an option to improve workability or when required, do not exceed the upper limit of the entrained air content requirement in the Table 1—Concrete Mix Table.

2. Retarding Admixtures
   Use concrete-retarding additives in bridge concrete when the average temperature is above 65 °F (the average of the expected high and the predicted low).
   a. Normally, concrete-retarding additives are not required for bridge curbs, handrails, crosswalks, or other appurtenances constructed separately from the decks.
   b. The Engineer may waive the use of retarders in substructure concrete when concrete can be placed within one hour after batching.

3. Water-Reducing Admixtures
   The Contractor may use water-reducing admixtures in Class AA concrete for bridge decks when conditions do not require a retarder. The Contractor may use water-reducing admixtures in other concrete when job or material conditions dictate a reduction in water requirements or when minimal set retardation is desired.
   Barrow County may allow Type F water-reducing admixtures when the Contractor requests it. The Contractor may construct bridge sections containing duct enclosures for stressing tendons with concrete using Type F (AASHTO M194) water reducer as approved by Barrow County.

4. Fly Ash
   The Contractor may use fly ash as an additive in concrete to promote workability and plasticity. The Contractor may use fly ash as a partial replacement for Portland cement in concrete if the following limits are met:
   a. Replace no more than 15 percent of the cement by weight.
   b. Replace cement with fly ash at the rate of 1.0 to 1.5 lbs of fly ash to 1.0 lb of cement.
   c. Ensure that the fly ash mix meets the requirements of Subsection 500.1.03.A, Subsection 830.2.03, “Portland Pozzolan Cement” and Subsection 831.2.03.A, “Fly Ash”.
   d. Calculate water-cement ratio based on the total cementious material in the mix including fly ash.
   e. Do not use Type IP cement in mixes containing fly ash.

5. Granulated Iron Blast-Furnace Slag
   If high-early strengths are unnecessary, the Contractor may use granulated iron blast-furnace slag as a partial replacement for Portland cement in concrete if the following limits are met:
   a. Replace no more than 50 percent of the cement by weight.
   b. Replace the cement with slag at the rate of 1.0 lb of slag to 1.0 lb of cement.
c. Ensure that the slag mix meets the requirements of Subsection 500.1.03.A.3, Subsection 830.2.02, “Portland Blast-Furnace Cement” and Subsection 831.2.03.A.3, “Granulated Iron Blast-Furnace Slag”

d. Calculate the water-cement ratio based on the total cementitious material in the mix including granulated iron-blast furnace slag.

e. Do not use Type IP cement or fly ash in slag mixes.

E. Mix Concrete

1. Central-Mixed Concrete

Mix central-mixed concrete as follows:

a. Establish the mixing time.

The Engineer will determine the mixing time for central mixed concrete, but the minimum mixing time will be one minute for stationary mixers of up to 1 yd³ capacity. Mixing time may be adjusted in the following situations:

• The Engineer will increase the minimum time by 15 seconds for each additional cubic yard or fraction thereof.
• For mixers with a capacity above 3 yd³, the minimum mixing time may be 90 seconds if the resulting mixture is homogeneous and meets the requirements of Subsection 500.3.02.D.1.c, “Mixer Performance Test.”
• The Engineer may waive mixing time requirements for stationary mixers of improved types or new designs that produce homogeneous concrete in less time than that established for a particular capacity by the foregoing. For these types of mixers, the Engineer may establish a minimum mixing time of one minute.

b. Start the mixing time when all cement and aggregates have been placed in the mixer.

c. Add some water to the mixer before adding the cement and aggregates, but ensure all water is in the mixer by the end of the first 1/4 of the specified mixing time.

2. Shrink-Mixed Concrete

Mix shrink-mixed concrete as follows:

a. Mix the batches as specified in Subsection 500.3.02.D.2.”Mixers and Agitators.”

b. Do the initial mixing in a stationary mixer for at least 30 seconds to thoroughly mix the ingredients. Do the final mixing in truck mixers.

c. Discharge all concrete before the drum or blades exceed 300 revolutions.

d. Do not allow truck mixing at mixing speed to exceed 100 drum or blade revolutions except as allowed when adding water according to Subsection 500.3.05.M, “Add Water to Concrete.”

3. Transit-Mixed Concrete

Mix transit-mixed concrete as follows:

a. For concrete mixed completely in a truck mixer, place all concrete ingredients into the mixer at the concrete plant except the quantity of water that may be withheld according to Subsection 500.3.05.M, “Add Water to Concrete.”

b. After loading the truck, begin operating at either agitating or mixing speed; however, start the mixing speed within 30 minutes after loading the truck mixer.

c. Mix the concrete for 70 to 150 revolutions at mixing speed. For revolutions above those specified for mixing speed, use agitating speed.

d. Discharge all concrete before exceeding 300 drum or blade revolutions.

4. Colored-Mixed Concrete
a. Proportion, batch and mix color additives in accordance with manufacturer’s instructions. Mix until color additives are uniformly dispersed throughout mixture and disintegrating bags, if used, have disintegrated.
b. If mixed at batch plant, schedule delivery of concrete to provide consistent mix times from batching until discharge.

F. Concrete Used in Construction
1. Requirements
   Use Type I or Type II Portland cement or Type IP Portland-Pozzolan cement for bridge construction, unless otherwise specified.
   
   **NOTES:**
   1. Do not use air-entraining cement.
   2. Do not use accelerators (24-hour accelerated strength concrete) that contain chlorides in any bridges where the concrete containing the additive will contact the reinforcing steel.

   a. Concrete Types: Use the tabulated results from the Table 1—Concrete Mix Table for the classes and specific requirements for each class of concrete. Use the appropriate class of concrete shown in the Plans or Specifications for each component of a structure, of the type as follows:
   - Class AAA—Prestressed concrete
   - Class AA1—Precast concrete as called for on the Plans
     If approved by the Engineer, you may use this class as high early-strength concrete and may use Type III cement in concrete used for this purpose.
     The Engineer may also specify the rate of compressive strength development when this concrete is used
   
   **NOTE: Barrow County will not add compensation to the Contractor for Class AA1 concrete when it is used at the request of the Contractor.**

   b. Class AA—Bridge superstructure concrete or precast concrete as called for on the Plans
   c. Class A—General purposes
   
   **NOTE: Do not air-entrain Class A concrete deposited in water (seal concrete). Ensure that the concrete has 10 percent additional cement and sufficient water to provide a 6 to 8 in. slump.**
   d. Class B—Massive sections or lightly reinforced sections or miscellaneous non-structural concrete
   e. Class CS—(Portland cement concrete subbase). Use this class as a subbase where required by the Plans. Concrete subbase may be composed of a mixture of Portland cement and graded aggregate or Portland cement, aggregate, and sand.

2. Acceptance of Design
   Determine laboratory acceptance strength by at least 8 compressive test specimens prepared and cured according to AASHTO T 126.
   a. Make the specimens from two or more separate trial batches.
   b. Make an equal number of specimens from each batch.
   c. Calculate the minimum average strength or acceptance strength (X) as follows:
   
      \[
      X = f'c + 2.0s
      \]

      Where:
      
      \[
      f'c = \text{required minimum compressive strength for each class of concrete from the Table 1—Concrete Mix Table}
      \]
s = average standard deviation of all 28-day specimens made in the field representing concrete of a given class from all ready-mix plants

Use the standard deviations shown in Table 4:

<table>
<thead>
<tr>
<th>Class of Concrete</th>
<th>Standard Deviation (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>370</td>
</tr>
<tr>
<td>A</td>
<td>650</td>
</tr>
<tr>
<td>AA</td>
<td>620</td>
</tr>
<tr>
<td>AA1</td>
<td>540</td>
</tr>
<tr>
<td>AAA</td>
<td>500</td>
</tr>
</tbody>
</table>

**Table 4—Standard Deviations for Calculating Acceptance Strength**

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**500.3.05 Construction**

**A. Meet General Responsibilities**

General construction responsibilities include:

1. Batch, mix, deliver, and place concrete according to the Specifications.
2. Have enough production and placement capacity to continuously mix, place, and finish the concrete in each pour unit during daylight hours. If necessary, place concrete at night when adequate lighting facilities exist and the Engineer approves of the operations and facilities.
3. If a pour cannot be completed, do the following:
   a. Form an approved construction joint.
   b. Remove the partial pour.
   c. Take other remedial measures directed by the Engineer at no additional expense to Barrow County.
4. Schedule placement to minimize exposure of freshly poured concrete to potentially harmful drying elements such as wind and sun before curing materials are applied and protect freshly poured concrete from exposure to excess moisture and freezing for a minimum of 24 hours when such weather conditions exist.

**B. Construct Falsework**

Accept responsibility for the design, construction, protection, and performance of falsework. Repair or remove and replace (as the Engineer directs) concrete, other material, or portions of the structure that are damaged or destroyed due to falsework failure.

Construct falsework for prestressed post-tensioned concrete structures according to the Contract Special Provisions.

Construct falsework for structures other than post-tensioned box girders as follows:

1. Meet Design Criteria

   Ensure that falsework structural components that have similar functions in an individual permanent span have the same geometric properties and are made of the same materials. When designing and centering formwork, treat concrete as a liquid, and use the following weights:
   - 150 lbs/ft³ for vertical loading
   - 85 lbs/ft³ for horizontal loading
   - 75 lbs/ft² live load for deck placement operations
Use the following falsework design criteria:

- Design and construct falsework logically so the Bridge Design Office can analyze it using a commonly accepted structural design theory.
- Avoid exceeding safe working values for material stresses.
- Provide support for the imposed loads, without settling or deforming and a way to compensate for settlement, if it occurs.

2. Support Falsework
   - Support falsework using one of these methods:
     - Support on piling driven and removed as directed
     - Found on a footing approved by the Engineer

3. Construct Falsework
   - Construct and set falsework to provide the finished structure the specified camber and finished grade.
   - Place “telltales” at locations directed by the Engineer to observe how much the falsework settles.

C. Meet Form Design Criteria
   - Ensure that forms meet the following design criteria:
     - Provide wet concrete and other loads and forces of construction support without bulging between the supports or bracing and without deviating from the lines and contours shown on the Plans.
     - Meet the design criteria for falsework in Subsection 500.3.05.B.1, “Meet Design Criteria.”
     - Account for the use of retarded concrete.
   - Ensure that bracing, ties, and supports are placed accurately.
   - If the formwork appears to be inadequately supported, tied, or braced (before or during concrete placement), the Engineer may require that the Work stop until the defects are corrected.

D. Use Acceptable Form Materials
   - Except as noted, fabricate forms from the following materials:
     - Lumber
     - Plywood
     - Metal
     - Plastic
     - Combinations of these
   - Use material free of defects that materially affect form strength or materially impair the accuracy or appearance of the concrete surface.
   - Use the form materials as follows:
     1. Lumber Forms
        - Construct wood forms as follows:
          a. Size and dress the lumber.
          b. Use lumber at least 1 in. thick.
          c. Use lumber for header forms used as screed supports and for curb face forms at least 2 in. thick.
          d. Avoid using scrap material or doing patchwork.
          e. Stagger all joints but those between abutting panels.
          f. Line the lumber used to form outside vertical surfaces of exterior beams or girders with an approved form liner.
g. Use chamfer strips mill-produced from high-quality lumber, free of defects.
h. Dress and finish chamfer strips on all three sides.
i. Size chamfer strips to the proper dimensions.

2. Plywood Forms
   Construct plywood forms as follows:
   a. If plywood is the type made for general concrete forms and is at least 5/8 in. thick, use it in place of 1 in. thick lumber to construct forms, if necessary.
   b. Ensure that plywood used to form open joints and to line forms is at least 1/4 in. thick.
   c. When nailing plywood directly to form studs, do not space the studs more than 16 in. apart.
   d. Use plywood in full sheets wherever practical. Do not do patchwork with small, irregular pieces.
   e. Have the Engineer inspect and approve plywood sheet layout.

3. Metal or Plastic Forms
   Construct metal or plastic forms as follows:
   a. Use metal or plastic to form concrete only if the Engineer approves the forms and if the forms produce satisfactory results.
   b. Use metal forms that produce finished concrete equal to or superior to concrete made from comparable wooden forms.
   c. Countersink bolts and rivets in the surfaces of metal forms that touch concrete.
   d. Grind welds smooth in the surfaces of metal forms to provide a smooth plane surface.

4. Other Material Uses
   Use tempered fiberboard for form liners when necessary if it is at least 1/4 in. thick. Use tempered fiberboard 1/8 in. thick only to form open joints. Support the fiberboard with suitable spacers arranged properly.
   Use approved synthetic materials for forming open joints and for other special uses, if necessary.

E. Construct Form Supports
   Construct form supports using metal ties, anchors, and hangers as follows:
   1. Construct supports that will remain in the finished concrete so they can be removed from the concrete face to a depth of at least 1 in. without damaging the concrete.
   2. Weld form supports to girder or beam flanges in continuous or cantilever spans only in the flange areas which are in compression.
   3. When ordinary wire ties or snap ties are permitted, cut them back at least 3/8 in (10 mm) from the face of the concrete.
   4. Design metal tie fittings that minimize the cavities made when they are removed. Fill all cavities after removing metal tie fittings.

F. Construct Temporary Forms
   Construct temporary forms as follows:
   1. Construct and maintain forms in a mortar-tight condition.
   2. Construct forms so that they can be removed easily without damaging the concrete, unless using forms that will remain in place.
   3. Build, line, and brace forms so that the formed concrete surface conforms with the dimensions, lines, and grades shown on the Plans.
   4. Build headwall forms for skewed pipe parallel to the roadway centerline or at right angles to the radius on curves.
Construct headwall forms as follows:

a. Lay enough pipe to extend through the headwall form.
b. After the concrete is poured and hardened, carefully cut and dress the protruding pipe ends so no ragged edges remain.

The Contractor may choose, as an alternate to the above method, to build a circular form that exactly fits the pipe circumference and face of the headwall form.

5. Construct form liner using plywood or other approved form liner as follows:
   a. Use form liner in large sheets. Do not do patchwork.
   b. Avoid irregular joint location in form liners.
   c. Have the Engineer inspect and approve the proposed liner layout.

6. Bevel forms at beam copings, girders, and other projections to ease removal.

7. Place chamfer strips to chamfer exposed edges of the concrete by the required amount.
   Use ¾ in. chamfers unless otherwise shown on the Plans.

8. Patch with tin or other metal only in those areas of the superstructure lying between and including the inside faces of the exterior beams.


10. Immediately before erecting forms or just before placing bar reinforcement steel, coat forms with a clear oil or other bond breaker to keep concrete from sticking to the forms.
    a. Do not allow the substance to stain or soften the concrete surface.
    b. Do not apply by reaching or pouring through previously placed reinforcement steel.

11. Wait to place concrete in any form until Barrow County inspects and approves the form.
   Inspection and approval does not diminish the responsibility to produce concrete surfaces free of warping, bulging, or other defects.

12. When removing forms, remove chamfer strips, blocks, and bracing.

13. Do not leave any part of a wooden form in the concrete.

14. If concrete surfaces do not meet finish specifications, correct the problems with the following steps, as directed by the Engineer:
    • Repair the defects using approved methods.
    • Remove and replace the affected portion of the Work.

G. Reuse Forms
Reuse forms and form material in good condition and satisfactory as determined by the Engineer. Do not use forms or form materials that are warped, cracked, split, bulging, have separated plies, or have unsatisfactory form liner.

Ensure that used forms are mortar tight and produce a finished concrete equivalent to that produced by new forms.

H. Construct Permanent Steel Bridge Deck Forms for Concrete Deck Slabs
Unless otherwise designated on the Plans, construct and use permanent steel bridge deck forms for concrete bridge deck slabs according to these Specifications. Do not use permanent steel bridge deck forms in panels where longitudinal deck construction joints are located between stringers.

Provide a structurally satisfactory slab when using permanent steel bridge deck forms.

1. Fabricate permanent steel bridge deck forms and supports from steel that conforms to
   ASTM A 653/653M Designation SS, Grade 80/550, Coating Designation G-165/Z-500 and
   ASTM A 924/924M.

2. Design permanent steel bridge deck forms as follows:
a. Account for the dead load of the following:
   - Form
   - Reinforcement steel
   - Plastic concrete
b. Add 50 lbs/ft² for construction loads.
c. Ensure that the unit working stress in the steel sheet does not exceed 0.725 of the specified minimum yield strength for the material furnished. However, do not allow the unit working stress to exceed 36,000 psi.
d. Account for deflection under the weight of the forms, the plastic concrete, and the reinforcement as follows:
   1) If deflection exceeds 1/180 of the design span or 1/2 in., whichever is less, use intermediate supports.
   2) Do not base deflection on a total load of less than 120 lbs/ft².
e. Base the permissible form camber on the actual dead load condition.
f. Do not use camber to compensate for deflection that exceeds the above limits.
g. Compute the form sheets design span using the clear span of the form, plus 2 in., measured parallel to the form flutes.
h. Compute physical design properties according to the requirements of the latest published edition of the American Iron and Steel Institute Specification for the Design of Cold Formed Steel Structural Members.
i. Ensure that all bottom reinforcement has a minimum concrete cover of 1 in. as shown in

![Figure 1](image)

j. Maintain the Plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck.
k. Do not use precast mortar blocks to support the deck reinforcement.
l. Do not treat permanent steel bridge deck forms as lateral bracing for the compression flanges of supporting structural members.

3. Do not weld to flanges in tension or to structural steel bridge elements fabricated from non-weldable steel grades.
   Have welders certified by the Department of Transportation weld metal deck forms or supports for metal deck forms.

I. Install Forms
   Install and maintain forms in a mortar-tight condition and according to approved fabrication and erection Plans.
   Place transverse construction joints at the bottom of a flute. Field drill 1/4 in. weep holes no less than 12 in. on center along the line of the joint.
1. Highway Bridge Forms
Install highway bridge forms using either Method 1 or Method 2:

- **Method 1.** Place forms so the ribs of the forms align with how the bottom transverse reinforcing in the slab is spaced.
- **Method 2.** Place forms with a 1 in. minimum clearance between the top of the form and the bottom of the main deck reinforcement. See Figure 1.

2. Railroad Bridge Forms

   Install railroad bridge forms as follows:
   a. Place the forms so the tops of the form ribs adjacent to the beam flange are at the bottom of the deck slab specified by the Plans.
   b. Maintain the full slab depth detailed on the Plans.
   c. Do not allow form ribs to project above the Plan bottom of the deck slab.
   d. Do not place form sheets directly on top of the stringer or floor beam flanges.
   e. Securely fasten form sheets to form supports using self-drilling screw fasteners, not by welding. If the Engineer approves, use fastener pins driven into place by a power tool.
   f. Ensure that form sheets have a minimum bearing length of 1 in. at each end.
   g. Do not leave loose sheets or accessories on the deck at the end of a day’s work.
   h. Place form supports so that they contact the flange of the stringer or floor beam.
   i. Attach form supports using welds, bolts, clips, or other approved means.
   j. Do not weld form supports to the flanges of non-weldable steel or to portions of the flange subject to tensile stresses.
   k. Ensure that welding and welds comply with AWS D 2.0 for fillet welds. However, 1/8 in. fillet welds are permitted.

J. Repair Damaged Forms

   Repair permanently exposed form metal to the Engineer’s satisfaction if the galvanized coating is damaged.
   1. Clean the damaged area.
   2. Go over the damaged area with a wire brush.
   3. Paint the area with two coats of zinc oxide-zinc dust primer that meet Federal Specification TT-P-641d, Type II and has no color added.
   4. Do not touch up minor heat discoloration in weld areas.

K. Construct Runways

   Provide runways into a deck pour area for moving buggies. If the Engineer approves, use runways to bridge a previous pour that has not reached the minimum strength or age requirements in Subsection 500.3.05.AF.4, “Live Loads—Pouring Equipment.” Construct and support runways to protect the forms and the reinforcement steel position.

L. Construct Work Bridges

   Provide a work bridge on deck pours. Support the bridge outside the area of the pour receiving a surface finish. If two or more spans will be poured on the same day, the Engineer may require two work bridges.
   Design and construct work bridges to meet the following:
   - Do not allow the bridge to sag into the fresh concrete.
   - Construct the bridge so that transverse finish and curing material can be applied easily regardless of the screed type.

M. Add Water to Concrete

   Add water to the concrete at the concrete plant. Do not add indiscriminate amounts of water at the job site.
If placement conditions require concrete of a more workable consistency, add small amounts of water at the job site if approved by the Engineer.

Add water at the job site as follows:

1. Determine the quantity of water required to provide the necessary consistency.
   The Engineer will not approve additions of water that cause the total amount of water to exceed the maximum water/cement ratio established in the Table 1—Concrete Mix Table.
   The Engineer will reject concrete with water added to it that produces a higher slump than specified in the Table 1—Concrete Mix Table.
2. Do not add water to concrete that has begun to set because of excessive mixing or to concrete that has exceeded mixing or haul time limitations.
3. When adding the water, carefully control the conditions.
4. Position the delivery so the measuring operation is not affected.
5. Measure the water carefully.
6. Inject the water into the mixer forcefully to facilitate uniform mixing.
7. Add water before discharging an appreciable amount of concrete.
8. Do not add more water after concrete discharge begins.
9. After adding the water, mix the concrete an additional 30 revolutions.
10. Finish mixing the concrete before the total revolutions at mixing speed exceed 150.

N. Volumetrically Proportion Concrete
Concrete ingredients may be proportioned volumetrically when non-air entrained concrete is used in miscellaneous concrete, non-exposed footings, or culverts smaller than bridge culvert size.

O. Prepare for Concrete Placement
Prepare for concrete placement as follows:

1. Ensure that an adequate supply of concrete will be furnished and placed to meet the requirements specified in Subsection 500.3.05.P, Table 5—Minimum Placement Rates.
2. To ensure a full bond between prestressed concrete deck panels and the cast-in-place concrete, clean the panel before placing the slab concrete.
3. Immediately before placing cast-in-place slab concrete, saturate the prestressed concrete deck panels with water.
4. Immediately before placing concrete in the forms, the concrete will be measured for acceptance tolerances.
   Acceptance tolerances for each class of concrete are listed in the Table 1—Concrete Mix Table.
   Conduct the applicable tests according to the procedures in the Sampling, Testing, and Inspection information.

P. Meet the Minimum Placement Rates
If concrete is not produced, placed, and finished according to the minimum placement rates, the Engineer may reject the pour. Concrete pours of a similar nature and size will not be allowed until the problem is corrected and the placement rate met.

The minimum placement rates are listed in Table 5:

Table 5—Minimum Placement Rates for Bridges, Culverts and Retaining Walls
1. Bridge Substructure

<table>
<thead>
<tr>
<th>Pour Size in Cubic Yards</th>
<th>Minimum Placement Rate in Cubic Yards per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td>10</td>
</tr>
<tr>
<td>26-50</td>
<td>15</td>
</tr>
<tr>
<td>51-75</td>
<td>20</td>
</tr>
<tr>
<td>76-100</td>
<td>25</td>
</tr>
<tr>
<td>101 and over</td>
<td>30 or as designated on the Plans or in the Special Provisions</td>
</tr>
</tbody>
</table>

The minimum placement rate for columns shall be the same as for culvert sidewalls and wingwalls.

2. Bridge Superstructure

<table>
<thead>
<tr>
<th>Pour Size in Cubic Yards</th>
<th>Minimum Placement Rate in Cubic Yards per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td>15</td>
</tr>
<tr>
<td>26-50</td>
<td>20</td>
</tr>
<tr>
<td>51-75</td>
<td>25</td>
</tr>
<tr>
<td>76 and over</td>
<td>30 or as designated on the Plans or in the Special Provisions</td>
</tr>
</tbody>
</table>

Pour handrail, parapet, curb, and barriers at a rate satisfactory to the Engineer.

3. Culverts

<table>
<thead>
<tr>
<th>Structure</th>
<th>Minimum Placement Rate in Cubic Yards per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footings and slabs</td>
<td>Same as for bridge substructures</td>
</tr>
<tr>
<td>Sidewalls and wingwalls</td>
<td>Use placement rates so that fresh concrete is not placed on concrete that has attained its initial set. Cover all concrete with fresh concrete within 45 minutes.</td>
</tr>
</tbody>
</table>

4. Retaining Walls

<table>
<thead>
<tr>
<th>Structure</th>
<th>Minimum Placement Rate in Cubic Yards per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footings</td>
<td>Same as for bridge substructures</td>
</tr>
<tr>
<td>Walls</td>
<td>Same as for culvert sidewalls and wingwalls</td>
</tr>
</tbody>
</table>

Q. Place Concrete

Place concrete as follows:
1. Do not allow aluminum to touch the concrete while mixing, transporting, handling, or placing it.
2. Transport, handle, and place concrete quickly so that it reaches its final position in the forms within the haul time limitations in Subsection 500.2.01.E.1, “Haul Time Limitations.”
3. Manipulate the delivery or conveyance unit to avoid vibration damaging to partially set concrete.
4. Immediately before placing the concrete, thoroughly clean and wet the forms.
5. Place concrete as close as possible to its final position in the forms.
6. Use chutes, troughs, or tubes to pour the concrete in the forms, without displacing reinforcement steel.
7. Modify or stop using the equipment if chutes, troughs, or tubes cause honeycombed or otherwise inferior concrete.
8. When placing concrete by pumping, operate the pumping equipment so that the concrete is produced in a continuous stream without air pockets.
   **NOTE:** Convey and place concrete by pumping only when specified in the Contract or when authorized by the Engineer.
9. When concrete placement requires dropping the concrete more than 5 ft., use pipes or tubes to place the concrete.
   Do not allow concrete to free-fall more than 5 ft. from the pipe or tube.
10. Place concrete in horizontal layers no more than 18 in. thick.
11. Place and compact succeeding batches in each layer before the preceding batch takes its initial set.
12. Place each succeeding layer before the underlying layer sets.
13. Consolidate the concrete to avoid cold joints between layers.
14. If the forms sag or bulge while concrete is being placed, remove the concrete causing the distortion and the concrete in adjoining areas if the Engineer requires. Removal prevents cold joints and displaced or damaged reinforcement.
15. Work the concrete around reinforcement bars without displacing them.
17. Vibrate concrete where it is deposited and vibrate other concrete while it is fresh. Vibrate as follows:
   a. Insert and withdraw vibrators slowly.
   b. Manipulate vibrators to work the concrete around reinforcement and embedded fixtures and into corners of forms.
   c. Vibrate sufficiently to compact the concrete but avoid causing the concrete to segregate.
   d. Stop vibrating before local areas of grout are formed.
   e. Apply vibrators no farther apart than twice the radius through which the vibration is visibly effective.
   f. Do not use vibrators or any other means that could cause segregation to move masses of concrete in the forms.
   g. Do not apply vibrators to sections of concrete that are no longer plastic.
   h. Vibrate concrete-filled steel grid floors by applying the vibrators to the steel.
   i. Vibrate concrete for precast or prestressed units as specified above in steps a through g, unless the Engineer approves alternate methods.
   j. Stop vibration when a mortar line appears on the face of the form and when the coarse aggregate particles are submerged in the concrete mortar.
18. Supplement vibration with spading to ensure smooth surfaces and dense concrete along form faces and in locations difficult to reach with vibrators.
19. After concrete sets initially, do not disturb the forms or the projecting reinforcing bars.

R. **Create Construction Joints**

Place construction joints according to the Plans or as directed by the Engineer. If an emergency affects continuous placement, the Engineer will decide if a construction joint is allowed. If allowed, the Engineer will provide instructions about where and how to make the joint.
The Engineer may eliminate certain construction joints if placement, finishing and forming methods can produce satisfactory results.
Create construction joints as follows:
1. Remove mortar splashed on form surfaces and projecting reinforcement steel before concrete reaches its initial set.
   a. Do not puddle dried mortar chips and dust into the plastic concrete.
   b. If excess mortar is not removed from reinforcement steel before the concrete reaches its initial set, delay cleaning until the concrete is thoroughly hardened.
2. If joining fresh concrete and hardened concrete, clean the hardened surface of laitance and incompletely bonded, loose, or foreign material. Ensure that laitance is completely removed from the following:
   • Joints between decks and curbs
   • Tops of seal courses
   • Construction joints in concrete exposed to sea water
3. Ensure that the surface of the concrete is dry before pouring the concrete against it.
4. Immediately before placing fresh concrete, tighten the forms against the existing concrete.
5. Use tremies or pumps to coat areas where fresh concrete will be poured with mortar or cement grout.
6. Begin placing concrete immediately after placing the mortar or grout.
7. Apply enough vibration to blend the material with the concrete at the construction joint.

S. Protect Fresh Concrete
Do not drive pile, blast, or perform other operations that vibrate the formwork or the concrete noticeably before the concrete reaches a strength of 2,000 psi and is 3 days old.
Protect fresh concrete from rainfall with waterproof material such as tarpaulins or plastic film. Ensure that the waterproof material is ready before pouring and is sufficient to cover the area of the pour.

T. Place Bridge Deck Concrete
Do not use calcium chloride or any other admixture containing chloride salts in concrete placed on permanent steel bridge deck forms.
Ensure that the tolerances are accurate for bar reinforcement placement in cast-in-place concrete so the top clearance to the bar reinforcement complies with Subsection 511.3.05.G.6, “Bridge Deck Slab Tolerances.”
Place bridge deck concrete according to the Contract Specifications and as follows:
1. Before pouring decks, set substantial bulkheads or headers and shape them to the required deck surface cross section.
2. Ensure that pouring sequences, procedures, and mixes comply with the Plans and Specifications.
3. Pour the deck according to the numbered sequence as follows:
   a. Unless otherwise shown on the Plans, pour each deck in one continuous operation.
   b. When dividing deck pours within any one complete unit (a simple span or a continuous or cantilever unit), pour and finish the concrete in the numbered sequence shown on the Plans, beginning with the lowest number.
   c. Make pours with the same number before pours with higher numbers. Make pours with the same number in any sequence. The numbered sequence shown on the Plans also applies to sidewalk pours, but it need not apply to curb, parapet, and handrail pours.
   d. Pour diaphragms between steel or prestressed concrete roadway beams at least 24 hours before pouring the deck slab.
e. Unless otherwise authorized by the Engineer, pour all diaphragms within a complete unit before pouring decks.

f. When constructing concrete T-Beams, place girder stems in uniform layers before placing slabs.

g. If T-Beam spans are supported without intermediate false bents, begin deck placement as soon as the first four stems are placed. After the first four stems, avoid getting more than three stems ahead of the advancing line of the deck pour and lagging by more than the space between stems.

h. If T-Beam spans are supported by intermediate false bents, place decks and stems the same as for T-Beam spans supported without intermediate false bents. However, ensure that the slab is placed before a cold joint develops between the stem and slab.

4. Do not make the deck pour until any previously poured concrete in the complete unit has set for 24 hours.

This requirement may be waived under certain conditions if the succeeding pour can be completed (except for final finishing) within four hours of the initial placement of the day. The Engineer must give written approval for this requirement to be waived.

Unless otherwise shown on the Plans, do not place handrail, sidewalks, parapets, and curbs in a complete unit until all the deck slabs in the unit have been poured.

5. Ensure that the pour is the same as the overlap direction (as shown in the shop drawings).

6. Use the following deck pour method:
   a. If there is super-elevation, begin deck pours on either the high or the low side.
   b. Dump each batch against previously placed concrete.
   c. Pour at a rate that ensures fresh concrete along the advancing line of the pour.
   d. Vibrate or tamp concrete dumped on fresh concrete to make the grout flow as follows:
      • Forward with or slightly ahead of the concrete
      • Along the bottoms and sides of the forms
      • Around the reinforcement steel

7. Once the concrete is poured, vibrate it enough to avoid honeycomb and voids, especially at the following locations:
   • Construction joints
   • Expansion joints
   • Valleys and ends of form sheets

Screed the concrete as follows:
   a. Use finishing devices operating parallel to the center line. As pouring proceeds, keep the concrete surface screeded to the required grade.
   b. Fill depressions ahead of the screed and keep a small roll of grout on the leading edge of the screed. Perform further screeding with minimum disturbance to the surface already brought to the grade.
   c. Take care during the placement and screeding to obtain sound concrete at the construction joint located where the slab joins the curb, parapet, or sidewalk.
   d. Do not place excess grout on the leading edge of the screed and do not allow it to remain in this area.
   e. Use either a longitudinal screed or a transverse screed.

   • Longitudinal Screed
     Before doing the final screeding, place enough concrete in front of the screeding position to deflect the dead load.
   • Transverse Screed
On beam or girder-supported spans with skew angles of 65° or less, place and operate the truss or beam supporting the strike-off parallel to the skew and make the advancing pour line parallel to the skew.

On beam or girder-supported spans with skew angles between 65° and 90°, position the screed either on the skew or at right angles to the bridge center line.

On superstructures supported by non-deflecting falsework and on beam- or girder-supported spans with a total dead load deflection no more than 1/2 in., position the screed at right angles to the bridge center line and make the advancing line of pour at right angles to the bridge center line.

f. As the pouring proceeds, keep the concrete surface screeded to the required grade.

g. Fill depressions ahead of the screed. Keep a small roll of grout on the leading edge of the screed.

h. Continue to screed without disturbing the surface already brought to the required grade.

i. Avoid producing unsound concrete where the slab joins the curb, parapet, or sidewalk. Remove excess grout from the leading edge of the screed at these construction joints.

8. Edge joints to be sealed, including dummy joints, as follows:
   a. Edge before the initial set or after the final set.
   b. If edging before the initial set, use edging tools of the proper radius as shown on the Plans.
   c. Carefully remove concrete from pouring operations on adjacent pours to achieve the required rounded edge.
   d. If edging after the final set, allow the joints to harden. After at least 12 hours, grind joints to approximate the plan radius either by hand or by mechanically operated grinding stones.
   e. To achieve full and uniform bearing, finish areas that are recessed for receiving joint members.

9. Finish bridge decks as follows:
   a. As soon as the concrete is hard enough and standing water and moisture sheen disappear, give the concrete a final finish by belting, brooming, or dragging.
      • Belt longitudinally using a wet canvas belt. Limit belting to spans no longer than 40 ft.
      • Drag transversely or longitudinally with a wet burlap drag.
      • Broom transversely using a stiff-bristled broom.
   b. Finish the following areas carefully:
      • Gutter lines
      • Joints
      • Drains
   c. After belting, dragging, or brooming and when shown on the Plans, groove the bridge deck and approach slabs perpendicular to the center line as follows:
      1) Do not begin grooving until the bridge deck is cured according to Subsection 500.3.05.Z, “Cure Concrete.”
      2) If necessary, groove in conjunction with planing required to make the surface corrections specified in Subsection 500.3.06.D, “Bridge Deck Surface Check.” Wait until the concrete is hard enough to support the equipment without distorting.
      3) Cut grooves into the hardened concrete using a mechanical saw device capable of producing grooves 0.125 in. wide, 0.125 in. deep, and 0.50 in. apart, center-to-center.
4) Extend the grooves across the slab to within 1ft. of the gutter lines.

**U. Place Concrete Parapet on Bridge Decks**
Place concrete barrier or parapets on bridge decks. The slip form method with an approved self-propelled extrusion machine as specified in Section 621 is optional.

**V. Place Seal Concrete**
Deposit concrete in water only when required by the Plans or when considered necessary by the Engineer.
When depositing the seal concrete, follow these guidelines:
- Keep the water as motionless as possible.
- Place the concrete continuously from beginning to end.
- Ensure that the concrete surface remains as horizontal as possible.

Place seal concrete as follows:
1. Place seal concrete carefully in a compacted mass as near to its final position as possible using a tremie, a bottom dump bucket, or other approved means.
   a. Use tremies to place seal concrete as follows:
      1) Support tremies so that the discharge end can move freely over the entire top surface of the work.
      2) Support tremies so that they can lower rapidly to stop or retard the flow of concrete.
      3) At the beginning of the work, close the discharge end to keep water out of the tube.
      4) Keep the tube sealed.
      5) Keep the tremie tube full to the bottom of the hopper.
      6) When dumping a batch into the hopper, induce concrete flow by slightly raising the discharge end and keeping it within the previously deposited concrete. This maintains a seal and forces the concrete to flow into position by hydraulic head.
   b. Use bottom-dump buckets to place seal concrete as follows:
      1) Ensure that the bottom-dump bucket is level full.
      2) Open the bucket only when it rests on the surface that will receive the charge.
      3) In lowering and raising the bucket, do not move the water unnecessarily.
   c. When approved by the Engineer, place seal concrete by pumping.
2. Wait at least 24 hours after placement to begin dewatering seal concrete, unless the Engineer determines a longer waiting period is necessary.
3. Remove laitance from the seal concrete before placing the footing.
4. Bore seals under spread footings the entire depth of the seal as specified for foundations in Subsection 211.3.05.C, “Boring of Foundations and Seals.”
5. If laitance buildup on seals under spread footings exceeds 1/4 in/ft of seal depth, the Engineer may decide to core the seal to determine acceptability.
6. When placing concrete exposed to sea water, control the water content to produce concrete of maximum density and create construction joints and prepare their surfaces according to the requirements of Subsection 500.3.05.R, “Create Construction Joints.”

**W. Pour CS Concrete**
Pour CS concrete as follows:
1. Meet CS concrete depth and surface finish requirements.
   - Ensure that the minimum depth is the same as shown on the Plans.
   - Do not vary the depth variation more than 1 in (25 mm).
   - Ensure that the surface finish is generally smooth and uniform.
• Smooth or fill float marks, voids, and other deformities exceeding 1/2 in. before placing approach slabs.

2. To prevent bonding:
   a. Lay clean polyethylene sheeting uniformly over the CS concrete in the approach slab area before placing the slabs.
   b. Use new, unused polyethylene sheeting free of holes, rips, and tears.
   c. Use polyethylene bond-breaking material at least 8 mils thick with an overlap of at least 6 in.

3. Maintain polyethylene sheeting in good condition throughout the construction process. Repair or replace sheeting deemed unsatisfactory as directed by the Engineer.

4. Cure CS concrete with the polyethylene sheeting used for bond breaking.

X. Pour Concrete in Cold Weather

When pouring concrete in cold weather, keep the concrete temperature at the point of delivery at least 50 °F. Do not use accelerator-containing chlorides.

Mix and pour concrete in cold weather as follows:

1. Keep concrete materials at the right temperatures.
   • Do not use materials in concrete mix that contain frozen lumps.
   • Do not incorporate water and aggregates into the mix with temperatures more than 150 °F.
   • If aggregates or water temperatures are above 100 °F, discharge the aggregates and water into the mixer and allow the temperatures to equalize before adding the cement.
   • Heat aggregate with steam, hot water coils, or other methods that do not damage the aggregates. Do not heat aggregates with direct flame.

2. Protect the poured concrete.
   • Keep concrete above 50 °F for at least 72 hours after placement.
   • Protect concrete from freezing for 6 days after placement.

Y. Pour Concrete in Hot Weather

Reduce hazards and difficulties related to placing and finishing concrete in hot weather before pouring. The Engineer may require measures to prevent concrete workability reduction, losses from cement hydration, evaporation, drying, or elevated concrete temperatures.

1. Place Concrete
   Cool forms and reinforcement with water immediately before placing concrete. Meet the minimum placement rates specified in Subsection 500.3.05.P, Table 5—Minimum Placement Rates.

2. Keep Concrete Cool
   Keep concrete cool as follows:
   a. Keep the concrete used for construction at no more than 90 °F when measured at the point of discharge from the delivery unit.
   b. If the concrete temperature might exceed 90 °F during concrete placement, begin placement when the air temperature cools if the Engineer requires.
   c. Cool the aggregates by fogging or other means that do not affect moisture content.
   d. Use chipped or crushed ice in the mix as a portion of the mixing water on a pound basis. If using ice, ensure that the ice melts before the batch is discharged from the mixing unit.
   e. If necessary, cool water by refrigeration to provide a lower concrete temperature.

3. Finish Concrete
Do not “splash on” water to aid screeding or finishing operations. For bridge decks, fog the surface when required, according to Subsection 500.3.05.Z.3, “Bridge Deck Curing.” If needed, use wind screens to prevent thermal or shrinkage cracks caused by rapid concrete surface drying.

Z. Cure Concrete
Concrete curing is an integral part of the concrete placement operation. Improperly cured concrete will be considered defective. If the Engineer determines that curing procedures do not comply with these Specifications, stop placing concrete. Resume concrete placement after taking remedial measures to ensure proper curing.

Begin curing unformed surfaces when the water sheen disappears from the surface or immediately after applying the surface finish. Continue curing for 5 days. Cure the formed surfaces after removing the forms. Remove them within 5 days after placing concrete. Continue curing until the concrete is 5 days old (from the time it is poured). Cure concrete surfaces exposed to air using methods that prevent premature drying or moisture loss. Ensure that curing conditions are the same throughout separate curing areas.

Use either or a combination of the two methods specified for curing concrete except bridge decks. Cure bridge decks as described in Subsection 500.3.05.Z.3, “Bridge Deck Curing.” Cure colored concrete in accordance with manufacturer’s instructions.

1. General Curing—Supplying Additional Moisture
   Do not use a method that causes the concrete to be alternately wet and dry. Cure concrete properly by supplying additional moisture through ponding, sprinkling, or fogging and then retaining the moisture as follows:
   a. Use cotton mats, burlap, sand, hay, or straw coverings.
      Cover with at least 2 in. of sand. Cover with at least 3 in. of hay or straw.
   b. Do not use sawdust or coverings that cause unsightly discoloration of concrete.
   c. Place coverings after completing the finishing operations when there is no danger of surface damage.
   d. Keep coverings moist continuously.
2. General Curing—Preventing Moisture Loss
   Keep concrete moist before and during the rubbing from the Type III—Rubbed Finish. Start curing immediately after the rub using approved waterproof paper, plastic sheets, or membrane-forming curing compounds, except when curing compounds are prohibited.
   a. Waterproof Paper or Plastic Sheets
      Ensure that the sheets and paper meet the requirements of AASHTO M 171 and use them as follows:
      • Use the widest possible widths.
      • Lap adjacent sheets at least 6 in.
      • Seal the laps with tape, mastic, glue, or other approved methods to form a waterproof cover of the entire area.
      • Keep the curing material from being displaced by wind.
      • Immediately replace or repair sheets or paper that tear, break, or become damaged during the curing period.
   b. Membrane-Forming Curing Compounds
Use as the curing agent AASHTO M 148, membrane-forming curing compounds, Type 1-D, Class A or B, or Type 2, Class A or B, white pigmented. Use the curing agent as follows:

- Do not use membrane-forming curing compounds on bridge decks or prestressed concrete bridge members, or in construction joint areas.
- When the water sheen disappears from the concrete surface, apply the curing compound uniformly to unformed areas.
- Apply the compound to formed surfaces if the forms are removed during the 5-day curing period.
- Cure the areas to be rubbed with liquid membrane-forming compounds for curing concrete, Type1-D, Class A or B (non-acrylic).
- Apply curing compound with fine-spraying equipment.
- Thoroughly agitate the compounds just before using them.
- Spray the surface again immediately after the first application at right angles to the first application.

Apply at least 1 gal. for each 150 ft² of surface.

Do not apply curing compound to the following:
- Joints where a concrete bond is required
- Reinforcement steel
- Joints where joint sealer will be placed

Close the surface to pedestrian or vehicular traffic for 7 days unless the surface is protected by planks, plywood, or a layer of sand at least 1 in. thick. Do not place this protection until at least 12 hours after applying the curing compound.

3. Bridge Deck Curing

Cure bridge deck concrete as follows:

a. Immediately after the water sheen disappears and the surface finish is applied, fog the surface to keep a film of water on the surface.

b. If surface damage occurs, delay fogging.

c. Keep the surface wet until after applying the sheet curing covers.

d. Thoroughly soak curing covers on the fabric side.

e. As soon as the concrete sets enough to prevent damage, apply the covers with the white-poly side up.

f. Use two-layer sheet curing material for bridge concrete according to AASHTO M 171. For the bottom layer, use a polyethylene film. For the top layer, use a white, burlap polyethylene sheet or a white, co-polymer-coated, absorbent, non-woven synthetic fabric.

g. Ensure that sheet curing material for bridge concrete meets Specification requirements for reflection and moisture retention and has no holes or tears.

h. Use enough sheet curing material to cover the deck surface.

i. Place the curing covers so that adjoining sheets overlap at least 18 in.

j. Weight all laps and side edges to prevent cover displacement before curing is completed.

k. Weight and overlap covers so the curing sheets maintain intimate contact with the concrete surface.
1. If there is no moisture under the curing covers during the 5-day curing period, apply additional moisture.

4. Parapet, Sidewalk, End Post, and Curb Face Curing
   The surface of parapets, sidewalk, end post, and horizontal and vertical faces of curbs are not considered part of the bridge deck. Cure these structures using the general curing methods in Subsections 500.3.05.Z.1, “General Curing—Supplying Additional Moisture,” and 500.3.05.Z.2, “General Curing—Preventing Moisture Loss,” unless the surfaces will receive a special surface coating (Subsection 500.3.05.AB.4, “Type III—Special Surface Coating Finish”).
   Do not cure surfaces receiving a special surface coating with membrane-forming curing compounds.
   Do not cure surfaces receiving protection surface treatment (75 percent boiled linseed oil and 25 percent mineral spirits solution) with membrane-forming curing compounds that contain acrylics.

AA. Prevent Plastic Shrinkage Cracking
   Take precautions to prevent plastic shrinkage cracking of concrete by doing the following:
   • Provide wind screens
   • Provide fogging equipment
   • Apply temporary wet coverings before moisture loss begins
   The Engineer will evaluate the effects of plastic shrinkage cracks and will require repair of cracks that create structural defects and corrode reinforcement steel.

AB. Finish Concrete
   Concrete surface finishes are classified according to whether the surfaces are formed or unformed. Refer to Table 6.
   When other Sections of the Specifications for concrete work state that the requirements of Section 500 apply, finish the concrete according to the other sections.

<table>
<thead>
<tr>
<th>Surface</th>
<th>Finish Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formed</td>
<td>Type I—Ordinary Formed Surface Finish</td>
</tr>
<tr>
<td></td>
<td>Type II—Special Formed Surface Finish</td>
</tr>
<tr>
<td></td>
<td>Type III—Rubbed Finish</td>
</tr>
<tr>
<td></td>
<td>Type III—Special Surface Coating Finish</td>
</tr>
<tr>
<td>Unformed</td>
<td>Type IV—Floated Surface Finish</td>
</tr>
<tr>
<td></td>
<td>Type V—Sidewalk Finish</td>
</tr>
<tr>
<td></td>
<td>Type VI—Stair Tread Finish</td>
</tr>
</tbody>
</table>

Table 6—Concrete Finish Types

Except for bridge deck finishes, which are covered in Subsection 500.3.05.T, “Place Bridge Deck Concrete,” step 9, finish all structural concrete surfaces with one or more of the finishes described here, unless otherwise shown on the Plans.

1. Type I—Ordinary Formed Surface Finish
   Complete formed concrete surfaces with this finish. However, leave concrete exposed directly to sea water undisturbed unless the Engineer requires additional work. See Subsection 500.3.05.V, “Place Seal Concrete,” step 6.
Achieve a Type I finish as follows:

a. Immediately after removing the forms, remove fins and surface irregularities.

b. Fill or point up the following:
   • Cavities produced by forms or ties
   • Holes
   • Broken corners or edges
   • Defects
   • Honeycombed edges

c. Remove and patch honeycombed areas to sound concrete.

d. Use patch mortar that consists of the same sand and cement as the concrete. Use the sand and cement in the same ratio as in the concrete.
   Use epoxy mortars in areas where heat generation and moisture will not decrease patch performance.

e. Cure the patches using one of the general curing methods specified in Subsection 500.3.05.Z.1, “General Curing—Supplying Additional Moisture” and 500.3.05.Z.2, “General Curing—Preventing Moisture Loss.”

f. Produce a sound and uniform finish.

g. If the Type I finish is not satisfactory, give the surfaces a Type III—Rubbed Finish where the Engineer considers it necessary to achieve a uniform and pleasing appearance.

2. Type II—Special Formed Surface Finish

Give a Type II finish to the following:
   • Exposed portions of pipe headwalls and culverts
   • Parapets and wingwalls
   • Ends of culvert slabs and walls

Achieve a Type II finish as follows:

a. Use a form liner unless the forms are made of plywood or steel.

b. Rub only when necessary if the surface has a pleasing, uniform appearance after completing the Type I finish and blending all pointed and patched areas.

c. If the surface finish is not satisfactory, give surfaces the Type III—Rubbed Finish where the Engineer considers it necessary to achieve a uniform and pleasing appearance.

3. Type III—Rubbed Finish

Apply a Type III finish to bridge areas checked in the table of Bridge areas Requiring a Type III Finish, below and to exposed areas of retaining walls, unless the Plans specify otherwise.

Achieve a rubbed finish as follows:

a. Begin the first rub immediately after removing forms, completing the Type I finish, and ensuring that all patches are thoroughly set, but before applying the required curing compound.

If finishing is postponed or there is not enough labor to keep it up-to-date, the Engineer will order a stop to any other work until the finishing is satisfactory.

b. Rub chamfered surfaces only once, but not during the first rubbing. Rub chamfered surfaces during either the second or the final rubbing.

c. To rub, wet the moist concrete on the curing surface with a brush and rub with a medium-coarse carborundum stone or equal abrasive until a paste comes to the surface.
Keep the entire concrete surface moist during rubbing to assure adequate curing.
d. Continue rubbing until all form marks and projections disappear, leaving a smooth, dense surface with no pits or irregularities.
e. Spread the paste material carefully and uniformly over the entire surface and leave it.
f. No earlier than 24 hours after the first rub, do the final rub with a fine carborundum stone or equal abrasive, leaving a smoothly textured surface that is uniform in color.
g. Finish the final rub before applying protective surface treatment required by the Plans.
h. Do not “whitewash” finished areas by using separately mixed grout or paste on the rubbing stone or by spreading it on the surface to be rubbed.
i. Thoroughly clean and blend into the surrounding surfaces any areas that are disfigured by drips from concrete placement or rubbing.

<table>
<thead>
<tr>
<th>Bridge Areas Requiring a Type III Finish (X)</th>
<th>Single Bridge Over Stream</th>
<th>Multiple Bridges Over Stream</th>
<th>Single Bridge Over Railroad</th>
<th>Multiple Bridges Over Railroad</th>
<th>Single Bridge Over Traffic Artery</th>
<th>Multiple Bridges Over Traffic Artery</th>
<th>Railroad Bridge Over Traffic Artery</th>
<th>Pedestrian Bridge Over Traffic Artery</th>
</tr>
</thead>
<tbody>
<tr>
<td>All exposed substructure areas, except tops and bottoms of caps. (5)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Outside surface of any exterior concrete beam, Lt. or Rt. (1), (2)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside surface of any exterior concrete beam, Lt. and Rt. (1), (3)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vertical surfaces of overhangs, curb, or sidewalk.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All vertical surfaces outside of exterior beam, Lt. or Rt. (2)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All vertical surfaces outside of exterior beam, Lt. or Rt. (3)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End bent cap beyond outside beam or girder.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End bent end walls beyond outside beam or girder.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>End posts and end bent wingwalls all exposed surfaces.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic face of curbs.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire handrails and posts, hand rail parapet, and barriers. (4), (5)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All other locations specified on Special Provisions.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

(1) — Including Prestressed Concrete Bridge Members.
(2) — "Lt. or Rt." — Rub the applicable surface when it can be seen from any adjoining bridge.
(3) — "Lt. and Rt." — Rub the applicable surfaces on both sides of centerline of each bridge.
(4) — Rubbing of bottom surface of rail not required.
(5) — Bottoms of caps and handrails shall be given a Type II finish.

For bridges using PSC Beams or PSC Deck Units, a Type III Special Surface Coating Finish shall be used where a Type III finish is required for exterior beams. The Type III Special Surface Coating Finish shall also be used on the exterior vertical faces of the parapet, barrier, and overhangs where PSC Beams or PSC Deck Units are used.

4. Type III — Special Surface Coating Finish

A Type III — Special Surface Coating Finish may be substituted for a Type III — Rubbed Finish.
The special surface coating finish consists of either a Class A or a Class B coating system, applied to produce a masonry-like textured finish on concrete surfaces. For contiguous structures, whether in the same Contract or in separate Contracts, use the same brand of special surface coating. If contiguous structures are in separate contracts, coordinate the Work with the other Contractor so that coating is applied as near as possible to the same time. If contractors cannot coordinate Work, the one who finishes the work last shall use the same brand or shall recoat all contiguous areas to provide a uniform appearance. Achieve a special surface coating finish as follows:

a. Ensure that surface coating material meets the requirements of Section 836. Select coating material from the QPL 17.

b. Do not use form oils that affect the bonding of surface coatings.

c. Do not use wax-based or other curing compounds incompatible with surface coatings. Have the coating manufacturer or the laboratory determine compatibility.

d. Use the coating color required in Section 836.

e. On surfaces that will receive a coating finish, do not cure with membrane-curing compound or remove forms with bond-breaking agents or excessive oil.

f. Apply coatings as follows:

   - Class A coatings at a rate that develops a 1/16 in (1.5 mm) thick coating.
   - Apply Class B coatings at a maximum rate of 60 ft² per gallon (1.5 m² per liter).
   - Ensure that the temperatures of the air, concrete, and compound are above 50 °F (10 °C).
   - Apply a test section as directed by the Engineer to determine the acceptance of a coating under field conditions.
   - Apply the coatings using a method that produces an acceptable finish, such as spraying, rolling, or a combination of these.

g. Protect coated surfaces from rain or freezing temperatures for 24 hours after application.

h. Ensure that the final coating produces a smoothly textured surface that is uniform in color, thickness, and appearance.

i. Remove and reapply coatings that chip, crack, blister, peel, or present an unsatisfactory appearance.

j. If the final appearance is unsatisfactory, apply a rubbed finish to slip-formed and formed walls and barriers.

5. Type IV—Floated Surface Finish

Use a Type IV finish only on the horizontal surfaces of the following:

- Curbs and sidewalks
- Tops of caps and footings
- Surface of slope paving
- Other similar structures

Apply the Type IV finish as follows:

a. After compacting the surface and screeding to the correct cross sections, float the surface with a wood float.

b. While floating the surface, bring enough mortar to the surface to achieve the desired finish, but do not reduce the wearing quality of the surface.
c. Make the final finish with a wood float or stiff-bristle broom.
d. If brooming, make the marks transverse to the traffic.

6. Type V—Sidewalk Finish
   Apply a Type V finish as follows:
a. After placing and compacting the concrete, strike it off and give it a Type IV finish.
b. Use an edging tool on all edges and along expansion joints unless the Plans require chamfers.
c. Mark off sidewalk surfaces in blocks with suitable grooving tools when required by the Plans or the Engineer.
d. Extend the rubbed finish on the traffic face of the curb to include the horizontal area of sidewalk between the curb corner and the longitudinal sidewalk groove.

7. Type VI—Stair Tread Finish
   Achieve a Type IV finish using a stiff-bristled broom.

AC. Remove Forms
Do not remove forms and their supports, including falsework, until the Engineer approves. Use a removal method approved by the Engineer. Approval does not relieve responsibility for the safety of the Work.

1. Form Removal Time
   Use a removal time shown on the Plans or specified by the Engineer.
   Use Table 7 to help establish when forms can be removed safely. However, do not count days where the temperature at any time during the day is at or below 40 °F, unless the cold weather concrete protective measures described in Subsection 500.1.03.G, “Cold Weather Concrete Curing and Protection Plan” were used.

<table>
<thead>
<tr>
<th>Form</th>
<th>Time Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom of beams</td>
<td>10 days</td>
</tr>
<tr>
<td>Bottom of caps, trestle pile bents</td>
<td>4 days</td>
</tr>
<tr>
<td>Bottom of all other caps</td>
<td>7 days</td>
</tr>
<tr>
<td>Overhangs and slabs, including culverts</td>
<td>7 days</td>
</tr>
<tr>
<td>Columns and retaining walls</td>
<td>18 to 48 hours</td>
</tr>
<tr>
<td>Sides of beams, posts, rails, caps, footings, wingwalls, and parapets</td>
<td>12 to 24 hours</td>
</tr>
<tr>
<td>Bottoms of cast-in-place rails and diaphragms</td>
<td>48 hours</td>
</tr>
<tr>
<td>Front face of curbs</td>
<td>3 hours</td>
</tr>
</tbody>
</table>

If using high-early strength concrete, the Engineer may reduce the time limitations if the concrete develops satisfactory strengths.

2. Form Removal Method
   Remove forms and falsework without injuring the concrete surface or overstressing the concrete members.
   Ensure that the stress from the weight of the removal process is transferred gradually and uniformly to the concrete.
   At the Contractor’s request, time of removal may be controlled by field tests on cylinders, subject to the following conditions:
a. No tests will be performed until concrete is a least 3 days old.
b. Required strengths will be shown on the Plans, as noted elsewhere in these Specifications, or as determined by the Engineer.
c. The Engineer may specify a minimum time in conjunction with minimum strength requirements.
d. Falsework and forms for culverts may be removed at such time as 75% of the concrete design strength is achieved.

AD. Apply Protective Surface Treatment

When the Plans specify a protective surface treatment, apply a boiled linseed oil mixture of 75 percent boiled linseed oil and 25 percent mineral spirits by volume to the concrete surfaces. Use linseed oil that meets the requirements of ASTM D 260, Type I or Type II. Use a quality commercial mineral spirit that passes infrared spectroscopic analysis to the satisfaction of the laboratory.

Unless otherwise noted on the Plans or the manufacturer’s recommendations, apply the mixture as a preservative seal coat to the top surfaces of bridge decks, curbs, and sidewalks and to the inside vertical faces of curbs, parapets, and end posts. Protect metal handrailing and metal handrail posts from treatment.

Apply the protective surface treatment as follows:

**CAUTION:** Because the linseed oil-petroleum spirits mixture has a low flash point and is readily flammable, protect the mixture from fire, especially cigarettes and sparks. Prohibit traffic from the treated area until the Engineer determines the concrete has regained its dry appearance.

1. Do not place the protective surface treatment until concrete work, including final rubbing, is completed and expansion joint sealing compound is placed.
2. Do not apply the treatment until the concrete is at least 14 days old.
3. Unless otherwise permitted by the Engineer, apply the treatment when the temperature of the concrete and air is at least 50 °F.
4. Apply in time to allow the treatment to dry thoroughly before allowing traffic, including haul traffic, on the structure.
   
   If the structure meets the following exceptions, apply the treatment after using the structure for hauling.
   
   - Temperature limitations prohibit application.
     
     The Engineer will send a written notification to the Contractor (or Bridge Contractor) if temperature requirements prohibit application.
   
   - The structure is absolutely required for hauling to complete a Contract.
     
     Request a written approval from the Engineer if hauling across a structure before the treatment is placed.

5. If applying the treatment after using the structure for hauling, thoroughly clean the surfaces to be treated to allow the treatment to penetrate completely.
6. If there are separate bridge and roadway Contracts, have the roadway Contractor clean the surfaces immediately upon request by the Engineer.
7. Prepare the surface for the treatment as follows:
   
   a. Clean off oil, grime, and loose particles that prevent the mixture from penetrating.
   
   b. Ensure that the concrete surfaces have at least 48 hours to dry after rainfall or wet cleaning operations.
c. Immediately before applying the treatment, direct an air blast over the surfaces to remove dust.
d. Mask the exposed plates of joints.

8. Apply the mixture by hand or by spraying in one application at the rate of 1 gal of mixture per 37.5 yd².
a. Thoroughly clean the inside of spraying equipment before putting the surface treatment in.
b. Keep spray nozzles within 18 in. of the concrete unless otherwise directed by the Engineer, Plans, or manufacturer.

AE. Apply Graffiti-Proof Coating
When the Plans specify a graffiti-proof coating, apply the coating system to concrete surfaces or over special surface coatings. Use material that complies with Section 838.

Apply the coating as follows:
1. Clean loose particles, dirt, grease, oil, and other foreign particles off the surface.
2. Apply the coating according to the manufacturer’s recommendations for:
   • Weather conditions
   • Material preparation
   • Coating application
   • Number of coats

AF. Expose New Concrete to Loads
Prohibit dead or live loads during or after construction except as described in this section. If using high early strength concrete, the Engineer may reduce time limitations if the concrete develops adequate strength.

1. Dead Loads on the Substructure
   After pouring footings, do not begin work on columns or piers for at least 12 hours.
   After pouring columns, do not begin cap construction for at least 24 hours.
   Do not place beams on caps or place falsework and forming for concrete T-Beam construction before the cap concrete reaches a minimum strength of 2,500 psi.

2. Dead Loads on the Superstructure
   If necessary, stockpile construction materials on decks within a complete unit (a simple span or continuous or cantilever unit) if the following conditions exist:
   • The deck concrete of the complete unit reaches its 28-day cylinder strength.
   • The deck concrete is at least 10 days old.
   • The curbs are at least 5 days old.
   The Engineer must approve the location, height, and spread of the loads.
   On composite-design bridges (those that have prestressed concrete beams or steel beams with shear connectors), do not pour curbs, parapets, or sidewalks until the deck concrete reaches a minimum strength of 1,500 psi or is at least 3 days old.

3. Dead Loads on Concrete Box Culverts
   Do not backfill any section of a concrete box culvert until the last concrete placed in that section is at least 14 days old, unless early cylinder breaks indicate otherwise.
   If early cylinder breaks indicate that design strength has been achieved, backfill sections of culverts when the concrete placed last is at least 7 days old.

4. Live Loads—Pouring Equipment
   Do not allow power-operated concrete buggies to cross a deck until the concrete reaches a minimum strength of
1,500 psi or is at least 3 days old.
Allow hand-operated buggies to cross after the concrete is 24 hours old.

5. Live Loads—Mixing and Lifting Equipment
Do not place mixers on a deck in a complete unit (a simple span or continuous or cantilever unit) until the deck concrete of the complete unit reaches its 28-day cylinder strength and is at least 10 days old.
When deck concrete reaches its 28-day cylinder strength and is at least 10 days old, allow mixer trucks on the unit during the curb concrete pour only if the pour is completed within 45 minutes of being started.
Do not allow any equipment on the unit for 5 days after curb pours.
The Engineer may allow concrete placement procedures that use heavy lifting equipment on the decks if the following conditions exist:
• The deck concrete reaches its 28-day cylinder strength.
• The deck concrete is at least 14 days old.
• The curbs on the deck are at least 10 days old.

6. Live Loads—Hauling over Bridges
Use a new bridge for hauling only if no other practical haul routes are available and only if the Engineer permits it.
a. Govern hauling by the restrictions and requirements listed in Table 8. If any of the restrictions and requirements are violated, the Engineer will limit loads to the following:
• Single 32,000 lb axle when the bridge design loading is HS 20-44 and/or Military Loading
• Single 24,000 lb axle when the bridge design loading is HS 15-44 or H 15-44

Table 8—Weight Limits for Hauling on New Bridges

<table>
<thead>
<tr>
<th>Axle Criteria</th>
<th>Bridge Design Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HS 20-44 and/or Military Loading</td>
</tr>
<tr>
<td>Maximum Axle Load Per Axle</td>
<td>60,000 lbs</td>
</tr>
<tr>
<td>Maximum Axle Load on Dual</td>
<td>45,000 lbs</td>
</tr>
<tr>
<td>Axles Per Axle</td>
<td></td>
</tr>
<tr>
<td>Maximum Total Load</td>
<td>100,000 lbs</td>
</tr>
</tbody>
</table>

b. Ensure that bridge concrete, including curbs, parapets, barriers and sidewalks, is at least 14 days old and has a minimum compressive strength of 3,000 psi.
c. Apply the linseed oil special protective treatment, if required see (Subsection 500.3.05.AD, “Apply Protective Surface Treatment”).
d. After applying the protective treatment (if required), apply water-repellent silicone materials to the handrail, handrail posts, end posts, and curb faces before hauling begins.
e. Do not allow more than one vehicle at a time on a simple or multiple-span unit.
f. Ensure that vehicle speeds, loaded or unloaded, do not exceed 5 miles/hr when the following loads occur:
• Bridges designed for HS 20-44 and/or Military Loading:
  — Loads on single axles exceed 32,000 lbs
— Loads on each dual axle exceed 24,000 lbs
• Bridges designed for HS 15-44 or H 15-44 loading:
  — Loads on single axles exceed 24,000 lbs
  — Loads on each dual axle exceed 16,000 lbs
When axle loads do not exceed these loads, ensure that vehicle speeds are 15 mph or less.

g. Place temporary guides on beams so wheels will track directly.
h. Keep earth approaches smooth and level with the bridge floor or approach slab to minimize impact.
   Stabilize sandy and other unstable soils (at no expense to Barrow County) with crushed stone or other suitable material for at least 10 ft. from the end of the bridge or approach slab.
i. Protect the ends of bridges or approach slabs with a timber strip at least 4 in. wide, cut to rest on either the paving rest of the bridge end or the pavement subgrade at the end of the approach slab. Keep the strip in place for protection during incidental hauling. Remove it before constructing the adjacent pavement. Keep the top of each timber strip flush with the top of the concrete surface. Fit the strip tightly against the end of the bridge or approach slab. If the timber strip is displaced, stop hauling until the strip is reset or replaced.
j. Clean spills off the bridge floor.

AG. Complete Corrective Work
After Barrow County gives the deck surface a Ride Quality Test described in Subsection 500.3.06.E, “Ride Quality Test,” complete corrective work at no cost to Barrow County and before doing the final surface texturing.
Complete corrective work as follows:
1. Plane the deck according to Section 431.
2. Limit concrete removal by planing so that the final bar cover is not less than the Plan cover minus 1/2 in.
3. If the final bar cover limits cannot be met, perform the corrective work as directed by the Engineer.
4. Ensure that the final riding surface complies with this Specification and the requirements for a grooved finish.
5. If necessary, use a bump grinder to correct bumps with a profile base line of 5 ft. or less.
6. Have planed decks retested as described in Subsection 500.3.06.E, “Ride Quality Test,” to ensure that the ride quality meets the requirements of this Specification.

AH. Plane the Deck
Schedule the ride quality test at least 5 days before needed by contacting Barrow County. Ensure that the area to be tested is clean and clear of obstructions.
When possible, delay expansion joint installation and temporarily bridge the joint to operate Lightweight Profiler and planning equipment across the joint.
Planning responsibilities are shown in Table 9:

<table>
<thead>
<tr>
<th>Area Planed</th>
<th>Person Responsible</th>
</tr>
</thead>
</table>

Table 9—Planning Responsibilities
AI. Perform Retaining Wall Incidentals
Retaining wall incidentals are as follows:
1. Drainage
   Unless otherwise shown on the Plans or in the Special Provisions, ensure that drainage for retaining walls is either Alternate A or Alternate B on Georgia Standards 4948 and 9031-L. Ensure that the Number 10 concrete sand complies with Subsection 801.2.02, “Fine Aggregate for Portland cement Concrete of All Types and for Mortar” and has a permeability coefficient of at least 100 ft. per day. The Engineer may waive the grading requirement for Number 10 concrete sand if the permeability coefficient of the material does not exceed 500 ft. per day. Omit the drainage blanket and stone for retaining walls only when the height does not exceed 6 ft. When the Plans specify different drainage details, furnish, place, or build the various items according to the Plan requirements.
2. Waterproofing and Dampproofing
   When waterproofing and dampproofing are specified in the Plans, comply with the requirements of Sections 530 and 531.

AJ. Place Utility Installation Hardware
When the Plans require placing utility installation hardware, the utility company involved will furnish the items. Place the items as directed on the Plans or Shop Drawings. All other work, including painting as required, is the utility company’s responsibility.

AK. Widen Bases and Pavement
When using narrow sections of Portland cement concrete to widen existing bases or bases and pavements, use Class B concrete as shown on the Plans or as directed by the Engineer.

AL. Open the Structure to Traffic
Open a structure to traffic other than haul traffic after all concrete in the decks, parapets, or curbs (sidewalks) reaches its 28-day cylinder strength and is at least 14 days old.

500.3.06 Quality Acceptance
A. Strength Requirement Tests
When job site test specimens fail to meet the strength requirements in the Table 1—Concrete Mix Table, determine the Final Acceptance or rejection of concrete in place by coring or non-destructive testing. At the Contractor’s request, Barrow County will determine the removal time for forms by conducting field tests on cylinders. Tests are subject to the following:
1. Tests will be performed when the concrete is at least three days old.
2. The Plans will show the required strengths.
3. At the Contractor’s request, the Engineer may specify a minimum time with minimum strength requirements.

B. Honeycombed Area Check
If there are honeycombed areas that extend beyond the reinforcement steel, the Engineer may reject the entire pour with the honeycombed area.

C. Bridge Deck Slab Concrete Inspection
The Engineer will carefully observe the construction methods used during all phases of the bridge deck slab construction.
These phases include the following:
- Metal form installation
- Reinforcement location and fastening
- Concrete item composition
- Mixing procedures
- Concrete placement and vibration
- Bridge deck finishing
Provide the needed facilities for the Engineer to safely and conveniently inspect the concrete.
The concrete inspection procedure is as follows:
1. After the deck concrete has been in place for at least two days, the Engineer will sound a hammer on at least two areas of the deck for each slab pour. This test checks for concrete soundness and form bonding.
   The two areas will encompass at least 10 percent of the total area of the deck pour.
2. The Engineer will sound other areas of the deck randomly.
3. If the Engineer doubts the soundness of an area, or if the Engineer decides that the concrete placement procedures used call for an inspection of the underside of the deck, remove at least one section of the forms for each span in the Contract.
4. Remove the form section after the pour is strong enough and when the Engineer desires to provide visual evidence that the concrete mix and the placement procedures are acceptable.
5. Remove another form section if the Engineer decides changes in the concrete mix or in the placement procedures warrant additional inspection.
6. Where form sections are removed, do not necessarily replace the forms, but repair the adjacent metal forms and supports neatly and securely.
7. When the form is removed, the Engineer will examine the concrete surfaces for cavities, honeycombing, and other defects.
8. If the Engineer finds irregularities but determines that the irregularities do not justify rejection of the Work, repair the concrete as the Engineer directs and give it an ordinary surface finish according to the Contract Specifications.
9. If the concrete where the form is removed is not acceptable, remove additional forms as necessary to inspect and repair the slab.
10. Modify the construction methods as required by the Engineer to create satisfactory slab concrete.
11. Remove or repair all unsatisfactory concrete as the Engineer directs.
    If the construction methods used and the inspection results indicate that the slabs have sound concrete, the Engineer may moderate the amount of random sounding and form removal after a substantial amount of slab has been constructed and inspected.

D. Bridge Deck Surface Check
After the final strike-off of the concrete and as close behind the final strike-off as possible, the Engineer will check the surface with a 10 ft. straightedge.
Attach the straightedge to a broom-type handle for easy control and use.
Bridges and approach slabs must meet a 1/8 inch in 10 ft. straightedge check made longitudinally and transversely.

**E. Ride Quality Test**

After the bridge decks and approach slabs are completed, Barrow County will perform a Ride Quality Test using the Lightweight Profiler and a profile index value determined according to GDT 134.

Barrow County will conduct the test as follows:

1. **Obtain Profile Index Values for bridge decks and approach slabs for:**
   - State roads with four lanes or more
   - State roads with 2 lanes where the current traffic count is 2,000 vehicles per day or higher
   - Other roads designated on the Plans
   
   Bridges and approach slabs must meet the straightedge check limits described in Subsection 500.3.06.D, “Bridge Deck Surface Check.”

2. **Obtain profiles in the wheel paths and in safety areas to within 6 ft. of barrier or curb lines.**

3. **Average the profile index values for bridge decks including the approach slabs for the left and right wheel path for each lane.**
   - The average value must not exceed 15 in/mile for each lane.
   - After the test is complete, correct individual bumps or depressions that exceed 2/10 in. from the blanking band on the profiler trace.
   
   The deck surface must then meet a 1/8 inch in 10 ft. straightedge check made transversely.
   
   Correct bridge decks and approach slabs that do not pass the Ride Quality Test as described in Subsection 500.3.05.AG, “Complete Corrective Work.”

**500.3.07 Contractor Warranty and Maintenance**

General Provisions 101 through 150.

**500.4 Measurement**

This work is measured for payment either per cubic yard (meter), per Lump Sum, or per linear foot, whichever is shown on the Plans.

- **Seal Concrete.** The quantity of seal concrete to be measured for payment is calculated using the horizontal seal dimensions specified on the Plans.

- **Grooving.** Grooving on bridge decks and approach slabs, completed acceptably according to Subsection 500.3.05.T, “Place Bridge Deck Concrete,” step 9.c, will be measured and paid for by the square yard. Payment is full compensation for furnishing the necessary equipment and performing the Work.

- **Class B Concrete.** Class B concrete used for base and pavement widening will be measured and paid for by the cubic yard complete in place and accepted.

**500.4.01 Limits**

**A. Measurement for Separate Payment**

There will be no separate measurement and payment for the following:

1. **On permanent steel bridge deck forms for concrete deck slabs:**
   - Extra reinforcing
   - Extra concrete
   - Other costs incurred because of the requirements of this Specification
All costs are included in the Lump Sum prices bid for superstructure concrete and superstructure reinforcement.

**B. Payment per Cubic Yard**

Measurement limits on payment per cubic yard are:

1. **Bridges, Concrete Culverts, Headwalls, and Retaining Walls**
   - The quantity of concrete measured for payment is the algebraic summation of the Base Pay Quantity and authorized quantity changes.
   - If additional quantities are necessary because of any of the following, these quantities are measured separately for payment:
     - Rocks were removed carefully but additional quantities are needed because footing depth and keyway dimension are irregular from unanticipated rock removal.
     - Voids or crevices exist within the spread footing area.
     - The Engineer authorized filling trenches cut in rock outside footing areas to ease dewatering.
   - These additional quantities will be paid as filler concrete per cubic yard.

2. **Seals**
   - When the Plans do not require a seal but a seal becomes necessary, or when the Plans do not show seal dimensions, the maximum pay dimensions in each direction will be the Plan dimension of the structural footing plus 3 ft., with 18 in. on each side.
   - If the Contractor uses lesser dimensions, measurement is based on the lesser dimensions.
   - Concrete placed beyond the maximum pay limits are not measured.

**C. Payment per Lump Sum**

For Lump Sum payment, determine the quantities required before submitting the bid.

The concrete quantity must conform to the Plan dimensions. Measurement is made as a unit, complete in place, and includes the following:

- Diaphragms
- Sidewalks
- Concrete parapets

Measurement does not include concrete in the following items that will be paid for separately:

- Concrete handrailings
- Barriers
- Prestressed bridge members.

Payments for parapets placed by slip-form method is included in the Lump Sum price bid for superstructure concrete.

Unless otherwise shown on the Plans, the cost of steel joints and metal bearing assemblies used in structures where there is no structural steel Pay Item are included in the Contract Price for superstructure concrete.

**D. Retaining Wall Incidentals**

Retaining wall incidentals will be measured for payment as follows:

1. **Drainage Systems**
   - Drainage items required by Special Plans are measured for payment by the unit specified on the Plans only when they are set up as specific Pay Items and are paid for separately.
   - Otherwise, their costs are included in the Contract Price for concrete.
   - Payment is full compensation for the costs of excavation and backfill necessary to place the drainage items required by Special Plans.
The following are not measured for separate payment. Costs are included in the Contract Price for concrete.
- Sand blankets
- Crushed or broken stone
- Weep holes

2. Miscellaneous
   The following are not measured for separate payment. Costs are included in the Contract Price for concrete.
   - Expansion material
   - Rubber or polyvinyl plastic water stops

E. Utility Installation Hardware
   The cost of placing utility hardware items is included in the Contract Price for the class of concrete the items are placed in.

500.5 Payment
This Work will be paid for at the Contract Price per cubic yard, per Lump Sum, or per linear foot, each complete in place and accepted.
Payment is full compensation for all things, including incidentals, and direct and indirect costs, to complete the Work.
Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Superstructure concrete class_____ Bridge no.______</td>
<td>Per lump sum</td>
</tr>
<tr>
<td>500</td>
<td>Concrete handrailing (designation)</td>
<td>Per linear foot</td>
</tr>
<tr>
<td>500</td>
<td>Class_____concrete</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Class_____concrete, high-early strength</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Seal concrete</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Class B concrete base or pavement widening</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Class_____concrete including reinforcement steel</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Class A concrete—filler</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Class_____concrete—retaining wall</td>
<td>Per cubic yard</td>
</tr>
<tr>
<td>500</td>
<td>Grooved concrete</td>
<td>Per square yard</td>
</tr>
<tr>
<td>500</td>
<td>Concrete barrier</td>
<td>Per linear foot</td>
</tr>
</tbody>
</table>

500.5.01 Adjustments
A. Contractor Costs
   Assume the following costs:
   1. Costs related to rejected concrete and removing rejected concrete
   2. Costs of forming an approved construction joint, removing a partial pour, or completing other remedial measures requested by the Engineer unless the fault lies solely with Barrow County
   3. Costs of repairing, removing, and replacing falsework as directed by the Engineer
   4. Costs of repairing, removing, or replacing forms
   5. Costs of air-blown mortar to repair honeycombed areas, if required by the Engineer
   6. Costs of using a higher class of concrete to widen existing bases or bases and pavements
B. Ride Quality Testing
Barrow County will conduct ride quality testing of bridge decks and approach slabs only twice per bridge at no cost to the Contractor.
Barrow County will conduct additional ride quality testing at the Contractor’s expense.

C. Plastic Shrinkage Crack Repair
The Engineer will determine how to repair cracks caused by plastic shrinking. Repair cracks at no cost to Barrow County.

D. Plan Quantities
For all bridges (except seal concrete), concrete culverts, headwalls, and retaining walls, the quantities shown on the Contract Plans, including Standard Plans, will be considered the Base Pay Quantity.
For seal concrete, the Plan quantities are approximate and are for estimating purposes only. The quantities will not be considered as Base Pay Quantities.
Calculated additions or deductions will be applied to the Base Pay Quantity when the Engineer makes authorized changes. Changes include, but are not limited to, authorized changes in the following:
- Footing dimensions
- Lengthening or shortening of concrete culverts
- Correcting Plan Quantities
- Dimension errors
- Multi-barrel culvert wall thicknesses
- Lengthening or shortening bridge columns
- Raising or lowering foundations

Calculations of the Base Pay Quantity and any changes will be made as follows:
1. No deductions will be made for the volume of concrete used by scorings, panels, and chamfers if the individual areas are less than 1 in².
The volume of concrete in fillets of the same area will be neglected.
2. The volume of structural steel and of steel and concrete piling encased in concrete will be deducted.
3. The volume of timber piling encased in concrete will be deducted on the basis of 0.8 ft³/linear foot of pile.
4. No deduction will be made for the volume of concrete displaced by the following:
   - Steel reinforcement
   - Shear connectors
   - Floor drains (unless they are paid for as separate Pay Items)
   - Incidental such as expansion material
   - Joint sealing compound
   - Utility thimbles and hangers

E. Filler Concrete
Filler concrete, measured as described in Subsection 500.4.01.B.1, “Bridges, Concrete Culverts, Headwalls, and Retaining Walls,” will be paid at 40 percent of the Contract Price per cubic meter for Class A Concrete or Class AA Concrete.

F. Seal Concrete
If there is no Contract Price for seal concrete, payment will be per cubic yard, measured as described in Subsection 500.4.01.B.2, “Seals,” and will be paid at 60 percent of the Contract Price per cubic yard for Class A concrete.
G. Lump Sum Payment Adjustments

Adjust the payment as follows:

1. Authorized Change Adjustments
   When authorized changes are made as described in Subsection 500.5.01.D, “Plan Quantities,” the lump sum payment may be adjusted on a pro rata basis or according to Section 104 and as determined by the Engineer.
   The Plans show tabulated quantities as a service. This does not relieve any responsibility to conform to Plan details.

2. Optional Plan Feature Adjustments
   If exercising an optional Plan feature, the Base Pay Quantity will not be changed if it is the only quantity change involved.
   However, if other changes are necessary, the quantity change resulting from the optional feature will be considered in the necessary quantity adjustments.

3. Falsework for Post-Tensioned Box Girder Bridge Adjustments
   When the falsework is completed for post-tensioned box girder bridges, 20 percent of the Lump Sum superstructure concrete price will be paid.
   Additional payments made as the concrete is placed must be adjusted for the payment for falsework. In other words, payment for concrete placed will be based on 80 percent of the superstructure bid price.

4. When Metal Deck Forms are used and have been placed, payment in the amount of 5% of the Lump Sum Superstructure Concrete price will be made. For Post-Tensioned Box Girder Bridges, this percentage (5%) will apply to that part of the superstructure concrete in the top slab of the box only.
Section 550—Storm Drain Pipe, Pipe-Arch Culverts, and Side Drain Pipe

550.1 General Description
This work includes furnishing and installing the following:
- Storm drain pipe
- Pipe-arch and elliptical culverts
- Side drain pipe flared end sections
- Tapered pipe inlets
Install structures according to the Specifications and the details shown on the Plans, or as directed by the Engineer.

550.1.01 Definitions
Side Drain – All driveway pipe (commercial, non-commercial, residential, utility, farm, logging, and mining).
General Provisions 101 through 150.

550.1.02 Related References
A. Standard Specifications
- Section 205—Roadway Excavation
- Section 207—Excavation and Backfill for Minor Structures
- Section 208—Embankments
- Section 645—Repair of Galvanized Coatings
- Section 815—Graded Aggregate
- Section 834—Masonry Materials
- Section 840—Corrugated Aluminum Alloy Pipe
- Section 841—Iron Pipe
- Section 843—Concrete Pipe
- Section 844—Steel Pipe
- Section 845—Smooth Lined Corrugated High Density Polyethylene (HDPE) Culvert Pipe
- Section 846—Polyvinyl chloride (PVC) Drain Pipe
- Section 847—Miscellaneous Pipe
- Section 848—Pipe Appurtenances

B. Referenced Documents
- General Provisions 101 through 150.
- GDOT Manual on Drainage Design for Highways
- Ga. Std. 1030D
- Ga. Std. 1030P
- GDT 136

550.1.03 Submittals
General Provisions 101 through 150.

550.2 Materials
Ensure materials meet the requirements of the following Specifications:
<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backfill Materials</td>
<td>207</td>
</tr>
<tr>
<td>Graded Aggregate</td>
<td>815</td>
</tr>
<tr>
<td>Reinforced Concrete Pipe</td>
<td>843.2.01</td>
</tr>
<tr>
<td>Nonreinforced Concrete Pipe</td>
<td>843.2.02</td>
</tr>
<tr>
<td>Mortar And Grout</td>
<td>834.2.03</td>
</tr>
<tr>
<td>Bituminous Plastic Cement</td>
<td>848.2.05</td>
</tr>
<tr>
<td>Rubber Type Gasket Joints (Concrete Pipe)</td>
<td>848.2.01</td>
</tr>
<tr>
<td>Preformed Plastic Gaskets</td>
<td>848.2.06</td>
</tr>
<tr>
<td>Corrugated Steel Pipe</td>
<td>844.2.01</td>
</tr>
<tr>
<td>Bituminous Coated Corrugated Steel Pipe</td>
<td>844.2.02</td>
</tr>
<tr>
<td>Corrugated Aluminum Alloy Pipe</td>
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<tr>
<td>Bituminous Coated Corrugated Aluminum Pipe</td>
<td>840.2.03</td>
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<tr>
<td>Aluminized Type 2 Corrugated Steel Pipe</td>
<td>844.2.06</td>
</tr>
<tr>
<td>Ductile Iron Pipe, Fittings and Joints</td>
<td>841</td>
</tr>
<tr>
<td>Precoated, Galvanized Steel Culverts</td>
<td>844.2.05</td>
</tr>
<tr>
<td>Smooth Lined Corrugated High Density (HDPE) Polyethylene Culvert Pipe</td>
<td>845.2.01</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC) Profile Wall Drain Pipe</td>
<td>846</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC) Corrugated Smooth Interior Drain Pipe</td>
<td>846</td>
</tr>
<tr>
<td>Miscellaneous Pipe</td>
<td>847</td>
</tr>
</tbody>
</table>

Use any of the following types of pipe:
- Reinforced concrete
- Nonreinforced concrete
- Corrugated steel or Aluminum
- Smooth-lined corrugated high density polyethylene (HDPE)
- Ductile iron
- Polyvinyl Chloride (PVC) Profile Wall Drain Pipe
- Polyvinyl Chloride (PVC) Corrugated Smooth Interior Drain Pipe

Use the type of pipe designated on the Plans, or acceptable alternate types when applicable. For a display of acceptable alternate pipe types see Selection Guideline for Culvert, Slope and Underdrain Pipe in Chapter 10 – Material Selection of the Georgia Department of Transportation’s Manual on Drainage Design for Highways. This document summarizes general applications for pipe.

For concrete, corrugated steel and aluminum pipes see Ga. Std. 1030D for minimum thicknesses, minimum cover, maximum fill, allowable pipe diameters and trench construction detail.

For HDPE and PVC pipes see Ga. Std. 1030P for minimum cover, maximum fill, allowable pipe diameters and trench construction details.

550.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.
550.3 Construction Requirements

550.3.01 Personnel
General Provisions 101 through 150.

550.3.02 Equipment
General Provisions 101 through 150.

550.3.03 Preparation and Backfill
Before installing pipe, shape the foundation material as shown on the Plans. Prepare structure excavations and foundation according to Section 207. Except, use the following backfill material requirements for HDPE and PVC pipe.
1. For cross drain applications use graded aggregate material meeting Subsection 815.2.01.
2. For longitudinal and side drain applications use Class II B2 soil or better per Subsection 810.2.01, if Class II B2 or better is not available use material conforming to Subsection 550.3.03.1.

550.3.04 Fabrication
General Provisions 101 through 150.

550.3.05 Construction
A. Drainage
Provide necessary temporary drainage. Periodically remove any debris or silt constricting the pipe flow to maintain drainage throughout the life of the Contract.

B. Damage
Protect the structure by providing sufficient depth and width of compacted backfill before allowing construction over a culvert. Repair damage or displacement from traffic or erosion occurring after installing and backfilling at no additional cost to Barrow County.

C. Installation
Check vertical and horizontal alignment of the pipe culvert or storm drain pipe barrel by sighting along the crown, invert and sides of the pipe, and by checking for sagging, faulting and invert heaving. Repair any issues involving incorrect horizontal and/or vertical alignment before backfilling pipe.
1. Concrete Pipe
   Lay sections in a prepared trench with the socket ends pointing upstream. Join section using either rubber gasket or preformed flexible sealant, installed according to the manufacturer’s recommendations.
2. Ductile Iron Pipe
   Lay pipe sections in a prepared trench, with bells pointing upstream. Construct joints according to Subsection 841.2.02.A.
3. Corrugated Aluminum or Steel Pipe and Pipe-Arches
   Lay pipe sections in a prepared trench, with outside laps of circumferential joints pointing upstream and longitudinal joints at the sides. Join the sections with coupling bands, fastened by two or more bolts. Before backfilling the structure:
   a. Repair exposed base metal in metal coating according to Section 645.
b. Recoat exposed base metal in bituminous coating with asphalt.

4. Smooth-Lined Corrugated HDPE Pipe
   Install smooth-lined corrugated HDPE pipe according to ASTM D 2321. Use fitting and couplings that comply with the joint performance criteria of AASHTO Standard Specifications for Highway Bridges, Division II. Ensure all joints are “silt tight” as stated in the AASHTO bridge specifications.

5. Specials (Wyes, Tees, and Bends)
   Install wyes, tees, and bends as shown on the Plans or as directed.

6. Tapered Pipe Inlets
   Locate and install tapered pipe inlet end sections as shown on the Plans or as directed.

7. Elongation
   Elongate metal pipe as shown on the Plans. Order the elongation of the vertical axis of the pipe to be done in the shop.
   Ensure the manufacturer ship metal pipe with wire ties in the pipe ends. Remove wire-ties immediately after completing the fill.

8. Flared End Sections
   Use flared end sections on the inlet, outlet, or on both ends of storm drain pipe, according to Plan details.

9. PVC Drain Pipe
   Install polyvinyl chloride (PVC) drain pipe according to ASTM D 2321. Use fittings and couplings complying with the joint performance criteria of AASHTO Standard Specifications for Highway Bridges, Division II. Ensure all joints are “silt tight” as stated in the AASHTO bridge specifications.

550.3.06 Quality Acceptance

A. Post Installation Inspection
   Inspect 100% of pipe under the roadbed, 100% of pipe in a closed drainage system and a minimum of 10.0 % of all other locations except in side drain application which are short enough to inspect from each end of the pipe. Conduct post installation inspections in accordance with the requirements of this Specification and GDT 136.
   Before post installation inspection, dewater installed pipe (if necessary) and provide the Engineer with a post installation inspection schedule. Notify the Engineer at least seven days in advance of beginning inspection. Perform post installation inspections once compacted backfill has reached a depth of 8 feet or after completion of the pipe installation and final cover, which includes the embankment and all non-asphalt bases and/or subgrades. Notify the Engineer of problems found during the inspection. The Engineer will determine if corrective action is necessary.
   Perform post installation inspection with the use of low barrel distortion video equipment with laser profile technology, non-contact video micrometer and associated software. Video and laser profiling and measurement technology must be certified by the company performing the work to meet the requirements of GDT 136. Inspection contractor personnel completing remote inspections shall be NASSCO – PACP Certified Technicians.
   For video recorded, laser profiled pipe indicating deflection is in excess of Specification requirements, the Contractor may elect to further test the pipe with the use of a mandrel. Ensure mandrel meets requirements of GDT 136 and the Engineer has approved before use. Pull the mandrel by hand.
Manual post installation inspection allowed for pipe diameters greater than 48 inches per Subsection 550.3.06.B. Re-inspect 100% of pipe remediation locations or where replacement was required.

**B. Manual Post Installation Inspections**
Perform a manual inspection by entering the pipe structure to record video and to make measurements. For all pipe structures considered a confined space, provide entry for all project inspection personnel according to OSHA requirements. Furnish a video recording of each inspection. On the recording, identify the date and time of the inspection, a description of the pipe structure, location, and viewing direction. Record the entire run of pipe. Provide a light source which allows observation of all areas of concern on the video recording. Furnish the video recording in a digital, reproducible format on one of the following media types: DVD or CD.

Measure the deflection of the pipe using either a metal or fabric tape and read to the nearest 0.5 inch. Measure crack width using either a crack comparator or a feeler gage capable of measuring 0.01 inch. Measure joint gaps using a tape or ruler and read to the nearest 0.5 inch. Other measuring devices may be used if approved by the Engineer.

Record the measurements and include them in the inspection report. Measure and record the following:
1. The location, length and greatest width of each crack.
2. Smallest inside diameter three times for each pipe section in the run. Take the first measurement vertically from the crown to invert (12 o’clock to 6 o’clock positions). Take the second measurement by rotating 60 degrees from vertical (2 o’clock to 8 o’clock positions). Take the third measurement by rotating 120 degrees from vertical (4 o’clock to 10 o’clock positions). For all measurements, stretch tape to full extent across inside of pipe.
3. Widest gap at each joint in the run.

Record the location and describe other defects not listed above. For each measurement location in a pipe, record the length from the nearest drainage structure.

**C. Inspection Report**
Submit inspection report to the Engineer after completion of the required post installation inspection. Ensure inspection report meets the requirements of this Specification and GDT 136.

**D. Requirements for Concrete Pipe:**
1. Joints: Note differential movement, cracks, spalling, improper gasket placement, movement or settlement of pipe sections, and leakage in the inspection report. Repair or replace pipe sections to the satisfaction of the Engineer where joint separation is greater than one inch. Repair or replace pipe sections where soil migration through the joint is occurring.
2. Longitudinal and Transverse Cracks: Cracks with a width less than 0.01 inch are considered hairline and minor and only need to be noted in the inspection report, no corrective action is necessary. When cracks are wider than 0.01 inch and extend for a length of 12 inch or more, regardless of position in the wall of the pipe, measure the width, length, and locations of the cracks and diameter of the pipe, both horizontally and vertically, use remediation methods in accordance with recommendations of the pipe manufacturer and submit to the Engineer for review and approval an evaluation utilizing a
Professional Engineer that takes into consideration structural integrity, environmental conditions, and the design service life of the pipe.
Seal by a method approved by the Engineer cracks having widths equal to or greater than 0.01 inch that extend for a length of 12 inch or more and determined to be detrimental. Remediate or replace pipe with cracks widths greater than 0.1 inch and determined by the Engineer to be beyond satisfactory structural repair. Repair or replace pipes having displacement across the crack.

E. Requirements for Smooth-Lined Corrugated HDPE & PVC Drain Pipe
1. **Joints:** Remediate pipe showing evidence of crushing at the joints. Note differential movement, improper joint sealing, movement or settlement of pipe sections, and leakage in the inspection report. Remediate joint separation of greater than 1 inch. Repair or replace pipe sections where soil migration through the joint is occurring.
2. **Cracks:** Remediate cracks or splits in the interior wall of the pipe. Use remediation methods in accordance with recommendations of the pipe manufacturer and accepted and authorized by the Engineer.
3. **Buckling, bulging, and racking:** Note in the inspection report flat spots or dents at the crown, sides or flowline of the pipe due to racking. Note areas of wall buckling and bulging in the inspection report. The Engineer will determine if corrective action is necessary.
4. **Deflection:** Where pipe deflection exceeds 5% of the nominal diameter, submit to the Engineer for review and approval an evaluation utilizing a Professional Engineer taking into consideration the severity of the deflection, structural integrity, environmental conditions, and the design service life of the pipe. Remediate or replace pipe where the evaluation finds the deflection could be problematic or where pipe deflection exceeds 7.5% of the nominal diameter.

F. Requirements for Corrugated Aluminum or Coated Steel Pipe
1. **Joints:** Remediate pipe showing evidence of crushing at the joints. Note differential movement, improper joint sealing, movement or settlement of pipe sections, and leakage in the inspection report. Remediate joint separation of greater than 1 inch. Repair or replace pipe sections where soil migration through the joint is occurring.
2. **Cracks:** Remediate cracks or splits in the interior wall of the pipe. Use remediation methods in accordance with recommendations of the pipe manufacturer and accepted and authorized by the Engineer.
3. **Buckling, bulging, and racking:** Note flat spots or dents at the crown, sides or flowline of the pipe due to racking in the inspection report. Note areas of wall buckling and bulging in the inspection report. The Engineer will determine if an additional evaluation by a Professional Engineer is required. Remediate or replace pipe where the evaluation finds the damaged section could be problematic.
4. **Deflection:** Where pipe deflection exceeds 5% of the nominal diameter, submit to the Engineer for review and approval an evaluation utilizing a Professional Engineer that takes into consideration the severity of the deflection, structural integrity, environmental conditions, and the design service life of the pipe. Remediate or replace pipe where the evaluation finds the deflection could be problematic or where pipe deflection exceeds 7.5% of the nominal diameter.
5. **Coating:** Note areas of the pipe where the original coating has been scratched, scoured or peeled in the inspection report. The Engineer will determine if repair is necessary. Use
remediation methods in accordance with recommendations of the pipe manufacturer and accepted and authorized by the Engineer.

550.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

550.4 Measurement
A. Excavation and Backfill
Backfill materials types II and III are measured according to Subsection 207.4, “Measurement.”

B. Flat Bottom and Circular Pipe (All Types)
The overall length of pipe installed, excluding tapered inlets, is measured in linear feet, along the central axis of the diameter of the pipe. Wyes, tees, and bends are included in this measurement.

C. Pipe-Arches
The overall length of pipe-arch installed is measured in linear feet, along the bottom center line of the pipe.

D. Multiple Installations
In multiple installations, each single line of culvert structure is measured separately.

E. Tapered Pipe Inlets
Tapered pipe inlet sections are measured as a unit; do not include them in the overall length of the pipe.

F. Flared-End Sections
Flared-end sections are measured separately by the unit and not included in the overall pipe length.

G. Smooth-Flow Pipe
Smooth-flow pipe is measured by the linear foot along the pipe invert.

H. Elliptical Pipe
Elliptical pipe is measured in linear feet along the bottom center line of the pipe.

I. Post Installation Inspection
No measurement will be made for post installation inspection.

550.4.01 Limits
Excavation and normal backfill are not measured for payment.

550.5 Payment
A. Backfill
There will be no separate payment for backfill material. Barrow County shall furnish G.A.B. backfill material for HDPE storm drain pipe bedding.

B. Pipe Installations
Pipe installations complete in place and accepted will be paid for at the Contract Price for each item.
This payment is full compensation for excavating, furnishing, and hauling materials; installing, cutting pipe where necessary; repairing or replacing damaged sections; post
installation inspection, making necessary connections; strutting, elongating, providing temporary drainage; joining an extension to an existing structure where required; and removing, disposing of, or using excavated material as directed by the Engineer.

1. Smooth Flow Pipe
   The quantity of each diameter and steel thickness of smooth flow pipe as measured will be paid for at the Contract Unit Price per linear foot bid for the various sizes. Payment is full compensation for furnishing labor, materials, tools, O-ring mechanical joints, equipment, and incidentals to complete this Item, including removing and disposing excavation material.

2. Flared-End Sections
   Flared-end sections, measured as specified above, will be paid for at the Contract Unit Price for each section of the specified size.
   Payment will also include sawing, removing, and replacing existing pavement removed to install a new drainage structure.

C. Post Installation Inspection
   No separate payment will be made for this work. Include the cost in the bid submitted for this pay item.
   Payment for this item is made as follows:
   One hundred percent of the Contract Price bid per linear foot is paid when the pipe is installed per the specifications including the required material documentation. The Contract Price is paid before post installation inspection.

   Payment will be made under:

| Item No. 550 | Storm drain pipe ___ in., H=___ | Per linear foot |
| Item No. 550 | Side drain pipe ___ in., H=___ | Per linear foot |
| Item No. 550 | Pipe arch (span) ____in. x (rise) ____in. | Per linear foot |
| Item No. 550 | Tapered pipe inlet ____ in., | Per each |
| Item No. 550 | Flared-end section ____ in., | Per each |
| Item No. 550 | Elliptical pipe ___ in. wide x ___ in. high | Per linear foot |

550.01 Adjustments
Excavation will not be paid for separately, but the other provisions of Section 205 and Section 208 shall govern.
Section 603—Rip Rap

603.1 General Description
This work includes placing protective coverings of sand-cement bag rip rap or stone rip rap. When required, this work includes placing crushed stone filter material or plastic filter fabric beneath stone rip rap on:
- Fill slopes
- Cut slopes
- End rolls
- Shoulders
- Ditches
- Stream banks
- Channel banks
- Other locations

603.1.01 Definitions
General Provisions 101 through 150.

603.1.02 Related References
A. Standard Specifications
   Section 800—Coarse Aggregate
   Section 801—Fine Aggregate
   Section 805—Rip Rap and Curbing Stone
   Section 815—Graded Aggregate
   Section 830—Portland Cement
   Section 832—Curing Agents
   Section 880—Water
   Section 881—Fabrics
B. Referenced Documents
   AASHTO T 134
   QPL 28

603.1.03 Submittals
General Provisions 101 through 150.

603.2 Materials
Ensure that the materials meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland cement</td>
<td>830.2.01</td>
</tr>
<tr>
<td>Rip Rap (Stone)</td>
<td>805.2.01</td>
</tr>
<tr>
<td>Membrane Curing Compound</td>
<td>832.2.03</td>
</tr>
<tr>
<td>Stone Filter Blanket</td>
<td>815.2.01 or 800.2.01 (Size No. 467*)</td>
</tr>
<tr>
<td>Fine Aggregate for Sand Cement Rip Rap</td>
<td>801.2.03</td>
</tr>
</tbody>
</table>
A. Bags for Sand-Cement Bag Rip Rap
   Use cotton, burlap, or fiber reinforced paper bags that can contain the sand-cement mixture without leaking during handling and placing. Do not use bags that previously held sugar or other material that will adversely affect the sand-cement mixture. Ensure that the capacity is at least 0.75 ft³ but not greater than 2 ft³.

B. Stone Dumped Rip Rap
   Stone dumped rip rap is designated on the Plans as Type 1 or Type 3 as defined in Subsection 805.2.01.

603.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

603.3 Construction Requirements

603.3.01 Personnel
General Provisions 101 through 150.

603.3.02 Equipment
General Provisions 101 through 150.

603.3.03 Preparation
General Provisions 101 through 150.

603.3.04 Fabrication
General Provisions 101 through 150.

603.3.05 Construction
Construct this Work according to the following requirements:

A. Preparing the Foundations
   Prepare the ground surface where the rip rap will be placed to conform with the correct lines and grades before beginning the placement.
   1. When filling depressions, compact the new material with hand or mechanical tampers. Dispose of excess material by spreading it neatly within the right-of-way as an incidental part of the work.
   2. Unless otherwise shown or provided below, begin placing the rip rap in a toe ditch constructed in original ground around the toe of the fill or the cut slope. Ensure that the toe ditch is 2 ft deep in original ground and the side next to the fill or cut has the same slope.
   3. After placing the rip rap, backfill the toe ditch and spread the excess dirt neatly within the right-of-way as an incidental part of the work.
4. When beginning rip rap in water or below normal water level, substitute an apron of rip rap for the toe ditch. Ensure that the width and thickness of this apron is as shown on the Plans or determined by the Engineer.

B. Placing Stone Rip Rap

Place rip rap to the limits shown on the Plans or as directed by the Engineer. Place and classify rip rap as follows:

1. Stone Plain Rip Rap
   Dump and handle stone plain rip rap into place to form a compact layer to the design thickness. Ensure that the thickness tolerance for the course is plus 12 in. with no under-tolerance. If the Plans do not show a thickness, place stone rip rap to at least 12 in. thick, but no greater than 2 ft thick.

2. Stone Dumped Rip Rap
   Dump stone dumped rip rap into place to form a uniform surface as thick as specified in the Plans.
   a. Ensure that the thickness tolerance for the course is minus 6 in. and plus 12 in. If the Plans or Proposal do not specify a thickness, place the course to at least 2 ft thick.
   b. Recycled concrete that meets the requirements of Subsection 805.2.01 may be used instead of stone when shown on the Plans or approved by the Engineer.

   **NOTE: Do not use recycled concrete in aesthetically sensitive areas.**

3. Stone Grouted Rip Rap
   Place stone grouted rip rap according to specifications for stone plain rip rap and these guidelines:
   a. Prevent earth from filling the spaces between the stones.
   b. After placing the stone, fill the spaces between them with 1:3 grout composed of Portland cement and sand mixed thoroughly with enough water to make a thick, creamy consistency.
   c. Place the grout beginning at the toe. Finish it by sweeping with a stiff bristle broom.
   d. After grouting, cover the rip rap and keep it wet for 5 days, or cover and keep wet for 24 hours and then coat with white pigmented membrane curing compound.

C. Placing Filter

Place woven plastic filter fabric under all rip rap. Follow these requirements for placing the filter fabric:

1. Prepare the surface to receive the fabric until it is smooth and free from obstructions, depressions, and debris.
2. Place the fabric with the long dimension running up the slope. Minimize the number of overlaps.
3. Place the strips to provide a width of at least 1 ft of overlap for each joint.
4. Anchor the filter fabric in place with securing pins of the type recommended by the fabric manufacturer. Place the pins on or within 3 in. of the centerline of the overlap.
5. Place the fabric so that the upstream strip will overlap the downstream strip.
6. Loosely place the fabric to prevent stretching and tearing during stone placement. Do not drop the stones more than 3 ft during construction.
7. Always protect the fabric during construction from clogging due to clay, silts, chemicals, or other contaminants.

8. Remove contaminated fabric or fabric damaged during installation or rip rap placement. Replace with uncontaminated or undamaged fabric at no expense to Barrow County.

D. Placing Sand-Cement Bag Rip Rap

Place rip rap to the limits shown on the Plans or as directed by the Engineer.

1. Proportioning Materials
   - Mix sand and Portland cement at the maximum ratio of 5:1 by weight.
   - Obtain a minimum compressive strength of 500 psi in 7 days.
   - For sand-cement bag rip rap, use enough water to make up the optimum moisture content of the aggregate and cement as determined by AASHTO T 134.
   - When sand-cement rip rap is to be prebagged, mix the sand cement dry. After placing each course, wet the bags until the bags are wet enough for proper cement hydration.

2. Placement
   - Before placing sand-cement bag rip rap, fill the bags full, but allow room to tie the bags.
   - Place the bagged rip rap by hand with the tied ends facing the same direction. Produce close, broken joints.
   - Place header courses when directed by the Engineer or required by the Plans.
   - After placing the bags, ram or pack them against one another to produce the required thickness and form a consolidated mass.
   - Do not allow the top of each bag to vary more than 3 in. above or below the required plane.

E. Placing Stone Blanket Protection

Ensure that the stone blanket protection meets the materials Specifications for stone filter blanket as specified in Subsection 603.2, “Materials,” except stone size No. 357 will be allowed instead of size No. 467.

Place stone blanket protection to the limits shown on the Plans, or as directed by the Engineer. Uniformly place this material to the thickness shown on the Plans and to a thickness tolerance of 0.5 in.

Do not use stone blanket protection on slopes steeper than two horizontal to one vertical or in areas highly susceptible to erosion. Do not use plastic filter fabrics with stone blanket protection.

603.3.06 Quality Acceptance

General Provisions 101 through 150.

603.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

603.4 Measurement

This work is measured for payment in square yards of accepted material of the specified thickness. Area measurements are made parallel to the surface on which the material is placed. Plastic filter fabric will be measured as the area of rip rap placed and accepted. No separate measurement will be made for fabric overlap joints, seams, or vertical sections at toe of slopes. No separate measurement is made for grout or cushioning sand.

Plan dimensions are figured by the use of filled bags 12 by 18 by 6 in. thick.
When filled bags are less than Plan dimensions or are of varying lengths or width, Plan square yards will be used to determine pay quantities, if overall dimensions are equal to or greater than those shown on the Plans.

**603.4.01 Limits**
General Provisions 101 through 150.

**603.5 Payment**
This work will be paid for at the Contract Price per square yard of material complete in place.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>603</td>
<td>Stone plain rip rap, ____ in. thick</td>
<td>Per square yard</td>
</tr>
<tr>
<td>603</td>
<td>Stone dumped rip rap (type), ____ in. thick</td>
<td>Per square yard</td>
</tr>
<tr>
<td>603</td>
<td>Stone grouted rip rap, ____ in. thick</td>
<td>Per square yard</td>
</tr>
<tr>
<td>603</td>
<td>Filter blanket</td>
<td>Per square yard</td>
</tr>
<tr>
<td>603</td>
<td>Sand-cement bag rip rap, ____ in. thick</td>
<td>Per square yard</td>
</tr>
<tr>
<td>603</td>
<td>Stone blanket protection, ____ in.</td>
<td>Per square yard</td>
</tr>
<tr>
<td>603</td>
<td>Plastic filter fabric</td>
<td>Per square yard</td>
</tr>
</tbody>
</table>

**603.5.01 Adjustments**
General Provisions 101 through 150.
Section 668—Miscellaneous Drainage Structures

668.1 General Description
This work includes constructing catch basins, drop inlets, manholes, junction boxes, spring boxes, drain inlets, special inlets with safety grates, and vertical tee sections. Construct according to these Specifications and the lines and grades shown on the Plans, or as established by the Engineer.

668.1.01 Definitions
General Provisions 101 through 150.

668.1.02 Related References
A. Standard Specifications
   Section 207—Excavation and Backfill for Minor Structures
   Section 500—Concrete Structures
   Section 607—Rubble Masonry
   Section 608—Brick Masonry
   Section 801—Fine Aggregate
   Section 830—Portland Cement
   Section 834—Masonry Materials
   Section 843—Concrete Pipe
   Section 853—Reinforcement and Tensioning Steel
   Section 854—Castings and Forgings
   Section 866—Precast Concrete Catch Basin, Drop Inlet, and Manhole Units
B. Referenced Documents
   General Provisions 101 through 150.

668.1.03 Submittals
   General Provisions 101 through 150.

668.2 Materials
The structures in this section may be constructed of brick, cast-in-place concrete, or pre-cast concrete, unless the Plans or Proposal specifies a specific type of construction. Use rubble masonry only when specified on the Plans. Ensure that materials meet the following specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class “A” or “B” Concrete</td>
<td>500</td>
</tr>
<tr>
<td>Sand for Bedding Material</td>
<td>801.2.01</td>
</tr>
<tr>
<td>Fine Aggregate for Mortar</td>
<td>801.2.02</td>
</tr>
<tr>
<td>Portland Cement</td>
<td>830.2.01</td>
</tr>
<tr>
<td>Brick</td>
<td>834</td>
</tr>
<tr>
<td>Masonry Stone</td>
<td>834</td>
</tr>
<tr>
<td>Mortar and Grout</td>
<td>834</td>
</tr>
<tr>
<td>Nonreinforced Concrete Pipe</td>
<td>843</td>
</tr>
<tr>
<td>Steel Bars for Reinforcement</td>
<td>853.2.01</td>
</tr>
</tbody>
</table>
Ensure that the materials for fabricating special inlets and their safety grates are according to Plan details.
Construct the following manholes and drainage structures from pre-cast or cast-in-place concrete:
Structures within the backfill limits of mechanically stabilized embankment retaining walls
Structures within 5 ft of the wall foundation’s front.

**668.2.01 Delivery, Storage, and Handling**
General Provisions 101 through 150.

**668.3 Construction Requirements**

**668.3.01 Personnel**
General Provisions 101 through 150.

**668.3.02 Equipment**
General Provisions 101 through 150.

**668.3.03 Preparation**
General Provisions 101 through 150.

**668.3.04 Fabrication**
General Provisions 101 through 150.

**668.3.05 Construction**

**A. Excavation and Backfill**
Excavate and prepare foundations for the structures included in this section; place pipe through the structures according to Section 207.

**B. Concrete**
Concrete units may be either poured-in-place or precast. Construct units as follows:
1. Poured-in-Place Units
   The throat or other nonreinforced portions of catch basins may be Class B concrete. Use Class A concrete for the top slab. Construct units according to Section 500.
2. Pre-Cast Reinforced Concrete Units
   Construct pre-cast reinforced concrete units as follows:
   a. Holes for Pipe
      Cast each unit with the number and dimensions of pipe holes necessary to incorporate the unit into the drainage system according to Plan details.
      Installation conditions may require additional pipe for which no holes have been cast. If so, make the holes and repair or replace, to the Engineer’s satisfaction, pipe damaged during the process.
b. **Pipe Connections**
   Use mortar or Class A concrete to connect pipe to units.

c. **Installation of Pre-cast Concrete**
   1) Pre-cast Reinforced Units: Set these units to within 1/2 in of grade on a bed of compacted sand 2 in to 3 in thick.
   2) Sectional Precast Reinforced Units: When using these units to build-up extra-depth catch basins or drop inlets, fill the joints between sections with mortar and wipe smooth.

C. **Brick Masonry**
Construct brick masonry structures according to Section 608.

D. **Mortar Rubble Masonry**
Construct rubble masonry structures according to Section 607.

E. **Castings**
Hold frame castings securely in place to proper line and grade. Make castings an integral part of the complete structure.
After completion, ensure that castings subject to traffic use are firm and stable under traffic.

F. **Maintenance**
Thoroughly clean fallen masonry, silt, debris, and other foreign matter from structures.

G. **Safety Grates**
Fabricate safety grates according to Plan details.

H. **Sanitary Sewer Manholes**
Ensure that sanitary and combination sanitary and storm sewer manholes conform to the following requirements and the related Specifications.
1. **Form Invert Channels**
   Shape invert channels to the lines and grades shown on the Plans, or as established by the Engineer. Ensure that channel surfaces are smooth.
   Form invert channels by one of the following methods:
   Directly form the invert channel in the concrete base of the manhole.
   Construct the invert channel of brick and mortar.
   Lay half-round tile in the concrete base of the manhole.
   Lay round sewer pipe through the manhole and cut out the top half of the pipe after the concrete base has set. Do not use this method if the Plans provide for an offset drop in the invert.

2. **Plaster Outside Walls**
   Plaster outside walls as follows:
   a. Saturate the outside wall of each brick manhole with water.
   b. Plaster the wall smooth with a mortar coat at least 1/2 in thick. Manufacture the mortar according to Section 834 with the following exceptions:
      Manufacture the mortar with one part cement to two parts mortar sand.
      Do not add hydrated lime.

3. **Connections to Manholes**
   Complete manhole connections to the Engineer’s satisfaction and as follows:
   a. Carefully connect existing sewer lines to new manholes to prevent infiltration of foreign substances.
   b. Construct manholes in or adjacent to existing sewer lines according to Section 660 to maintain continuous sewage flow in existing lines.
668.3.06 Quality Acceptance
General Provisions 101 through 150.

668.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.

668.4 Measurement
Catch basins, drop inlets, manholes, junction boxes, drain inlets, special inlets, and safety grates, complete in place and accepted, are measured for payment according to the following:

A. Catch Basins and Drop Inlets
   Each catch basin or drop inlet is grouped for measurement as follows:
   Group 1: Structures connected to pipe 36 in or less in diameter, regardless of the pipe skew
   Group 2: Structures connected to pipe over 36 in diameter regardless of the pipe skew
   Catch basins or drop inlets, complete in place and accepted, are measured by the unit.
   In addition, each catch basin or drop inlet deeper than 6 ft is measured for additional payment.
   The extra depth is measured in linear feet.

B. Manholes
   Manholes are measured for payment as follows:
   1. Sanitary and Storm Sewer Manholes
      Sanitary sewer manholes and storm sewer manholes are measured separately and divided into two types:
      Type 1: Structures connected to pipe 42 in or less in diameter regardless of the pipe skew
      Type 2: Structures connected to pipe 48 in to 84 in diameter regardless of the pipe skew
      Each manhole is measured by the unit.
   2. Manhole Additional Depth
      In addition to Types 1 and 2 above, each Manhole deeper than 6 ft is measured for additional payment, termed “manhole additional depth.” This additional depth is measured in linear feet and does not include the upper 6 ft. Manhole additional depth is classed as follows:
      Manhole Additional Depth, Class 1: Applies to each manhole deeper than 6 ft, but not deeper than 10 ft. Class 1 payment is for the manhole depth between 6 ft and 10 ft.
      Manhole Additional Depth, Class 2: Applies to each manhole deeper than 10 ft, but not deeper than 20 ft. Class 2 payment is for the manhole depth between 6 ft and 20 ft.
      Manhole Additional Depth, Class 3: Applies to each manhole deeper than 20 ft, but not deeper than 30 ft. Class 3 payment is for the manhole depth between 6 ft and 30 ft.
      Manhole Additional Depth, Class 4: Applies to each manhole deeper than 30 ft, but not deeper than 45 ft. Class 4 payment is the manhole depth between 6 ft and 45 ft.
      Manhole additional depth is measured for payment at the class that includes the greatest depth below the original 6 ft.
      For example, a manhole 32 ft deep would be measured and paid for as follows:
      Storm (or sanitary) sewer manhole, type____ Per each
      Storm (or sanitary) sewer manhole, type____, additional Depth Class 4 26 linear feet

C. Junction Boxes, Spring Boxes, and Drain Inlets
   Junction boxes, spring boxes, and drain inlets are measured by the unit.
   1. Each junction box will be complete according to Plan details.
2. Each drain inlet will consist of a pipe elbow or tee, concrete collar, and casting of the required diameter.
3. Each spring box will be complete according to Plan details.

D. Safety Grates
Safety grates fabricated and installed according to Plan details are measured by the square foot, computed from the overall surface dimensions of each grate.

E. Special Inlets for Safety Grates
Special inlets, complete in place, are measured for payment in cubic yards according to Section 500.

F. Vertical Tee Sections (or Saddles)
Vertical tee sections are not measured for separate payment.

668.4.01 Limits
General Provisions 101 through 150.

668.5 Payment
Payment for the various structures under this Section will be made as follows:

A. Catch Basins and Drop Inlets
Catch basins or drop inlets will be paid for at the Contract Price per each. Depth in excess of 6 ft will be paid for at the Contract Price per linear foot.
Payment is full compensation for the following:
• Furnishing castings
• Making pipe connections regardless of skew
• Providing materials, making forms, and disposing of surplus material

B. Manholes
Sanitary sewer and storm sewer manholes, complete in place, will be paid for at the Contract Price per each. Manhole additional depth of the appropriate class will be paid for at the Contract Price per linear foot.
Payment is full compensation for the following:
• Furnishing castings, fittings, and other appurtenances called for on the Plans to complete the Item
• Making pipe connections regardless of skew
• Making pipe connections regardless of skew
• Providing materials, making forms, and disposing of surplus material

NOTE: No additional payment will be made for connecting manholes to existing or new sewer lines. Include costs related to connections in the Contract Price for the structure.

C. Junction Boxes, Spring Boxes, and Drain Inlets
Junction boxes, spring boxes, or drain inlets will be paid for at the Contract Price per each. Payment is full compensation for the following:
• Furnishing castings, fittings, and other appurtenances called for on the Plans to complete the Item
• Making pipe connections regardless of skew
• Providing materials, making forms, and disposing of surplus material

D. Pipe
Pipe entering or exiting catch basins, drop inlets, manholes, junction boxes, spring boxes, or drain inlets, will be paid for under the section of the Specifications governing the pipe.

**E. Sand Bedding Material for Precast Structures**
No separate payment will be made for this material. Its cost is included in the Contract Price for the structure under which it is used.

**F. Excavation and Normal Backfill**
No separate payment will be made for excavation and normal backfill. Their cost is included in the Contract Price for the structure being excavated.

**G. Safety Grates**
Safety grates will be paid for at the Contract Price per square foot.

**H. Inlets for Safety Grates**
Inlets for safety grates will be paid for at the Contract Price per cubic yard of Class “A” concrete, including reinforcing steel.

**I. Vertical Tee Sections (or Saddles)**
Vertical tee sections will be included in payment for the section of structure they are incorporated in.
No separate payment will be made for excavation, backfill, and disposal of surplus material.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>668</td>
<td>Catch basin, group_____</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Catch basin, group_____ additional depth</td>
<td>Per linear foot</td>
</tr>
<tr>
<td>668</td>
<td>Drop inlet, group_____</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Drop inlet, group_____ additional depth</td>
<td>Per linear foot</td>
</tr>
<tr>
<td>668</td>
<td>Sanitary sewer manhole, type_____</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Sanitary sewer manhole, type_____, additional depth class_____</td>
<td>Per linear foot</td>
</tr>
<tr>
<td>668</td>
<td>Storm sewer manhole, type_____</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Storm sewer manhole, type_____, additional depth class_____</td>
<td>Per linear foot</td>
</tr>
<tr>
<td>668</td>
<td>Junction box</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Spring box</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Drain inlet, __ in</td>
<td>Per each</td>
</tr>
<tr>
<td>668</td>
<td>Safety grate, type_____</td>
<td>Per square foot</td>
</tr>
<tr>
<td>500</td>
<td>Class A concrete, including bar reinforcing steel</td>
<td>Per cubic yard</td>
</tr>
</tbody>
</table>

**668.5.01 Adjustments**
General Provisions 101 through 150.
Section 700—Grassing

700.1 General Description
This work includes preparing the ground, furnishing, planting, seeding, fertilizing, sodding, and mulching disturbed areas within the Right-of-Way limits and easement areas adjacent to the right-of-way as shown on the Plans except as designated by the Engineer to remain natural.

700.1.01 Definitions
General Provisions 101 through 150.

700.1.02 Related References
A. Standard Specifications
   - Section 160—Reclamation of Material Pits and Waste Areas
   - Section 163—Miscellaneous Erosion Control Items
   - Section 718—Wood Fiber
   - Section 822—Emulsified Asphalt
   - Section 882—Lime
   - Section 890—Seed and Sod
   - Section 891—Fertilizers
   - Section 893—Miscellaneous Planting Materials
   - Section 895—Polyacrylamide

B. Referenced Documents
   - QPL 33
   - QPL 84

700.1.03 Submittals
Submit manufacturer’s product expiration date along with written instructions to ensure proper application, safety, storage, and handling of Polyacrylamide products used in The Work.

700.2 Materials
Use materials that meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Fiber Mulch</td>
<td>718.2</td>
</tr>
<tr>
<td>Agricultural Lime</td>
<td>882.2.01</td>
</tr>
<tr>
<td>Seed</td>
<td>890.2.01</td>
</tr>
<tr>
<td>Sod</td>
<td>890.2.02</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>891.2.01</td>
</tr>
<tr>
<td>Plant Topsoil</td>
<td>893.2.01</td>
</tr>
<tr>
<td>Mulch</td>
<td>893.2.02</td>
</tr>
</tbody>
</table>
Inoculants | 893.2.04
Tackifiers | QPL 33
Anionic Polyacrylamide | QPL 84 & Section 895

* Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition

A. Seeds
Whenever seeds are specified by their common names, use the strains indicated by their botanical names.

B. Water
Obtain the water for grassing from an approved source. Use water free of harmful chemicals, acids, alkalies, and other substances that may harm plant growth or emit odors. Do not use salt or brackish water.

C. Agricultural Lime
Agricultural lime rates will be based on a laboratory soil test report. The Contractor is responsible for ensuring the tests are performed by an approved laboratory. Provide a copy of test results to the Engineer. Refer to Section 882 Lime and GSP 18 of the Sampling and Testing Inspection manual for additional information on rates, use, handling and sampling procedures.

D. Fertilizer Mixed Grade
Fertilizer analysis and rates will be based on a laboratory soil test report. The Contractor is responsible for ensuring the tests are performed by an approved laboratory. Provide a copy of test results to the Engineer. Refer to Section 891 Fertilizer and GSP 18 of the Sampling and Testing Inspection manual for additional information on rates, use, handling and sampling procedures.

E. Mulch
Use straw or hay mulch according to Subsection 700.3.05.G.
Use wood fiber mulch in hydroseeding according to Subsection 700.3.05.F.1.

700.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

700.3 Construction Requirements

700.3.01 Personnel
General Provisions 101 through 150.

700.3.02 Equipment
Use grassing equipment able to produce the required results.
Never allow the grading (height of cut) to exceed the grassing equipment’s operating range.

A. Mulch Material Equipment
Use mulching equipment that uniformly cuts the specified materials into the soil to the required control depth.
B. Hydroseeding Equipment
   For hydroseeding equipment, see Subsection 700.3.05.F.

700.3.03 Preparation
General Provisions 101 through 150.

700.3.04 Fabrication
General Provisions 101 through 150.

700.3.05 Construction
Follow the planting zones, planting dates, types of seed, seed mixtures, and application rates described throughout this Section. The Engineer has the authority to alter the planting dates as set forth by a period of 2 weeks. This 2-week period may be applied to either the beginning of the specified planting and/or to the end of the specified planting season.
In general:
Obtain the Engineer’s approval before changing the ground cover type.
Do not use annual rye grass seeds with permanent grassing.
Follow the planting zones indicated on the Georgia State Planting Zone Map, below.
Sod may be installed throughout the year, weather permitting.
For permanent grassing, apply the combined amounts of all seeds for each time period within each planting zone and roadway location listed in the Seeding Table, below. Do not exceed the amounts of specified seed.

See the Georgia Department of Transportation Construction of Transportation Systems, 2013 edition for the GEORGIA STATE PLANTING ZONE MAP.
### NON-NATIVE GRASS SEEDING TABLE 1
(Temporary and Permanent Seed Types for Shoulders, Medians and Slopes 3:1 or Flatter)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Bermuda Grass (Hulled)</td>
<td><em>Cynodon dactylon</em></td>
<td>Required Permanent Grass</td>
<td>10</td>
<td>1</td>
<td>April 16 – August 31</td>
</tr>
<tr>
<td>Common Bermuda Grass (Unhulled)</td>
<td><em>Cynodon dactylon</em></td>
<td>Required Permanent Grass</td>
<td>10</td>
<td>2, 3, 4</td>
<td>April 1 – October 15</td>
</tr>
<tr>
<td>Bahaia Grass</td>
<td><em>Paspalum motatum</em></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rye Grass, Millet, Cereal Grass (Oats)</td>
<td><em>Lolium penne spsp.</em></td>
<td>Temporary Grass</td>
<td>50</td>
<td>1</td>
<td>September 1 – April 15</td>
</tr>
<tr>
<td></td>
<td><em>Multiflorum, Echinochloa cursgalli, Avena sativa</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rye Grass, Millet, Cereal Grass (Oats)</td>
<td><em>Lolium penne spsp.</em></td>
<td>Temporary Grass</td>
<td>50</td>
<td>2, 3, 4</td>
<td>October 16 – March 31</td>
</tr>
<tr>
<td></td>
<td><em>Multiflorum, Echinochloa cursgalli, Avena sativa</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NON-NATIVE SEEDING TABLE 2
(Temporary and Permanent Seed Types for back slopes, fill slopes and areas which will not
be subject to frequent mowing, slopes steeper than 3:1)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>50</td>
<td>1, 2</td>
<td>March 1-August 31</td>
</tr>
<tr>
<td>Weeping Lovegrass</td>
<td>Eragrostis curvula</td>
<td>Temporary Grass</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>75</td>
<td>1, 2</td>
<td>September 1-February 28</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>Festuca arundinacea</td>
<td>Temporary Grass</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>50</td>
<td>3, 4</td>
<td>April 1 – October 31</td>
</tr>
<tr>
<td>Weeping Lovegrass</td>
<td>Eragrostis curvula</td>
<td>Temporary Grass</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>50</td>
<td>3, 4</td>
<td>November 1 – March 31</td>
</tr>
<tr>
<td>Weeping Lovegrass</td>
<td>Eragrostis curvula</td>
<td>Temporary Grass</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NATIVE GRASS SEEDING TABLE 3
For Non-mowable Slopes or Areas Designated as Permanent Native Grass Plots.
Plant native seed mixes on back slopes, fill slopes and areas which will not be subject to frequent
mowing (slopes steeper than 3:1).

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Wild Rye</td>
<td><em>Elymus canadensis</em></td>
<td>Cool Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Virginia Wild Rye</td>
<td><em>Elymus virginicus</em></td>
<td>Cool Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Bottle-brush Grass</td>
<td><em>Hystrich patula</em></td>
<td>Cool Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Little Bluestem</td>
<td><em>Schizachyrium scoparium</em> (Andropogon scoparius)</td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
<tr>
<td>Indiangrass</td>
<td><em>Sorghastrum nutans</em></td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
<tr>
<td>Eastern Gama Grass</td>
<td><em>Tripsacum dactyloides</em></td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
<tr>
<td>Rice Cut Grass</td>
<td><em>Leersia oryzoides</em></td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
<tr>
<td>Deertongue</td>
<td><em>Panicum clandestinum</em></td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
<tr>
<td>Switchgrass</td>
<td><em>Panicum virgatum</em></td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
<tr>
<td>Woolgrass</td>
<td><em>Scirpus cyperinus</em></td>
<td>Cool Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>River Oats</td>
<td><em>Chasmanthium latifolium</em></td>
<td>Cool Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Purple Top</td>
<td><em>Tridens flavus</em></td>
<td>Warm Season</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>March 31 – August 31</td>
</tr>
</tbody>
</table>
See plan sheets/plant lists for detailed native restoration and riparian mitigation seed mix combinations to be applied at a minimum rate total of 10 lbs per acre for each combined mix. If the mix is not provided in the plan sheets, use a minimum of 3 species based on planting dates shown above.

**HERBACEOUS PLANT SEEDING TABLE 4**  
(Approved for Riparian Mitigation or for Seed Mixes on Slopes Steeper than 3:1-Requiring Permanent Planting)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Pye Weed</td>
<td><em>Eupatorium fistulosum</em></td>
<td>Herbaceous</td>
<td>Minimum 2</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Ironweed</td>
<td><em>Vernonia novaboracensis</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>March 1 – August 31</td>
</tr>
<tr>
<td>White snakeroot</td>
<td><em>Ageratina altissima</em> (Eupatorium rugosum)</td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Swamp milkweed</td>
<td><em>Asclepias incarnata</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>March 1 – August 31</td>
</tr>
<tr>
<td>Frost aster</td>
<td><em>Aster pilosus</em> (Symphyotrichum pilosum)</td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Partridge pea</td>
<td><em>Chamaecrista fasciculata</em> (Cassia fasciculata)</td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>March 1 – August 31</td>
</tr>
<tr>
<td>Lance-leaf coreopsis</td>
<td><em>Coreopsis lanceolata</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Tall coreopsis</td>
<td><em>Coreopteris tripterus</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Boneset</td>
<td><em>Eupatorium perfoliatum</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Sneezeweed</td>
<td><em>Helenium autumnale</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Swamp sunflower</td>
<td><em>Helianthus angustifolius</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>March 1 – August 31</td>
</tr>
<tr>
<td>Fringed</td>
<td><em>Lysimachia ciliata</em></td>
<td>Herbaceous</td>
<td>Up to 10</td>
<td>1, 2, 3, 4</td>
<td>September 1</td>
</tr>
</tbody>
</table>
For native restoration and riparian mitigation seed mix combinations, use Table 4 for approved native herbaceous seed types in combination with Table 3 of native grass seeds. Native restoration and riparian seed mixes should incorporate a mix of 60% native grass types (see Table 3) and 40% native herbaceous types (see Table 4) applied at a minimum rate total of 10 lbs per acre for each combined mix.

**TABLE 5: TEMPORARY GRASS - SPECIES, SEEDING RATES AND PLANTING DATES**

<table>
<thead>
<tr>
<th>Species</th>
<th>Rates per 1000 sq. ft.</th>
<th>Rates per Acre</th>
<th>Planting Date By Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 &amp; 2</td>
</tr>
<tr>
<td>Rye (Grain)</td>
<td>3.9 lbs</td>
<td>168 lbs</td>
<td>8/1 - 11/30</td>
</tr>
<tr>
<td>Ryegrass</td>
<td>0.9 lbs</td>
<td>40 lbs</td>
<td>8/1 - 11/30</td>
</tr>
<tr>
<td>Rye &amp; Annual Lespedeza</td>
<td>0.6 lbs</td>
<td>28 lbs</td>
<td>3/1 - 4/1</td>
</tr>
<tr>
<td></td>
<td>0.6 lbs</td>
<td>24 lbs</td>
<td></td>
</tr>
<tr>
<td>Sudangrass</td>
<td>1.0 lbs</td>
<td>60 lbs</td>
<td>4/1 - 8/31</td>
</tr>
<tr>
<td>Browntop Millet</td>
<td>1.1 lbs</td>
<td>50 lbs</td>
<td>4/1 - 6/30</td>
</tr>
<tr>
<td>Wheat</td>
<td>3.9 lbs</td>
<td>168 lbs</td>
<td>9/1 - 12/31</td>
</tr>
</tbody>
</table>

When stage construction or other conditions prevent completing a roadway section continuously, apply temporary grassing to control erosion. Temporary grassing is used to stabilize disturbed areas for more than sixty (60) calendar days. Temporary grass may be applied any time of the year, utilizing the appropriate seed species and application rate as shown in the chart above. Apply mulch to areas planted in temporary grass at the rate of $\frac{3}{4}$ inch to 1.5 inches. Do not place slope mats on areas planted in temporary grass.
A. Ground Preparation

Prepare the ground by plowing under any temporary grass areas and preparing the soil as follows:

1. Slopes 3:1 or Flatter
   - On slopes 3:1 or flatter, plow shoulders and embankment slopes to between 4 in. and 6 in. deep.
   - Plow front and back slopes in cuts to no less than 6 in. deep. After plowing, thoroughly disk the area until pulverized to the plowed depth.

2. Slopes Steeper Than 3:1
   - Serrate slopes steeper than 3:1 according to Plan details when required.
   - On embankment slopes and cut slopes not requiring serration (sufficient as determined by the Engineer), prepare the ground to develop an adequate seed bed using any of the following methods as directed by the Engineer:
     - Plow to a depth whatever depth is practicable.
     - Use a spiked chain.
     - Walk with a cleated track dozer.
     - Scarify.
   - Disking cut slopes and fill slopes is not required.

3. All Slopes
   a. Obstructions
      - Remove boulders, stumps, large roots, large clods, and other objects that interfere with grassing or may slide into the ditch.
   b. Topsoil
      - Spread topsoil stockpiled during grading evenly over cut and fill slopes after preparing the ground.
      - Push topsoil from the top over serrated slopes. Do not operate equipment on the face of completed serrated cuts.

   - For Permanent Grassing in native restoration areas, multitrophic native planting areas, riparian areas, stream restoration areas, and wetland and stream mitigation areas, provide the minimum ground preparation necessary to provide seed to soil contact. Riparian areas may also be seeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing vegetation without plowing or tilling soil. Ensure that existing vegetation is less than 3 inches in height (this may be achieved by mowing or using a mechanical string trimmer).

B. Grassing Adjacent to Existing Lawns

When grassing areas adjacent to residential or commercial lawns, the Engineer shall change the plant material to match the type of grass growing on the adjacent lawn. The Contract Unit Price will not be modified for this substitution.

C. Temporary Grassing

Apply temporary grassing according to Subsection 163.3.05.F. Determine lime requirements by a laboratory soil test.
   - Refer to seeding Table 5 for species, amounts of seed and planting dates.
   - In March or April of the year following planting and as soon as the weather is suitable, replace all areas of temporary grass with permanent grass by plowing or overseeding using
the no-till method. If the no-till method is used, ensure that temporary grass is less than 3 inches in height (this may be achieved by mowing). Additional mulch will be required only if the temporary grass does not provide adequate mulch to meet the requirements of Subsection 700.3.05.G, “Mulching.”

Temporary grass, when required, will be paid for according to Section 163. Projects that consist of asphalt resurfacing with shoulder reconstruction and/or shoulder widening: Type II Wood Fiber Blanket is used to stabilize disturbed areas, no till seeding will be used when permanent grassing is applied and the areas will not be re-disturbed.

**D. Applying Agricultural Lime and Fertilizer Mixed Grade**

Apply and mix lime and fertilizer as follows:

1. **Agricultural Lime**
   - Uniformly spread agricultural lime on the ground at the approximate rate determined by the laboratory soil test.
   - Agricultural Lime may be used as filler material in mixed grade fertilizer in lieu of inert material. The use of agricultural lime as filler material is to be shown on the fertilizer bag or invoice from the supplier. Do not deduct any amount of fertilizer when lime is used as filler.

2. **Fertilizer Mixed Grade**
   - Uniformly spread the fertilizer selected according to Subsection 700.2.D over the ground or by use of hydroseeding. For bid purposes base estimated quantities on an initial application of 400 lb/acre of 19-19-19.

3. **Mixing**
   - Before proceeding, uniformly work the lime and fertilizer into the top 4 in. of soil using harrows, rotary tillers, or other equipment acceptable to the Engineer.
   - On cut slopes steeper than 3:1, other than serrated slopes, reduce the mixing depth to the maximum practical depth as determined by the Engineer.
   - Omit mixing on serrated slopes.

4. **Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas**
   - Omit the application of lime and fertilizer within riparian areas.

**E. Seeding**

Prepare seed and sow as follows:

1. **Inoculation of Seed**
   - Inoculate each kind of leguminous seed separately with the appropriate commercial culture according to the manufacturer’s instructions for the culture.
   - When hydroseeding, double the inoculation rate.
   - Protect inoculated seed from the sun and plant it the same day it is inoculated.

2. **Sowing**
   - Weather permitting, sow seed within 24 hours after preparing the seed bed and applying the fertilizer and lime.
   - Sow seed uniformly at the rates specified in the seeding tables. Use approved mechanical seed drills, rotary hand seeders, hydroseeding equipment, or other equipment to uniformly apply the seed. Do not distribute by hand.
   - To distribute the seeds evenly sow seed types separately, except for similarly sized and weighted seeds. They may be mixed and sown together.
Do not sow during windy weather, when the prepared surface is crusted, or when the ground is frozen, wet, or otherwise non-tillable.

3. Overseeding
Temporary grass areas that were prepared in accordance with Subsection 700.3.05.A, may be overseeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing temporary grass without plowing or tilling soil and in accordance with Subsection 700.3.05.C.

4. Riparian Seed Mix shall be used when specified in the Plans. A mix of at least three (3) species from Seeding Table 3 (Native Grasses) and at least two (2) species from Seeding Table 4 (Approved Riparian Mitigation – Herbaceous Plants). The seed, shall be applied as Permanent Grassing within those areas designated on the Plans. The kinds of seed, shall be used according to the appropriate Planting Dates given in the tables.

F. Hydroseeding
Hydroseeding may be used on any grassing area. Under this method, spread the seed, fertilizer, and wood fiber mulch in the form of a slurry. Seeds of all sizes may be mixed together. Apply hydroseeding as follows:
1. Use wood fiber mulch as a metering agent and seed bed regardless of which mulching method is chosen. Apply wood fiber mulch at approximately 500 lbs/acre.
2. Prepare the ground for hydroseeding as for conventional seeding in Subsection 700.3.05.A.
3. Use specially designed equipment to mix and apply the slurry uniformly over the entire seeding area.
4. Agitate the slurry mixture during application.
5. Discharge slurry within one hour after being combined in the hydroseeder. Do not hydroseed when winds prevent an even application.
6. Closely follow the equipment manufacturer’s directions unless the Engineer modifies the application methods.
7. Mulch the entire hydroseeded area according to Subsection 700.3.05.F.1, above, and Subsection 700.3.05.G, below.
Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas may be hydroseeded. When hydroseeding in these areas only use water, seed and wood fiber mulch.

G. Mulching
Except as noted in Subsection 700.3.05.B and Subsection 700.3.05.C, apply mulch immediately after seeding areas as follows:
Areas with permanent grass seed and covered with slope mats or blankets will not require mulch.
Evenly apply straw or hay mulch between 3/4 in and 1-1/2 in deep, according to the texture and moisture content of the mulch material.
Mulch shall allow sunlight to penetrate and air to circulate as well as shade the ground, reduce erosion, and conserve soil moisture. If the type of mulch is not specified on the Plans or in the Proposal, use any of the following as specified.
1. Mulch with Tackifier
   Apply mulch with tackifier regardless of whether using ground or hydroseeding equipment for seeding.
a. Mulch uniformly applied manually or with special blower equipment designed for the purpose. When using a blower, thoroughly loosen baled material before feeding it into the machine so that it is broken up.

b. After distributing the mulch initially, redistribute it to bare or inadequately covered areas in clumps dense enough to prevent new grass from emerging (if required). Do not apply mulch on windy days.

c. Apply enough tackifier to the mulch to hold it in place. Immediately replace mulch that blows away. If distributing the mulch by hand, immediately apply the tackifier uniformly over the mulched areas. Tackifier: Use a tackifier listed in the Laboratory Qualified Products Manual and apply at the manufacturer’s recommended rates.

2. Walked-in-Mulch
   Apply walked-in-mulch on slopes ranging in steepness from 5:1 to 2:1 and treat as follows:
   a. Immediately walk it into the soil with a cleated track dozer. Make dozer passes vertically up and down the slope.
   b. Where walked-in-mulch is used, do not roll or cover the seeds as specified in Subsection 700.3.05.E.3.

3. Apply only wheat straw mulch on Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas after they have been seeded. The wheat straw mulch is to be applied with a maximum thickness of 1 inch.

H. Sod
   Furnish and install sod in all areas shown on the Plans or designated by the Engineer.
   1. Kinds of Sod
      Use only Common Bermudagrass (Cyndon dactylon) or one of the following Bermudagrass varieties:
      - Tifway 419
      - Tifway II
      - Tift 94
      - Tifton 10
      - Midlawn
      - Midiron
      - GN-1
      - Vamont
      No dwarf Bermuda types shall be used. Sod shall be nursery-grown and be accompanied with a Georgia Department of Agriculture Live Plant License Certificate or Stamp. Sod shall consist of live, dense, well-rooted material free of weeds and insects as described by the Georgia Live Plant Act.
   2. Type And Size Of Sod:
      Furnish either big roll or block sod. Ensure that big roll sod is a minimum of 21 inches wide by 52 feet long.
      Minimum dimensions for block sod are 12 inches wide by 22 inches long. Ensure all sod consists of a uniform soil thickness of not less than 1 inch.
   3. Ground Preparation
      Excavate the ground deep enough and prepare it according to Subsection 700.3.05.A to allow placing of sod. Spread soil, meeting the requirements of Subsection 893.2.01, on prepared area to a depth of 4 inches.
   4. Application of Lime and Fertilizer
Apply lime and fertilizer according to Subsection 700.3.05.D within 24 hours prior to installing sod.

5. Weather Limitation
Do not place sod on frozen ground or where snow may hinder establishment.

6. Install Sod
Install Sod as follows:
- Place sod by hand or by mechanical means so that joints are tightly abutted with no overlaps or gaps. Use soil to fill cracks between sod pieces, but do not smother the grass.
- Stake sod placed in ditches or slopes steeper than 2:1 or any other areas where sod slipping can occur.
- Use wood stakes that are at least 8 in. in length and not more than 1 in. wide.
- Drive the stakes flush with the top of the sod. Use a minimum of 8 stakes per square yard to hold sod in place.
- Once sod is placed and staked as necessary, tamp or roll it using adequate equipment to provide good contact with soil.
- Use caution to prevent tearing or displacement of sod during this process. Leave the finished surface of sodded areas smooth and uniform.

7. Watering Sod
After the sod has been placed and rolled or tamped, water it to promote satisfactory growth. Additional watering will be needed in the absence of rainfall and during the hot dry summer months. Water may be applied by Hydro Seeder, Water Truck or by other means approved by the Engineer.

8. Dormant Sod
Dormant Bermuda grass sod can be installed. However, assume responsibility for all sod through establishment and until final acceptance.

9. Establishment
Sod will be inspected by the Engineer at the end of the first spring after installation and at the time of Final Inspection. Replace any sod that is not live and growing. Any cost for replacing any unacceptable sod will be at the Contractor’s expense.

I. Application of Nitrogen
Apply nitrogen at approximately 50 lbs/acre when specified by the Engineer after plants have grown to 2 inches in height.
One application is mandatory and must be applied before Final Acceptance.
Apply nitrogen with mechanical hand spreaders or other approved spreaders capable of uniformly covering the grassed areas. Do not apply nitrogen on windy days or when foliage is damp.
Do not apply nitrogen between October 15 and March 15 except in Zone 4.
1. Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas
Do not apply nitrogen to these areas.

J. Application of Polyacrylamide (PAM)
1. Prepare soil according to project Plans and Specifications prior to applying PAM.
2. Apply PAM according to manufacturer’s recommendations and the requirements listed herein.
3. Apply Polyacrylamide (PAM) to all areas that receive permanent grassing.
4. Apply PAM (powder) before grassing or PAM (emulsion) to the hydroseeding operation.
5. Use only anionic PAM.
6. Ensure that the application method provides uniform coverage to the target and avoids drift to non-target areas including waters of the state.
7. Achieve > 80% reduction in soil loss as measured by a rainfall simulator test performed by a certified laboratory (1 hour storm duration, 3 inches rainfall per hour).
8. Ensure uniform coverage to the target area and minimize drift to non-target areas. Apply anionic PAM to all cut and fill slopes, permanently grassed or temporarily grassed, either prior to grassing or in conjunction with hydroseeding operations. Mulch will not be eliminated.
9. Use application rates in accordance with manufacturer’s instructions.
10. Do not exceed 200 lbs/acre/year.
11. Do not include polyacrylamide when planting in Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas.

700.3.06 Quality Acceptance
The Engineer may require replanting of an area that shows unsatisfactory growth for any reason at any time.
Except as otherwise specified or permitted by the Engineer, prepare replanting areas according to the Specifications as if they were the initial planting areas. Use a soil test or the Engineer’s guidance to determine the fertilizer type and application rate, then furnish and apply the fertilizer.

700.3.07 Contractor Warranty and Maintenance
A. Plant Establishment
   Before Final Acceptance, provide plant establishment of the specified vegetation as follows:
   1. Plant Establishment
      Preserve, protect, water, reseed or replant, and perform other work as necessary to keep the grassed areas in satisfactory condition.
   2. Watering
      Water the areas during this period as necessary to promote maximum growth.
   3. Mowing
      Mow seeded areas of medians, shoulders, and front slopes at least every 6 months. Avoid damaging desirable vegetation.
      In addition, mow as necessary to prevent tall grass from obstructing signs, delineation, traffic movements, sight distance, or otherwise becoming a hazard to motorists.
      Do not mow lespedezas or tall fescue until after the plants have gone to seed.
   4. Do not mow riparian areas, stream restoration areas, or wetland and stream mitigation areas after planting.

B. Additional Fertilizer Mixed Grade
   Apply fertilizer based on the initial soil test report at half the recommended rate each spring after initial plant establishment. For bid purposes apply 200 lbs/acre of 19-19-19. Continue annual applications until Final Acceptance.
   This additional fertilizer will be measured and paid for at the Contract Unit Price for fertilizer mixed grade.
Do not apply additional fertilizer to Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas.

**C. Growth and Coverage**
Provide satisfactory growth and coverage, ensuring that vegetation growth is satisfactory with no bare spots larger than 1 ft². Bare spots shall comprise no more than 1 percent of any given area. An exception is given for seed not expected to have germinated and shown growth at that time.

**D. Permissible Modifications**
When all Items of the work are ready for Final Acceptance except for newly planted repaired areas or other areas with insufficient grass, the Contractor may fill the eroded areas or treat bare areas with sod obtained, placed, and handled according to Subsection 700.3.05.H. Carefully maintain the line and grade established for shoulders, front slopes, medians, and other critical areas. Sod as described above will not be paid for separately, but will be an acceptable substitute for the satisfactory growth and coverage required under this Specification. These areas treated with sod are measured for payment under the Item for which the sod is substituted.

**700.4 Measurement**

**A. Permanent Grassing**
Permanent Grassing will be measured for payment by the acre.

**B. Mulches**
Straw or hay mulch applied to permanent grassing areas will be measured by the ton. Wood fiber mulch furnished by the Contractor for permanent grassing is not measured for separate payment.

**C. Quantity of Sod**
Sod is measured for payment by the number of square yards, surface measure, completed and accepted.

**D. Water**
Water furnished and applied to promote a satisfactory growth is not measured for payment.

**E. Quantity of Lime and Fertilizer Mixed Grade**
Lime and fertilizer are measured by the ton. Lime used as a filler in fertilizer is measured by the ton.

**F. Quantity of Nitrogen Used for Permanent Grassing**
Nitrogen is measured in pounds based on the weight of fertilizer used and its nitrogen content.

**G. Replanting and Plant Establishments**
No measurement for payment is made for any materials or work required under Subsection 700.3.06 and Subsection 700.3.07.

**H. Temporary Grass**
Temporary grass is measured for payment by the acre according to Section 163.

**I. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas**
Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be measured by the acre and included under the pay item “Native Restoration and Riparian Seeding”.

700.4.01 Limits
General Provisions 101 through 150.

700.5 Payment
As grassing and planting progress, the Contractor will receive full measurement and payment on regular monthly estimates provided the work complies with the Specifications.

A. Permanent Grassing
Permanent grassing will be paid for at the Contract Price per acre, complete and in place. Payment is full compensation for preparing the ground, seeding, wood fiber mulch, polyacrylamide, and providing plant establishment, soil tests and other incidentals.

B. Straw or Hay Mulch
Straw or hay mulch required for Permanent Grassing will be paid for according to Section 163.

C. Fertilizer Mixed Grade
Fertilizer mixed grade will be paid for at the Contract Price per ton. Payment is full compensation for furnishing and applying the material.

D. Lime
Lime will be paid for at the Contract Price per ton. Lime used as filler in fertilizer will be paid for per ton. Payment is full compensation for furnishing and applying the material.

E. Nitrogen
Nitrogen will be paid for at the Contract Price per pound of nitrogen content. Payment is full compensation for furnishing and applying the material.

F. Sod
Sod will be paid by the square yard in accordance with the following schedule of payments. Payment is full compensation for ground preparation, including addition of topsoil, furnishing and installing live sod, and for Plant Establishment.
1. 70% of the Contract Price per square yard will be paid at the satisfactory completion of the installation.
2. 20% of the Contract Price will be paid upon satisfactory review of sod which is healthy, weed free and viable at the inspection made at the end of the first spring after installation.,
3. 10% of the contract price will be paid upon satisfactory review of sod that is healthy, weed free and viable at the Final Acceptance.

G. Temporary Grass
Temporary Grass will be paid for under Section 163.

H. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas
Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be paid for at the Contract Price per acre, complete and in place. Payment is full compensation for preparing the ground, seeding, and providing plant establishment and other incidentals included under the pay item “Native Restoration and Riparian Seeding”.
Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 700</th>
<th>Permanent grassing</th>
<th>Per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 700</td>
<td>Agricultural lime</td>
<td>Per ton</td>
</tr>
<tr>
<td>Item No. 700</td>
<td>Description</td>
<td>Unit</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Fertilizer mixed grade</td>
<td>Per ton</td>
<td></td>
</tr>
<tr>
<td>Fertilizer nitrogen content</td>
<td>Per pound</td>
<td></td>
</tr>
<tr>
<td>Sod</td>
<td>Per square yard</td>
<td></td>
</tr>
<tr>
<td>Native Restoration and Riparian Seeding</td>
<td>Per acre</td>
<td></td>
</tr>
</tbody>
</table>

**700.5.01 Adjustments**

General Provisions 101 through 150.
Section 716—Erosion Control Mats (Slopes)

716.1 General Description
This work includes furnishing and placing erosion control mats (blankets) made of fiberglass, excelsior, jute mesh, bituminous treated roving, and straw, synthetic, or coconut over grass areas prepared according to Section 700 for permanent grass. Place according to the Plans or as directed by the Engineer. This specification is not applicable for waterways.

716.1.01 Definitions
General Provisions 101 through 150.

716.1.02 Related References
A. Standard Specifications
   Section 712—Fiberglass Blanket
   Section 713—Organic and Synthetic Material Fiber Blanket
   Section 714—Jute Mesh Erosion Control
B. Referenced Documents
   General Provisions 101 through 150.

716.1.03 Submittals
General Provisions 101 through 150.

716.2 Materials
General Provisions 101 through 150.

716.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

716.3 Construction Requirements

716.3.01 Personnel
General Provisions 101 through 150.

716.3.02 Equipment
General Provisions 101 through 150.

716.3.03 Preparation
General Provisions 101 through 150.

716.3.04 Fabrication
General Provisions 101 through 150.

716.3.05 Construction
The contractor may elect to use either Section 712 – Fiberglass Blanket, Section 713 – Organic and Synthetic Material Fiber Blanket (except do not use Type II Wood Fiber Blanket), or Section 714 – Jute Mesh Erosion Control on slopes. All of the materials, construction and measurement portions of the noted sections apply to the type mat (blanket) selected for use.
Place blankets or mats vertically on the slopes beginning at the top of the slope and extending to the bottom of the slope.
Horizontal installation of the blankets or mats is not permitted.
The application of mulch is not required for permanent grassing when one of the above noted mats or blankets is placed on the previously prepared and grassed slopes with 24 hours.

**716.3.06 Quality Acceptance**
General Provisions 101 through 150.

**716.3.07 Contractor Warranty and Maintenance**
General Provisions 101 through 150.

**716.4 Measurement**
Erosion control mats (Slopes) are measured according to the Specification sections referenced in Subsection 716.3.05.

**716.4.01 Limits**
General Provisions 101 through 150.

**716.5 Payment**
Erosion control mats (Slopes), measured as specified in Section 712, Section 713, or Section 714 will be paid for at the Contract Unit Price per square yard.
This payment is full compensation for constructing the mat (blanket) and providing materials, equipment, tools, labor, and incidentals needed to maintain mats (blankets) for the life of the Contract or until a stand of grass has developed enough to prevent erosion.

Payment will be made under:

| Item No. 716 | Erosion control mats (slopes) | Per square yard |

**716.5.01 Adjustments**
General Provisions 101 through 150.
SECTION 01050
FIELD ENGINEERING

PART 1 - GENERAL

1.01 SCOPE OF WORK

WORK covered in this Section includes the surveying and field engineering required to complete the project and meet the provisions of this document.

1.02 QUALITY CONTROL

CONTRACTOR shall employ a Land Surveyor registered in the State of Georgia and acceptable to the OWNER/ENGINEER, where and when necessary.

1.03 SUBMITTALS

A. Upon request, submit documentation verifying accuracy of survey work. Documentation may include, but is not limited to, original field notes, worksheets, cutsheets, etc.

B. Submit at least two sets of prints of "as-constructed" drawings with a surveyor's certificate verifying that elevations and locations are in conformance with the contract drawings.

C. Submit an ASCII text file in PNEZD (point, northing, easting, elevation, description) format of all as-constructed locations of structures; i.e., valves, hydrants, meters, etc. Coordinates shall be state plane and shall have an accuracy of +/- 3.0 feet. Elevations shall be based on mean sea level.

D. See Section 01720 (Project Record Documents) for additional requirements.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 SURVEY REQUIREMENTS

A. Construction Staking

The CONTRACTOR shall provide all construction staking using recognized surveying and engineering practices. The surveyor will locate lines, grades and locations called for in the contract drawings. Survey shall be based on state plane coordinates and elevations shall be referenced to mean sea level.
B. "As Constructed Drawings"

CONTRACTOR shall maintain record drawings in accordance with Section 01720 (Project Record Documents) of these CONTRACT DOCUMENTS. The final "as constructed" drawings shall show the horizontal location of all manholes, water lines, structures, earth embankments and ponds, etc.. All horizontal locations shall be referenced to state plane coordinate systems and to existing streets, roads or major structures. The elevations of all gravity sewers, storm sewers, structure inverts, structure tops, shall be shown. The ENGINEER will provide two sets of plans for the CONTRACTOR's use in completing this work.

END OF SECTION
SECTION 01070

ABBREVIATIONS

PART 1  GENERAL

1.01  GENERAL

Wherever in these Specifications and CONTRACT DOCUMENTS the abbreviations, or pronouns in place of them are used, the intent and meaning shall be interpreted as specified herein.

1.02  ABBREVIATIONS

AASHTO  American Association of State Highway and Transportation Officials
ACI  American Concrete Institute
ACPA  American Concrete Pipe Association
AISC  American Institute of Steel Construction
AISI  American Iron and Steel Institute
AITC  American Institute of Timber Construction
ANSI  American National Standards Institute
APHA  American Public Health Association
ASA  American Standards Association
ASCE  American Society of Civil Engineers
ASTM  American Society for Testing and Materials
AWWA  American Water Works Association
CFR  Code of Federal Regulations
CRSI  Concrete Reinforcing Steel Institute
EPA  Environmental Protection Agency
FS  Federal Specifications
MSS  Manufacturer's Standardization Society of the Valve and Fitting Industry
MUTCD  Manual on Uniform Traffic Control Devices
NBS  National Bureau of Standards
NCPI  National Clay Pipe Institute
NCSA  National Crushed Stone Association
NSF  National Sanitation Foundation
OSHA  Occupational Safety and Health Administration
PCI  Prestressed Concrete Institute
SSPC  Steel Structures Painting Council
WEF  Water Environment Federation

PART 2  PRODUCTS - Not Used

PART 3  EXECUTION - Not Used

END OF SECTION
SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Pre-Bid Submittal for Equipment and Materials

1. Equipment model numbers or catalog numbers are listed in the specifications to identify a standard or quality required in this project. Alternate equipment or materials may be utilized by and furnished by the CONTRACTOR when such equipment or material has been approved by the ENGINEER and OWNER. Prebid submittals shall be submitted to the ENGINEER for evaluation regarding whether the equipment or material meets the specifications. ENGINEER shall approve or disapprove based on the information submitted by the manufacturer. The OWNER will also be consulted during this process. Submittals shall be made at least fifteen (15) calendar days prior to the bid opening; and if approved, the approval will be issued by addendum. Submittals made less than fifteen (15) calendar days prior to the bid opening will not allow adequate time for evaluation, and will not be considered for inclusion in the project.

2. THE PRE-BID SUBMITTALS SHALL LIST ANY AND ALL DEVIATIONS FROM ITEMS SPECIFIED, AND THE ADVANTAGES TO BE DERIVED IF THE DEVIATION IS APPROVED. IF NO DEVIATIONS ARE NOTED, IT WILL BE ASSUMED THAT NO SUCH DEVIATIONS EXIST, AND THE FINAL SUBMITTALS WILL ALLOW NO DEVIATIONS.

3. Pre-Bid submittals shall be required for the following items of equipment or materials:

   a. Valves
   b. Pipe and pipe joints

B. Shop Drawings and Product Data

1. CONTRACTOR shall submit complete drawings, engineering data and manufacturer's published instructions and recommendations for all equipment, materials, and products to be incorporated into WORK to ENGINEER for review and approval. Submittal of drawings and engineering data shall be in accordance with requirements of Supplementary General Provisions. Shop Drawings and/or engineering data, as appropriate, shall be submitted for the following: (including, but not limited to)

   a. Pipe, valves, valve boxes, hydrants, tapping sleeves, fittings.

   b. Miscellaneous iron castings and gratings, manhole frames and covers and manhole steps.
c. Concrete: Proposed mix design of each class of concrete. All concrete and masonry accessories and steel reinforcement, including bending diagrams and bar schedule, ties, spreaders, chairs, inserts, for coatings, waterstops, curing and sealing compounds, and epoxy bonding agents.

d. Concrete Formwork: Shop drawings and design calculations for formwork the CONTRACTOR intends to use in construction of the WORK. CONTRACTOR shall furnish said shop drawings and design calculations at no additional cost to OWNER. CONTRACTOR shall submit to ENGINEER for approval, prior to beginning of concreting operations, engineering data and manufacturer’s literature on all form ties, spreaders, bar supports, form coatings, and prefabricated steel forms intended for use in the WORK.

e. Concrete Reinforcement: Submit shop drawings indicating sizes, spacings, locations and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting and spacing devices.

f. Premixed grouts and mortars: Submit laboratory reports to ENGINEER for approval. Submittal must include sieve analysis of fine and coarse aggregate and mix design. Test results and reports required by manufacturer and testing standards shall be submitted to ENGINEER for his review.

g. Precast concrete structures.

h. Storm Drain Pipe.

i. Grass seed, fertilizer, and commercial mulch.

2. Shop drawings and engineering data shall be prepared by original equipment vendors or fabricators, as applicable. Purchase specifications by CONTRACTOR or Supplier shall not be acceptable as substitute for actual vendor drawings and data.

3. Shop drawings and each item of engineering data shall bear CONTRACTOR's approved stamp as per Supplementary General Provisions.

4. Design calculations and drawings for sheeting and shoring, and concrete formwork shall bear signed and dated stamp of licensed professional engineer.

5. A sieve analysis for all purchased material and all material to be reused as pipe bedding, foundation backfill, granular backfill or select backfill.

6. The following is required for all cast in place concrete and asphalt concrete to be placed as a part of this project:

   a. Sources(s) of materials to be used for the various types of pavement.

   b. Detailed specifications for all materials to be used including the job mix formula for asphaltic concrete paving, application rates, etc.
1.02 RELATED REQUIREMENTS

Sections 00700 and 00800

1.03 PROCEDURES

A. Deliver one (1) complete set of submittals to ENGINEER at kpeters@eminc.biz.

B. Transmit each item identifying Project, CONTRACTOR, SUBCONTRACTOR, major supplier; identify pertinent drawing sheet and detail number, and specification section number, as appropriate. Identify deviations from CONTRACT DOCUMENTS. Provide space for CONTRACTOR and ENGINEER review stamps.

C. Comply with progress schedule for submittals related to WORK progress. Coordinate submittal of related items.

D. After ENGINEER review of submittal, revise and resubmit as required, identifying changes made since previous submittal.

E. The CONTRACTOR shall reimburse OWNER for any charges from ENGINEER due to repeated inadequate submissions of Shop Drawings or material submittals beyond three (3) reviews by ENGINEER.

F. Upon approval ENGINEER shall return one (1) set of submittals to CONTRACTOR. Sets will be distributed between ENGINEER, Construction Observer, and OWNER.

G. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.04 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial construction progress schedules in duplicate within ten (10) days after date of OWNER-CONTRACTOR Agreement. After review by ENGINEER, revise and resubmit as required. Submit revised schedules with each Application for Payment, reflecting changes since previous submittal.

B. Submit horizontal bar chart with separate bar for each major trade or operation, identifying first work day of each week.

C. Show complete sequence of construction by activity, identifying WORK of separate stages and other logically grouped activities. Show projected percentage of completion for each item of WORK as of time of each Application for Progress Payment.

D. Show submittal dates required for shop drawings, product data, and samples, and product delivery dates, including those furnished by OWNER and those under Allowances.

E. Revise schedule to list change orders, for each application for payment.
1.05 SAMPLES

A. CONTRACTOR shall furnish, at ENGINEER’S request, samples of materials utilized in fabrication or production of equipment, materials, products supplied under these Specifications. Cost of samples requested shall be paid for by CONTRACTOR. Samples will be tested by qualified independent testing laboratory selected by ENGINEER to determine if mechanical and chemical properties of materials supplied are in accordance with requirements of these Specifications and CONTRACT DOCUMENTS. OWNER shall pay for laboratory testing of material samples provided by CONTRACTOR. CONTRACTOR shall pay for all retests made necessary by failure of materials, etc., to conform to requirements set forth herein.

B. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

B. Include identification on each sample, giving full information.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION
SECTION 01515

TEMPORARY WATER

PART 1  GENERAL

1.01  SCOPE

This section is intended to include requirements for temporary water to be provided by CONTRACTOR.

1.02  REQUIREMENTS INCLUDED

A.  Temporary water service
B.  Maintenance
C.  Removal

1.03  SERVICE REQUIREMENTS

Water Quality: Water used for flushing and testing of water systems shall be potable water.

1.04  USE OF EXISTING SYSTEM

Existing system may be used for temporary water with owners permission.

1.05  COSTS

All water for construction purposes (limited to use on this Project only) shall be provided by OWNER. CONTRACTOR shall pay all costs necessary to convey water about the work, provide water for temporary potable use, construction purposes, and testing. The cost of the water shall be factored into the project unit prices.

PART 2  PRODUCTS

2.01  MATERIALS

A.  Materials may be new or used, adequate to the purpose.
B.  Drinking Water Dispensers; Standard products.
PART 3 EXECUTION

3.01 INSTALLATION
A. Install initial service at time of job mobilization.
B. Modify and extend service as work progresses.
C. Size piping to supply construction needs.
D. Provide pumps, pressure tanks, automatic controls, and storage tanks as necessary to pressurize system.
E. Disinfect piping used for drinking water.

3.02 MAINTENANCE
Maintain system to provide continuous service with adequate pressure to outlets, including OWNER's system when temporary service is connected.

3.03 REMOVAL
Restore existing and permanent facilities used for temporary purposes to original condition.

END OF SECTION
SECTION 01516
TEMPORARY SANITARY FACILITIES

PART 1  GENERAL

1.01  SCOPE

This section is intended to include requirements for temporary sanitary facilities provided by CONTRACTOR, including provisions for CONTRACTOR'S use of existing and permanent facilities.

1.02  REQUIREMENTS INCLUDED

A.  Temporary Sanitary Facilities
B.  Maintenance and Service
C.  Removal
D.  Cleaning

1.03  USE OF EXISTING FACILITIES

Do not use existing sanitary facilities.

1.04  USE OF PORTABLE FACILITIES

A.  CONTRACTOR shall provide portable sanitary facilities at such places as approved by the OWNER.

B.  CONTRACTOR shall pay all costs for installation, maintenance, and removal of temporary sanitary facilities.

PART 2  PRODUCTS

2.01  MATERIALS

May be new or used, adequate to the purpose, which will not create unsanitary conditions.

2.02  TOILET FACILITIES

Enclosed portable self-contained units or temporary water closets and urinals, secluded from public view.
PART 3 EXECUTION

3.01 INSTALLATION
   A. Provide facilities at time of site mobilization.
   B. Modify and extend services as work progresses.

3.02 MAINTENANCE AND SERVICE
   A. Clean areas of facilities weekly and maintain in a sanitary condition.
   B. Provide toilet paper, paper towels, and soap in suitable dispensers.

3.03 REMOVAL
   Remove portable units when other facilities are available or prior to Substantial Completion.

END OF SECTION
PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Administrative provisions for Substantial Completion and for final acceptance.

1.02 RELATED REQUIREMENTS

A. Section 01720 - Project Record Documents.

1.03 SUBSTANTIAL COMPLETION

A. When the CONTRACTOR considers the work substantially complete, he shall request in writing that the ENGINEER schedule a pre-final inspection.

B. The ENGINEER will conduct a pre-final inspection with the CONTRACTOR and determine if the project is substantially complete, and generate a punch list of uncompleted items.

C. If the ENGINEER determines that the project is not substantially complete, he will notify the CONTRACTOR in writing which items need to be finished before the project can be considered substantially complete. The CONTRACTOR shall continue working to complete all punch list items and resubmit a revised punch list when he considers the work is substantially complete.

D. When the ENGINEER determines that the work is substantially complete, he will schedule an inspection with the OWNER, CONTRACTOR and ENGINEER. A final punch list will be prepared at this time.

E. After all punch list items have been completed, the CONTRACTOR shall send a request in writing to the ENGINEER to schedule a final inspection. When all punch list items are complete, the ENGINEER will issue a certificate of substantial completion.

1.04 FINAL COMPLETION

A. When the CONTRACTOR is issued substantial completion, he shall submit the following certificates with progress pay application:

1. All WORK has been completed and inspected for compliance with the CONTRACT DOCUMENTS and all deficiencies listed with the certificate of substantial completion have been corrected.

2. All equipment and systems have been tested, adjusted and are fully operational.

3. OWNER's personnel have been fully instructed in the operation of all equipment (include sign off for each system).

4. WORK is complete and ready for final inspection.
B. Should ENGINEER's inspection find WORK incomplete, he will promptly notify CONTRACTOR in writing listing observed deficiencies.

C. CONTRACTOR shall remedy deficiencies and send a request for another final inspection.

D. When ENGINEER finds work is complete, he will process final pay request documents.

1.05 REINSPECTION FEES

Should status of completion of WORK require reinspection by ENGINEER due to failure of WORK to comply with CONTRACTOR's claims on pre-final or final inspection, the OWNER will back charge the CONTRACTOR for each extra reinspection required of the ENGINEER. The CONTRACTOR shall reimburse the OWNER by certified check prior to final payment of retainage.

1.06 CLOSEOUT SUBMITTALS

A. Project Record Documents: Under provisions of Section 01720.

B. Evidence of Payment and Release of Liens: In accordance with Conditions of the Contract.

C. Consent of Surety to Final Payment.

Consent of Surety is to be sent by Surety directly to Engineering Management, Inc. to the attention of the Project Engineer.

1.07 APPLICATION FOR FINAL PAYMENT

A. Prior to application for final payment, the CONTRACTOR shall give the ENGINEER a list of all additions or deletions not previously approved by change order.

B. The ENGINEER will review this list and prepare a final close-out change order for the items that are justified by the terms of the contract or approved by field order.

C. After approval of the final close-out change order, the contractor may submit his application for final payment.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION
SECTION 01710

FINAL CLEAN-UP

PART 1  GENERAL

1.01 REQUIREMENTS INCLUDED

Final clean-up of site, roadway and buildings.

1.02 DESCRIPTION

Execute clean-up prior to inspection for Substantial Completion of the WORK.

1.03 DISPOSAL REQUIREMENTS

Remove and dispose of waste materials, rubbish, debris and trash in compliance with provisions of governing laws, codes, ordinances and regulations. Do not burn or bury rubbish, trash, debris and waste materials on Project site.

PART 2  PRODUCTS

2.01 CLEANING MATERIALS

A. Use materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only materials and methods recommended by manufacturer of material being cleaned.

PART 3  EXECUTION

3.01 PERIODIC CLEANING

A. On a regular and frequent basis during progress of WORK, perform cleaning necessary to keep Project site and adjacent properties free from unsightly and unsafe accumulation of scrap and waste materials, debris, rubbish and trash resulting from construction operations.

1. Provide sufficient trash bins and containers for collection of scrap and waste material, debris, rubbish and trash.

2. Provide separate, closable top metal containers for collection of oil and paint soaked rags; empty volatile substance cans and other waste products subject to spontaneous combustion.

3. Designate approved eating areas and provide covered containers conforming to local health codes for collection of waste paper and left-over foodstuffs. Enforce usage of containers by workmen.
B. Dispose of scrap and waste materials, debris, rubbish and trash by one of the following optional methods:

1. Provide services of company regularly engaged in refuse disposal operations, including usage of large metal dump-type trash containers.
2. Use own forces and equipment for loading, hauling and disposal.

C. Remove accumulations of scrap and waste materials as bins and containers are filled and not less than once per week.

1. Remove containers containing products subject to spontaneous combustion daily.
2. Remove containers containing waste paper and left-over foodstuff daily.
3. Legally dispose of all waste materials, rubbish, volatile materials and cleaning materials off Project site.
4. Dispose of no materials in waterways.

3.02 DUST CONTROL

A. Site Work

When working on unpaved or disturbed streets, CONTRACTOR shall maintain a water truck on site for dust control. All dusty work sites in residential/commercial areas shall be watered at least twice per day and whenever directed by the OWNER's representative.

B. Buildings

During application of finished surface materials, including painting and decorating, employ dust control methods during cleaning operations to prevent dust from contaminating wet and freshly coated surfaces.

3.03 FINAL CLEANING

A. Site Work

1. All piles of dirt and rocks shall be removed from the work area.
2. All disturbed areas shall be grassed and mulched according to these specifications.
3. All construction debris shall be removed to an approved disposal site.
4. All streets shall be swept with a mechanical sweeper.
5. All erosion control measures (silt fence, checkdams, etc.) shall be removed and disposed of upon stabilization of disturbed area.
3.04 INSPECTION

Prior to occupancy by OWNER of any designated portion of WORK, conduct inspection in presence of OWNER to verify WORK is properly clean and ready for acceptance by OWNER.

END OF SECTION
SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Maintenance of Record Documents and Samples.

B. Submittal of Record Documents and Samples.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. In addition to requirements in General Conditions, it is the CONTRACTOR’s responsibility to maintain two record copies of:

   2. Specifications.
   3. Addenda.
   4. Approved Change Orders, field orders or other modifications to the Contract.
   5. Approved shop drawings, product data, and samples.
   6. Field test records.
   7. Inspection certificates.
   8. Manufacturer's certificates.

B. Store Record Documents and samples apart from documents used for construction. Records should be stored in a clean dry area with easy access.

C. Maintain Record Documents in a clean, dry and legible condition. Do not use Record Documents for construction purposes.

D. Keep Record Documents and samples available for inspection by Engineer.

1.03 RECORDING

A. Record information on clean sets of plans and contract specifications. Label each sheet of the Project Record Drawings in the lower right corner with the neatly printed words "PROJECT RECORD DRAWINGS."

B. Two (2) sets of CONTRACT DOCUMENTS and Drawings shall remain clean without mark-up for record purposes. CONTRACTOR shall use an additional set for marking measurements, on-site changes, items of construction that are actually used, and other conditions as they are encountered during the course of the WORK. This marked-up set of CONTRACT DOCUMENTS and Drawings shall consist of red-lined copies of plans and shop drawings, shall indicate actual field dimensions, shall represent the work as actually constructed, and shall be recorded on a daily basis. Failure to produce these records on request of ENGINEER or OWNER shall constitute grounds to halt construction with no time extension until steps are taken to see that these records are being properly made.

C. Use colored pens or pencils for marking each description of work.
1. The CONTRACTOR shall use colored pencils for marking record copies of Contract Drawings and Specifications. Use a different colored pencil for each trade.

2. Establish a color code denoting what trade will use what color, and show this on a schedule on the front sheet of the "PROJECT RECORD DOCUMENTS."

D. Record information concurrently with construction progress. **DO NOT CONCEAL ANY WORK UNTIL REQUIRED INFORMATION IS RECORDED.**

E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:

1. Measured depths of elements of foundation in relation to finish first floor or benchmark.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Use stations and offsets or coordinates.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
4. Field changes of dimension and detail.
5. Changes made by Modifications.
6. Details not on original Contract Drawings.
7. References to related shop drawings and Modifications.

F. Prior to final construction inspection, CONTRACTOR shall furnish to ENGINEER two (2) neatly marked sets of construction plans which accurately depict the conditions and records all changes made during construction. ENGINEER shall promptly notify CONTRACTOR in writing if additional information is required.

G. Other Documents: Maintain manufacturer's certifications, inspection certifications, and field test records, required by individual Specifications sections.

H. As-Constructed Survey Record Drawings:

1. Prior to final payment, the CONTRACTOR shall submit the following items:
   a. Two (2) sets of as-constructed survey record drawings prepared by a registered surveyor. Drawings shall show location of all manholes, valves, fire hydrants, water meters, water lines, sewerlines, etc.
   b. All horizontal locations shall be referenced to state plane coordinate system and to existing streets or major structures.
   c. Elevations of all gravity sewers, structure inverts and tops shall be shown.
   d. Plan and profile views of all gravity sewers shall be provided.
   e. Submit an ASCII text file in PNEZD (point, northing, easting, elevation, description) format of all structures (i.e., valves, hydrants, meters,
manholes, etc.). Coordinates shall have an accuracy of +/- 1.0 foot. Elevations shall be based on mean sea level.

f. Digital files of as-constructed drawings in Auto Cad “DWG” format and Adobe “PDF” format shall be submitted to ENGINEER on a compact disc, flash drive or via email.

PART 2  PRODUCTS
Not Used.

PART 3  EXECUTION
Not Used.

END OF SECTION
SECTION 02100
SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. WORK to be performed under this section shall consist of clearing and grubbing the site within the limits of the Contract as shown on Drawings and disposal of all waste materials.

B. WORK also included under this section shall include the removal and replacement of existing fences and the erection of temporary fences.

C. Definitions

1. Clearing: The removal and disposal of all exposed objectionable matter such as: trees, brush, logs, buildings, fences, poles, rubbish, loose boulders and other debris resting on or protruding through the ground surface.

2. Grubbing: The removal and disposal of all objectionable matter such as: logs, poles, stumps, structures, boulders, rubbish, and other debris which is embedded in the soil.

1.02 REGULATORY REQUIREMENTS

A. Conform to applicable code for disposal of debris.

B. Conform to local Fire Department Codes for burning debris on site. Contractor shall obtain all necessary permits prior to burning on site.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials used for protection of trees and vegetation not to be removed during clearing operations shall be at Contractor's option. Materials chosen shall be approved by the ENGINEER prior to installation and upon installation shall be approved by the ENGINEER to ensure maximum protection to vegetation.

B. Materials used for the repair of trees and vegetation damaged outside clearing limits shown on Drawings shall be at Contractor's option but must be approved by the ENGINEER prior to use.

C. Wound paint shall be a standard bituminous product.

D. Herbicides shall not be used unless written approval is given by OWNER.

E. Explosives shall not be used unless written approval is given by OWNER.
F. Materials used for the replacement or relocation of existing fences shall be of equal or superior quality to those fence materials existing prior to construction unless specified otherwise on the plans.

PART 3 EXECUTION

3.01 CLEARING

A. No tree, shrub, or other landscaping plants shall be removed unless absolutely necessary for the construction of the proposed improvements. All shrubs or landscaping plants removed or damaged during construction shall be replaced by the Contractor at his expense, with landscaping approved by the ENGINEER.

B. Limits of clearing shall be contained within the areas within Right-of-way, Easement and Construction limits as shown on Drawings.

C. Existing fences that, at the direction of OWNER, can be reused shall be carefully removed and stored at such a distance they shall not be damaged by construction activity.

D. Fences that cannot be reused shall be removed to such a distance to allow construction activity and shall be replaced with new materials similar to existing fences upon completion of construction.

3.02 GRUBBING

A. The limits of grubbing shall be contained within Right-of-way, Easement and Construction limits as shown on Drawings.

B. Stumps and roots shall be grubbed and removed to a depth not less than 2 feet below existing grade or bottom of foundation structure.

C. All holes or cavities which extend below the subgrade elevation of proposed WORK shall be filled with crushed rock or other suitable material and compacted to the same density as the surrounding material.

3.03 PROTECTION

A. Streets, roads, adjacent property, and other works to remain shall be protected throughout the work in accordance with local laws and ordinances.

B. Contractor shall make every effort to protect existing bench marks, R/W markers, monuments, iron pins, property corner markers, etc. If any are disturbed or destroyed, CONTRACTOR shall provide services of a registered land surveyor to replace the markers, as directed by OWNER, at no expense to OWNER.

C. No trees shall be cut outside of areas designated without specific approval of ENGINEER, and any trees designated shall be protected from damage by CONTRACTOR’s construction operations.

D. Existing trees and other vegetation to remain shall be protected as directed by OWNER:
1. Trees shall be protected by fencing, barricades, or wrapping.
2. Shrub and bushes shall be protected by fencing, barricades, or wrapping. Wrapping of bushes and shrubs with plastic film will not be permitted.
3. Shallow-rooted plants shall be protected at ground surface under and in some cases outside the spread of branches by fencing, barricades, or ground cover protection.

E. In the event that archaeological resources are uncovered, CONTRACTOR shall notify OWNER prior to proceeding with WORK.

F. It shall be the responsibility of the CONTRACTOR to inspect the site, determine the amount of work required, and include this work in his proposal.

G. CONTRACTOR is to erect temporary fences as necessary to preserve the privacy of all affected property owners whose existing fences are being removed or relocated. Temporary fences shall be of sufficient strength and quality to prevent escape of animals and livestock and to prevent the intrusion of animals and people.

H. It is CONTRACTOR's responsibility to coordinate the removal and erection of fences with each affected property owner and to maintain any temporary and relocated fences throughout the contract period.

I. CONTRACTOR shall assume all costs incurred by any property owner in the loss of animals or livestock due to an insufficiency of replaced or temporary fences during the contract period and maintenance period thereafter.

J. It is the CONTRACTOR's responsibility to secure any insurance necessary to protect himself in the event of loss or damage to any animals, livestock and property for the duration of the project and maintenance period.

3.04 DISPOSAL

A. CONTRACTOR shall remove and dispose of all excess material resulting from clearing or site preparation operations. CONTRACTOR shall dispose of such materials in a manner acceptable to OWNER and the local governing authority and at an approved location where such materials can be lawfully disposed.

B. CONTRACTOR may, at no cost, retain any materials of value from clearing operations for his own use or disposal by sale unless otherwise stated in these Specifications. Such material shall be removed from construction area before date of completion of WORK under these Specifications. OWNER assumes no responsibility for protection or safekeeping of any materials so retained by CONTRACTOR.

C. Materials will not be disposed of by burying unless approved by OWNER. Buried materials will be covered with not less than 2 feet of earth material.

D. Burning will be permitted if the required permits have been acquired from the local Fire Department. Burning will be permitted only at times when conditions are considered favorable for burning and at locations approved by proper State or local authorities.
Materials to be burned shall be piled neatly and, when in a suitable condition, shall be burned completely. Piling for burning shall be done in such a manner and in such locations as to cause the least fire risk. All burning shall be so thorough that the materials are reduced to ashes. No logs, branches, or charred pieces shall be permitted to remain. CONTRACTOR shall at all times take special precautions to prevent fire from spreading to areas beyond the limits of cleared areas and shall have available at all times, suitable equipment and supplies for use in preventing and suppressing fires. Unguarded fires will not be permitted. CONTRACTOR shall assume all responsibility for damages caused by spreading fires.

E. Material to be removed from site shall be removed as it accumulates to prevent any unsightly spoil areas.

END OF SECTION
SECTION 02225
EARTHWORK FOR UTILITIES

PART 1  GENERAL

1.01  SCOPE OF WORK

Work under this section shall include all operations necessary for excavating, backfilling and compaction of material necessary for the construction of pipelines and all appurtenant facilities including sewage pump station, concrete saddles, pipe protection, etc., and for the disposal of waste and unsuitable materials.

1.02  RELATED WORK

A.  Section 02270 – Temporary Erosion Control

B.  Section 02931 - Grassing

1.03  REFERENCES

A.  American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), Annual Book of Standards

1.  ASTM D2167, Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

2.  ASTM D1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method


4.  AWWA C600, Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

5.  AWWA C605, Standard for Underground Installation of PVC Pressure Pipe and Fittings for Water

6.  AWWA C150, American National Standard for the Thickness Design of Ductile-Iron Pipe

7.  ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes


1.04  GENERAL
Elevations of the existing ground and the elevations of existing grades of structures are believed to be reasonably correct, but do not purport to be absolutely so, and, together with any schedule of quantities are presented only as an approximation. The CONTRACTOR shall satisfy himself, however, by actual examination of the site of the WORK as to the existing elevations and the amount of work required under this section. If the CONTRACTOR is not willing to accept any ground surface elevations indicated upon the Drawings for payment, he shall so notify the ENGINEER prior to starting any excavation work.

PART 2 PRODUCTS

2.01 BEDDING AND HAUNCHING STONE

A. Class IA or IB aggregate materials shall be in accordance with ASTM D 2321 and ASTM C33 for gravity sewer, wet trench conditions, under roads, structures and driveways.

B. For PVC water line and forcemain, CONTRACTOR shall use reused or imported Class II, III or IVA materials in accordance with ASTM D2321. Materials shall be free of stone, clods, broken rock, or concrete larger than 1.5 inches in largest dimension, organic matter, rubbish, or other unsuitable material for all other trench conditions not mentioned in Paragraph 2.01.A, unless otherwise directed by ENGINEER or OWNER.

2.02 INITIAL BACKFILL

Reused or imported earth free of stone, clods, broken rock, or concrete, or organic matter, rubbish, or other unsuitable material.

Soil types shall be in accordance with ASTM D2487, and the Unified Soil Classification System. Backfill Classification shall be in accordance with ASTM D2321. Suitable Subsoil: Reused and/or imported free of stone larger than 3 inch size, and debris. For backfill supporting structures and piping, Unified Soil Classification System (USCS) Groups GW and GP compacted to 97% Modified Proctor per ASTM D-1557. For backfill under roadways, pavement and sidewalks, USCS Groups GW and GP compacted to 98% Standard Proctor, Groups GM, GC, SW, SP, and SM compacted to 98% Standard Proctor, USCS Group SC compacted to 99% Standard Proctor, and USCS Groups ML and CL compacted to 100% Standard Proctor per ASTM D-698. For backfill not supporting any type of structure, paving, or sidewalk, Groups GW, GP, GM, and GC compacted to 90% Standard Proctor, Groups SW, SP, and SM compacted to 91% Standard Proctor, Groups ML, and CL compacted to 92% Standard Proctor, and Groups OL, MH, CH, and OH compacted to 93% Standard Proctor per ASTM D-698. Unsuitable soil: USCS Groups MH, CH, OL, OH, and PT.

2.03 FINAL BACKFILL

Reused or imported earth free of stone, clods, broken rock, or concrete larger than 3 inches in largest dimension, or organic matter, rubbish, or other unsuitable material.

PART 3 EXECUTION
3.01  INSPECTION

A. Verify bedding and backfill material to be used are acceptable. Do not use frozen material.

B. Verify areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen.

3.02  PREPARATION

A. Identify required lines, levels, contours, and datum.

B. When necessary, compact subgrade surfaces to density requirements for backfill material.

3.03  SHEETING, SHORING AND BRACING

A. CONTRACTOR shall be responsible for supporting and maintaining all excavations required even to the extent of sheeting and shoring the sides and ends of excavations with timber or other supports. All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressure exerted and to conform with OSHA 29 CFR 1926, Subpart P – Excavations, latest revision.

B. Excavations adjacent to existing or proposed utilities, buildings and structures, or in paved streets or alleys shall be sheeted, shored and braced adequately to prevent undermining beneath or subsequent settlement of such structures or pavements. Underpinning of adjacent utilities and structures shall be done when necessary to maintain utilities and structures in safe condition. The CONTRACTOR shall be held liable for any damage resulting to such utilities, structures or pavements as a result of his operations.

C. The need and adequacy of sheeting, shoring, bracing, or other provisions to protect men and equipment in a trench or other excavation shall be the sole and exclusive responsibility of CONTRACTOR.

D. Moving trench boxes or sheeting: When using moveable trench support, care should be taken so not to disturb the pipe location, joints, or embedment. Removal of any trench protection below the top of the pipe and within the dimensions of the trench shown on the construction details (for Class 2, 4, and 5 Bedding) shall be prohibited after pipe embedment is compacted. Therefore, moveable trench supports shall only be used in wide trench construction where supports extend below the top of the pipe, or on a shelf above the pipe installed in a narrow trench in accordance with construction details. Any voids left in the embedment material by support removal shall be carefully filled with Class IA or IB aggregate materials and compacted.

3.04  EXCAVATION

A. Trench Excavation

1. Trench excavation shall consist of the removal of materials necessary for the construction of pipelines and all appurtenant facilities including collars, concrete saddles, and pipe protection called for on Drawings.

2. Excavation for pipelines shall be made in open cut unless otherwise shown on
Drawings. Trenches shall be cut true to lines and grades shown on Drawings. Minimum pipe cover shall be 48” measured from the top of pipe to the ground surface.

3. Use of motor-powered trenching machine will be permitted but full responsibility for the preservation, replacement, and/or repair of damage to any existing utility services and private property shall rest with CONTRACTOR.

4. Bell holes for bell and spigot pipe and/or mechanical joint pipe shall be excavated at proper intervals so the barrel of the pipe will rest for its entire length upon the bottom of the trench or bedding material.

5. Pipe trenches shall not be excavated more than 400 feet in advance of pipe laying and all work shall be performed to cause the least possible inconvenience to the public. Adequate temporary bridges or crossings shall be constructed and maintained where required to permit uninterrupted vehicular and pedestrian traffic.

6. Unless otherwise specified herein or shown on Drawings, wherever pipe trenches are excavated below elevation shown on Drawings, CONTRACTOR, at his own expense, shall fill the void thus made to proper grade with bedding and haunching material in accordance with Part 2.01A.

7. In all cases where materials are deposited along open trenches they shall be placed so that no damage will result to the WORK and/or adjacent property in case of rain or other surface wash.

8. Remove soft, spongy, or otherwise unstable materials encountered at elevation of pipe which will not provide a firm foundation for the pipe. Extend bedding depth as necessary to reach firm materials.

B. Any unauthorized excavation shall be corrected at the CONTRACTOR's expense.

C. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

D. Grade top perimeter of excavation to prevent surface water run-off into excavation.

E. Notify ENGINEER of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

F. Trench widths shall be in accordance with construction details for Pipe Bedding and Haunching (G-2) for sewer pipelines and Water Main Bedding (W11) for water pipelines.

3.05 DEWATERING

A. CONTRACTOR shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the WORK. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of final lines and grades of bottoms of excavations. Methods of dewatering may include sump pumps, well points, deep wells, or other suitable methods which do not damage or weaken structures, foundations, or subgrades. Shallow excavations may be dewatered using open
ditches provided such ditches are kept open and free-draining at all times. Dewatering methods used shall be acceptable to ENGINEER. Footing pits or trenches shall be protected by small earth dikes and plastic covers when they are left open in rainy weather.

B. When significant (more than 30 L.F. continuously in a trench) ground water is encountered in soils containing fines, the CONTRACTOR shall notify the ENGINEER. In these areas, the trench shall be lined with an approved filter fabric between the bedding and haunching material and the trench walls to reduce the affects of migration of fines which can diminish pipe support.

C. Unless specifically authorized by ENGINEER, groundwater encountered within the limits of excavation shall be depressed to an elevation not less than two feet below the bottom of such excavation before pipe laying or concreting is started and shall be so maintained. No concrete structures shall be exposed to unequal hydrostatic forces until the concrete has reached its specified 28-day strength. Water shall not be allowed to rise above bedding during pipe laying operations. CONTRACTOR shall exercise care to prevent damage to pipelines or structures resulting from flotation, undermining, or scour. Dewatering operations shall commence when ground or surface water is first encountered and shall be continued until such times as water can safely be allowed to rise in accordance with provisions of this section.

D. Standby pumping equipment shall be kept on the job site. A minimum of one standby unit (one for each ten in the event well points are used) shall be available for immediate installation should any pumping unit fail. Installation of well points or deep wells shall be adequately sized to accomplish the WORK. Drawings or design of proposed well point or deep well dewatering systems shall be submitted to ENGINEER for review.

E. CONTRACTOR shall not operate dewatering devices (i.e., pumps, etc.) before the hour of 8:00 AM and after the hours of 8:00 PM in a residential area unless otherwise approved by ENGINEER or OWNER.

F. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with foundation backfill at no cost to OWNER. Foundation backfill shall be placed in bottom of trench to within 6" of the bottom of pipe. Six (6) inches of bedding stone shall be placed over the top of the foundation backfill.

G. CONTRACTOR shall dispose of water from the WORK in a suitable manner without damage to adjacent property. Conveyance of water shall be such as to not interfere with construction operations or surrounding property owners. No water shall be drained into WORK built or under construction without prior consent of ENGINEER. CONTRACTOR will be held responsible for the condition of any pipe or conduit which he may use for drainage purposes, and all such pipes or conduits shall be left clean and free of sediment.

H. Storm water runoff shall be controlled by means of temporary erosion control methods specified in Section 02270, as shown on Drawings, or as directed by ENGINEER.

I. Water shall be disposed of in such a manner as not to be a menace to public health and in accordance with applicable Environmental Protection Agency, Corps of Engineers, and State Environmental Protection Division standards and permits.
3.06 BEDDING/BACKFILLING

A. The backfilling of trenches shall be started immediately after construction of same has been viewed by the Project Observer. Bedding shall be aggregate and backfill material shall be earth or aggregate in accordance with Part 2 and the Drawings. Material shall be deposited in the initial horizontal layer to the spring line of the pipe (before compaction) on each side of the pipe. The initial layer shall be thoroughly tamped or rammed around the pipe until the initial layer’s density is equal to the density of the adjacent undisturbed soils. The second bedding material layer shall be deposited horizontally to a depth to provide a cover of not less than 12 inches over top of pipe. The remainder of the backfill shall be placed in horizontal layers 12 inches (maximum) in depth. The second and subsequent bedding/backfill layers shall be compacted by compaction tools to a density equal to the density of the adjacent undisturbed soils, except under roads, structures, and driveways.

B. Compact aggregate and soil backfill under roads, parking lots, structures, and driveways to a minimum of 95% of maximum dry density at not less than 2% below nor more than 2% above the optimum moisture content as determined by ASTM D 698. The top 12 inches shall be compacted to 100 percent of maximum dry density. Consolidation by saturation or ponding will not be permitted.

C. All backfilling shall be done in such a manner that the pipe or structure over or against which it is being placed will not be disturbed or injured. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be removed and repaired to the satisfaction of OWNER and then re-backfilled.

D. Backfilling shall not be done in freezing weather except by permission of the ENGINEER, and shall not be done with frozen material or upon frozen materials.

E. All backfilling shall be left with smooth, even surfaces, properly graded and shall be maintained in this condition until final completion and acceptance of the work. Where directed by the ENGINEER, the backfill shall be mounded slightly above the adjacent ground.

F. Leave stockpile areas completely free of excess fill materials. After construction and cleanup, stockpile areas shall be seeded in accordance with provisions specified in Section 02931.

G. Use “Type 5” bedding (Detail W11) in all wet trenches and under roads/driveways, regardless of pipe material.

H. Use the appropriate bedding type shown on detail G-2 for all gravity sewer.

I. For push on joint waterline, bedding shall be at a minimum “Type 2” (Detail W11) Pipe Bedding. If laying conditions dictate, Type 3, 4, or 5 bedding shall be used per manufacturer’s recommendations based on depth of cover.

J. Restrained joint waterline pipe and fittings bedding shall meet the requirements for Type 3 Pipe Bedding. If laying conditions dictate, Type 4 or 5 bedding shall be used.

3.07 SUBSURFACE OBSTRUCTIONS
A. In excavating, backfilling, and laying pipe, case must be taken not to remove, disturb, or injure any existing water, telephone, gas pipes, storm drainage pipe, headwalls or catch basins, or other conduits or structures, without the approval of the ENGINEER. If necessary, the CONTRACTOR at his own expense, shall sling, shore up, and maintain such structures in operation, and shall repair any damage to them. Before final acceptance of the work, he shall return all such structures to as good condition as before the work started.

B. The CONTRACTOR shall give sufficient notice to the interested utility of his intention to remove or disturb any pipe, conduit, etc., and shall abide by their regulations governing such work. In the event that any subsurface structure becomes broken or damaged in the execution of the work, the CONTRACTOR shall immediately notify the proper authorities, and shall be responsible for all damage to persons or property caused by such breaks. Failure of the CONTRACTOR to promptly notify the affected authorities shall make him liable for any needless loss so far as interference with the normal operation of the utility.

C. When pipes or conduits providing service to adjoining buildings are broken during progress of the work, the CONTRACTOR shall repair them at once.

D. Delays such as would result in buildings or residences being without services overnight or for a needlessly long period during the day will not be tolerated. Should it become necessary to move the position of a pipe, conduit or structure, it shall be done by the CONTRACTOR in strict accordance with the instructions given by the ENGINEER or the utility involved.

E. The OWNER or the ENGINEER will not be liable for any claim made by the CONTRACTOR based on underground obstructions being different from that indicated in these CONTRACT DOCUMENTS or plans.

3.08 BORROW EXCAVATION

Wherever the backfill of excavated areas or the placement of embankments or other fills require material not available at the site, suitable material shall be obtained from other sources. This may require the opening of borrow pits at points not immediately accessible to the WORK. In such cases, CONTRACTOR shall make arrangements with the property owner and shall pay all costs incident to the borrowed material including royalties, if any, for the use of the material. Before a borrow pit is opened, the quality and suitability of the material to be obtained shall be approved by the ENGINEER. Any soil tests required for approval of the borrowed material proposed, shall be at the OWNER's expense.

3.09 DISPOSAL OF WASTE AND UNSUITABLE MATERIALS

A. Materials removed by excavation, which are suitable for the purpose, shall be used to extent possible for backfilling pipe trenches and for making embankment fills, subgrades or for such other purposes as may be shown on Drawings. Materials not used for such purposes shall be considered waste material and shall be disposed of at the CONTRACTOR's expense.

B. Waste materials shall be spread in uniform layers and neatly leveled and shaped. Spoil banks shall be provided with sufficient and adequate openings to permit surface drainage of adjacent lands.
C. Unsuitable materials, consisting of rock, wood, vegetable matter, debris, soft or spongy clay, peat, and other objectionable material so designated by the ENGINEER, shall be removed from the work site and disposed of by CONTRACTOR at his expense.

D. No waste material shall be dumped on private property unless written permission is furnished by owner of property and unless required permits are issued from the local jurisdiction.

3.10 TESTING

A. Compaction of fill and backfill to the specified moisture-density relationship of soils shall be verified by in-place density tests using ASTM D 2167, D1556 or other ASTM in-place density tests approved by the ENGINEER. Maximum density determination and in-place density tests shall be performed by a soils technician employed by the OWNER. Frequency and location of tests shall be adequate to ensure proper compaction has been achieved.

B. CONTRACTOR shall assist soils technician with excavation of test pits to the elevations required by OWNER or ENGINEER.

C. Areas not meeting the required compaction shall be recompacted until the desired degree of compaction is achieved. All costs associated with re-testing failed areas of compaction shall be paid for by the CONTRACTOR.

3.11 PROTECTION

Protect excavation by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in of loose soil into excavation. Protection shall be in accordance with OSHA 29 CFR 1926, Subpart P-Excavations, latest revision.

3.12 FINAL GRADING

A. After other earthwork operations have been completed, sites of all structures and embankments shall be graded to finished grade as shown on the Drawings. Grading operations shall be so conducted that materials shall not be removed or loosened beyond required limits. Finished surfaces shall be left in smooth and uniform planes such as are normally obtainable from use of hand tools. If CONTRACTOR is able to obtain required degree of evenness by means of mechanical equipment, he will not be required to use hand labor methods. Slopes and ditches shall be neatly trimmed and finished.

B. Unless otherwise specified or shown on the Drawings, all finished ground surfaces shall be graded and dressed to present a surface varying not more than plus or minus 0.10 foot. Any finished surfaces resulting in inadequate drainage or washouts shall be corrected by the CONTRACTOR at his expense.

3.13 SETTLEMENT

A. CONTRACTOR shall be responsible for all settlement of backfill, fills, and embankments which may occur during warranty period.
B. CONTRACTOR shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after receipt of written notice from ENGINEER or OWNER.

3.14 DUST CONTROL

The CONTRACTOR shall use all means necessary to control dust on and near work areas and on and near all off-site borrow areas when dust is caused by construction operations during performance of work. The CONTRACTOR shall thoroughly moisten all surfaces as required to prevent dust being a traffic hazard and a nuisance to the public and neighbors.

END OF SECTION
SECTION 02227
ROCK REMOVAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Removal of all rock materials discovered during excavation for the purpose of construction. Removal shall include drilling and/or blasting incidental thereto and disposal of excavated materials.

1.02 RELATED WORK

A. Section 02200 – Earthwork

B. Section 02225 - Earthwork for Utilities

1.03 REFERENCES


C. Rules and Regulations of Safety Fire Commissioner, Chapter 120-3-10.

1.04 QUALITY ASSURANCE

A. When necessary for prosecution of the WORK, the use of explosives to assist rock removal may be exercised by CONTRACTOR provided this use is in compliance with all local, State, Federal and other Governmental regulations applying to transportation, storage, use and control of explosives.

B. Explosives Firm: Company specializing in explosives for disintegration of subsurface rock with documented experience.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for use of explosives as follows:

1. Rules and Regulations of Safety Fire Commissioner, Chapter 120-3-10.

2. NFPA 495


B. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.

C. All explosives shall be stored securely in compliance with all laws and ordinances, and all
such storage places shall be clearly marked DANGEROUS EXPLOSIVES. Blasting caps, electric blasting caps, detonating primers, and primed cartridges shall not be stored in the same magazine with other explosives or blasting agents. Locked storage shall be provided satisfactory to the OWNER, never closer than allowed by the Safety Fire Commissioner.

PART 2  PRODUCTS

2.01  MATERIALS

A. Rock (Definition): Solid mineral material with a volume in excess of 1/2 cu yd that cannot be broken down and removed by use of heavy construction equipment, such as a Caterpillar 225 or equivalent, having a bucket curling force rated at not less than 25,700 pounds, bulldozer such as a Caterpillar D8K equipped with single tooth hydraulic ripper, 3/4 cu yd capacity power shovel, rooters, etc., without drilling or blasting. Materials which can be loosened with a pick, hard pan, boulders less than 1/2 cu yd in volume, chert, clay, soft shale, soft and disintegrated rock and any similar material shall not be considered as rock. (All materials to be considered unclassified or common excavation)

B. Explosives: Shall be suitable for intended purposes at the CONTRACTOR's option subject to review by OWNER.

C. Delay Devices: Type recommended by explosives firm to be used as accessory to explosives. Subject to review by OWNER.

D. Blasting Mat: When the use of explosives is necessitated during prosecution of the WORK, CONTRACTOR shall incorporate the use of blasting mats of type recommended by explosives firm to lessen the danger of projectiles occasionally resultant from blasting of rock.

PART 3  EXECUTION

3.01  INSPECTION

A. CONTRACTOR shall verify site conditions and note irregularities affecting work of this Section prior to performing any operations involving explosives. CONTRACTOR shall submit to OWNER for review a detailed plan for using explosives to include, but not limited to:

1. Sequence of WORK
2. Equipment
3. Protection to be provided for existing structures to remain
4. Personnel
   a) Training
   b) Previous experience with the use of explosives in similar situation

B. Beginning work of this Section means acceptance of existing condition.
C. Rock in utility trenches shall be excavated over the horizontal limits of excavation and to depths as follows:

<table>
<thead>
<tr>
<th>Size of Pipeline (Inches)</th>
<th>Depth of Excavation Below Bottom of Pipe (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4</td>
<td>6</td>
</tr>
<tr>
<td>4 to 6</td>
<td>8</td>
</tr>
<tr>
<td>Over 8</td>
<td>12</td>
</tr>
</tbody>
</table>

1. Space below grade for pipe shall then be backfilled with bedding stone in accordance with Section 02225 or other approved materials and tamped to proper grade.

3.02 ROCK REMOVAL - MECHANICAL METHOD

A. Excavate for and remove rock by the mechanical method. Utilizing hand operated or mechanical equipment specifically designed for the purpose of rock removal.

B. Where pipes are constructed on concrete cradles, rock shall be excavated to bottom of cradle as shown on plans.

C. Where rock foundation is obtained at grade for over 50 percent of area of any one structure, the portion of foundation that is not rock shall be excavated below grade to reach a satisfactory foundation of rock. The portion below grade shall be backfilled with Class C concrete.

D. Where rock foundation is obtained at grade for less than fifty (50%) of any one structure and satisfactory rock cannot be found over the remaining area by reasonable additional excavation, the rock shall be removed for a depth of twelve (12) inches below grade and the space below grade shall be backfilled with crushed stone as specified for pipelines and structures.

E. Rock excavation near existing pipelines or other structures shall be conducted with utmost care to avoid damage. Injury or damage to other structures and properties shall be promptly repaired to the satisfaction of the OWNER and by CONTRACTOR at his own expense.

F. Remove and dispose of excavated material from site.

G. CONTRACTOR shall correct excess rock removal by backfill to grade with Class C (3000 psi) concrete in accordance with backfilling and compaction requirements of Section 02225 (Earthwork for Utilities), or Section 02200 (Earthwork) at his own expense.

3.03 ROCK REMOVAL - EXPLOSIVES METHODS
A. The CONTRACTOR shall notify any owners of adjacent buildings or structures, and any public utility owners having structures or other installations above or below ground, in writing prior to use of explosives. Such notice shall be given sufficiently in advance so that they may take such steps as they may deem necessary to protect their property from injury and/or damage.

B. Rock excavation by use of explosives shall be conducted with due regard for safety of persons and property in the vicinity and in strict conformance with requirements of local, State and Federal ordinance, laws and regulations of the Safety Fire Commissioner.

C. Blasting shall be conducted so as not to endanger persons or property, and whenever required, the blast shall be covered with mats or otherwise satisfactorily confined. The CONTRACTOR shall be held responsible for and shall make good any damage caused by blasting or accidental explosions.

D. The CONTRACTOR shall permit only authorized and qualified persons to handle and use explosives.

E. Smoking, firearms, matches, open flame lamps, and other fires, flame or heat producing devices and sparks shall be prohibited in or near explosive magazines or while explosives are being handled, transported or used.

F. No person shall be allowed to handle or use explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs.

G. All explosives shall be accounted for at all times. Explosives not being used shall be kept in a locked magazine, unavailable to persons not authorized to handle them. The CONTRACTOR shall be held responsible for maintaining an inventory and use record of all explosives. Appropriate authorities shall be notified of any loss, theft, or unauthorized entry into a magazine.

H. No explosives or blasting agents shall be abandoned.

I. CONTRACTOR's employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including, but not limited to, visual and audible warning signals, flags, or barricades, to ensure safety.

J. A seismograph shall be used at the nearest structure during blasting events that are within 750 feet of the nearest house, public building, school, church, commercial or institutional building, dam and roadway. The velocity/shock wave shall not exceed the established limits of U.S. Bureau of Mines RI 8507; appendix (b).

Exception: Where all pedestrian and vehicular traffic on a roadway can be restricted to a distance of 750 feet or greater from the blast site at the time of the firing of the blast or where a variance is issued by the State Fire Marshal’s Office.

K. Disintegrate rock and remove from excavation.

L. Cut away rock at excavation bottom to form level bearing.

M. Remove shaled layers to provide sound and unshattered base for pipe foundations.
N. Remove excavated material from site.

O. Correct unauthorized rock removal or overbreak in accordance with backfilling and compaction requirements at CONTRACTOR expense.

P. **The CONTRACTOR shall be responsible for applying for and obtaining any and all required permits for blasting work at no additional cost to OWNER.**

3.04 FIELD QUALITY CONTROL

Provide for visual inspection of bearing surfaces and cavities formed by removed rock for inspection by ENGINEER and OWNER.

END OF SECTION
SECTION 02645
FIRE HYDRANTS

PART 1   GENERAL

1.01  SUMMARY

CONTRACTOR shall furnish all labor, equipment, and materials and install at location indicated on CONTRACT DRAWINGS, or as directed, fire hydrants as necessary or required for proper completion of the work under this Contract.

1.02  REFERENCES

American Water Works Association (AWWA), Section C502, standard for Dry-Barrier Fire Hydrants (Latest Edition)

PART 2   PRODUCTS

2.01  MATERIALS

A.  Hydrants shall be manufactured in full compliance with AWWA C502, 200 psi working pressure, and as herein amended.

B.  Hydrants shall be Mueller A-423 Super Centurion 250, American Darling B-84-B-250 psi, or M&H Style 929-250 psi.

C.  Hydrants shall be three-way, post type, dry top traffic model with compression main valve opening against and closing in the direction of normal water flow.

D.  Internal main valve diameter shall be minimum of 5¼”.

E.  Hydrants shall have name of manufacturer, year manufactured, and nominal valve size in legible, raised letters cast on barrel of bonnet.

F.  Dry Top Bonnet

1.  Shall be constructed with moisture-proof lubrication chamber which provides automatic lubrication of threads and bearing surfaces each time hydrant is operated.

2.  Assembly shall be comprised of top "O" ring serving as dirt and moisture barrier and a lower "O" ring which shall serve as a pressure seal.

G.  Operating Nut

1.  Shall be of regular pentagon shape measuring 1½” point to flat; i.e. National Standard, and shall open by turning counter-clockwise (left).
2. Nozzle caps shall have same cross-section as operating nut and shall come with heavy duty, non-kinking chains.

3. Chains shall be securely affixed to hydrant upper barrel and permit free turning of caps.

H. Traffic Design

1. Hydrant barrel sections shall be connected at groundline in a manner that will prevent damage to hydrant when struck by vehicle.

2. Main valve rod sections shall be connected at groundline by frangible coupling.

3. Standpipe and groundline safety construction shall be such that the hydrant nozzles can be rotated to any desired position without disassembling or removing top operating components and top section of hydrant standpipe.

I. Main valve shall be made of synthetic rubber and formed to fit the valve seat accurately.

J. Main Valve Seat

1. Shall be of bronze and assembly into hydrant shall involve bronze to bronze thread engagement.

2. Two (2) "O" ring seals shall be provided as positive pressure seal between the bronze seat ring and shoe.

3. Valve assembly pressure seals shall be obtained without employment of torque compressed gaskets.

4. Hydrants shall be designed to allow removal of all operating parts through hydrant barrel by means of single, light weight disassembly wrench without excavation.

K. Drain

1. Mechanism shall be designed to operate automatically with the operation of main valve and shall allow a momentary flushing of drain ports.

2. Minimum of two (2) internal and two (2) external bronze lined drain ports shall be required in main valve assembly to drain hydrant barrel.

3. Inlet connection shall be cast iron inlet elbow and shall have 6" mechanical joint connection.

4. Barrel extension sections shall be available in 6" increments complete with rod, extension coupling and necessary flanges, gaskets and bolts so that extending hydrant can be accomplished without excavating.

5. No lead will be allowed in nozzle installation.
6. Hydrants shall be tested in strict accordance with AWWA C502 at supplier's expense. Certificate of compliance shall be furnished to OWNER upon request.

L. Fire hydrants shall have two 2½" diameter hose connections and one 6" diameter pumper connection. Standard hose threads shall be provided.

2.02 SPARE PARTS

CONTRACTOR shall provide the OWNER with two (2) sets of maintenance wrenches and five (5) breakaway repair kits for each type of hydrant provided.

PART 3  EXECUTION

3.01 SETTING HYDRANTS

A. Hydrants shall be placed at locations indicated on CONTRACT DRAWINGS in manner to provide complete accessibility and so that possibility of damage from vehicles and injury to pedestrians will be minimized.

B. Hydrants to be installed so the finish grade is at the hydrant bury line.

C. All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the roadway, with the pumper nozzle facing the roadway.

D. When a hydrant is set in soil that is pervious, drainage shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with coarse sand from the bottom of the trench to at least 6-inches above the drain port opening in the hydrant to a distance of 12-inches around the elbow.

E. When a hydrant is set in clay or other impervious soil, a drainage pit 2x2x2 feet shall be excavated below each hydrant and filled with coarse gravel or crushed stone mixed with coarse sand under and around the elbow of the hydrant and to a level of 6-inches above the drain port.

F. Extension required to bring hydrant to proper grade shall be furnished and installed by CONTRACTOR at his expense.

G. Fire hydrant assembly shall consist of the ductile iron tee, gate valve, 6” ductile iron lead pipe, and hydrant. Pipe restrainer shall be used to restrain assembly. Pipe restrainers shall be Anchore Coupling type or MJ Field-Lok fittings as manufactured by U. S. Pipe or approved equivalent. PVC IS NOT ALLOWED FOR HYDRANT ASSEMBLY.

3.02 PAINTING, COATING AND LUBRICATING

A. Iron parts of hydrant shall be thoroughly cleaned inside and outside.

B. Unless otherwise stipulated or directed, surface shall be coated or painted with, or dipped in, an asphalt or bituminous base paint or coating, except for the exterior portion above the groundline.
C. Exterior of hydrant valve above finished groundline shall be thoroughly cleaned and painted in shop with two (2) coats of epoxy primer. Then two (2) coats of enamel shall be applied at factory. Color shall be silver.

D. Following installation, hydrants shall be painted with two (2) field coats of enamel. Color shall be selected by OWNER.

E. Coatings shall be manufactured by Koppers, Tenemec, or approved equivalent.

F. Bronze, threaded and contact moving parts shall, during shop assembly, be lubricated and protected by coating of rust proof compound to prevent damage in shipment.

END OF SECTION
SECTION 02660
WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

WORK covered by this Section consists of furnishing and installing water distribution pipes and appurtenances, including, but not limited to, reaction blocking, testing, and disinfection.

1.02 RELATED WORK

Section 02225 - Earthwork for Utilities

1.03 REFERENCES

   2. ASTM F 477, Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA) Standards.
   4. AWWA C151, Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or other Liquids.
   5. AWWA C153, Standard for Ductile-Iron Compact Fittings, 3 in. through 24 in. and 54 in. through 64 in., for Water Service.
   7. AWWA C550, Standard for Protective Epoxy Interior Coatings for Valves and Hydrants.
   8. AWWA C600, Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
   9. AWWA C651, Standard for Disinfecting Water Mains.
10. AWWA C900, Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in., for Water Distribution.

1.04 SUBMITTALS

Submit manufacturer's certifications for all pipe, valves, and fittings shipped to the job site. The certifications shall state that all specified tests have been made and the results thereof comply with the requirements of this Specification. Each certificate shall be signed for the manufacturer by a person having legal authority to bind the manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. CONTRACTOR shall be responsible for safe unloading, storage and care of material furnished by or to him until it has been incorporated into work.

B. Unload pipe, fittings, or valves by lifting with hoists or skidding to avoid damage.
   1. Pipe shall not be unloaded by rolling or dropping off trucks.
   2. Pipe handled on skidways shall not be skidded or rolled against pipe already on ground.

C. Unload material at site of work, near place where it will be placed in trench.
   1. Materials shall be placed so as to least interfere with traffic.
   2. Provide signs, lights, and barricades as necessary to protect public.

D. Handle material carefully to prevent breakage and to avoid damage to coatings and linings.
   1. Keep interior of pipe, fittings, and valves, free of dirt or foreign matter at all times.
   2. Do not place materials in drainage ways or ditches.

E. Materials that cannot be placed along site of the work shall be stored at CONTRACTOR's expense. OWNER's storage yards may be utilized if available.

1.06 SITE CONDITIONS

Water used for construction, testing, or disinfection will be furnished by OWNER through connections to OWNER's water system made by CONTRACTOR upon approval by OWNER. CONTRACTOR WILL COORDINATE THIS USAGE AND COST WITH OWNER.

PART 2 PRODUCTS
All water distribution piping mains shall be new unused. All materials used and come into contact with drinking water during its distribution shall not adversely affect drinking water quality and public health and must be certified for conformance with American National Standards Institute/National Sanitation Foundation Standard 61 (ANSI/NSF Standard 61).

Any pipe, solder, or flux used in the installation or repair of water lines must be lead free. Pipes and fittings must not contain more than 8.0% lead, and solders and flux must not contain more than 0.2% lead.

2.01 DUCTILE IRON PIPE

A. Shall conform to latest requirements of AWWA C151.

B. Shall be cement mortar lined in accordance with AWWA C104 standard thickness.
   1. Unless otherwise specified, pipe shall have push-on compression type joints conforming to AWWA C111 or AWWA C153.
   2. Unless otherwise specified, pressure class shall be 350 psi.

C. Ductile iron pipe for minor creek crossings shall be connected with restrained joints.

2.02 PLASTIC PIPE (PVC)

A. 3” Diameter and Smaller
   1. Polyvinyl Chloride (PVC) pipe 3” diameter and smaller shall conform to requirements of ASTM D-2241.
   2. Pipe shall be pressure Class 315 (SDR 13.5).
   3. PVC plastic extrusion compound shall meet requirements of ASTM D-1784 for Class 112454-B (PVC 1120).
   4. Pipe and couplings shall bear National Sanitation Foundation Testing Laboratories, Inc., seal of approval for potable water use.

B. 4” Diameter and Larger
   1. Polyvinyl chloride (PVC) pipe 4” diameter and larger shall meet requirements of AWWA C900.
   2. Pipe shall be Pressure Class 305 (DR14) as indicated with outside diameter (OD) dimensions of cast iron pipe.
   3. Joints
      a) Shall be made with elastomeric gaskets.
      b) Bell end pipe using elastomeric gaskets shall meet requirements of ASTM D 2122.
c) Elastomeric gasket couplings shall meet requirements of AWWA C900 (latest revision) for the specified pipe class and shall meet the requirements of ASTM F477.

4. Provide marking on pipe exterior as specified in AWWA C900.

2.03 DUCTILE IRON FITTINGS
A. Fittings for ductile iron pipe and PVC pipe shall be ductile iron and shall conform to requirements of AWWA C110 or AWWA C153 and shall be cement mortar lined in accordance with AWWA C104 standard thickness.
B. Joints shall conform to AWWA C111.
C. Fittings shall be mechanical joint unless otherwise specified on Drawings.
D. Gaskets for PVC pipe shall be duct tip transition type compatible with type of pipe used.

2.04 RESTRAINED JOINTS – DIP and PVC
A. DIP Push-on application – restrained joints shall be “Fast-Grip Gasket” by ACIPCO or “Field-Lok Gasket” by U. S. Pipe.
B. DIP pipe with integral manufactured restrained joints shall be American Flex-Ring or Lok-Ring, or U.S. Pipe TR FLEX.
C. DIP Mechanical joint restraints shall be “Mega-Lug 1100 Series” by EBBA Iron Sales, MJ-Field-Lok Series DI by U. S. Pipe or approved equal.
D. PVC Push-on application restrained joints shall be “Mega-Lug 1500 Series” by EBBA Iron Sales, or approved equal.
E. PVC mechanical joint restraints shall be “Mega-Lug 2000 PV Series” by EBBA Iron Sales, MJ Field Lok Series PV by U.S. Pipe or approved equal.
F. Joint preparation and installation shall be in accordance with manufacturer’s recommendations.

2.05 GATE VALVES
A. Shall conform to requirements of AWWA C509 for resilient seated gate valves, ductile iron body, with bonded epoxy coating conforming to AWWA C550.
B. Shall be designed for 250 psi working pressure and 500 psi hydrostatic test pressure.
C. Shall be of iron body, bonded epoxy, and shall have non-rising bronze stem, and shall be wrench operated.
D. Valves shall open by turning counter-clockwise.
E. Operating nuts shall be standard two inches square.
F. Suitable stem guides shall be provided, where required.

G. Shall be furnished with mechanical joint suitable for connection to pipe into which it will be installed for buried service.

H. Shall be furnished with flanged joint suitable for connection to pipe into which it will be installed for non-buried service.

I. Valves shall be manufactured by Mueller, American Flow Control, U. S. Pipe and Foundry Co. or M&H Valve.

J. Small Gate Valves: Valves smaller that 3 inches shall conform to level of quality and manufacturing standards established for valves 3 inches and larger by respective AWWA Standards.

2.05 AIR RELEASE VALVES

A. Shall be float operated and incorporate a simple lever mechanism to enable the valve to automatically release accumulated air from a fluid system while that system is pressurized and operating.

B. Internal parts shall be stainless steel.

C. The air release valve shall be Crispin-PL10, Type N with 3/16” orifice.

2.06 AIR RELEASE AND AIR & VACUUM VALVES

A. Shall be constructed to exhaust air during filling, release small amounts of accumulated air during operation, and open upon impending vacuum to admit air.

B. Shall exhaust air up to sonic velocity without blowing shut.

C. The air release and air & vacuum valve shall be Crispin UL20, 2” orifice.

2.07 VALVE MARKERS

A. Shall be furnished with each valve installed as indicated on the drawings, with exception of fire hydrant valves. The marker shall be a fiber reinforced composite material with an ultraviolet light inhibitor and curved cross section with a minimum dimension of 3.75 inches wide. The post design shall be capable of flattening out when hit and then returning to its normal upright position. The decal shall be placed on the side of the marker which is facing the roadway.

B. Valve markers shall be Rhino FiberCurve Fiberglass Utility Marking Post with PolyTech Coating or approved equal. The valve marker shall be blue and 66-inches in length. Each valve marker shall have the TriView Marking System decal #GD8-5194K.

2.08 VALVE BOXES AND COVERS

A. Shall be provided with all buried valves.
B. Shall be of adjustable screw type with drop covers, of length required with a minimum 6” of adjustment allowed, and installed as shown on standard details of Drawings.

C. Shaft shall be 5¼ inch diameter with base to be minimum of 8¾ inch diameter by 9-inch height inside.

D. Base size and extension piece shall be as required for each individual size of valve and depth.

E. The words “WATER VALVE” or “WATER” shall be cast into the cover.

2.09 TAPPING VALVES

A. Valves and tapping sleeves shall be furnished at locations indicated on Drawings, together with necessary appurtenances.

B. Tapping machines and competent supervision shall be provided for making of tap. Tap shall be performed in the presence of OWNER.

C. Tapping sleeves shall be properly sized to fit existing pipe. Tapping sleeves for DIP shall be cast or ductile iron of the split-sleeve, mechanical joint type. Tapping sleeves shall be equal to American-Darling, Mueller, or M&H Valve.

D. Tapping sleeves for PVC shall be fabricated of stainless steel, and shall be clamp on type, equal to Smith-Blair, Ford, or Romac Industries, Inc.

E. Valves furnished with sleeves shall conform to requirements herein above for gate valves, except for modifications required to permit use of full size cutter through valves.

F. Outlet of valves shall be mechanical joint for joining with water mains.

G. After tap is completed, the “cut out” section of pipe or “coupon” shall be tagged, labeled as to date and location, and submitted to Owner.

H. Tapping sleeves shall be pressure tested immediately after installation as per the testing requirements of this section.

2.10 INSERTABLE VALVES

A. Insertable valves and tapping sleeves shall be furnished at locations indicated on Drawings, together with necessary appurtenances needed to provide a complete installation.

B. All necessary equipment and competent supervision shall be provided for making of tap and inserting valve. Work shall be performed in the presence of ENGINEER or OWNER.

C. Tapping sleeves and insertable valves shall be properly sized to fit existing pipe and shall be manufactured by Severn Trent Services, Inc., Romac Industries, Inc., or approved equal.

2.11 LINE STOPS

A. Line stops shall be furnished at locations indicated on Drawings, together with necessary
appurtenances needed to provide a complete installation.

B. All necessary equipment and competent supervision shall be provided for making of tap and performing line stop procedure. Work shall be performed in the presence of ENGINEER or OWNER.

C. Tapping sleeves and line stop mechanism shall be properly sized to fit existing pipe and shall be manufactured by Severn Trent Services, Inc. or approved equal.

2.12 DETECTION WIRE AND TAPE

A. Detection wire shall be size #14 AWG solid copper for PVC and ductile iron pipe. All splices shall be made with water proof connectors.

B. Detection wire shall be installed along pipe and wrapped a minimum of three (3) times per joint.

C. Detection tape for both PVC and ductile iron pipe:

   1. Minimum of 2 inches wide.
   2. Non-metallic inert, bonded layer of plastic or mylar.
   3. Highly resistant to alkalis, acids or other destructive chemical components encountered in soils.
   4. “Blue” colored and bearing the imprint “CAUTION: WATERLINE BURIED BELOW”.
   5. Shall be installed 18 inches above pipe.

PART 3 EXECUTION

3.01 ALIGNMENT AND GRADES

A. Pipe and appurtenances shall be installed at locations shown on the Drawings and to position, alignment, and grade shown thereon, or in event of conflict, as directed by ENGINEER.

B. Depth of Pipes

   1. Shall be 48 inches measured from finished grade to top of pipe unless otherwise specified.

   2. Where obstructions are encountered, depth may be greater than 48 inches.

   3. Depths less than 48 inches may be used only when approved by ENGINEER in writing.

C. Valves shall be installed with stems vertical.

D. Pipe Curvatures shall be within horizontal or vertical permissible deflection at joint, as specified by manufacturer or AWWA Specification C600.

3.02 INSTALLING PIPE
A. General

1. Pipe and appurtenances shall be installed only when trench conditions are suitable.
2. Trenches must be dry.
3. Proper implements, tools, and facilities shall be provided by CONTRACTOR for safe and convenient performance of the work.
4. All trench excavation and backfilling shall be in conformance with Section 02225.

B. Installation

1. Lower pipe, fittings, valves, and hydrants carefully into trench piece by piece by means of derrick, ropes, or other suitable tools or equipment.
2. Prevent damage to water main materials and protective coatings and linings.
3. Do not drop or dump water line materials into trench.
4. Carefully examine pipe and fittings for cracks and other defects while suspended above trench immediately before installation in final position. Defective pipe or fittings shall be clearly marked and shall be removed from site.
5. Clean bell and spigot ends of each piece of pipe thoroughly before pipe is laid.
6. Prevent foreign material from entering pipe while it is being placed in line.
   a) Provide protective covering for ends of pipe until connection is made to adjacent pipe, if necessary.
   b) No debris, tools, clothing, or other materials shall be placed in pipe during laying operations.
7. As each length of pipe is placed in trench, spigot end shall be centered in bell and pipe forced home and brought to correct line and grade.
   a) Pipe shall be secured in place with approved backfill material tamped around it.
   b) Precautions shall be taken to prevent dirt from entering joint space.
8. Open ends of pipe shall be closed by watertight plug, or other means approved by ENGINEER, at times when pipe laying is not in progress. If water is in trench, plug shall remain in place until trench is pumped completely dry. Water shall not be allowed to run into pipe at any time during construction.
9. Lay pipe with bell ends facing in direction of laying, unless directed otherwise by ENGINEER. Where pipe is laid on grade of 10 percent or greater, laying shall start
at bottom and shall proceed upward with bell ends of pipe upgrade.

3.03 CUTTING PIPE

Cut pipe for inserting valves, fittings, or closure pieces in neat and workmanlike manner without damage to pipe or lining and as per manufacturer’s requirements.

JOINTING

A. Jointing of pipe, fittings, and valves shall be made in strict compliance with manufacturer’s printed instructions.

B. Mechanical Joints

1. Thoroughly clean outside of spigot and inside of bell.
2. Clean gasket.
3. Tighten nuts with torque limiting wrench.
4. Nuts spaced 180 degrees apart shall be tightened alternately in order to produce equal pressure.

C. Push-On Joints

1. Furnish and install adapters if required to join bells and spigots of different sizes.
2. Thoroughly clean inside of bell and outside of spigot end.
3. Insert and lubricate gasket using lubricant furnished or recommended by pipe manufacturer.
4. Spigot end of pipe shall be entered into socket with care used to keep joint from contacting ground.
5. Complete joint by forcing plain end to bottom of socket with forked tool or jack-type tool.

D. Restrained Joints

1. Restrained joints shall be installed in areas shown on drawings and in accordance with manufacturer’s recommendations.

3.05 SETTING VALVES AND FITTINGS

A. Valves, fittings, plugs, and caps shall be set and joined to pipe in manner specified above for cleaning, laying and joining pipe.

B. Valves shall be set plumb and a valve box shall be provided for every valve.
1. Valve box shall not transmit shock or stress to valves and shall be centered and plumb over wrench nut of valve, with box cover flush with surface of finished pavement or such other level as may be directed.

2. **FOR INSTALLATION WHERE THERE ARE ROADSIDE DITCHES, VALVES AND VALVE BOXES SHALL BE PLACED ON THE BACK SIDE OF THE DITCH AT LEAST FIVE (5) FEET FROM THE CENTERLINE OF THE DITCH.**

   C. Backfill around valves shall be carefully tamped in 6 inch layers for full depth of trench with valve box in place.

   D. Provide concrete pad at surface as indicated on Drawings.

3.06 **ANCHORAGE**

   A. Plugs, caps, tees, bends, and valves, unless otherwise specified, shall be provided with reaction blocking.

   B. Reaction blocking shall be concrete of a mix not leaner that 1 part cement to 2-1/2 parts sand and 5 part stone, and having a compressive strength of not less that 3,000 psi after 28 days.

   C. Blocking shall be placed between solid, unexcavated earth and fitting to be anchored; area of bearing on pipe and on ground in each instance shall be that shown on Drawings or as directed by ENGINEER.

   D. Blocking shall, unless otherwise shown or directed, be so placed that pipe and fitting joints will be accessible for repair.

   E. Metal harness of tie rods or clamps of adequate strength to prevent movement may be used instead of concrete blocking if approved by ENGINEER in writing.

   F. Steel rods or clamps shall be galvanized.

3.07 **CONNECTION TO EXISTING MAINS**

   A. CONTRACTOR shall coordinate with officials of existing water system regarding connections to existing mains. Tap connections shall be performed in the presence of the OWNER.

   B. Connection to existing mains shall be made at such time as to minimize disruption of water service to public.

   C. Approximate locations of required connections to existing mains are shown on Drawings, but it is CONTRACTOR's responsibility to ascertain exact locations of these mains.

   D. Connections to existing mains shall be made in a complete and workmanlike manner using proper fittings and specials to suit actual conditions.

   E. Existing pipes which are cut or damaged by CONTRACTOR shall be repaired, reconnected, and returned to service in equal or better condition.
3.08 STREAM AND UTILITY CROSSINGS

A. Where indicated on CONTRACT DRAWINGS, or required by conditions encountered, pipe shall be placed beneath stream beds or ditches, around, over, or under sewers, culverts, gas mains, telephone ducts, water mains, or other structures.

1. Do not pass pipe through any drainage pipe, culvert, sewer, or manhole.

2. Provide minimum of 48 inches under stream beds or ditches, unless approved by ENGINEER in writing.

3. Provide minimum of 6 inch earth or sand cushion between proposed water line and any other utility or structure, or as indicated on drawings.

D. Where water lines are installed below free flowing streams and storm drainage ditches, ductile iron pipe shall be used for minimum of three feet either side of streambed. Ductile iron pipe shall be connected with restrained joint.

E. When water lines are installed under wet weather ditches and when approved by ENGINEER, ductile iron pipe is not required.

F. Where water line crosses or parallels a sewer line, a minimum of 18-inch vertical clearance (edge to edge) and 10-foot horizontal clearance shall be maintained.

3.09 HYDROSTATIC TESTS

A. Pressure and leakage tests will be required on each section of line between main valves and shall be conducted in accordance with AWWA C600 and/or C605.

B. When a section of pipe of a length deemed adequate by ENGINEER is ready for testing, line shall be thoroughly blown free of air and prepared for testing.

C. Procedure

1. Furnish and install corporation stops at high points on line to release air as line is filled with water. (No additional payments will be made for taps necessary for air release.)

2. Furnish suitable pump, connections, and necessary apparatus including means for accurately measuring water introduced into line during testing.

3. Test pressure shall not be less than 1.25 times the stated working pressure of the pipeline measured at the highest elevation along the test section. Test pressure shall not be less than 200 psi or 1.5 times the stated working pressure at the lowest elevation (whichever is greater) of the test section. The test pressure shall not exceed the thrust restraint design pressures or 1.5 times the pressure rating of the pipe or joint, whichever is less as specified by the manufacturer.

a) Test pressures shall be as directed by the ENGINEER.
4. Testing Allowance
   a) The testing allowance is the maximum amount of water that may be added into the pipeline section during hydrostatic testing in order to maintain ±5 psi of the test pressure.
   b) The maximum allowable makeup water shall be based on the following formula:

   \[ L = \frac{S \times D \times (P^{0.5})}{133,200} \]

   Where \( L \) is the testing allowance of makeup water in gallons per hour; \( S \) is the test length in feet, \( D \) is the pipe diameter in inches and \( P \) is the average test pressure in pounds per square inch.
   c) No pipe installation shall be accepted if the amount of makeup water required exceeds the amount determined in the formula above.

5. Locate, remove and replace any defective pipe, valves, fittings or hydrants.

6. Repeat tests until results are satisfactory to the ENGINEER.

3.10 DISINFECTION

A. Pipe, fittings, valves, and appurtenances which have been exposed to contamination by construction shall be thoroughly cleaned, chlorinated, drained, and flushed in accordance with AWWA C651.

B. During disinfection of the water mains, an appropriate cross-connection control device, consistent with the degree of hazard, shall be provided for backflow protection of the active distribution system.

C. The “tablet method” of disinfection which consists of placing calcium hypochlorite granules or tablets in the water main as it is being installed and then filling the main with potable water when installation is complete is not allowed.

D. Procedure
   1. Flush line prior to disinfection. Flushing shall produce minimum velocity of 2.5 feet per second in pipe.
   2. Disinfect pipe using liquid chlorine or hypochlorite to produce a dosage of 50 mg/L for a 24 hour contact period.
   3. After 24 hour contact period, flush chlorinated water from line until chlorine concentration of water leaving main is no higher than that generally prevailing in system, or less than 1.0 mg/L.
4. Disposal of the heavily chlorinated water shall be in accordance with AWWA C651. The environment to which this water will be discharged shall be inspected. If there is any question that the water will damage the environment, a reducing agent shall be used to neutralize the chlorine.

5. CONTRACTOR shall have sample analyzed for bacteriological quality by a certified laboratory.

C. Repeat disinfection procedure until bacteriological analysis results are acceptable to OWNER and Health Department.

D. Water mains and appurtenances must be completely installed, flushed, disinfected, and satisfactory bacteriological sample results received prior to permanent connections being made to the existing water system, or service connections activated to individual water customers. Sanitary construction practices must be followed during installation of the final connection, so that there is no contamination of the new or existing water main with foreign matter or groundwater.

3.11 CLEAN-UP AND RESTORATION

A. Before work shall be considered complete, material not used and rubbish of every character must be removed from job site.

B. Fences and other private or public facilities and structures disturbed must be in essentially a good condition as existed before work was done.

C. Subsequent settlement of pavement or backfill, or erosion over or in trenches shall be replaced or repaired by CONTRACTOR and surface brought to grade.

D. Special precautions shall be taken to prevent storm water erosion of trenching.

E. Storm water culverts and structures shall be kept cleaned of mud, debris, and silt caused by construction.

F. Any and all items disturbed by construction shall in every case be restored to their original conditions, as closely as possible, after completion of construction.

END OF SECTION
SECTION 02750
PROTECTION, RELOCATION AND RESTORATION OF EXISTING UTILITIES

PART 1  GENERAL

1.01  SCOPE OF WORK

A. CONTRACTOR shall relocate or restore, as indicated on CONTRACT DRAWINGS or as directed by ENGINEER, all existing utilities. The Utilities Protection Center (UPC) must be contacted at least three regular business days before work begins. The UPC can be reached at the state-wide toll-free number: 811.

B. CONTRACTOR shall be required, at his own expense, to do everything necessary to protect, support, and sustain all sewers, culverts, water, or gas pipes, electric lights, power, telephone, or telegraph poles or conduits, and other fixtures laid across or along site of WORK, even to the extent of using hand labor in making trench openings under or over these. OWNER, as well as company or corporation owning said pipes, poles, or conduits must be notified in advance of same by CONTRACTOR, before any such fixtures are removed or disturbed. In case any of said sewer, gas, or water pipes, service pipes, electric lights, power, telephone or telegraph poles or conduits, or other fixtures are damaged they shall be repaired by authorities having control of the same, and expense of said repairs shall be paid by CONTRACTOR or deducted from monies which are due or to become due said CONTRACTOR under this Contract.

C. No underground or overhead facilities encountered shall be disturbed without proper authority from OWNER, and then only in such manner as OWNER may prescribe and approve.

D. Should it become necessary to change position, or permanently or temporarily remove any electric conduits, telephone conduits, water pipes, gas pipes, sewerage pipes, or other pipes, conduits, or wires in order to clear structure being built or to permit CONTRACTOR to use a particular method of construction CONTRACTOR shall cease work if necessary, until satisfactory arrangements shall have been made by owners of said pipes, wires, or conduit, to properly care for or relocate same as necessary to permit WORK to proceed as required for proper completion of Contract.

E. No claims for damages will be allowed CONTRACTOR on account of any delay occasioned thereby.

1.02  GENERAL CONDITIONS

A. In addition to showing structures to be built under this Contract, CONTRACT DRAWINGS show certain information obtained by ENGINEER regarding pipes, pole lines, conduits, and other structures which exist along lines of WORK, both at and below surface of ground.
B. ENGINEER and OWNER expressly disclaim any responsibility for accuracy or completeness of information given on CONTRACT DRAWINGS with regard to existing structures, and CONTRACTOR will not be entitled to any extra compensation on account of inaccuracy or incompleteness of such information, said structures being indicated only for convenience of CONTRACTOR who must verify information to his own satisfaction.

C. Information given upon CONTRACT DRAWINGS will not relieve CONTRACTOR of his obligation to support and protect all pipes, conduits, and other structures which may be encountered during construction of WORK, and to make good all damages done to such pipes, conduits, and other structures, as provided in these Contract Documents.

D. CONTRACTOR shall locate all underground obstructions prior to excavation so as to prevent any damage to those services or other utilities.

E. Any such damages must be repaired without delay and cost of such repairs must be borne by CONTRACTOR.

PART 2 PRODUCTS
A. See Section 02200 - Earthwork
B. See Section 02660 - Water Distribution Systems
C. See Section 02736 – Sanitary Sewer

PART 3 EXECUTION
3.01 RELOCATION OF WATER LINES
A. Only when directed and approved by ENGINEER shall any water mains, service lines, or water meters be relocated during progress of WORK.
B. Material used during relocation of any water mains or appurtenances shall be of same size and strength as existing material.
C. When existing water lines and appurtenances are removed for relocation and are not to be replaced by new material, they shall be suitably stored until they are relocated.
D. When existing water lines and appurtenances are removed for relocation and are to be replaced by new material, remaining materials shall be disposed of by CONTRACTOR at his expense.
3.02 RELOCATION OF SANITARY SEWERS

A. Only when directed and approved by ENGINEER shall any sanitary sewer lines or service laterals be relocated during progress of WORK.

B. Material used during relocation of any sanitary lines shall be of same size and strength as existing material. As a minimum, materials shall be as specified herein.

C. Removed material during relocation of sanitary sewers shall be disposed of by CONTRACTOR at his expense.

3.03 RELOCATION OF ELECTRIC POWER POLES AND CONDUITS

A. Power pole relocation and electric service relocation as shown on CONTRACT DRAWINGS or as directed by ENGINEER, shall be performed by Local Electrical Department.

B. Temporary electrical service shall be provided when permanent electric service will be interrupted for more than one day.

C. Cost of relocation of all electric utilities shall be responsibility of CONTRACTOR.

3.04 RELOCATION OF GAS LINES

A. Gas mains and gas services which are to be relocated after approval by ENGINEER, shall be relocated by Local Gas Company.

B. Temporary gas service shall be provided when permanent gas service will be interrupted for more than one day.

C. Cost of relocation for gas mains shall be responsibility of CONTRACTOR.

3.05 RELOCATION OF TELEPHONE

A. Telephone cable and conduit which are to be relocated after approval by ENGINEER shall be relocated by local telephone company.

B. Cost of relocation of telephone cable and conduit shall be responsibility of CONTRACTOR.

END OF SECTION
SECTION 02905

SITE RESTORATION

PART 1  GENERAL

1.01  SCOPE OF WORK

A. Work included in this section consists of, but is not limited to: the restoration of pavement (asphalt, concrete and granular), driveway, concrete curbs and gutters, sidewalks, fences, walls, underground and above ground utilities, repair, replacement and/or relocation. Restoration of the landscaping, i.e., shrubs, trees and grassing, is also part of this work.

B. The CONTRACTOR shall visit the site prior to submitting a bid and become familiar with the existing conditions. No additional compensation or time extensions will be given due to the contractor's execution of the work described above.

C. No separate payment will be made for work covered under this section. Costs should be included with the price bid for other items.

1.02  QUALITY ASSURANCE

A. The CONTRACTOR shall notify the Utility Protection Center at least 72 hours prior to beginning any construction. Call TOLL FREE 811, 7:00 A. M. to 4:30 P.M., Monday through Friday.

B. Any existing site improvements damaged during construction will be repaired at the CONTRACTOR's expense, to its existing condition or as directed by the ENGINEER.

1.03  REFERENCES

A. Standard Specifications, Construction of Roads and Bridges, Latest Edition - Department of Transportation, State of Georgia, will be used for items of work not covered by these specifications or not shown on the drawings.

B. Section 02931 - Grassing.

PART 2  PRODUCTS

2.01  MATERIALS

Existing materials may be reused when restoring the construction site to original condition unless those materials have been damaged or deteriorated in any way. If material cannot be reused as determined by the ENGINEER, it shall be replaced with new material of like type.
PART 3 EXECUTION

3.01 GENERAL

Particular care shall be taken to minimize disturbance to existing site improvements within the limits of construction. The CONTRACTOR will take whatever measures are necessary to prevent damage which may include, but is not limited to, erection of barriers, tree protective fencing, shoring and bracing of excavations and staging of the construction.

3.02 CONSTRUCTION

All work will proceed in an orderly sequence and the construction will be done in a workmanlike manner. No excavations will be allowed to remain open overnight and they will either be properly backfilled or covered with steel plates to allow safe crossing of trenches by vehicles and/or pedestrians.

3.03 MAINTENANCE

A. The CONTRACTOR will notify the ENGINEER to review restored areas as soon as construction is complete and no further disturbances/damages would be likely to occur.

B. The CONTRACTOR shall warrant the work free from defects of material and workmanship for a period of one year after acceptance.

C. Clean up work areas by removing any scraps, rubbish or surplus material and dispose of them properly off the project site.

D. Wash and hose down paved surfaces to remove all mud, debris, and other extraneous material, just prior to final review.

END OF SECTION
# PARKWAY EXTENSION - PHASE 2 IMPROVEMENTS
FOR THE PARK 53 INDUSTRIAL AND TECHNOLOGY COMPLEX
FOR THE
WINDER-BARROW INDUSTRIAL BUILDING AUTHORITY
AND BARROW COUNTY BOARD OF COMMISSIONERS

## Barrow County 2016 ARC #16-ARC-007
Winder Barrow Industrial Building Authority 2017 One Georgia #18GQ-007-03-4866

### AUGUST 2019

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- G1 COVER
- G2 LEGEND & GENERAL NOTES
- C1 SITE PLAN/PARK 53 TYPICAL SECTION
- C2 GRADING AND DRAINAGE PLAN
- C3 WATER PLAN
- C4 STORM SEWER PROFILES
- C5 PARK 53 SOUTH ROAD EXTENSION PROFILE
- ECA EROSION CONTROL NOTES & LEGEND
- ECB USGS TOPOGRAPHIC MAP - DRAINAGE AREAS, STATE WATER & RECEIVING WATER, SAMPLE POINT LOCATIONS
- EC1 EROSION CONTROL PLAN INITIAL PHASE
- EC2 EROSION CONTROL PLAN INTERMEDIATE PHASE
- EC3 EROSION CONTROL PLAN FINAL PHASE
- D1 EROSION CONTROL DETAILS
- D2 CONSTRUCTION DETAILS
- D3 CONSTRUCTION DETAILS
- D4 CONSTRUCTION DETAILS

## OWNERS
WINDER-BARROW INDUSTRIAL BUILDING AUTHORITY & BARROW COUNTY BOARD OF COMMISSIONERS
30 N. BROAD STREET
WINDER, GA 30680
Office Phone: 770-307-3034

## PRIMARY PERMITTEE
BARROW COUNTY
30 N. BROAD STREET
WINDER, GA 30680
CONTACT: AUTRON HAYES
Office Phone: 770-867-0667
ahayes@barrowga.org

## 24 HOUR CONTACT:
MARK WHIDDON
Mobile Phone: 678-425-5980

## PROJECT CONTACTS:
JEN PEETERS
CINDIE VALENTINE

## LOCATION MAP

---

### BOARD MEMBERS
- H. David Smith - Chairman
- David Brock - Member
- Nelson McGinnis - Member
- Pat Graham - Member
- David Maynard - Member
- Lisa Maloof - Community and Economic Development Director

### BARROW COUNTY BOARD OF COMMISSIONERS
- Pat Graham - Chairman
- Joe Goodman - District 1
- William J. "Bill" Brown - District 2
- Rolando Alvarez - District 3
- Isaiah Berry - District 4
- Billy Parks - District 5
- Ben Hendrix - District 6
**PROJECT DESCRIPTION**

This project consists of the construction of approximately 1,250 L.F. of new roadway with curb and gutter and associated storm drain.

**IRRIGATION**

This is generally done as an emergency treatment. The site is sprinkled with water until the surface is wet. Repeat as needed.

**SEEDING**

Tall fescue shall be applied at the rate shown below. Dry straw or hay of good quality and free of weed seeds can be used. Dry straw or hay shall be applied at the rate shown below.

**MULCH**

Mulching is required and shall be done immediately after seeding. Mulch shall be applied to all exposed areas within 14 days.

**SPILL PREVENTION AND CONTROL**

· Contacted within 24 hours at 1-800-424-8802. All spills will be cleaned up immediately upon discovery. All spills will be reported as required by local, state, and federal regulations.

· Spill prevention practices and procedures will be reviewed after a spill and adjusted as necessary to prevent future spills.

**EROSION CONTROL**

· The escape of sediment from the site shall be prevented by the installation of erosion and sediment control measures and practices prior to, or concurrent with, land-disturbing activities.

· Erosion control measures shall be maintained at all times. If full implementation of the approved plan does not provide for effective erosion control, additional erosion and sediment control measures shall be implemented to control, or treat this sediment source. Practices will be checked daily.

· The extent and location of erosion control measures should be approved by the local, state, and federal agencies.

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**EROSION CONTROL INSTALLATION OF SILT FENCE, TEMPORARY MULCHING, AND REPORTING REQUIREMENTS**

· The escape of sediment from the site shall be prevented by the installation of erosion and sediment control measures and practices prior to, or concurrent with, land-disturbing activities.

· Erosion control measures shall be maintained at all times. If full implementation of the approved plan does not provide for effective erosion control, additional erosion and sediment control measures shall be implemented to control, or treat this sediment source. Practices will be checked daily.

· The extent and location of erosion control measures should be approved by the local, state, and federal agencies.

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**SILT FENCE STORAGE**

Silt fence storage: 1. L.F. X 1.53' high X 1.5' deep = 0.09 C.Y./1 L.F.

**TOTAL AMOUNT OF ON-SITE STORAGE**

Total amount of on-site storage (initial phase): 175 C.Y. + 235 C.Y. + 150 C.Y. = 560 C.Y.

**DISTURBED AREA TOTAL**

3.19 acres

**TOTAL AMOUNT OF ON-SITE STORAGE**


**PROJECT TIMELINE**

- Month 1-2: Survey, plans, and specifications
- Month 3: Construction
- Month 4: Final grading of all shoulders and slopes
- Month 5: Trench excavation, temporary stockpiling of excavated material, installation of waterline and appurtenances, and backfilling of trench
- Month 6: Installation of storm drainage structures and pipes
- Month 7: Clearing operations where necessary
- Month 8: Final grading of all shoulders and slopes

**EROSION CONTROL INSTALLATION OF SILT FENCE, TEMPORARY MULCHING, AND REPORTING REQUIREMENTS**

- The escape of sediment from the site shall be prevented by the installation of erosion and sediment control measures and practices prior to, or concurrent with, land-disturbing activities.

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**DISTURBED AREA TOTAL**

3.19 acres

**TOTAL AMOUNT OF ON-SITE STORAGE**

Total amount of on-site storage (initial phase): 175 C.Y. + 235 C.Y. + 150 C.Y. = 560 C.Y.
**EROSION CONTROL NOTES:**

- Erosion control measures will be maintained at all times. If full implementation of the approved plan does not provide for effective erosion control, additional erosion and sediment control measures shall be implemented to control or treat the sediment source. Practices will be checked daily.
- Any disturbed area left exposed for a period greater than 14 days shall be stabilized with mulch or temporary seeding.
- The escape of sediment from the site shall be prevented by the installation of erosion and sediment control measures and practices prior to, or concurrent with, land-disturbing activities.
- The extent and location of erosion control measures shown (Sheets EC1-EC3) are the estimated required. Additional erosion control measures may be required due to the actual field conditions, and will be installed at the owner/developer's expense when directed by the proper governing authority.
- The primary permittee must retain the design professional who prepared the plan to conduct inspections during the intermediate grading and drainage BMP phase and during the final BMP phase.

**REPORTING:**

- The applicable permittees are required to submit the sampling results to the DCO for the specified location of the sampling point, and reporting periods are as follows:
  - The initial sampling shall be conducted after the plan is implemented as shown. The sampling point shall be installed in a manner that is accessible to the DCO and sampling results may be submitted by the permittee or developer.
  - All sampling reports shall include the following information:
    - The total number of test results, test methods, and time of sampling or measurements.
    - The name and number of the water sampling point.
    - The date of collection of the samples.
    - The number of the test results.
    - The sample analysis were conducted.
    - The name of the analytical laboratory performing the analyses.

**RETENTION OF RECORDS:**

- The permittee shall retain the following records at the construction site and the retention of these records shall be readily available at a designated and accessible location from commencement of construction to the date of application of the NPDES permit:
  - All records of time of start and stop dates of construction.
  - All records of time of start and stop dates of erosion control activities.
  - All records of time of start and stop dates of sediment control activities.
  - All records of time of start and stop dates of BMP activities.

**EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES.**

- Erosion control, sedimentation, and pollution control plans shall be prepared in accordance with the following requirements:
  - All erosion, sedimentation, and pollution control plans shall be prepared conforming to the Georgia Water Quality Control Act and the Manual for Erosion and Sediment Control in Georgia published by the Georgia Soil and Water Conservation Commission.
  - Erosion and sediment control plans shall be prepared for all land-disturbing activities, as defined in the General NPDES Permit No. GAR-100002.

**CERTIFICATION - ES&P DESIGN PROFESSIONAL:**

- I certify that the permittee's Erosion, Sedimentation, and Pollution Control Plan provides for an appropriate and comprehensive system of best management practices required by the Georgia Water Quality Control Act and the document "Manual for Erosion and Sediment Control in Georgia" (Manual) published by the Georgia Soil and Water Conservation Commission as of January 1 of the year in which the land-disturbing activity was permitted, and that the designed system of best management practices and sampling methods is expected to meet the requirements contained in the General Permit No. GAR-10002.
- I certify under penalty of law that this plan was prepared after a site visit to the locations described herein by myself or my authorized agent, under my supervision.
- I certify that the permittee's Erosion, Sedimentation, and Pollution Control Plan provides for the monitoring of: (a) all perennial and intermittent streams and other water bodies shown on the USGS topographic map and all other field verified perennial and intermittent streams and other water bodies, or (b) where any such specific identified perennial or intermittent stream and other water body is not proposed to be sampled, I have determined in my professional judgment, utilizing the factors required in the General Permit No. GAR-10002, that the increase in the turbidity of each specific identified sampled receiving water will be representative of the increase in the turbidity of a specific identified un-sampled receiving water.
- I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

**KENNETH L. PETERS**

**P.E. - LICENSE NO. 26331**

**GSWCC LEVEL II CERTIFICATION NO. 919**

**IMPARED STREAM REQUIREMENTS, TMDL PLANS, AND ALTERNATIVE BMP NOTES:**

1. This project is not located within one linear mile and within the same watershed as Marbury Creek. Marbury Creek is listed on Georgia's 2018 "305(b)/303(d) List Documents." TMDL plans will be incorporated into the final plan.

2. Alternative BMPs will not be installed during this project.
USGS TOPOGRAPHIC MAP

ON-SITE AND OFF-SITE WATERSHED BOUNDARY

DRAINAGE FLOW DIRECTION

1 IN = 1000 FT
1 IN = 300 M

CERTIFICATION: JAYJ DRAUGHTS/PORFESSIONAL

KENNETH L. PETERS
P.E. - LICENSE NO. 26331
GSWCC LEVEL II CERTIFICATION NO. 919

DRAINAGE BASIN A
ON-SITE AND OFF-SITE WATERSHED (±173 ACRES)
PROJECT SITE DRAINAGE BASIN (±3.19 ACRES)

RECEIVING WATER #1: UNNAMED TRIBUTARY OF MARBURY CREEK

SAMPLE POINT A1

SAMPLE POINT A2

WATERSHED INFORMATION

<table>
<thead>
<tr>
<th>Sheet Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RECEIVING WATERS WHICH ARE WITHIN 200 FEET OF THE PROJECT SITE ARE LABELED AS &quot;STATE WATER&quot;</td>
</tr>
<tr>
<td>2. SEE THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN DOCUMENT, PLAN SHEET ECB FOR ADDITIONAL INFORMATION REGARDING RECEIVING WATERS AND SAMPLING REQUIREMENTS. SEE SHEETS EC1-EC3 FOR DETAILED LOCATION OF SAMPLE POINTS.</td>
</tr>
<tr>
<td>3. SITE VISIT DETERMINED THAT THERE ARE NO WETLANDS IN THE VICINITY OF THIS PROJECT.</td>
</tr>
</tbody>
</table>

PROJECT TITLE
PARKWAY EXTENSION - PHASE 2
IMPROVEMENTS FOR THE PARK 53 INDUSTRIAL AND TECHNOLOGY COMPLEX
FOR THE WINDER-BARROW INDUSTRIAL BUILDING AUTHORITY AND BARROW COUNTY BOARD OF COMMISSIONERS

EXPERIENCE
TRUST
SOLUTIONS
MANAGEMENT
ENGINEERING
303 Swanson Drive, Lawrenceville, GA 30043
www.eminc.biz
phone 770-962-1387
fax # 770-962-8010
NOTES:
1. VALVE MARKER SHALL BE BLUE FOR WATER VALVES, GREEN FOR FORCEMAIN VALVES, GREEN FOR SEWER, AND WHITE FOR REUSE VALVES.
2. DECLAL SHALL BE 2-7/8" X 14" OR APPROVED EQUAL.
3. DECAL PER PIPELINE TYPE

BEFORE DIGGING IN THIS AREA CALL DESTRUCTION OF THIS SIGN VIOLATES FEDERAL LAW

VALVE MARKER SHALL BE RHINO TRI-VIEW FLEX OR APPROVED EQUAL WITH DECAL ON ALL SIDES.

DECAL SHOWN ABOVE Mark FOR PIPE DESIGNATIONS

FLEXIBLE VALVE MARKER

FINISH GRADE

3" FROM TOP

3' 5.5'

5.5'

NOTES:
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FINISH GRADE

3" FROM TOP

3' 5.5'

5.5'
COUNTY ROAD CONSTRUCTION SERVICES AGREEMENT

PARKWAY EXTENSION – PHASE 2 IMPROVEMENTS
PARK 53 INDUSTRIAL AND TECHNOLOGY COMPLEX

(Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18gq-007-3-4886 Project)

This County Road Construction Services Agreement (the “Agreement”) is made and entered into this ____ day of ______________, 2020 (the “Effective Date”) by and between BARROW COUNTY, a political subdivision of the State of Georgia, acting by and through its governing authority, the Barrow County Board of Commissioners (“County”), in conjunction with the WINDER-BARROW INDUSTRIAL BUILDING AUTHORITY, a public body corporate and politic created pursuant to the Constitution and law of the State of Georgia (“Authority”) (references herein to the County shall be read to include the Authority where appropriate), and _________________, a __________________, with its principal place of business located at ___________________________________________ (“Contractor”), collectively referred to as the “Parties”.

W I T N E S S E T H:

WHEREAS, under authority granted to it by the Georgia General Assembly as codified in the Official Code of Georgia Annotated (“O.C.G.A.”) § 32-4-42, the County desires to engage a contractor to perform services for a project regarding the construction, maintenance, administration, or operation of one or more County roads or activities incident thereto, as defined below; and

WHEREAS, in accordance with O.C.G.A. § 32-4-60 et seq., the County solicited bids for RFB2020-12 Parkway Extension – Phase 2 Improvements for the Park 53 Industrial and Technology Complex (Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18gq-007-3-4886 Project) (herein referred to as the “RFB” or the “Project”), a copy of which is maintained on file with the County Purchasing Department; and

WHEREAS, the Contractor submitted a complete and timely bid, attached hereto as “Exhibit A” and incorporated herein by reference, and met all bid requirements such that the County awarded the Project to the Contractor; and

WHEREAS, the County finds that specialized knowledge, skills, and training are necessary to perform the Work (defined below) contemplated under this Agreement; and

WHEREAS, the Contractor has represented that it is qualified by training and experience to perform the Work; and

WHEREAS, based upon Contractor’s bid, the County has selected Contractor as the successful bidder, and
WHEREAS, Contractor desires to perform the Work as set forth in this Agreement under the terms and conditions provided in this Agreement; and

WHEREAS, the public interest will be served by this Agreement; and

WHEREAS, Contractor has familiarized itself with the nature and extent of the Contract Documents, the Project, and the Work, with all local conditions and federal, state and local laws, ordinances, rules and regulations in any manner that may affect cost, progress or performance of Work, and Contractor is aware that he must be licensed to do business in the State of Georgia.

NOW THEREFORE, for and in consideration of the mutual promises, the public purposes, and the acknowledgements and agreements contained herein and other good and adequate consideration, the sufficiency of which is hereby acknowledged, the Parties hereto do mutually agree as follows:

Section 1. Contract Documents

This Agreement along with the following documents, attached hereto (except as expressly noted otherwise below) and incorporated herein by reference, constitute the “Contract Documents”:

A. Request for Bids (a true and correct copy of which has been provided to Contractor with original maintained on file with the County Purchasing Department);

B. Bid Documents from Contractor, dated ______________ ____, 2019, attached hereto as “Exhibit A”;

C. Scope of Work, (a true and correct copy of which has been provided to Contractor with original maintained on file with the County Purchasing Department);

D. Federal Labor Standards Provision, attached hereto as “Exhibit B”;

E. Applicable Wage Determination (General Decision Number: GA20190219), attached hereto as “Exhibit C”;

F. Performance Bond and Payment Bond, attached hereto as “Exhibits D.1 and D.2”;

G. Noncollusion Affidavit of Prime Bidder, attached hereto as “Exhibit E”;

H. Final Affidavit, attached hereto as “Exhibit F”;

I. Alien Employment affidavits attached hereto as “Exhibits G.1 and G.2”;

J. Plans, drawings and specifications (included in the RFP referenced in 1.A. above), with any modifications (if issued), attached hereto as “Exhibit H”;
K. Additional Payment/Retainage Requirements, attached hereto as “Exhibit I”;

L. Key Personnel, attached hereto as “Exhibit J”;


N. Notice Requirement for Affirmative Action to Equal Employment Opportunity (Executive Order 11246), attached hereto as “Exhibit L”;

O. Contract Administration provisions (if issued), attached hereto as “Exhibit M”;

P. General Conditions (if issued), attached hereto as “Exhibit N”;

Q. Supplementary Conditions (if issued), attached hereto as “Exhibit O”;

R. Notice of Award, attached hereto as “Exhibit P”;

S. Contractor Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion (Lower-Tier Participant) for HUD Programs, attached hereto as “Exhibit Q”;

T. Barrow County Code of Ethics (codified in the official Code of Barrow County);

U. The following, which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Change Orders (defined in Section 6 below), other written amendments, and other documents amending, modifying, or supplementing the Contract Documents if properly adopted in writing and executed by the Parties.

In the event of any discrepancy among the Contract Documents, that provision that inures most to the benefit of the County, as determined by the County in its sole discretion, shall govern.

Section 2. Project Description

The Project is defined generally as RFB2020-12 Parkway Extension – Phase 2 Improvements for the Park 53 Industrial and Technology Complex (Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18gq-007-3-4886 Project), which involves road construction to extend the public access road to Park 53 (the “Project”).

Section 3. The Work

A. The Work. The Work to be completed under this Agreement (the “Work”) includes, but shall not be limited to, the work described in the Scope of work, location of structure, culvert information, pictures, Georgia Department of Transportation (“GDOT”) deficiency report, GDOT specifications and Bid Form, included in the RFB2020-12 and elsewhere in the Contract Documents for the Project, a true and correct copy of which has been provided to Contractor with original maintained on file in the County Purchasing Department. The Work includes all material,
labor, insurance, tools, equipment, machinery, water, heat, utilities, transportation, facilities, services and any other miscellaneous items and work reasonably inferable from the Contract Documents. The term “reasonably inferable” takes into consideration the understanding of the Parties that some details necessary for proper execution and completion of the Work may not be shown on the drawings or included in the specifications or Scope of Work, but they are a requirement of the Work if they are a usual and customary component of the Work or are otherwise necessary for proper and complete installation and operation of the Work. Contractor shall complete the Work in strict accordance with the Contract Documents. In the event of any discrepancy among the terms of the various Contract Documents, the provision most beneficial to the County, as determined by the County in its sole discretion, shall govern.

B. Notice to Proceed. The County will issue a Notice to Proceed, which Notice to Proceed shall state the dates for beginning Work (“Commencement Date”) and the Expected Date of Final Completion (defined in Section 4(A) below). Unless otherwise approved, the Contractor shall perform its obligations under this Agreement as expeditiously as is consistent with reasonable skill and care and the orderly progress of the Work.

C. Plans; Drawings and Specifications. The plans, drawings and specifications, a true and correct copy of which has been provided to Contractor with original maintained on file in the County Purchasing Department, are hereby acknowledged by the Parties and incorporated herein by reference.

D. Shop Drawings, Product Data, and Samples. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents, but must be in conformity therewith. The purpose of their submittal is to demonstrate, for those portions of the Work for which submittals are required by the Contract Documents, the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

(i) “Shop Drawings” are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or a subcontractor, sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

(ii) “Product Data” are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

(iii) “Samples” are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

The Contractor shall review for compliance with the Contract Documents and shall approve and submit to the Contract Administrator Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the County or of separate contractors. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and
coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Contract Administrator without action. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved in writing by the Contract Administrator, provided that submittals that are not required by the Contract Documents may be returned without action.

The Work shall be completed in accordance with approved submittals, provided that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Contract Administrator’s approval of Shop Drawings, Product Data, Samples or similar submittals, unless the Contractor has specifically informed the Contract Administrator in writing of such deviation at the time of submittal and (1) the Contract Administrator has given written approval to the specific deviation as a minor change in the Work, or (2) a written Change Order has been issued and approved to authorize the deviation. The Contract Administrator’s approval of the Shop Drawings, Product Data, Samples or similar submittals shall not relieve the Contractor of responsibility for errors or omissions therein.

The Contractor shall, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, direct the Contract Administrator’s attention to any additional revisions included other than those requested by the Contract Administrator on previous submittals. In the absence of such written notice drawing the Contract Administrator’s attention to such additional revisions, the Contract Administrator’s approval of a resubmission shall not apply to such additional revisions.

The Contractor shall maintain at the Project site(s) one record copy of the Contract Documents in good order and marked currently to record field changes and selections made during construction and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These documents shall be available to the County and Contract Administrator and shall be delivered to the Contract Administrator or County upon completion of the Work.

Section 4. Contract Periods; Liquidated Damages; Expedited Completion; Partial Occupancy or Use

A. Contract Term. The term of this Agreement (“Term”) shall commence on the Effective Date and continue until the earlier of the Expected Date of Final Completion or the proper termination and non-renewal of this Agreement (provided that certain obligations, including but not limited to Warranty obligations, will survive termination/expiration of this Agreement). Contractor warrants and represents that it will perform its Work in a prompt and timely manner, which shall not impose delays on the progress of the Work. The Contractor shall commence Work pursuant to this Agreement within five (5) business days of the Commencement Date provided by the County and the Parties intend that all Work shall be completed on or before ______________ following the commencement date specified in the Notice to Proceed. Every effort will be made by Contractor to shorten this period. If the Term of this Agreement continues beyond the fiscal year in which this Agreement is executed, the Parties agree that this Agreement, as required
by O.C.G.A. § 36-60-13, shall terminate absolutely and without further obligation on the part of
the County on June 30 of each year of the Term, and further, that this Agreement shall
automatically renew on July 1 of each subsequent year absent the County’s provision of written
notice of non-renewal to Contractor at least five (5) calendar days prior to the end of the then
current fiscal year. Title to any supplies, materials, equipment, or other personal property shall
remain in Contractor until fully paid for by the County.

B. Time is of the Essence; Liquidated Damages. Contractor specifically
acknowledges that TIME IS OF THE ESSENCE of this Agreement and that County will suffer
financial loss if the Work is not completed in accordance with the deadlines specified in Section
4(A) above and within the Contract Documents. The County and Contractor also recognize the
delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual
loss suffered by the County if the Work is not completed within the specified times. Accordingly,
instead of requiring any such proof, the County and Contractor agree that, as liquidated damages
for delay (but not as a penalty), the Contractor shall pay to the County One hundred and fifty
dollars and 00/100 Dollars ($150.00) for each and every calendar day that expires after a
deadline provided in the Contract Documents.

C. Expediting Completion. The Contractor is accountable for completing the Work
within the time period provided in the Contract Documents. If, in the judgment of the County, the
Work is behind schedule and the rate of placement of work is inadequate to regain scheduled
progress to ensure timely completion of the entire Work or a separable portion thereof, the
Contractor, when so informed by the County, shall immediately take action to increase the rate of
work placement by:

(1) An increase in working forces;
(2) An increase in equipment or tools;
(3) An increase in hours of work or number of shifts;
(4) Expediting delivery of materials; and/or
(5) Other action proposed if acceptable to County.

Within five (5) calendar days after such notice from County that the Work is behind schedule, the
Contractor shall notify the County in writing of the specific measures taken and/or planned to
increase the rate of progress. The Contractor shall include an estimate as to the date of scheduled
progress recovery. Should the County deem the plan of action inadequate, the Contractor shall
take additional steps to make adjustments as necessary to its plan of action until it meets with the
County’s approval and such approval is provided in writing by the County.

D. Partial Occupancy or Use. The County may occupy or use any completed or
partially completed portion of the Work at any stage when such portion is designated by separate
agreement between the County and Contractor, provided such occupancy or use is consented to by
the insurer and authorized by public authorities having jurisdiction over the Work. Such partial
occupancy or use may commence whether or not the portion is substantially complete, provided
the County and Contractor have accepted in writing the responsibilities assigned to each of them
for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and
insurance, and have agreed in writing concerning the period for correction of the Work and
commencement of warranties required by the Contract Documents. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the County, Contractor and Contract Administrator shall jointly inspect the area to be occupied, or portion of the Work to be used, in order to determine and record the condition of the Work. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

Section 5. Contractor’s Compensation; Time and Method of Payment

A. Maximum Contract Price. The total amount paid under this Agreement as compensation for Work performed and reimbursement for costs incurred shall not, in any case, exceed $_________.__ (the “Maximum Contract Price”), except as outlined in Section 6 below. The compensation for Work performed shall be based upon the amount specified in Exhibit A, and Contractor represents that the Maximum Contract Price is sufficient to perform all of the Work set forth in and contemplated by this Agreement.

B. Additional Payment and Retainage Requirements. Additional payment and retainage requirements are included as “Exhibit I”, attached hereto and incorporated herein by reference.

C. Material Deviations. Any material deviations in tests or inspections performed, or times or locations required to complete such tests or inspections, and like deviations from the Work described in this Agreement shall be clearly communicated to the County before charges are incurred and shall be handled through written Change Orders, as described in Section 6 below. Whenever the Contract Administrator considers it necessary or advisable, it shall have authority to require inspection or testing of the Work. However, neither this authority of the Contract Administrator nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Contract Administrator to the Contractor, subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

D. Taxes. The County is a governmental tax-exempt entity and shall not be responsible for paying any taxes on any materials or services provided for herein. At Contractor’s request, County shall provide evidence of its tax-exempt status. To the extent, if any, that the County furnishes tangible personal property to Contractor for incorporation into the Project, Contractor shall be responsible for paying the amount of tax owed for such tangible personal property.

Section 6. Change Orders

A. Change Order Defined. A “Change Order” means a written modification of the Contract Documents, signed by representatives of the County and the Contractor with appropriate authorization.

B. Right to Order Changes. The County reserves the right to order changes in the
Work to be performed under this Agreement by altering, adding to, or deducting from the Work. All such changes shall be incorporated in written Change Orders and executed by the Contractor and the County. Such Change Orders shall specify the changes ordered and any necessary adjustment of compensation and completion time. If the Parties cannot reach an agreement on the terms for performing the changed work within a reasonable time to avoid delay or other unfavorable impacts as determined by the County in its sole discretion, the County shall have the right to determine reasonable terms, and the Contractor shall proceed with the changed work.

C. Change Order Requirement. Any work added to the scope of this Agreement by a Change Order shall be executed under all the applicable conditions of this Agreement. No claim for additional compensation or extension of time shall be recognized, unless contained in a written Change Order duly executed on behalf of the County and the Contractor.

D. Authority to Execute Change Order. The County Manager has authority to execute, without further action of the Barrow County Board of Commissioners, any number of Change Orders so long as their total effect does not materially alter the terms of this Agreement or materially increase the Maximum Contract Price, as set forth in Section 5(A) above. Any such Change Orders materially altering the terms of this Agreement, or any Change Order increasing the price by more than Twenty-five Thousand Dollars ($25,000.00), must be approved by resolution of the Barrow County Board of Commissioners.

E. Minor Changes in the Work. The Contract Administrator will have the authority to order minor changes in the Work not involving adjustment in the Maximum Contract Price or extension of the Term and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order signed by the Contract Administrator. The Contractor shall carry out such written orders promptly. If the minor changes subsequently may affect adjustments in the Maximum Contract Price or the Term, the changes shall then be converted to a written Change Order by the requesting Party.

Section 7. Covenants of Contractor.

A. Ethics Code; Conflict of Interest. Contractor agrees that it shall not engage in any activity or conduct that would result in a violation of the Barrow County Code of Ethics or any other similar law or regulation. Contractor certifies that to the best of his knowledge no circumstances exist which will cause a conflict of interest in performing the Work. Should Contractor become aware of any circumstances that may cause a conflict of interest during the Term of this Agreement, Contractor shall immediately notify the County. If the County determines that a conflict of interest exists, the County may require that Contractor take action to remedy the conflict of interest or terminate the Agreement without liability. The County shall have the right to recover any fees paid for services rendered by Contractor when such services were performed while a conflict of interest existed, if Contractor had knowledge of the conflict of interest and did not notify the County within five (5) business days of becoming aware of the existence of the conflict of interest.

B. Meetings. The Contractor is required to meet with the County’s personnel, or designated representatives, to resolve technical or contractual problems that may occur during the Term of this Agreement at no additional cost to the County. Meetings will occur as problems arise
and will be coordinated by the County or the Contract Administrator. The Contractor will be given 
a minimum of three (3) full business days’ notice of meeting date, time, and location. Face-to-
face meetings are desired. However, at the Contractor’s option and expense, a conference call 
meeting may be substituted. Consistent failure to participate in problem resolution meetings, two 
consecutive missed or rescheduled meetings, or failure to make a good faith effort to resolve 
problems, may result in termination of the contract for cause.

C. Expertise of Contractor. Contractor accepts the relationship of trust and confidence 
established between it and the County, recognizing that the County’s intention and purpose in 
entering into this Agreement is to engage an entity with the requisite capacity, experience, and 
professional skill and judgment to provide the Work in pursuit of the timely and competent 
completion of the Work undertaken by Contractor under this Agreement. The Contractor agrees 
to use its best efforts, skill, judgment, and abilities to perform its obligations and to further the 
interests of County and the Project in accordance with County’s requirements and procedures, and 
Contractor shall employ only persons duly qualified in the appropriate area of expertise to perform 
the Work described in this Agreement.

D. Proper Execution by Contractor. Contractor agrees that it will perform its services 
in accordance with the usual and customary standards of the Contractor’s profession or business 
and in compliance with all federal, state, and local laws, regulations, codes, ordinances, or orders 
applicable to the Project, including, but not limited to, O.C.G.A. § 50-5-63, any applicable records 
retention requirements, and Georgia’s Open Records Act (O.C.G.A. § 50-18-70, et seq.). Any 
additional work or costs incurred as a result of error and/or omission by Contractor as a result of 
not complying with the Contract Documents or not meeting the applicable standard of care or 
quality, including but not limited to those of repeated procedures and compensation for the 
Contract Administrator’s services or expenses, will be provided at Contractor’s expense and at no 
additional cost to the County. This provision shall survive termination of this Agreement.

It is the Contractor’s responsibility to be reasonably aware of all applicable laws, statutes, 
ordinances, building codes, and rules and regulations. If the Contractor observes that portions of 
the Contract Documents are at variance therewith, the Contractor shall promptly notify the 
Contract Administrator and the County in writing of any portions of the Contract Documents that 
are at variance with the applicable laws, statutes, ordinances, building codes, and rules and 
regulations.

The Contractor’s duties shall not be diminished by any approval by the County or Contract 
Administrator of Work completed or produced; nor shall any approval by the County or Contract 
Administrator of Work completed or produced release the Contractor from any liability therefor, 
it being understood that the County is ultimately relying upon the Contractor’s skill and knowledge 
in performing the Work required under the Contract Documents.

Organization of the specifications into divisions, sections and articles, and arrangement of 
drawings shall not control the Contractor in dividing the Work among subcontractors or in 
establishing the extent of Work to be performed by any trade.

E. Familiarity with the Work.
(i) **Contractor Familiarity with Work.** Contractor represents that it has familiarized itself with the nature and extent of the Contract Documents, the Work, work site(s), locality, and all local conditions, laws and regulations that in any manner may affect cost, progress, performance, or furnishing of the Work. Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Contract Documents, site conditions, authorities, tests, reports and studies relative to that portion of the Work, as well as the information furnished by the County, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the Project site(s) affecting it. Contractor represents and agrees that it has correlated the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, inconsistencies, or ambiguities in the Contract Documents; however, any errors, inconsistencies, omissions, or ambiguities discovered by the Contractor shall be reported promptly to the Contract Administrator and County in writing. Contractor represents that it has given the County written notice of all errors, omissions, inconsistencies, or ambiguities that the Contractor has discovered in the Contract Documents so far, and the written resolution thereof by the County is acceptable to the Contractor. Further, Contractor acknowledges that its obligation to give notice of all such errors, omissions, inconsistencies, or ambiguities shall be continuing during the Term of this Agreement. Any failure on the part of the Contractor to notify the Contract Administrator and County in writing of any errors, omissions, inconsistencies, or ambiguities in the Contract Documents that Contractor discovered or reasonably should have discovered shall result in a waiver and full release by the Contractor of any future arguments or defenses based on such errors, omissions, inconsistencies, or ambiguities against the County. Further, if the Contractor fails to perform its obligations pursuant to this paragraph, the Contractor shall pay such costs and damages to the County as would have been avoided if the Contractor had performed such obligations.

(ii) **Inspection of Prior Work.** If part of the Contractor’s Work depends for proper execution or results upon construction or operations by a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Contract Administrator apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the County’s or separate contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work, except as to defects not then reasonably discoverable, and Contractor shall be responsible for all costs and damages resulting from its failure to report reasonably discoverable defects.

(iii) **Contractor Requests for Information.** If, with undue frequency (as determined by the County in its sole discretion), the Contractor requests information that is obtainable through reasonable examination and comparison of the Contract Documents, site conditions, and previous correspondence, interpretations or clarifications, the
Contractor shall be liable to the County for reasonable charges from the Contract Administrator for the additional services required to review, research and respond to such requests for information.

F. Supervision, Inspection and Construction Procedures. The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Agreement, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety therefor and, except as stated below, shall be fully and solely responsible for the jobsite safety for such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the County and Contract Administrator and shall not proceed with that portion of the Work without further written instructions from the County or Contract Administrator as approved in writing by the County.

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of this Agreement. The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury or loss to: (a) employees and other persons who may be affected, (b) the Work and materials and equipment to be incorporated therein, whether in storage on or off the Project site(s), under care, custody or control of the Contractor or Contractor’s subcontractors or sub-subcontractors, and (c) other property at the Project site(s) or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the Project site(s) by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the County and Contract Administrator in writing.

G. Tests and Inspections. Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, or ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made promptly at an appropriate time to avoid unreasonable delay in the Work. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the County, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Contract Administrator
timely notice of when and where tests and inspections are to be made so that the Contract Administrator may be present for such procedures. Required permits or certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and delivered to the Contract Administrator within ten (10) calendar days of issuance.

H. Budgetary Limitations. Contractor agrees and acknowledges that budgetary limitations are not a justification for breach of sound principals of Contractor’s profession and industry. Contractor shall take no calculated risk in the performance of the Work. Specifically, Contractor agrees that, in the event it cannot perform the Work within the budgetary limitations established without disregarding sound principals of Contractor’s profession and industry, Contractor will give written notice immediately to the County.

I. County’s Reliance on the Work. The Contractor acknowledges and agrees that the County does not undertake to approve or pass upon matters of expertise of the Contractor and that therefore, the County bears no responsibility for Contractor’s Work performed under this Agreement. The Contractor acknowledges and agrees that the acceptance of Work by the County is limited to the function of determining whether there has been compliance with what is required to be produced under this Agreement. The County will not, and need not, inquire into adequacy, fitness, suitability or correctness of Contractor’s performance. Contractor further agrees that no approval of designs, plans, or specifications by any person, body, or agency shall relieve Contractor of the responsibility for adequacy, fitness, suitability, and correctness of Contractor’s Work under professional and industry standards, or for performing services under this Agreement in accordance with sound and accepted professional and industry principles.

J. Contractor’s Reliance on Submissions by the County. Contractor must have timely information and input from the County in order to perform the Work required under this Agreement. Contractor is entitled to rely upon information provided by the County, but Contractor shall be required to provide immediate written notice to the County if Contractor knows or reasonably should know that any information provided by the County is erroneous, inconsistent, or otherwise problematic.

K. Uncovering and Correction of Work. If a portion of the Work is covered contrary to the Contract Administrator’s request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Contract Administrator, be uncovered for examination by the Contract Administrator and be replaced at the Contractor’s expense without change in the Agreement Term.

If a portion of the Work has been covered which the Contract Administrator has not specifically requested to examine prior to its being covered or which the Contract Documents did not require to remain uncovered until examined, the Contract Administrator may request to see such Work, and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the County’s expense, which expense shall be agreed upon in writing prior to being incurred. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor’s expense, unless the condition was caused by the County, in which event the County
shall be responsible for payment of such costs including reasonable charges, if any, by the Contract Administrator for additional service, which expense shall be agreed upon in writing prior to being incurred.

If the County prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the County may do so instead of requiring its removal and correction, in which case the Maximum Contract Price will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

L. Clean Up. Contractor shall keep the Project site(s) and surrounding area free from accumulation of waste materials or rubbish caused by operations under this Agreement. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials. If the Contractor fails to clean up as provided in the Contract Documents, the County may do so, and the cost thereof shall be charged to the Contractor.

M. Contractor’s Representative. _________________ shall be authorized to act on Contractor’s behalf with respect to the Work as Contractor’s designated representative.

N. Independent Contractor. Contractor hereby covenants and declares that it is engaged in an independent business and agrees to perform the Work as an independent contractor and not as the agent or employee of the County. Nothing contained in this Agreement shall be construed to make the Contractor or any of its employees, servants or subcontractors an employee, servant or agent of the County for any purpose. The Contractor agrees to be solely responsible for its own matters relating to the time and place the Work is performed and the method used to perform such Work; the instrumentalities, tools, supplies, and/or materials necessary to complete the Work; hiring of subcontractors, agents, or employees to complete the Work; and the payment of employees, including benefits and compliance with Social Security, withholding, and all other regulations governing such matters. The Contractor agrees to be solely responsible for its own acts and those of its subordinates, employees, and subcontractors during the life of this Agreement. There shall be no contractual relationship between any subcontractor or supplier and the County by virtue of this Agreement with the Contractor. Any provisions of this Agreement that may appear to give the County the right to direct Contractor as to the details of the services to be performed by Contractor or to exercise a measure of control over such services will be deemed to mean that Contractor shall follow the directions of the County with regard to the results of such services only. It is further understood that this Agreement is not exclusive, and the County may hire additional entities to perform Work related to this Agreement.

Inasmuch as the County and the Contractor are independent of each other, neither has the authority to bind the other to any third person or otherwise to act in any way as the representative of the other, unless otherwise expressly agreed to in writing signed by both Parties hereto. The Contractor agrees not to represent itself as the County’s agent for any purpose to any party or to allow any employee of the Contractor to do so, unless specifically authorized, in advance and in writing, to do so, and then only for the limited purpose stated in such authorization. The Contractor shall assume full liability for any contracts or agreements the Contractor enters into on behalf of the County without the express knowledge and prior written consent of the County.
O. Responsibility of Contractor and Indemnification of County. The Contractor covenants and agrees to take and assume all responsibility for the Work rendered in connection with this Agreement. The Contractor shall bear all losses and damages directly or indirectly resulting to it and/or the County on account of the performance or character of the Work rendered pursuant to this Agreement. To the fullest extent permitted by law, Contractor shall defend, indemnify, and hold harmless the County and the County’s elected and appointed officials, officers, boards, commissions, employees, representatives, consultants, servants, agents, attorneys and volunteers (individually an “Indemnified Party” and collectively “Indemnified Parties”) from and against any and all claims, suits, actions, judgments, injuries, damages, losses, costs, expenses and liability of any kind whatsoever, including, but not limited to, attorney’s fees and costs of defense (“Liabilities”), which may arise from or be the result of an alleged willful, negligent, or tortious act or omission arising out of the Work, performance of contracted services, or operations by the Contractor, any subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts the Contractor or subcontractor may be liable, regardless of whether or not the act or omission is caused in part by a party indemnified hereunder. This indemnity obligation does not include Liabilities caused by or resulting from the sole negligence of an Indemnified Party. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this provision.

In any and all claims against an Indemnified Party, by any employee of the Contractor, its subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts the Contractor or subcontractor may be liable, the indemnification obligation set forth in this provision 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 workers’ or workmen’s compensation acts, disability benefit acts, or other employee benefit acts. This obligation to indemnify, defend, and hold harmless the Indemnified Party(ies) shall survive expiration or termination of this Agreement, provided that the claims are based upon or arise out of actions or omissions that occurred during the performance of this Agreement.

P. Insurance.

(1) Requirements: The Contractor shall have and maintain in full force and effect for the duration of this Agreement, insurance insuring against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work by the Contractor, its agents, representatives, employees or subcontractors. All policies shall be subject to approval by the County as to form and content. These requirements are subject to amendment or waiver if approved in writing by the County Manager.

(2) Minimum Limits of Insurance: Contractor shall maintain the following insurance policies with coverage and limits no less than:

(a) Commercial General Liability: $1,000,000 (one million dollars)
combined single limit per occurrence comprehensive/extended/enhanced Commercial General Liability policy with coverage including bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom, damage to premises/operations, products/completed operations, independent consultants and contractual liability (specifically covering the indemnity), broad-from property damage, and underground, explosion and collapse hazard. This coverage may be achieved by using an excess or umbrella policy. The policy or policies must be on “an occurrence” basis (“claims made” coverage is not acceptable). If a general aggregate limit applies, the general aggregate limit shall apply separately to this project/location, and the general aggregate limit shall be twice the required occurrence limit.

(b) Commercial Automobile Liability (owned, non-owned, hired): $1,000,000 (one million dollars) combined single limit per occurrence $2,000,000 (two million dollars) aggregate for comprehensive Commercial Automobile liability coverage (owned, non-owned, hired) including bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom.

(c) Workers’ Compensation and Employers’ Liability: Workers’ Compensation policy with limits as required by the State of Georgia and Employers’ Liability limits of $1,000,000 (one million dollars) per occurrence or disease. (If Contractor is a sole proprietor, who is otherwise not entitled to coverage under Georgia’s Workers’ Compensation Act, Contractor must secure Workers’ Compensation coverage approved by both the State Board of Workers’ Compensation and the Commissioner of Insurance. The amount of such coverage shall be the same as what is otherwise required of employers entitled to coverage under the Georgia Workers’ Compensation Act. Further, the Contractor shall provide a certificate of insurance indicating that such coverage has been secured and that no individual has been excluded from coverage.)

If higher limits are maintained by Contractor than shown above, the County shall be entitled to coverage for any additional insurance proceeds in excess of the specified minimum limits maintained by the Contractor.

(3) Deductibles and Self-Insured Retentions: Any deductibles or self-insured retentions must be declared to and approved by the County in writing so that the County may ensure the financial solvency of the Contractor; self-insured retentions should be included on the certificate of insurance.

(4) Other Insurance Provisions: Each policy shall contain, or be endorsed to contain, the following provisions respectively:

(a) General Liability, Automobile Liability and Umbrella Liability Coverage.
(i) **Additional Insured Requirement.** The County and County’s elected and appointed officials, officers, boards, commissioners, employees, representatives, consultants, servants, agents and volunteers (individually “Insured Party” and collectively “Insured Parties”) shall be named as additional insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased, or used by the Contractor; automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Insured Parties. Nothing contained in this section shall be construed to require the Contractor to provide liability insurance coverage to any Insured Party for claims asserted against such Insured Party for its sole negligence.

(ii) **Primary Insurance Requirement.** The Contractor’s insurance coverage shall be primary noncontributing insurance as respects to any other insurance or self-insurance available to the Insured Parties. Any insurance or self-insurance maintained by the Insured Parties shall be in excess of the Contractor’s insurance and shall not contribute with it.

(iii) **Reporting Requirement.** Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Insured Parties.

(iv) **Separate Coverage.** Coverage shall state that the Contractor’s insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to limits of insurance provided.

(v) **Defense Costs/Cross Liability.** Coverage shall be provided on a “pay on behalf” basis, with defense costs payable in addition to policy limits. There shall be no cross liability exclusion.

(vi) **Subrogation.** The insurer shall agree to waive all rights of subrogation against the Insured Parties for losses arising from Work performed by the Contractor for the County.

(b) **Workers’ Compensation Coverage:** The insurer providing Workers’ Compensation Coverage will agree to waive all rights of subrogation against the Insured Parties for losses arising from Work performed by the Contractor for the County.

(c) **All Coverages:**

(i) **Notice Requirement.** Each insurance policy required by this Agreement shall be endorsed to state that coverage shall not be reduced,
suspended, voided, or canceled except after thirty (30) calendar days’ prior written notice (or 10 calendar days if due to non-payment) has been given to the County. In addition, Contractor shall provide written notice to County at least thirty (30) days prior to any reduction, suspension, voiding, or cancellation of coverage. The County reserves the right to accept alternate notice terms and provisions, provided they meet the minimum requirements under Georgia law.

(ii) **Starting and Ending Dates.** Policies shall have concurrent starting and ending dates.

(iii) **Incorporation of Indemnification Obligations.** Policies shall include a Project-specific endorsement incorporating the indemnification obligations assumed by the Contractor under the terms of this Agreement, including but not limited to Section 7(O) of this Agreement.

(5) **Acceptability of Insurers:** The insurance to be maintained by Contractor must be issued by a company licensed or approved by the Insurance Commissioner to transact business in the State of Georgia. Such insurance shall be placed with insurer(s) with an A.M. Best Policyholder’s rating of no less than “A-” and with a financial rate of Class VII or greater. The Contractor shall be responsible for any delay resulting from the failure of its insurer to provide proof of coverage in the proscribed form.

(6) **Verification of Coverage:** Contractor shall furnish to the County for County approval certificates of insurance and endorsements to the policies evidencing all coverage required by this Agreement prior to the start of work. Without limiting the general scope of this requirement, Contractor is specifically required to provide an endorsement naming the County as an additional insured when required. The certificates of insurance and endorsements for each insurance policy are to be on a form utilized by Contractor’s insurer in its normal course of business and are to be signed by a person authorized by that insurer to bind coverage on its behalf, unless alternate sufficient evidence of their validity and incorporation into the policy is provided. The County reserves the right to require complete, certified copies of all required insurance policies at any time. The Contractor shall provide proof that any expiring coverage has been renewed or replaced prior to the expiration of the coverage.

(7) **Subcontractors:** Contractor shall either (1) ensure that its insurance policies (as described herein) cover all subcontractors and the Work performed by such subcontractors or (2) ensure that any subcontractor secures separate policies covering that subcontractor and its Work. All coverage for subcontractors shall be subject to all of the requirements stated in this Agreement, including, but not limited to, naming the Insured Parties as additional insureds.

(8) **Claims-Made Policies:** Contractor shall extend any claims-made insurance policy for at least six (6) years after termination or final payment under the Agreement, whichever is later, and have an effective date which is on or prior to the Effective Date.
(9) **Progress Payments:** The making of progress payments to the Contractor shall not be construed as relieving the Contractor or its subcontractor or insurance carriers from providing the coverage required in this Agreement.

Q. **Bonds.** In accordance with O.C.G.A. § 32-4-69, for road construction contracts valued at five thousand dollars ($5,000.00) or more, or in any other instance where the County has elected to include such bond requirements as exhibits to this Agreement, the Contractor shall provide Performance and Payment Bonds on the forms attached hereto as “**Exhibits D.1 and D.2**” and with a surety licensed to do business in Georgia and listed on the Treasury Department’s most current list (Circular 570 as amended). Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under this Agreement, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

R. **Assignment of Agreement.** The Contractor covenants and agrees not to assign or transfer any interest in, or delegate any duties of this Agreement, without the prior express written consent of the County. As to any approved subcontractors, the Contractor shall be solely responsible for reimbursing them, and the County shall have no obligation to them.

S. **Employment of Unauthorized Aliens Prohibited – E-Verify Affidavit.** Pursuant to O.C.G.A. § 13-10-91, the County shall not enter into a contract for the physical performance of services unless:

1. the Contractor shall provide evidence on County-provided forms, attached hereto as “**Exhibits G.1 and G.2**” (affidavits regarding compliance with the E-Verify program to be sworn under oath under criminal penalty of false swearing pursuant to O.C.G.A. § 16-10-71), that it and its subcontractors have registered with, are authorized to use and use 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, and that they will continue to use the federal work authorization program throughout the contract period, or

2. the Contractor provides evidence that it is not required to provide an affidavit because it is an individual licensed pursuant to Title 26 or Title 43 or by the State Bar of Georgia and is in good standing.

The Contractor hereby verifies that it has, prior to executing this Agreement, executed a notarized affidavit, the form of which is provided in “**Exhibit G.1**”, and submitted such affidavit to County or provided the County with evidence that it is an individual not required to provide such an affidavit because it is licensed and in good standing as noted in sub-subsection (2) above. Further, Contractor hereby agrees to comply with the requirements of the federal Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603, O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02.

In the event the Contractor employs or contracts with any subcontractor(s) in connection with the covered contract, the Contractor agrees to secure from such subcontractor(s) attestation of the subcontractor’s compliance with O.C.G.A. § 13-10-91 and Rule 300-10-
1-02 by the subcontractor’s execution of the subcontractor affidavit, the form of which is attached hereto as “Exhibit G.2”, which subcontractor affidavit shall become part of the contractor/subcontractor agreement, or evidence that the subcontractor is not required to provide such an affidavit because it is licensed and in good standing as noted in subsection (2) above. If a subcontractor affidavit is obtained, Contractor agrees to provide a completed copy to the County within five (5) business days of receipt from any subcontractor.

Where Contractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the County Manager or his/her designee shall be authorized to conduct an inspection of the Contractor’s and Contractor’s subcontractors’ verification process at any time to determine that the verification was correct and complete. The Contractor and Contractor’s subcontractors shall retain all documents and records of their respective verification process for a period of five (5) years following completion of the contract. Further, where Contractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the County Manager or his/her designee shall further be authorized to conduct periodic inspections to ensure that no County Contractor or Contractor’s subcontractors employ unauthorized aliens on County contracts. By entering into a contract with the County, the Contractor and Contractor’s subcontractors agree to cooperate with any such investigation by making their records and personnel available upon reasonable notice for inspection and questioning. Where a Contractor or Contractor’s subcontractors are found to have employed an unauthorized alien, the County Manager or his/her designee may report same to the Department of Homeland Security. The Contractor’s failure to cooperate with the investigation may be sanctioned by termination of the contract, and the Contractor shall be liable for all damages and delays occasioned by the County thereby.

Contractor agrees that the employee-number category designated below is applicable to the Contractor. [Information only required if a contractor affidavit is required pursuant to O.C.G.A. § 13-10-91.]

[ ] ___ 500 or more employees.
[ ] ___ 100 or more employees.
[ ] ___ Fewer than 100 employees.

Contractor hereby agrees that, in the event Contractor employs or contracts with any subcontractor(s) in connection with this Agreement and where the subcontractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the Contractor will secure from the subcontractor(s) such subcontractor(s’) indication of the above employee-number category that is applicable to the subcontractor.

The above requirements shall be in addition to the requirements of State and federal law and shall be construed to be in conformity with those laws.

T. Records, Reports and Audits.

(1) Records:
(a) Books, records, documents, account ledgers, data bases, and similar materials relating to the Work performed for the County under this Agreement ("Records") shall be established and maintained by the Contractor in accordance with applicable law and requirements prescribed by the County with respect to all matters covered by this Agreement. Except as otherwise authorized or required, such Records shall be maintained for at least three (3) years from the date that final payment is made to Contractor by County under this Agreement. Furthermore, Records that are the subject of audit findings shall be retained for three (3) years or until such audit findings have been resolved, whichever is later.

(b) All costs claimed or anticipated to be incurred in the performance of this Agreement shall be supported by properly executed payrolls, time records, invoices, contracts, or vouchers, or other official documentation evidencing in proper detail the nature and propriety of the charges. All checks, payrolls, invoices, contracts, vouchers, orders, or other accounting documents pertaining in whole or in part to this Agreement shall be clearly identified and readily accessible.

(2) Reports and Information: Upon request, the Contractor shall furnish to the County any and all Records in the form requested by the County. All Records stored on a computer database must be of a format compatible with the County’s computer systems and software.

(3) Audits and Inspections: At any time during normal business hours and as often as the County may deem necessary, Contractor shall make available to the County or County’s representative(s) for examination all Records. The Contractor will permit the County or County’s representative(s) to audit, examine, and make excerpts or transcripts from such Records. Contractor shall provide proper facilities for County or County’s representative(s) to access and inspect the Records, or, at the request of the County, shall make the Records available for inspection at the County’s office. Further, Contractor shall permit the County or County’s representative(s) to observe and inspect any or all of Contractor’s facilities and activities during normal hours of business for the purpose of evaluating Contractor’s compliance with the terms of this Agreement. In such instances, the County or County’s representative(s) shall not interfere with or disrupt such activities.

U. Confidentiality. Contractor acknowledges that it may receive confidential information of the County and that it will protect the confidentiality of any such confidential information and will require any of its subcontractors, contractors, and/or staff to likewise protect such confidential information. The Contractor agrees that confidential information it receives or such reports, information, opinions, or conclusions that Contractor creates under this Agreement shall not be made available to, or discussed with, any individual or organization, including the news media, without prior written approval of the County. Contractor shall exercise reasonable precautions to prevent the unauthorized disclosure and use of County information whether specifically deemed confidential or not.
Contractor acknowledges that the County’s disclosure of documentation is governed by Georgia’s Open Records Act, and Contractor further acknowledges that, if Contractor submits records containing trade secret information and if Contractor wishes to keep such records confidential, Contractor must submit and attach to such records an affidavit affirmatively declaring that specific information in the records constitutes trade secrets pursuant to Article 27 of Chapter 1 of Title 10, and the Parties shall follow the requirements of O.C.G.A. § 50-18-72(a)(34) related thereto.

V. Licenses, Certifications and Permits. The Contractor covenants and declares that it has obtained all diplomas, certificates, licenses, permits, or the like required of the Contractor by any and all national, state, regional, county or local boards, agencies, commissions, committees or other regulatory bodies in order to perform the Work contracted for under this Agreement; provided that some permits or licenses related to the Project may be obtained as part of the Work and shall be obtained as required. The Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work, which are customarily secured after execution of the Agreement and which are legally required. Contractor shall furnish copies of such permits, licenses, etc. to the County within ten (10) days after issuance.

W. Key Personnel. All of the individuals identified in “Exhibit J”, attached hereto, are necessary for the successful completion of the Work due to their unique expertise and depth and breadth of experience. There shall be no change in Contractor’s Project Manager or members of the Project team, as listed in “Exhibit J”, without written approval of the County. Contractor recognizes that the composition of this team was instrumental in the County’s decision to award the Work to Contractor and that compelling reasons for substituting these individuals must be demonstrated for the County’s consent to be granted. Any substitutes shall be persons of comparable or superior expertise and experience. Failure to comply with the provisions of this paragraph shall constitute a material breach of Contractor’s obligations under this Agreement and shall be grounds for termination.

X. Authority to Contract. The Contractor covenants and declares that it has obtained all necessary approvals of its board of directors, stockholders, general partners, limited partners, or similar authorities to simultaneously execute and bind Contractor to the terms of this Agreement, if applicable.

Y. Ownership of Work. All reports, designs, drawings, plans, specifications, schedules, work product, and other materials, including those in electronic form, prepared or in the process of being prepared for the Work to be performed by the Contractor (“Materials”) shall be the property of the County, and the County shall be entitled to full access and copies of all Materials in the form prescribed by the County. Any Materials remaining in the hands of the Contractor or subcontractor upon completion or termination of the Work shall be delivered immediately to the County whether or not the Project or Work is commenced or completed, provided, however, that Contractor may retain a copy of any deliverables for its records. The Contractor assumes all risk of loss, damage or destruction of or to Materials. If any Materials are lost, damaged, or destroyed before final delivery to the County, the Contractor shall replace them at its own expense. Any and all copyrightable subject matter in all Materials is hereby assigned to
the County, and the Contractor agrees to execute any additional documents that may be necessary to evidence such assignment.

Z. Nondiscrimination. During the performance of this Agreement, the Contractor agrees as follows:

1. Compliance with Regulations: The Contractor shall comply with the Regulations, hereinafter defined, relative to nondiscrimination in federally-assisted programs of the Department of Transportation (the “DOT”), Title 49, Code of Federal Regulations, part 21, as well as Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and all other provisions of Federal law, as they may be amended from time to time (the “Regulations”), which are herein incorporated by reference and made a part of this Agreement.

2. Nondiscrimination: The Contractor, with regard to the Work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the Agreement covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiations made by the Contractor for Work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor’s obligations under this Agreement and the Regulations relative to nondiscrimination on the ground of race, color, sex, or national origin.

4. Information and Reports: The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, and other sources of information and its facilities as may be determined by the County, GDOT, or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the County, or GDOT or the Federal Highway Administration, as appropriate, and shall set forth what efforts it has made to obtain such information.

5. Sanctions for Noncompliance: In the event of the Contractor’s noncompliance with the nondiscriminatory provision of this Agreement, County shall impose contract sanctions as it or GDOT or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

   a. Withholding of payments to the Contractor under the Agreement until Contractor complies; and/or
(b) Cancellation, termination, or suspension of the Agreement, in whole or in part.

(6) Incorporation of Provisions: The Contractor shall include the provisions of paragraphs (1) through (5) in every subcontract, procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issue thereto.

The Contractor shall take such action with respect to any subcontractor or procurement as the County or GDOT or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctioning noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the County to enter into such litigation to protect the interest of the County and, in addition, the Contractor may request the Georgia Department of Transportation to enter into such litigation to protect the interests of the State and the United States to enter into such litigation to protect the interests of the United States.

AA. Equal Employment Opportunity (EEO) Clause. During the performance of this Agreement, Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and the employees are treated during employment without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor. (See also the “Standard Federal Equal Employment Opportunity Construction Contract Specification (Executive Order 11246)” attached hereto at “Exhibit K.”)

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations and orders of the
Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by the rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance. Provided, however, that in the event a Contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

BB. Certification of Non-segregated Facilities. The Contractor certifies that s/he does not maintain or provide for his/her employees any segregated facility at any of his/her establishments, and that s/he does not permit employees to perform their services at any location, under his/her control, where segregated facilities are maintained. S/He certifies further that s/he will not maintain or provide for employees any segregated facilities at any of his/her establishments, and s/he will not permit employees to perform their services at any location under his/her control where segregated facilities are maintained. The Contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause of this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. S/He further agrees that (except where s/he has obtained identical certifications from proposed subcontractors for specific time periods) s/he will obtain identical certification from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that s/he will retain such certifications in his/her files; and that s/he will forward the following notice to such proposed subcontractors (except where proposed subcontractors have submitted identical certifications for specific time periods).
CC. Compliance with Clean Air and Water Acts. The Agreement is subject to the requirements of the Clean Air Act, as amended, 42 USC 1857 et. seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended from time to time. In compliance with said regulations:

(1) The Contractor shall require of subcontractors that any facility to be utilized in the performance of any nonexempt contract or subcontract is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 4C CFR 15.20.

(2) The Contractor will comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857c-8) and section 308 of the Federal Water Pollution Control Act as amended, (330 USC 1318) relating to inspection, monitoring, entry, reports, and information, as well as all other requirements specified in said section 114 and section 308, and all regulations and guidelines issued thereunder.

(3) The Contractor will provide prompt notice of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized or to be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

(4) The criteria and requirements of paragraphs (1) through (4) of this Section shall be included in every nonexempt subcontract. Contractor’s failure to ensure such inclusion shall be a breach of this Agreement and subject to remedy as otherwise provided herein.

Section 8. Covenants of the County

A. Right of Entry. County shall provide for right of entry for Contractor and Contractor’s equipment as required for Contractor to complete the Work; provided that Contractor shall not unreasonably encumber the Project site(s) with materials or equipment.

B. County’s Representative. ______________________________ shall be authorized to act on County’s behalf with respect to the Work as the County’s designated representative on this Project; provided that any changes to the Work or the terms of this Agreement must be approved as provided in Section 6 above.

Section 9. Final Project Documents; Warranty

A. Final Project Documents. Prior to final payment, Contractor shall deliver to County a written assignment of all warranties, guaranties, certificates, permits, and other documents, including without limitation, all contractors’ and manufacturers’ warranties. At such time, Contractor shall also deliver to the County copies of all as-built drawings, operations, and maintenance manuals, and any other pertinent documents relating to the construction and operation of the Work that is not otherwise in the possession of the County.
B. Warranty. The Contractor warrants to the County and the Contract Administrator that materials and equipment furnished under the Agreement will be of good quality and new, unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, is considered defective. This warranty excludes remedy for damage or defect caused by abuse by the County or modifications to the Work not executed by the Contractor or an employee/subcontractor/sub-subcontractor thereof.

Except as may be otherwise specified or agreed, the Contractor shall repair or replace all defects in materials, equipment, or workmanship appearing within one year (the “Warranty Period”) from the date of Project completion at no additional cost to the County. Further, Contractor shall provide all maintenance services, including parts and labor, for one year (the “Maintenance Period”) from the date of Final Completion at no additional cost to the County. An inspection shall be conducted by the County or its representative(s) near the completion of the respective Warranty Period/Maintenance Period to identify any issues that must be resolved by the Contractor. After the expiration of the Maintenance Period, County shall be responsible for repairing issues resulting from normal wear and tear and shall be responsible for general maintenance of the equipment; however, expiration of any Warranty Period or Maintenance Period shall not affect the Contractor’s continued liability under an implied warranty of merchantability and fitness. All warranties implied by law, including fitness for a particular purpose and suitability, are hereby preserved and shall apply in full force and effect beyond any Warranty Period or Maintenance Period. County may purchase additional maintenance services from the Contractor upon a written bid for such services being executed by authorized representatives of both Parties, and upon execution, such bid for additional services shall be incorporated herein by this reference.

Section 10. Termination

A. For Convenience. The County may terminate this Agreement for convenience at any time for any or no reason upon providing written notice thereof to Contractor at least thirty (30) calendar days in advance of the termination date.

B. For Cause. The Contractor shall have no right to terminate this Agreement prior to completion of the Work, except in the event of County’s failure to pay the Contractor within thirty (30) calendar days of Contractor providing the County with notice of a delinquent payment and an opportunity to cure. The County may terminate this Agreement for cause as provided in Section 11 of this Agreement. The County shall give Contractor at least seven (7) calendar days’ written notice of its intent to terminate the Agreement for cause and the reasons therefor, and if Contractor, or its Surety, fails to cure the default within that period, the termination shall take place without further notice. The County shall then make alternative arrangements for completion of the Project.

C. Statutory Termination. In compliance with O.C.G.A. § 36-60-13, this Agreement shall be deemed terminated as provided in Section 4(A) of this Agreement. Further, this Agreement shall terminate immediately and absolutely at such time as appropriated or otherwise unobligated funds are no longer available to satisfy the obligation of the County.
D. **Payment.** Provided that no damages are due to the County for Contractor’s failure to perform in accordance with this Agreement, and except as otherwise provided herein, the County shall, upon termination for convenience or statutory termination, pay Contractor for Work performed prior to the date of termination in accordance with Section 5 herein. The County shall have no further liability to Contractor for such termination. At its sole discretion, the County may pay Contractor for additional value received as a result of Contractor’s efforts, but in no case shall said payment exceed any remaining unpaid portion of the Maximum Contract Price.

If this Agreement is terminated for cause, the County will make no further payment to the Contractor or its Surety until the Project is completed and all costs of completing the Project are paid. If the unpaid balance of the amount due the Contractor, according to this Agreement, exceeds the cost of finishing the Project, County shall provide payment to the Contractor (or its Surety) for services rendered and expenses incurred prior to the termination date, provided that such payment shall not exceed the unpaid balance of the amount otherwise payable under this Agreement minus the cost of completing the Project. If the costs of completing the Project exceed the unpaid balance, the Contractor or its Surety shall pay the difference to the County.

E. **Assumption of Contracts.** The County reserves the right in termination for cause to take assignment of all contracts between the Contractor and its subcontractors, vendors, and suppliers. The County will promptly notify the Contractor of the contracts the County elects to assume. Upon receipt of such notice, the Contractor shall promptly take all steps necessary to effect such assignment.

F. **Conversion to Termination for Convenience.** If the County terminates this Agreement for cause and it is later determined that the County did not have grounds to do so, the termination will be converted to and treated as a termination for convenience under the terms of Section 10(A) above.

G. **Requirements Upon Termination.** Upon termination, the Contractor shall: (1) promptly discontinue all services, cancel as many outstanding obligations as possible if requested to do so by the County, and not incur any new obligations, unless the County directs otherwise; and (2) promptly deliver to the County all data, drawings, reports, summaries, and such other information and materials as may have been generated or used by the Contractor in performing this Agreement, whether completed or in process, in the form specified by the County.

H. **Reservation of Rights and Remedies.** The rights and remedies of the County and the Contractor provided in this Section are in addition to any other rights and remedies provided under this Agreement or at law or in equity.

**Section 11. County’s Rights; Contractor Default**

A. **County’s Rights Related to the Work.**

   (i) **County’s Right to Stop the Work.** If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, as required by the Contract Administrator, or persistently fails to carry out Work in accordance with the Contract
Documents, the County may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the County to stop the Work shall not give rise to a duty on the part of the County to exercise this right for the benefit of the Contractor or any other person or entity. Such a stoppage of Work shall not extend the Expected Date of Final Completion of the Work.

(ii) County’s Right to Carry Out the Work. If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven (7) calendar day period after receipt of written notice from the County to commence and/or continue correction of such default or neglect with diligence and promptness, the County may, without prejudice to other remedies the County may have, correct such deficiencies. In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including County’s expenses and compensation for the Architect/Engineer’s and/or Contract Administrator’s additional services (if any) made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the County.

B. Contractor Default. For the purposes of this Agreement, Contractor shall be in default if any of the following occur during the Term of this Agreement: (a) a failure to fulfill in a timely and proper manner Contractor’s obligations under this Agreement; (b) Contractor violates any of the material provisions, agreements, representations or covenants of this Agreement or any applicable city, state, or federal laws, which do not fall within the force majeure provisions of this Agreement; (c) the Contractor becomes insolvent or unable to pay its debts as they mature, or makes an assignment for the benefit of creditors, or files a bankruptcy petition under the United States Bankruptcy Code; or (d) Contractor is the subject of a judgment or order for payment of money, which judgment or order exceeds $100,000 and is no longer subject to appeal or, in the opinion of the County, would be fruitless to appeal and where (i) such judgment or order shall continue un-discharged or unpaid for a period of thirty (30) calendar days, (ii) an insurer acceptable to the County has not acknowledged that such judgment or order is fully covered by a relevant policy of insurance, or (iii) the County is otherwise reasonably satisfied that such judgment or order is not likely to be satisfied or complied with within sixty (60) calendar days of its issuance.

In the event of Contractor’s default under this Agreement, the County shall send written notice to the Contractor setting forth the specific instances of the default and providing the Contractor with at least seven (7) calendar days to cure or otherwise remedy the default to the reasonable satisfaction of the County. If the default is not remedied during the stated cure period, then the County may, at its election: (a) in writing terminate the Agreement in whole or in part; (b) cure such default itself and charge the Contractor for the costs of curing the default against any sums due or which become due to the Contractor under this Agreement; and/or (c) pursue any other remedy then available, at law or in equity, to the County for such default.

Section 12. Construction Management

If a Contract Administrator other than the County has been hired in relation to the Project, the Contract Administrator’s administration of the construction of the Project shall be as described
in “Exhibit M,” attached hereto. The Contractor agrees to the construction administration and management provisions contained therein.

**Section 13. Miscellaneous**

A. **Complete Agreement.** This Agreement, including all of the Contract Documents, constitutes the complete agreement between the Parties and supersedes any and all other agreements, either oral or in writing, between the Parties with respect to the subject matter of this Agreement. No other agreement, statement, or promise relating to the subject matter of this Agreement not contained in this Agreement or the Contract Documents shall be valid or binding. This Agreement may be modified or amended only by a written document signed by representatives of both Parties with appropriate authorization.

B. **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Georgia without regard to choice of law principles. If any action at law or in equity is brought to enforce or interpret the provisions of this Agreement, the rules, regulations, statutes and laws of the State of Georgia will control. Any action or suit related to this Agreement shall be brought in the Superior Court of Barrow County, Georgia or the U.S. District Court for the Northern District of Georgia – Gainesville Division, and Contractor submits to the jurisdiction and venue of such court.

C. **Counterparts.** This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

D. **Invalidity of Provisions; Severability.** Should any article(s) or section(s) of this Agreement, or any part thereof, later be deemed illegal, invalid or unenforceable by a court of competent jurisdiction, the offending portion of the Agreement should be severed, and the remainder of this Agreement shall remain in full force and effect to the extent possible as if this Agreement had been executed with the invalid portion hereof eliminated, it being the intention of the Parties that they would have executed the remaining portion of this Agreement without including any such part, parts, or portions that may for any reason be hereafter declared invalid.

E. **Business License.** Prior to commencement of the Work to be provided hereunder, Contractor shall apply to the County for a business license, pay the applicable business license fee, and maintain said business license during the Term of this Agreement, unless Contractor provides evidence that no such license is required.

F. **Notices.**

   (1) **Communications Relating to Day-to-Day Activities.**

   All communications relating to the day-to-day activities of the Work shall be exchanged between ________________ for the County and ________________ for the Contractor.
(2) Official Notices.

All other notices, requests, demands, writings, or correspondence, as required by this Agreement, shall be in writing and shall be deemed received, and shall be effective, when (1) personally delivered, or (2) on the third calendar day after the postmark date when mailed by certified mail, postage prepaid, return receipt requested, or (3) upon actual delivery when sent via national overnight commercial carrier to the Party at the addresses given below, or at a substitute address previously furnished to the other Party by written notice in accordance herewith:

NOTICE TO COUNTY shall be sent to:

Barrow County
County Manager
Barrow County Historic Courthouse
30 N. Broad Street
Winder, Georgia 30680

NOTICE TO AUTHORITY shall be sent to:

Winder-Barrow Industrial Building Authority
P.O. Box 456
Winder, Georgia 30680

NOTICE TO CONTRACTOR shall be sent to:

____________________
____________________
____________________

G. Waiver of Agreement. No failure by the County to enforce any right or power granted under this Agreement, or to insist upon strict compliance by Contractor with this Agreement, and no custom or practice of the County at variance with the terms and conditions of this Agreement shall constitute a general waiver of any future breach or default or affect the County’s right to demand exact and strict compliance by Contractor with the terms and conditions of this Agreement. Further, no express waiver shall affect any term or condition other than the one specified in such waiver, and that one only for the time and manner specifically stated.

H. Survival. All sections of this Agreement which by their nature should survive termination will survive termination, including, without limitation, confidentiality obligations, warranties, and insurance maintenance requirements.

I. Sovereign Immunity. Nothing contained in this Agreement shall be construed to be a waiver of the County’s sovereign immunity or any individual’s qualified good faith or official immunities.
J. **No Personal Liability.** Nothing herein shall be construed as creating any individual or personal liability on the part of any of County’s elected or appointed officials, officers, boards, commissions, employees, representatives, consultants, servants, agents, attorneys or volunteers. No such individual shall be personally liable to the Contractor or any successor in interest in the event of any default or breach by the County or for any amount which may become due to the Contractor or successor or on any obligation under the terms of this Agreement. Likewise, Contractor’s performance of services under this Agreement shall not subject Contractor’s individual employees, officers, or directors to any personal liability, except where Contractor is a sole proprietor. The Parties agree that their sole and exclusive remedy, claim, demand, or suit shall be directed and/or asserted only against Contractor or the County, respectively, and not against any elected or appointed official, officers, boards, commissions, employees, representatives, consultants, servants, agents, attorneys and volunteers.

K. **Force Majeure.** Neither the County nor Contractor shall be liable for their respective non-negligent or non-willful failure to perform or shall be deemed in default with respect to the failure to perform (or cure a failure to perform) any of their respective duties or obligations under this Agreement or for any delay in such performance due to: (i) any cause beyond their respective reasonable control; (ii) any act of God; (iii) any change in applicable governmental rules or regulations rendering the performance of any portion of this Agreement legally impossible; (iv) earthquake, fire, explosion, or flood; (v) strike or labor dispute, excluding strikes or labor disputes by employees and/or agents of Contractor; (vi) delay or failure to act by any governmental or military authority; or (vii) any war, hostility, embargo, sabotage, civil disturbance, riot, insurrection, or invasion. In such event, the time for performance shall be extended by an amount of time equal to the period of delay caused by such acts, and all other obligations shall remain intact.

L. **Headings.** All headings herein are intended for convenience and ease of reference purposes only and in no way define, limit, or describe the scope or intent thereof, or of this Agreement, or in any way affect this Agreement.

M. **No Third-Party Rights.** This Agreement shall be exclusively for the benefit of the Parties and shall not provide any third parties with any remedy, claim, liability, reimbursement, cause of action or other right.

N. **Successors and Assigns.** Subject to the provision of this Agreement regarding assignment, each Party binds itself, its partners, successors, assigns, and legal representatives to the other Party hereto, its partners, successors, assigns, and legal representatives with respect to all covenants, agreements, and obligations contained in the Contract Documents.

O. **Agreement Construction and Interpretation.** Contractor represents that it has reviewed and become familiar with this Agreement. The Parties hereto agree that, if an ambiguity or question of intent or interpretation arises, this Agreement is to be construed as if the Parties had drafted it jointly, as opposed to being construed against a Party because it was responsible for drafting one or more provisions of the Agreement. In the interest of brevity, the Contract Documents may omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not
intended to affect the interpretation of either statement.

P. **Material Condition.** Each term of this Agreement is material, and Contractor’s breach of any term of this Agreement shall be considered a material breach of the entire Agreement and shall be grounds for termination or exercise of any other remedies available to the County at law or in equity.

Q. **Use of Singular and Plural.** Words or terms used as nouns in the Agreement shall be inclusive of their singular and plural forms, unless the context of their usage clearly requires contrary meaning.
IN WITNESS WHEREOF, the County and the Contractor have executed this Agreement effective as of the date first above written.

CONTRACTOR: ____________________

By: ______________________________________
Print Name: _________________________________
Its: [CORPORATE SEAL]
(required if corporation)

Attest/Witness:

By: ______________________________________
Print Name: _________________________________
Its: [CORPORATE SEAL]
((Assistant) Corporate Secretary if corporation)

BARROW COUNTY, GEORGIA

By: ___________________________________
Pat Graham, Chairman

Attest: [COUNTY SEAL]

By: ____________________________________
Danielle Austin, County Clerk

WINDER-BARROW INDUSTRIAL BUILDING AUTHORITY

By: ___________________________________
Chairman

Attest: [AUTHORITY SEAL]

By: _________________________________
(Assistant) Secretary
EXHIBIT A

BID DOCUMENTS FROM CONTRACTOR
EXHIBIT B
FEDERAL LABOR STANDARDS PROVISION

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A.1.(i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (See Exhibit C below) (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii)) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(a) The contracting officer shall require that any class of laborers or mechanics, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, US. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action
within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all
laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project.) Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable program (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii)(a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), US. Government Printing Office, Washington, DC, 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

1. That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5(a)(3)(i) and that such information is correct and complete;

2. That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph A.3(ii)(b) of this section.
(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph A.3(i) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.

4.(i) **Apprentices and Trainees.** Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the US. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeymen's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification.

If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the US. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journey hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performs. In addition, any trainee performing work on the job site in excess of the ration permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) **Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. **Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract.

6. **Subcontracts.** The contractor or subcontractor will insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

7. **Contract termination:** debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounded for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. **Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. **Disputes concerning labor standards.** Disputes arising out of a labor standards provision of this contract shall to be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of
its subcontractors) and HUD or its designee, the US. Department of Labor, or the employees or their representatives.

10. (i) **Certification of Eligibility.** By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the US. Criminal Code, 18 U.S.C. 1001. Additionally, US. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of ...influencing in any way the action of such Administration...makes, utters or publishes any statement, knowing the same to be false...shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. **Complaints, Proceedings, or Testimony by Employees.** No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. **Contract Work Hours and Safety Standards Act.** As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

1. **Overtime requirements:** No contractor or subcontractor contracting for any part of the contract work may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. **Violation:** liability for unpaid wages, liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.
(3) **Withholding for unpaid wages and liquidated damages:** HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any money payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) **Subcontracts:** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. **Health and Safety**

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly part 1518) and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96).

(3) The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The Contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.
EXHIBIT C

APPLICABLE WAGE DETERMINATION

(General Decision Number: GA20190219)

The attached Wage Determination includes a list of wage rates and fringe benefit rates for each labor category of workers which the U.S. Department of Labor has determined to be prevailing in this area. **This Wage Determination is subject to modification in January 2020.**
General Decision Number: GA20190219 01/04/2019

Superseded General Decision Number: GA20180231

State: Georgia

Construction Type: Highway

County: Barrow County in Georgia.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015.

If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.
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<tr>
<td>LABORER: Pipelayer............ $12.45</td>
<td>0.00</td>
</tr>
<tr>
<td>Role</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LABORER</td>
<td>Asphalt (Includes Distributor, Raker, Screed, Shoveler, and Spreader)</td>
</tr>
<tr>
<td></td>
<td>LABORER: Common or General, Includes Erosion Control</td>
</tr>
<tr>
<td>OPERATOR</td>
<td>Backhoe/Excavator/Trackhoe</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Bobcat/Skid Steer/Skid Loader</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Broom/Sweeper</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Bulldozer</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Compactor</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Concrete Saw</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Crane</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Distributor</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Grader/Blade</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Hydroseeder</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Loader</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Mechanic</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Milling Machine Groundsman</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Milling Machine</td>
</tr>
<tr>
<td></td>
<td>OPERATOR: Paver (Asphalt, Aggregate, and Concrete)</td>
</tr>
</tbody>
</table>
OPERATOR: Piledriver............$ 16.70          0.00
OPERATOR: Roller................$ 16.04          0.00
OPERATOR: Scraper...............$ 12.64          0.00
OPERATOR: Screed................$ 14.67          1.86
OPERATOR: Shuttle Buggy........$ 14.06          1.98
PAINTER:  Spray..................$ 23.30          0.00
TRAFFIC CONTROL:  Flagger.......$ 12.58          0.00
TRAFFIC CONTROL:
Laborer-Cones/
Barricades/Barrels -
Setter/Mover/Sweeper.........$ 13.59          0.00
TRAFFIC SIGNALIZATION:
Laborer.........................$ 13.75          1.14
TRAFFIC SIGNALIZATION:
Electrician.....................$ 23.33          4.19
TRUCK DRIVER: Dump Truck......$ 15.00          0.00
TRUCK DRIVER: Flatbed Truck.....$ 14.91          1.07
TRUCK DRIVER: Hydroteeder
Truck...........................$ 16.74          0.00
TRUCK DRIVER: Lowboy Truck.....$ 18.98          0.00
TRUCK DRIVER: Off the Road
Truck...........................$ 12.38          0.00
TRUCK DRIVER: Pickup Truck.....$ 13.29          0.00
TRUCK DRIVER: Water Truck.....$ 13.19          1.46
TRUCK DRIVER: Semi/Trailer

Truck............................$ 16.26            0.00

-------------------------------------------------------------------------------

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

================================================================

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

------------------------------------------------------------------

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion.
date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

- WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the
Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue,
N.W. Washington, DC
20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue,
N.W. Washington, DC
20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:
4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION
EXHIBIT D.1

PERFORMANCE BOND

BARROW COUNTY

KNOW ALL MEN BY THESE PRESENTS THAT ____________________________________________

(as CONTRACTOR, hereinafter referred to as the “Principal”), and _____________________

(as SURETY COMPANY, hereinafter referred to as the “CONTRACTOR’S SURETY”), are held
and firmly bound unto Barrow County, Georgia, and the Winder-Barrow Industrial Building
Authority (collectively referred to as OWNER and hereinafter referred to as the “County”), for the
use and benefit of the County, in the sum of ____________________________________________ Dollars ($________.__),
lawful money of the United States of America, for the payment of which the Principal and the
Contractor’s Surety bind themselves, their heirs, executors, administrators, successors and assigns,
jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement
with the County for the construction of a project known as RFB2020-12 Parkway Extension –
Phase 2 Improvements for the Park 53 Industrial and Technology Complex (Barrow County
2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017
OneGeorgia #18gq-007-3-4886 Project) (hereinafter referred to as “the PROJECT”), which
agreement is incorporated herein by reference in its entirety (hereinafter referred to as the
“CONTRACT”).

NOW THEREFORE, the conditions of this obligation are as follows:

1. That if the Principal shall fully and completely perform each and all of the terms, provisions
and requirements of the Contract, including and during the period of any warranties or
guarantees required thereunder, and all modifications, amendments, changes, deletions,
additions, and alterations thereto that may hereafter be made, and if the Principal and the Contractor’s Surety shall indemnify and hold harmless the County from any and all losses, liability and damages, claims, judgments, liens, costs and fees of every description, including but not limited to, any damages for delay, which the County may incur, sustain or suffer by reason of the failure or default on the part of the Principal in the performance of any and all of the terms, provisions, and requirements of the Contract, including all modifications, amendments, changes, deletions, additions, and alterations thereto, and any warranties or guarantees required thereunder, then this obligation shall be void; otherwise to remain in full force and effect;

2. In the event of a failure of performance of the Contract by the Principal, which shall include, but not be limited to, any breach or default of the Contract:
   a. The Contractor’s Surety shall commence performance of its obligations and undertakings under this Bond no later than thirty (30) calendar days after written notice from the County to the Contractor’s Surety; and
   b. The means, method or procedure by which the Contractor’s Surety undertakes to perform its obligations under this Bond shall be subject to the advance written approval of the County.

The Contractor’s Surety hereby waives notice of any and all modifications, omissions, additions, changes, and advance payments or deferred payments in or about the Contract, and agrees that the obligations undertaken by this Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, and advance payments or deferred payments.

The Parties further expressly agree that any action on this Bond may be brought within the time allowed by Georgia law for suit on contracts under seal.
IN WITNESS WHEREOF, the Principal and Contractor’s Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or attorneys-in-fact, as set forth below.

CONTRACTOR ("Principal"):  
__________________________  
By: __________________________ (signature)  
__________________________ (print)  
Title: __________________________ (SEAL)  
Attest:      Date: __________________________  
_____________________ (signature)  
_____________________ (print)  
Title: ________________  
Date:_________________  

CONTRACTOR’S SURETY:  
__________________________  
By: __________________________ (signature)  
__________________________ (print)  
Title: __________________________ (SEAL)  
Attest:      Date: __________________________  
_____________________ (signature)  
_____________________ (print)  
Title: ________________  
Date:_________________  

(ATTACH SURETY’S POWER OF ATTORNEY)
KNOW ALL MEN BY THESE PRESENTS THAT __________________________
(as CONTRACTOR, hereinafter referred to as the “Principal”), and _______________________
(as SURETY COMPANY, hereinafter referred to as the “CONTRACTOR’S SURETY”), are held
and firmly bound unto Barrow County, Georgia, and the Winder-Barrow Industrial Building
Authority (collectively referred to as OWNER and hereinafter referred to as the “County”), for the
use and benefit of any “Claimant,” as hereinafter defined, in the sum of
_______________________________________________________ Dollars ($_______.__),
lawful money of the United States of America, for the payment of which the Principal and the
Contractor’s Surety bind themselves, their heirs, executors, administrators, successors and assigns,
jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement
with the County for the construction of a project known as RFB2020-12 Parkway Extension –
Phase 2 Improvements for the Park 53 Industrial and Technology Complex (Barrow County
2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017
OneGeorgia #18gq-007-3-4886 Project) (hereinafter referred to as “the PROJECT”), which
agreement is incorporated herein by reference in its entirety (hereinafter referred to as the
“CONTRACT”).

NOW THEREFORE, the condition of this obligation is such that if the Principal shall
promptly make payment to any Claimant, as hereinafter defined, for all labor, services, and
materials used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

A “Claimant” shall be defined herein as any Subcontractor, person, Party, partnership, corporation, or other entity furnishing labor, services, or materials used or reasonably required for use in the performance of the Contract, without regard to whether such labor, services, or materials were sold, leased, or rented, and without regard to whether such Claimant is or is not in privity of the Contract with the Principal or any Subcontractor performing Work on the Project.

In the event of any claim made by the Claimant against the County, or the filing of a Lien against the property of the County affected by the Contract, the Contractor’s Surety shall either settle or resolve the Claim and shall remove any such Lien by bond or otherwise as provided in the Contract.

The Parties further expressly agree that any action on this Bond may be brought within the time allowed by Georgia law for suit on contracts under seal.

IN WITNESS WHEREOF, the Principal and Contractor’s Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers, as set forth below.

[SIGNATURES ON FOLLOWING PAGE]
CONTRACTOR:

____________________________

By: __________________________ (signature)

____________________________ (printed)

Title: __________________________ (SEAL)

Date: __________________________

Attest:

____________________________ (signature)

____________________________ (printed)

Title: __________________________

Date: __________________________

CONTRACTOR’S SURETY:

____________________________

By: __________________________ (signature)

____________________________ (printed)

Title: __________________________ (SEAL)

Date: __________________________

Attest:

____________________________ (signature)

____________________________ (printed)

Title: __________________________

Date: __________________________

(ATTACH SURETY’S POWER OF ATTORNEY)
EXHIBIT E

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF _________________
COUNTY OF _______________

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

(1) He is ___________________________(Owner, Partner, Officer, Representative, or Agent) of
_________________________ (the “Bidder” ) that has submitted the attached Bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all
pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive of sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives,
employees, or parties in interest, included in this affidavit, has in any way colluded, conspired, connived,
or agreed, directly or indirectly, with any other Bidder, firm or person to submit a collusive or sham Bid in
connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in
connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or
collusion or communication or conference with any other Bidder, firm or person to fix the price or prices
in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price of
any other Bidder or to secure through any collusion, conspiracy, connivance, or unlawful agreement any
advantage against Barrow County or any person interested in the proposed Contract; and,

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any
collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents,
representatives, owners, employees, or parties in interest, including this Affiant.

(6) Bidder has not directly or indirectly violated any law, ordinance or regulation related to the Bid.

_______________________________________
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
__________, 20___.

_____________________________
Notary Public

[NOTARY SEAL]

My Commission Expires:
EXHIBIT F

FINAL AFFIDAVIT

STATE OF __________________
COUNTY OF ________________

TO BARROW COUNTY, GEORGIA

I, _______________________________, hereby certify that all suppliers of materials, equipment and service, subcontractors, mechanics, and laborers employed by ______________________ or any of its subcontractors in connection with the construction of __________________________ for Barrow County, Georgia have been paid and satisfied in full as of ______________, 20_____, and that there are no outstanding obligations or claims of any kind for the payment of which Barrow County, Georgia on the above named project might be liable, or subject to, in any lawful proceeding at law or in equity.

______________________________
Signature

______________________________
Title

Personally appeared before me this ____ day of ________, 20____._______________________, who under oath deposes and says that he is ______________________________ of the firm of __________________________________, that he has read the above statement, and that to the best of his knowledge and belief same is an exact true statement.

______________________________
Notary Public

[NOTARY SEAL]

My Commission Expires
EXHIBIT G.1

CONTRACTOR AFFIDAVIT AND AGREEMENT

STATE OF ________________
COUNTY OF ________________

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 Barrow County 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:

_______________________________________  I hereby declare under penalty of perjury that the foregoing is true and correct.
Federal Work Authorization User Identification Number

_______________________________________  Executed on ____________, 20__ in __________ (city), __________ (state).
Date of Authorization

_______________________________________  ______________________________
Name of Contractor  Signature of Authorized Officer or Agent

_______________________________________  Printed Name and Title of Authorized Officer or Agent
RFB2020-12 Parkway Extension – Phase 2 Improvements for the Park 53 Industrial and Technology Complex

_______________________________________  SUBSCRIBED AND SWORN BEFORE ME ON THIS THE ________ DAY OF
Name of Project

_______________________________________  ____________, 20__.
Barrow County, Georgia

_______________________________________  ______________________________
Name of Project

_______________________________________  Notary Public
Name of Public Employer

[NOTARY SEAL]
My Commission Expires:
EXHIBIT G.2

SUBCONTRACTOR AFFIDAVIT

STATE OF ___________________
COUNTY OF _______________

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 ___________________ (name of contractor) on behalf of Barrow County 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 (5) business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five (5) business days of receipt, a copy of the 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

________________________
Name of Project

RFB2020-12 Parkway Extension – Phase 2
Improvements for the Park 53 Industrial and Technology Complex

________________________
Name of Public Employer

________________________
Name of Project

Barrow County, Georgia

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

[NOTARY SEAL]

My Commission Expires:
EXHIBIT H

PLANS, DRAWINGS AND SPECIFICATIONS

Plans, drawings and specifications (a true and correct copy of which has been provided to Contractor as included in the RFP maintained on file with the County Purchasing Department), with any modifications (if issued).
EXHIBIT I

ADDITIONAL PAYMENT/RETAINAGE REQUIREMENTS

A. Defined Terms. Terms used in this Agreement shall have their ordinary meaning, unless otherwise defined below or elsewhere in the Contract Documents.

(i) “Substantial Completion” means when the Work or designated portion thereof is complete in accordance with the Contract Documents so that any remaining Work includes only (1) Minor Items that can be completed or corrected within the following thirty (30) calendar days, (2) Permitted Incomplete Work that will be completed by the date agreed upon by the Parties, and (3) any Warranty Work. Substantial Completion shall require complete operation of all applicable building systems including, but not limited to, mechanical, electrical, plumbing, fire protection, fire alarm, telecom, data, security, elevators, life safety, and accessibility (if any).

(ii) “Minor Item” means a portion or element of the Work that can be totally complete within thirty (30) calendar days.

(iii) “Permitted Incomplete Work” means Work that is incomplete through no fault of the Contractor, as determined by the County in its sole discretion.

(iv) “Final Completion” means when the Work has been completed in accordance with terms and conditions of the Contract Documents.

B. Payment for Work Completed and Costs Incurred. County agrees to pay the Contractor for the Work performed and costs incurred by Contractor upon certification by the Contract Administrator and the County that the Work was actually performed and costs actually incurred in accordance with this Agreement. Payment shall be based on the value of the Work completed, as provided in the Contract Documents, plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and, only if approved in writing by the County (which approval shall be given at the sole discretion of the County), such materials and equipment suitably stored, insured, and protected off site at a location approved by the County in writing, less retainage (as described below). Compensation for Work performed and reimbursement for costs incurred shall be paid to the Contractor upon receipt and approval by the County of invoices setting forth in detail the Work performed and costs incurred, along with all supporting documents required by the Contract Documents or requested by the County to process the invoice. Invoices shall be submitted on a monthly basis, and such invoices shall reflect costs incurred versus costs budgeted. Each invoice shall be accompanied by an Interim Waiver and Release upon Payment (or a Waiver and Release upon final payment in the case of the invoice for final payment) procured by the Contractor from all subcontractors in accordance with O.C.G.A. § 44-14-366.

The County shall pay the Contractor within thirty (30) calendar days after approval of the invoice by County staff, less any retainage as described in Section D below. No payments will be made for unauthorized work. Payment will be sent to the designated address by U.S. Mail only; payment will not be hand-delivered, though the Contractor may arrange to pick up payments directly from
the County or may make written requests for the County to deliver payments to the Contractor by
Federal Express delivery at the Contractor’s expense.

C. Evaluation of Payment Requests. The Contract Administrator will evaluate the
Contractor’s applications for payment and will either issue to the County a Certificate for Payment
(with a copy of the Contractor’s application for payment) for such amount as the Contract
Administrator determines is properly due, or notify the Contractor and County in writing of the
Contract Administrator’s reasons for withholding certification in whole or in part. The Contract
Administrator may reject Work that does not conform to the Contract Documents and may
withhold a Certificate of Payment in whole or in part, to the extent reasonably necessary to protect
the County. When the reasons for withholding certification are removed, certification will be made
for amounts previously withheld.

Even following a Certificate of Payment, the County shall have the right to refuse payment of any
invoice or part thereof that is not properly supported, or where requests for payment for Work or
costs are in excess of the actual Work performed or costs incurred, or where the Work product
provided is unacceptable or not in conformity with the Contract Documents, as determined by the
County in its sole discretion. The County shall pay each such invoice or portion thereof as
approved, provided that neither the approval or payment of any such invoice, nor partial or entire
use or occupancy of the Project by the County, shall be considered to be evidence of performance
by the Contractor to the point indicated by such invoice, or of receipt or acceptance by the County
of Work covered by such invoice, where such work is not in accordance with the Contract
Documents.

D. Final Payment and Retainage. The County and Contractor shall comply with the
provisions of O.C.G.A. § 13-10-80. The Contractor through each invoice may request payment of
no more than ninety percent (90%) of that portion of the Work completed during the term covered
by such invoice until fifty percent (50%) of the Maximum Contract Price, as may be adjusted, is
due and the manner of completion of the Work and its progress are reasonably satisfactory to the
County. Payment for the remaining ten percent (10%) of Work completed and covered by such
invoices shall be retained by the County until Substantial Completion. Once fifty percent (50%)
of the Maximum Contract Price, as may be adjusted, is due and the manner of completion of the
Work and its progress are reasonably satisfactory to the County, no additional retainage shall be
withheld, except as provided below. All amounts retained by the County shall be held as a lump
sum until Substantial Completion of the Work, regardless of earlier completion of individual
component(s) of the Work; provided, however, that, at the discretion of the County and with the
written approval of the Contractor, the retainage of each subcontractor may be released separately
as the subcontractor completes his or her work.

If, after discontinuing the retention, the County determines that the Work is unsatisfactory or has
fallen behind schedule, retention may be resumed at the previous level. If retention is resumed by
the County, the Contractor and subcontractors shall be entitled to resume withholding retainage
accordingly. At Substantial Completion of the Work and as the Contract Administrator determines
the Work to be reasonably satisfactory, the County shall, within thirty (30) days after the invoice
and other appropriate documentation as may be required by the Contract Documents are provided
to the County, pay the retainage to the Contractor. If at that time there are any remaining
incomplete Minor Items or Permitted Incomplete Work, an amount equal to 200 percent of the value of each Minor Item or Permitted Incomplete Work, as determined by the Contract Administrator in its sole discretion, shall be withheld until such item, items or work are completed. The reduced retainage shall be shared by the Contractor and subcontractors as their interests may appear.

The Contractor shall, within ten (10) days from its receipt of retainage from the County, pass through payments to subcontractors and shall reduce each subcontractor’s retainage in the same manner as the Contractor’s retainage is reduced by the County; provided, however, that the value of each subcontractor’s work complete and in place equals fifty percent (50%) of his or her subcontract value, including approved Change Orders and other additions to the subcontract value; provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his or her work including any warranty work as the Contractor in his or her reasonable discretion may require, including, but not limited to, a payment and performance bond. The subcontractor shall, within ten (10) days from the subcontractor’s receipt of retainage from the Contractor, pass through payments to lower tier subcontractors and shall reduce each lower tier subcontractor’s retainage in the same manner as the subcontractor’s retainage is reduced by the Contractor; provided, however, that the value of each lower tier subcontractor’s work complete and in place equals fifty percent (50%) of his or her subcontract value, including approved Change Orders and other additions to the subcontract value; provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his or her work including any warranty work as the subcontractor in his or her reasonable discretion may require, including, but not limited to, a payment and performance bond.

Final payment of any retained amounts to the Contractor shall be made after certification by the Contract Administrator that the Work has been satisfactorily completed and is accepted in accordance with the Agreement and Contract Documents.

Neither final payment nor any remaining retainage shall become due until the Contractor submits to the Contract Administrator (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the County or County property might be responsible or encumbered (less amounts withheld by County) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance, required by the Contract Documents to remain in force after final payment, is currently in effect and will not be canceled or allowed to expire until at least thirty (30) calendar days prior written notice has been given to the County; (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) a release or waiver of liens, claims, security interests, and encumbrances by all subcontractors and material suppliers, and (6), if required by the County, other data establishing payment or satisfaction of obligations, such as receipts, to the extent and in such form as may be designated by the County. If a subcontractor or material supplier refuses to furnish a release or waiver as required by the County, the Contractor may furnish a bond satisfactory to the County to indemnify the County against such lien. If such lien remains unsatisfied after payments are made,
the Contractor shall refund to the County all money that the County may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

Acceptance of final payment by the Contractor, a subcontractor or material supplier shall constitute a waiver of claims by that payee, except those claims previously made in writing and identified by that payee as unsettled at the time of final application for payment.
EXHIBIT J

KEY PERSONNEL

The following individuals are designated as Key Personnel under this Agreement and, as such, are necessary for the successful prosecution of the Work:

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<thead>
<tr>
<th>Individual</th>
<th>Position</th>
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<tbody>
<tr>
<td></td>
<td>___________, Project Manager</td>
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EXHIBIT K

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS
(Executive Order 11246)

1.) As used in these specifications:

   a. “Covered area” means Barrow County, Georgia;

   b. “Director” means Director, Office of Federal Contract Compliance Program, United States Department of Labor, or any person to whom the Director delegates authority;


   d. “Minority” includes:

      (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2.) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3.) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trade which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan
does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4.) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5.) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications. Executive Order 11246, or the regulations promulgated pursuant thereto.

6.) In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.

7.) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union, or if referred, not employed by the Contractor, this shall be documented in the file with the reasons therefor, along with whatever additional actions the Contractor may have taken.
d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, lay-off, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Directs its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source. The Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment of minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8.) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7a through p of those Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9.) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved it goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10.) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race color, religion, sex or national origin.
11.) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12.) The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13.) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action stops, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.5.

14.) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15.) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977).
EXHIBIT L

NOTICE OF REQUIREMENT FOR
AFFIRMATIVE ACTION TO EQUAL EMPLOYMENT OPPORTUNITY
(Executive Order 11246)

1.) The Offerer's or Bidder's attention is called to the “Equal Opportunity Clause” and the “Standard Federal Equal Employment Opportunity Construction Contract Specifications” set forth herein.

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

<table>
<thead>
<tr>
<th>Timetable</th>
<th>Goals for minority participation</th>
<th>Goals for female participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Until Further Notice</td>
<td>19.5</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

These goals are applicable to each non-exempt contractor's total on-site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, Federally assisted or non-Federally related project, contract or sub-contract.

The contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3.) The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4.) As used in this Notice, and in the contract resulting from this solicitation, the “covered area” is Barrow County, Georgia.
EXHIBIT M

CONTRACT ADMINISTRATION PROVISIONS

(if issued)
EXHIBIT N

GENERAL CONDITIONS

Please refer to the Project Manual, Specifications and Scope of Work attached hereto or otherwise incorporated herein.
EXHIBIT O

SUPPLEMENTARY CONDITIONS
EXHIBIT P

NOTICE OF AWARD

TO: __________________________________________
___________________________________________
___________________________________________

PROJECT TITLE:  RFB2020-12 Parkway Extension – Phase 2 Improvements for the Park 53 Industrial and Technology Complex (Barrow County 2016 ARC #16-arc-007 and the Winder-Barrow Industrial Building Authority 2017 OneGeorgia #18gq-007-3-4886 Project)

Barrow County Board of Commissioners (Owner) has considered the Bid submitted by you for the above described Project which was opened and read on ________________, 2020. You are hereby notified that your Bid has been accepted for the Project in the amount of $__________________ dollars.

You are required in the bid documents to furnish the required Payment Bond and Performance Bond each in the amount of one hundred percent (100%) of the Contract amount. Also, a Certificate(s) of Insurance is to be submitted as called for in the bid documents. Attached please find the fully executed Construction Agreement for your use. Upon Barrow County’s receipt of the other stated documents, a NOTICE TO PROCEED will be generated.

If you fail to furnish the other stated documents within ten (10) days from the date of receipt of this document, Owner will be entitled to such rights as may be granted by law to ensure Project is completed on schedule.

Please execute the acknowledgement below and return it to: Misty Landers, Finance Department, Barrow County Board of Commissioners, 30 North Broad Street, Winder, GA. 30680.

Dated this __________ day of __________, 2020.

BARROW COUNTY BOARD OF COMMISSIONERS (OWNER)

By: __________________________________________
    Michael R. Renshaw, County Manager

ACCEPTANCE OF NOTICE OF AWARD:
RECEIPT OF THIS NOTICE OF AWARD IS HEREBY ACKNOWLEDGED:

By: __________________________________________ Title: ________________________________________

Dated this __________ day of __________, 2020.
EXHIBIT Q
CONTRACTOR CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION (LOWER-TIER PARTICIPANT) FOR HUD PROGRAMS


1. By signing and submitting this proposal, the prospective lower-tier participant certifies that neither it, its principals nor affiliates, is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. Further, the Participant provides the certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that an erroneous certification was rendered, in addition to other remedies available to the Federal Government, the Department or agency with which this transaction originated may pursue available remedies.

3. Further, the Participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the Participant learns that this certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. By submitting this proposal, it is agreed that should the proposed covered transaction be entered into, the Participant will not knowingly enter into any lower-tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction unless authorized by the agency with which this transaction originated.

5. It is further agreed that by submitting this proposal, the Participant will include this Certification, without modification, in all lower-tier covered transactions and in all solicitations for lower-tier covered transactions.

Contractor Name_________________________________Date___________________________
Title_________________________Address__________________________________________
City_____________________________State___________________Zip____________________

NON-CERTIFICATION:

As the perspective lower-tier participant, I am unable to certify to statements in this Certification as explained in the attachment to this proposal.

Contractor Name_________________________________Date___________________________
Title_________________________Address__________________________________________
City_____________________________State____________________Zip____________________

The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.
BID BOND

BARROW COUNTY, GEORGIA

BIDDER (Name and Address):

________________________________________________________

SURETY (Name and Address of Principal Place of Business):

________________________________________________________

OWNER (hereinafter referred to as the “County” (Name and Address):

Barrow County, Georgia  Winder-Barrow Industrial Building Authority
30 North Broad Street  P.O. Box 456
Winder, Georgia 30680  Winder, Georgia 30680

BID

BID DUE DATE:

PROJECT (Brief Description Including Location):

________________________________________________________

BOND

BOND NUMBER:

DATE (Not later than Bid due date):

PENAL SUM: ____________________________

(Words)  (Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby to the County, subject to the terms printed below or on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent or representative.

BIDDER

Bidder’s Name and Corporate Seal

By: ____________________________

Signature and Title:

Attest: ____________________________

Signature and Title:

SURETY

Surety’s Name and Corporate Seal

By: ____________________________

Signature and Title:

Attest: ____________________________

Signature and Title:

Note: (1) Above addresses are to be used for giving any notice required by the terms of this Bid Bond.

(2) Any singular reference to Bidder, Surety, the County or any other party shall be considered plural where applicable.
1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to the County upon Default of Bidder the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension of that time agreed to in writing by the County) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.

3. This obligation shall be null and void if:
   3.1 The County accepts Bidder’s Bid and Bidder delivers within the time required by the Bidding Documents (or any extension of that time agreed to in writing by the County) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents; or
   3.2 All Bids are rejected by the County; or
   3.3 The County fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension of that time agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon Default by Bidder within 30 calendar days after receipt by Bidder and Surety of a written Notice of Default from the County, which Notice will be given with reasonable promptness and will identify this Bond and the Project and include a statement of the amount due.

5. Surety waives notice of, as well as any and all defenses based on or arising out of, any time extension to issue a Notice of Award agreed to in writing by the County and Bidder, provided that the total time, including extensions, for issuing a Notice of Award shall not in the aggregate exceed 120 days from Bid due date without Surety’s written consent.

6. No suit or action shall be commenced under this Bond either prior to 30 calendar days after the Notice of Default required in paragraph 4 above is received by Bidder and Surety or later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the State of Georgia.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

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

11. The term “Bid” as used herein includes a Bid, offer or proposal, as applicable under the particular circumstances.

12. The terms of this Bid Bond shall be governed by the laws of the State of Georgia.
COUNTY OF BARROW

STATE OF GEORGIA

BARROW COUNTY ETHICS ORDINANCE

AN ORDINANCE TO AMEND THE CODE OF ORDINANCES OF
BARROW COUNTY, TO ESTABLISH THE CODE OF
ETHICS FOR BARROW COUNTY; TO FURTHER AND
INCORPORATE THE POLICIES AND LAWS OF THE STATE
OF GEORGIA RELATING TO ETHICAL STANDARDS; TO CREATE
THE BOARD OF ETHICS AND PROVIDE FOR ITS CONSTITUENT
MEMBERSHIP, DUTIES, AND RESPONSIBILITIES; TO PROVIDE
FOR THE INVESTIGATION OF ETHICS COMPLAINTS; TO PROVIDE
FOR THE ENFORCEMENT OF ETHICAL STANDARDS; TO PROVIDE
FOR SEVERABILITY; TO PROVIDE FOR AN EFFECTIVE DATE;
AND FOR OTHER PURPOSES.

WHEREAS, the Constitution of the State of Georgia, approved by the voters of the State
in November of 1982, and effective July 1, 1983, provides in Article IX, Section II, Paragraph I
Thereof, that the governing authority of the county may adopt clearly reasonable ordinances,
resolutions and regulations;

WHEREAS, O.C.G.A. § 36-1-20 authorizes counties to enact ordinances for protection
and preserving the public health, safety and welfare of the population of the unincorporated
areas of the County;

WHEREAS, the governing authority of Barrow County, to wit, the Board of
Commissioners, desires to exercise its authority in adopting this Ordinance;

WHEREAS, it is essential to the proper operation of democratic government that public
officials of independent and impartial, that governmental decisions and policy be made in the
proper channels of the governmental structure, that public office not be used for private gain
other than the remuneration provided by law, and that there be public confidence in the
integrity of government;
WHEREAS, the attainment of one or more of these ends is impaired whenever there exists a conflict between the private interests of an elected official or a governmental employee and his duties as such;

WHEREAS, the public interest, therefore, requires that the law protect against such conflicts of interest and establish appropriate ethical standards with respect to the conduct of elected officials and government employees in situations where conflicts exist;

WHEREAS, it is also essential to the proper operation of government that those best qualified be encouraged to serve the government. Accordingly, legal safeguards against conflicts of interest must be so designed as not unnecessarily or unreasonably to impede the recruitment and retention by the government of those men and women who are best qualified to serve it;

WHEREAS, an essential principle underlying the staffing of our government structure is that its elected officials and employees should not be denied the opportunity, available to all other citizens, to acquire and retain private economic and other interests, except where conflicts with the responsibility of such elected officials and employees to the public cannot be avoided;

WHEREAS, in recognition of these goals and principles, it is the policy of the Board of Commissioners to institute, establish, promote and enforce standards of ethical conduct for all of Barrow County's officers and employees; and

WHEREAS, it is a further policy of the Board of Commissioners that the proper administration of Barrow County's government and the promotion and enforcement of standards of ethical conduct for Barrow County's officers and employees would be best served by the creation of a Barrow County Board of Ethics for the investigation of complaints related to ethical standards;
NOW, THEREFORE, BE IT ORDAINED AND RESOLVED BY THE BOARD OF
COMMISSIONERS OF BARROW COUNTY, GEORGIA AS FOLLOWS:

ARTICLE ONE: GENERAL PROVISIONS

Section One. Short Title.

This Ordinance shall be known as "The Barrow County Ethics Ordinance," and may be
Cited and referred to as such.

Section Two. Definitions.

For the purposes of this Ordinance, the following terms, phrases, words and their
derivations shall have the meaning provided herein. When no inconsistent with the context,
words used in the present tense include the future, words in the plural number included the
singular number and words in the singular number include the plural number.

(A) "Board" means the Barrow County Board of Commissioners.

(B) "Board of Ethics" means the Barrow County Board of Ethics as formed and
described herein.

(C) "Business Entity" means any business of whatever nature regardless of how
designated or formed, whether a sole proprietorship, partnership, joint venture,
association, trust, corporation, limited liability company, or any other type of
business enterprise and whether a person acting on behalf of, or as a
representative or agent of, the business entity.

(D) "Confidential Information" means any information that, by law or practice, is not
reasonably available to the public.

(E) "County Official" means the Barrow County Board of Commissioners, any
member
of a board, commission or authority appointed by the Board, the Chief of

3
Operations or his/her equivalent and any other elected or appointed officer or employee of Barrow County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

(F) "Employee" means all those persons employed on a regular or part-time basis by The County, as well as those persons whose services are retained under the terms of a contract with the County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

(G) "Family" means the spouse, parents, children, brothers and sisters, related by blood or marriage of a county official or employee.

(H) "Interest" means direct or indirect pecuniary or material benefit accruing to a County Official or Employee as a result of a contract or transaction which is or may be the subject of an official act or action by or with the County, except for such contracts or transactions which, by their terms and by the substance of their provisions, confer the opportunity and right to realize the accrual of similar benefits to all other persons and/or property similarly situated. The term "interest" shall not include any remote interest. For purposes of this Ordinance, a County Official or Employee shall be deemed to have an interest in the affairs of:

(1) His or her family;

(2) Any business entity in which the county official or employee is a member, officer, director, employee or prospective employee;

(3) Any business entity as to which the stock, legal ownership, or beneficial ownership of a county official or employee is in excess of five percent (5%) of the total stock or total legal and beneficial ownership, or which is
controlled or owned directly or indirectly by the county official or employee.

(l) "Official Act" or "Official Duties" means any legislative, administrative, appointive or discretionary act of any County Official or Employee of the County or any agency, board, authority or commission thereof.

ARTICLE TWO: CODE OF ETHICS FOR COUNTY SERVICE GENERALLY AND FOR EMPLOYEES

This Article Two is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A. § 45-10-1, as it may be amended from time to time.

Any person in County service shall;

Section One.

Put loyalty to the highest moral principles and to country above loyalty to person, party, or government department.

Section Two.

Uphold the Constitution, laws and legal regulations of the United States and the State of Georgia and of all governments therein and never be a party to their evasion.

Section Three.

Give a full day's labor for a full day's pay and give to the performance of his duties his earnest effort and best thought.

Section Four.

Seek to find and employ more efficient and economical ways of getting tasks accomplished.
Section Five

Never discriminate unfairly by the dispensing of special favors or privileges to anyone, whether for remuneration or not, and never accept, for himself or his family, favors or benefits under circumstances which might be construed by reasonable persons as influencing the performance of his governmental duties.

Section Six

Make no private promises of any kind binding upon the duties of office, since a government employee has no private word that can be binding on public duty.

Section Seven.

Engage in no business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Eight.

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Nine.

Expose corruption wherever discovered.

Section Ten.

Uphold these principles, ever conscious that public office is a public trust.

ARTICLE THREE: CODE OF ETHICS FOR COUNTY OFFICIALS AND DEPARTMENT DIRECTORS

This Article Three is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A.§ 45-10-3, as it may be amended from time to time.

All County Officials and Department Directors shall:
Section One.

Uphold the Constitution, laws and regulations of the United States, the State of Georgia, the County of Barrow and all governments therein and never be a party to their evasion.

Section Two.

Never discriminate by the dispensing of special favors or privileges to anyone, whether or not for remuneration.

Section Three.

Not engage in any business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Four.

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Five.

Expose corruption wherever discovered.

Section Six.

Never solicit, accept, or agree to accept gifts, loans, gratuities, discounts, favors, hospitality or services from any person, association or corporation under circumstances from Which it could reasonably be inferred that a major purpose of the donor is to influence the performance of the member’s official duties.

Section Seven.

Never accept any economic opportunity under circumstances where he knows or should know that there is a substantial possibility that the opportunity is being afforded him with intent to influence his conduct in the performance of his official duties.
Section Eight.

Never engage in other conduct which is unbecoming to a member or which constitutes a breach of public trust.

Section Nine.

Never take any official action with regard to any matter under circumstances in which he knows or should know that he has a direct or indirect monetary interest in the subject matter of such matter or in the outcome of such official action.

ARTICLE FOUR: SPECIFIC PROVISIONS RELATED TO CONFLICT OF INTEREST TRANSACTIONS AND DISCLOSURES

The following provisions related to conflict of interest transactions and disclosures are intended to supplement and elaborate upon the Code of Ethics set forth in Articles Two and Three above and all such provisions shall be read and interpreted in accordance therewith.

Section One. Compliance with Applicable Law.

No County Official or Employee shall engage in any activity or transaction that is prohibited by law, now existing or hereafter enacted, which is applicable to him or her by virtue of his or her office or employment. Other provisions of law or regulations shall apply when any provisions of this Ordinance shall conflict with the laws of the State of Georgia or the United States, except to the extent that this Ordinance permissibly sets forth a more stringent standard of conduct. The laws of the State of Georgia or the United States shall apply when this Ordinance is silent.

Section Two. Conflict of Interest Transactions.

(A) No County Official or Employee shall acquire or maintain an interest in any contract or transaction if a reasonable basis exists that such an interest will be affected directly by his or her official act or action or by official acts or actions of
the County, which the County Official or Employee has a reasonable opportunity
to influence, except consistent with the disclosure and abstention provisions set
forth herein.

(B) Barrow County shall not enter into any contract involving services or property
with a County Official or Employee or with a business entity in which the County
Official or an Employee has an interest. Provided that the disclosure and
abstention provisions set forth herein are followed, this paragraph shall not apply
to the following:

(1) The designation of a bank or trust company as a depository for county
funds;

(2) The borrowing of funds from any bank or lending institution which offers
competitive rates for such loans;

(3) Contracts entered into with a business which employs a consultant,
provided that the consultant's employment with the business is not
incompatible with this Ordinance;

(4) Contracts for services entered into with a business which is the only
available source for such goods or services; and

(5) Contracts entered into under circumstances that constitute and emergency
situation, provided that a record explaining the emergency is prepared by
the Board and submitted to the Chief of Operations (or his/her equivalent)
to be kept on file.
Section Three. Financial Disclosures.

Financial disclosures shall be governed by federal and state law as it may be amended from time to time and this Ordinance shall not require any additional financial disclosure reports to be filed other than those required by federal and state law.

Section Four. Zoning Application Disclosures.

All disclosures with regard to zoning applications shall be governed in their entirety by the Conflict of Interest in Zoning Actions provisions contained in O.C.G.A.§ 36-67A-1, et seq., as it may be amended from time to time.

Section Five. Disclosures Related to Submission of Bids or Proposals for County Work or Contract.

Persons submitting bids or proposals for county work who have contributed $250.00 or more to a County Official must disclose on their bid or proposal the name of the County Official(s) to whom the contribution was made and the amount contributed. Such a disclosure must also be made prior to a request for any change order or extension of any contract awarded to the person who submitted the successful bid or proposal.

Section Six. Withholding of Information.

No County Official or Employee shall knowingly withhold any information that would impair the proper decision making of the Board or any of the County's boards, agencies, authorities or departments.

Section Seven. Incompatible Service.

No County Official or Employee shall engage in or accept private or public employment or render service for any private or public entity, when such employment or service is incompatible with the proper discharge of his or her official duties or would tend to impair his or her independence of judgment or action in the performance of his or her official duties, unless
otherwise permitted by law and unless public disclosure is made.

**Section Eight. Unauthorized Use of Public Property.**

No County Official or Employee shall request or permit the unauthorized use of county-owned vehicles and equipment, including but not limited to computers, pagers and cellular telephones, materials or property for personal convenience or profit.

**Section Nine. Political Recrimination and Activity.**

(A) No County Official or Employee, whether elected or appointed, shall either cause the dismissal or threaten the dismissal from any county position as a reward or punishment for any political activity. No County Official or Employee shall direct any person employed by the County to undertake political activity on behalf of such County Official or Employee, any other County Official or Employee, or any other individual, political party, group or business organization, during such time that the Employee is required to conduct county business. This section does not prohibit incidental telephone calls made for the purpose of scheduling a County Official’s daily county business.

(B) Employees of the county are encouraged to exercise their right to vote, but no employee shall make use of government time or equipment to aid a political candidate, party or cause; or use a government position to influence, coerce, or intimidate any person in the interest of a political candidate, party or cause. No employee shall be hired, promoted, favored or discriminated against with respect to employments because of his or her political opinions or affiliations.

(1) *Seeking elective office.* A government employee seeking elective office within the county may, upon declaring candidacy, either resign or submit a
request in writing to the Chief of Operations (or his/her equivalent) for a leave of absence without pay from the date of his or her announcement through the duration of the campaign or announcement of the election results. In the alternative, the government employee seeking elective office within the County may continue to work for the County, provided, however, that the employee shall not engage in election activities during his or her County working hours or with use of County equipment. If elected to office, the employee shall immediately, upon the date of election, be separated from employment with the county upon written request and approval of the Chief of Operations (or his/her equivalent).

(2) Political campaign involvement. A government employee may not be involved in any political activity which would constitute a conflict of interest; including participation in any aspect of any political campaign for any office in Barrow County Government.

(3) Solicitation of contributions. A government employee may not knowingly solicit, accept or receive political contributions from any person, to be used in support of or opposition to any candidate for office in the county.

Section Ten. Appearance Before County Entities.

No County Official or Employee shall appear on behalf of any private person other than himself or herself, his or her spouse, or his or her minor children, before any county agency, authority or board. However, a member of the Board of Commissioners may appear before such groups on behalf of his constituents in the course of his duties as a representative of the electorate or in the performance of public or civic obligations.
Section Eleven.  **Timely Payment of Debts to the County and Fiscal Responsibility.**

All County Officials and Employees shall pay and settle, in a timely and prompt fashion, all accounts between them and Barrow County, including the prompt payment of all taxes and shall otherwise demonstrate personal fiscal responsibility.

Section Twelve.  **Solicitation or Acceptance of Gifts.**

(A) County Officials and employees shall not accept gifts, gratuities or loans from organizations, business concerns, or individuals with whom he or she has official relationships on business of the county government. These limitations are not intended to prohibit the acceptance of articles of negligible value which are distributed generally, nor to prohibit employees from accepting social courtesies which promote good public relations, or to prohibit employees from obtaining loans from regular lending institutions. It is particularly important that inspectors, contracting officers and enforcement officers guard against relationships which might be construed as evidence of favoritism, coercion, unfair advantage or collusion.

(B) Consistent with the provisions set forth in Articles Two and Three and Section 12(A) above, there shall be no violation of this Ordinance in the following circumstances:

1. Meals and beverages given in the usual course of entertaining associated with normal and customary business or social functions.

2. An occasional gift from a single source of $101.00 or less in any calendar year.

3. Ceremonial gifts or awards.
(4) Gifts of advertising value only or promotional items generally distributed
To public officials.

(5) Awards presented in recognition of public service.

(6) Reasonable expenses of food, travel, lodging and scheduled entertainment
for a meeting that is given in return for participation in a panel or speaking
engagement at the meeting.

(7) Courtesy tickets or free admission extended for an event as a courtesy or
for ceremonial purposes, given on an occasional basis and not to include
season tickets of any nature.

(8) Gifts from relatives or members of the County Official or Employee's
household.

(9) Honorariums or awards for professional achievement.

(10) Courtesy tickets or free admission to educational seminars, educational or
information conventions or other similar events.

Section Thirteen. Disclosure of Interest.

Any member of the Board who has a financial or personal interest in any proposed
legislation or action before the Board shall immediately disclose publicly the nature and extent
of such interest.

Any other County Official or Employee who has a financial or personal interest in any
proposed legislation or action before the Board and who participates in discussion with or
gives an official opinion or recommendation to the Board in connection with such proposed
legislation or action shall disclose publicly the nature and extent of such interest.
Section Fourteen. Abstention to Avoid Conflicts of Interest.

(A) Except as otherwise provided by law, no County Official or Employee shall participate in the discussion, debate, deliberation, vote or otherwise take part in the decision-making process on any item before him in which the County Official or Employee has a conflict of interest as set forth above.

(B) To avoid the appearance of impropriety, if any County Official or Employee has a conflict of interest or has an interest that he or she has reason to believe either violates this Ordinance or may affect his or her official acts or actions in any matter, the County Official or Employee shall immediately leave the meeting room, except that if the matter is being considered at a public meeting, the County Official or Employee may remain in the meeting room.

(C) In the event of a conflict of interest, the County Official or Employee shall announce his or her intent to abstain prior to the beginning of the discussion, debate, deliberation or vote on the item, shall not participate in any way, and shall abstain from casting a vote.

ARTICLE FIVE: THE BOARD OF ETHICS

Section One. Creation and Composition of Board of Ethics.

There is hereby created a five-member Barrow County Board of Ethics, which shall consist of the following members:

(A) One appointee by the Board of Directors of the Barrow County Chamber of Commerce.

(B) One appointee selected by a majority of the voting County elected officials (not including the members of the Board of Commissioners) who shall each have one vote for such appointee:
(C) One appointee selected by a majority of the voting employees of Barrow County (not including the County elected officials or the members of the Board of Commissioners) who are in the employ of Barrow County on a full-time basis on The effective date of the vote, which vote shall be conducted by the Director of Human Resources or his/her designee;

(D) One appointee of the Barrow County Personnel Review Board; and

(E) One appointee of the Barrow County Board of Commissioners, which appointee shall be selected by a majority vote of the Board of Commissioners.

Section Two. Appointment Procedures.

The initial appointments of the members of the Board of Ethics shall be accomplished as follows: Within five (5) business days of the effective date of this Ordinance, the Barrow County Chief of Operations (or his/her equivalent) or his/her designee shall notify the respective appointing body or individuals of the duty to appoint or vote upon a member for placement on the Board of Ethics. The body or individuals so notified shall have thirty (30) days in which to conduct their appointment process and provide the Chief of Operations (or his/her equivalent) with the name of the appointment, or the name of the individual for whom he or she is voting as the appointee in the case of the elected officials. Within five (5) business days of receipt of the appointment information or calculation of the votes as the case may be, the Chief of Operations (or his/her equivalent) shall thereafter provide the names of the appointees to the Board of Commissioners. The Board of Commissioners shall appoint the five persons so identified at the next regular meeting of the Board of Commissioners following receipt of the names of the appointees from the Chief of Operations (or his/her equivalent).

All appointments following the expiration of the initial terms and all appointments made
In the cases of vacancies created during a particular term shall be made by the applicable body or individuals as indicated in Section One of this Article. The Chief of Operations (or his/her equivalent) or his/her designee shall notify the applicable body or individuals responsible for making an appointment at least forty-five (45) days prior to the expiration of the respective term or immediately upon knowledge of a vacancy created during a term. Upon such notification, the appointment process shall proceed as set forth above in this Section.

Section Three. Qualifications of Members of Board of Ethics.

A person is eligible to be appointed as a member of the Board of Ethics if the person, while serving:

(A) Resides in the County and is a registered voter;

(B) Is not an Employee or County Official and has not been an Employee or County Official during the three (3) months immediately preceding his or her appointment or be the spouse, parent, child or sibling of an Employee or County Official;

(C) Is not an officer or employee of any political party;

(D) Does not hold any elected or appointed office and is not a candidate for office of the United States, this State or the County and has not held any elected or appointed office during the three (3) months immediately preceding his or her appointment.

Section Four. Terms; Vacancies.

Members of the Board of Ethics shall each serve a two (2) year term without compensation, and shall continue to serve until their successors are appointed and qualified. The Board positions appointed pursuant to sub-sections (A), (B), and (C) of Section One of this
Article shall serve an initial full two-year term and shall thereafter serve two-year terms upon appointment. The Board positions appointed pursuant to sub-sections (D) and (E) of Section One of this Article shall serve an initial one-year term and shall thereafter serve two-year terms upon appointment. If any vacancy occurs during a term, the remaining members shall at that time choose an alternate member mutually agreed upon to temporarily serve until the position is filled by appointment as provided in Section One and Section Two to fulfill the remainder of the then existing term.

**Section Five. Removal of Member.**

The Board of Commissioners may remove a member of the Board of Ethics on the grounds of neglect of duty, misconduct in office or engagement in political activity in violation of this Ordinance. Before initiating the removal of a member from the Board of Ethics, the Board of Commissioners shall give the member written notice of the reason for the intended action and the member shall have the opportunity to reply. Thereafter, the Board of Commissioners shall afford such member an opportunity for a hearing before the Board of Commissioners.

**Section Six. Organization and Internal Operating Regulations.**

(A) Members of the Board of Ethics shall not be compensated.

(B) The Board of Ethics shall elect one of its members to act as Chairperson for a term of one year or until a successor is duly elected. The Board of Ethics shall also elect one of its members to act as Vice-Chairperson for the same term and to act for the Chairperson in his or her absence, because of disqualification or vacancy.

(C) There shall be no regularly scheduled monthly or bimonthly meetings of the
Board of Ethics, however, the Board of Ethics shall meet at least once annually in January of each year for purposes of election of officers and such other business as the Board of Ethics deems proper and in accordance with this Ordinance. Meetings shall be called by majority vote or by call of the chairperson. Meetings of the Board of Ethics shall be conducted in the public hearing room utilized by the Board of Commissioners, shall be duly publicized, and shall be otherwise conducted in accordance with the open meetings requirements under state law.

(D) Three members of the Board of Ethics shall constitute a quorum for the transaction of business. The Chairperson shall be entitled to the same voting rights as the other members of the Board of Ethics.

(E) No official action concerning complaints shall be taken by the Board of Ethics, except by the affirmative vote of at least four (4) members of the Board of Ethics.

Section Seven. Duties and Powers.

The Board of Ethics shall have the following duties and powers:

(A) To establish any procedures, rules and regulations governing its internal organization and conduct of its affairs, provided that such procedures, rules and regulations do not conflict with any provision contained herein.

(B) To receive and hear complaints of violations of standards required by this Ordinance.

(C) To make investigations as it deems necessary to determine whether any person has violated this Ordinance, but only after a least four (4) members of the Board of Ethics have voted affirmatively to conduct the investigation.

(D) To take such action as provided in this Ordinance as deemed appropriate because of any violation of this Ordinance.
(E) To perform any other function authorized by this Ordinance.

(F) To issue advisory opinions as provided in this Ordinance.

Section Eight. 

Staffing and Expenses.

The Board of Ethics shall be provided sufficient meeting space and other reasonable supportive services to carry out its duties required under this Ordinance. The Chief of Operations (or his/her equivalent) shall designate an administration employee who shall serve as the filing clerk for the Board of Ethics and who shall be authorized to receive all filings before the Board of Ethics to publish notices of all meetings upon request of the Board of Ethics' Chairperson and to serve as the recording clerk for the Board of Ethics.

Section Nine.

Counsel.

The Board of Ethics may petition the Barrow County Board of Commissioners for appointment of counsel on a case-by-case basis to assist it in carrying out its responsibilities or to act as a hearing officer. Any such appointed counsel shall be approved by the Board of Commissioners, shall perform services at an approved hourly rate, and shall serve at the joint pleasure of the Board of Ethics and the Board of Commissioners.

Section Ten.

Adherence to the Ethics Ordinance.

The Board of Ethics shall be governed by and subject to this Ordinance, except as to any requirements related to financial disclosures. If a member of the Board of Ethics has a conflict of interest or must disqualify himself under this Ethics Code or by law, the remaining members shall at that time choose an alternate person mutually agreed upon to hear that matter.
Section Eleven. Prohibition Against Certain Conflicting Political Activity.

(A) **Definitions.** The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them, except where the context clearly indicates a different meaning:

(1) "**Member of the Board of Ethics**" means an individual who occupies the position of a member of the Board of Ethics or a prospective member of the Board of Ethics.

(2) "**Political Party**" means a national political party, a state political party, a political action committee, and/or any affiliated organization.

(3) "**Election**" includes a primary, special and general election.

(4) "**Nonpartisan Election**" means:

   (a) An election at which none of the candidates is to be nominated or elected as representing a political party, any of whose candidates for presidential elector received votes in the last preceding election at which presidential electors were selected; and

   (b) An election involving a question or issue which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance, or any question or issue of similar character

(5) "**Partisan**" when used as an adjective, refers to a political party.

(6) "**Political Fund**" means any fund, organization, political action committee or other entity that, for purposes of influencing in any way the outcome of any partisan election, receives or expends money or
anything of value or transfers money or anything of value to any other fund, political party, candidate, organization, political action committee or other entity.

(7) "Contribution" means any gift, subscription, loan, advance, deposit of money, allotment of money, or anything of value given or transferred by one person to another, including in cash, by check, by draft, through a payroll deduction or allotment plan, by pledge or promise, whether or not enforceable, or otherwise.

(B) **Permissible Activities.** All members of the Board of Ethics are free to engage in political activity to the widest extent consistent with the restrictions imposed in this Section, which restrictions are imposed for the sole purpose of ensuring neutrality and the appearance of neutrality of the Board of Ethics. Each member of the Board of Ethics retains the right to:

(1) Register and vote in any election;

(2) Participate in the nonpartisan activities of a civic, community, social, labor, or professional organization or of a similar organization;

(3) Be a member of a political party or other political organization and participate in its activities to the extent consistent with law;

(4) Attend a political convention, rally, fundraising function, or other political gathering;

(5) Sign a political petition as an individual;

(6) Make a financial contribution to a political party or organization;

(7) Take an active part, as a candidate or in support of a candidate, in a
nonpartisan election;

(8) Be politically active in connection with a question which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance or any other question or issue of a similar character;

(9) Serve as an election judge or clerk or in a similar position to perform nonpartisan duties as prescribed by state or local law; and

(10) Otherwise participate fully in public affairs in a manner which does not materially compromise his or her efficiency or integrity as a member of the Board of Ethics or the neutrality, efficiency or integrity of the Board of Ethics.

(C) Prohibited Activities.

(1) A member of the Board of Ethics may not take an active part in political management or in a political campaign, except as permitted by subsection of this section.

(2) A member of the Board of Ethics shall not take part in or be permitted to do any of the following activities:

(a) Serve as an officer of a political party, a member of a national, state or local committee of a political party, an officer or member of a committee of a partisan political club, or be a candidate for any of these positions;

(b) Organize or reorganize a political party organization or political club;

(c) Directly or indirectly solicit, receive, collect, handle, disburse, or
account for assessments, contributions or other funds for a partisan political purpose;

(d) Organize, sell tickets to, promote or actively participate in a fundraising activity of a candidate in a partisan election or of a political party or political club;

(e) Take an active part in managing the political campaign of a Candidate for public office in a partisan election or a candidate for political party office;

(f) Become a candidate for, or campaign for, an elective public office in a partisan election;

(g) Solicit votes in support of or in opposition to a candidate for Public office in a partisan election;

(h) Act as recorder, watcher, challenger or similar officer at the polls on behalf of a political party or a candidate in a partisan election;

(i) Drive voters to the polls on behalf of a political party or a candidate in a partisan election;

(j) Endorse or oppose a candidate for public office in a partisan election or a candidate for political party office in a political advertisement, broadcast, campaign literature, or similar material;

(k) Serve as a delegate, alternate or proxy to a political party convention;

(l) Address a convention, caucus, rally or similar gathering of a political party in support of or in opposition to a partisan
candidate for public office or political party office;

(m) Initiate or circulate a partisan nominating position.

(3) Nothing contained in this section shall prohibit activity in political management or in a political campaign by any member of the Board of ethics connected with a nonpartisan election or a nonpartisan issue of any type.

Section Twelve. Limitation of Liability.

No member of the Board of Ethics, or any person acting on behalf of the Board of Ethics, shall be liable to any person for any damages arising out of the enforcement or operation of this Ethics Ordinance, except in the case of willful or wanton conduct. This limitation of liability shall apply to the County, the members of the Board of Ethics, the employees of the Board of Ethics and any person acting under the direction of the Board of Ethics.

Section Thirteen. Advisory Opinion.

The Board of Ethics shall render an advisory opinion based on a real or hypothetical set of circumstances when requested to do so in writing by a County Official or Employee related to that County Official's or Employee's conduct or transaction of business. Such advisory opinions shall be rendered pursuant only to a written request, fully setting forth the circumstances to be reviewed by the Ethics Board. The proceedings of the Ethics Board pursuant to this section shall be held in public to the extent consistent with state law and the opinions of the Ethics Board shall be made available to the public.

Section Fourteen. Complaints.

The Board of Ethics shall be responsible for hearing and deciding any complaints filed regarding alleged violations of this Ordinance by any person. The following procedures shall be followed when filing a complaint:
(A) Any person may file a complaint alleging a violation of any of the provisions of This Ordinance by submitting it to the Chief of Operations (or his/her equivalent), who shall immediately deliver such complaint to the Chairman of the Board of Ethics or his or her designee. A copy of such complaint shall immediately be forwarded by registered mail to the County Official or Employee against whom the complaint was filed. The complaint must be supported by affidavits based on personal knowledge, shall set forth such facts as would be admissible in evidence, and shall show affirmatively that the affiant is competent to testify to the matters stated therein. All documents referred to in an affidavit(s) should be attached to the affidavit(s). The person filing the complaint shall verify the complaint by his or her signature thereon. A complaint must be filed within six (6) months of the date the alleged violation is said to have occurred, or in case of concealment or nondisclosure within six (6) months of the date the alleged violation should have been discovered after due diligence. In the event the Board of Ethics makes an initial determination that a complaint is technically deficient, the Board of Ethics shall submit a list of deficiencies to the complainant and offer the complainant the opportunity to correct the deficiencies within seven (7) days prior to the complaint being dismissed for technical deficiencies.

(B) Upon receipt of a complaint alleging misconduct, the County Official or Employee against whom the complaint was filed may reply to the complaint within thirty (30) days, unless such time for reply is extended by the Board of Ethics upon good cause shown. The response of the County Official or Employee must be supported by affidavits based on personal knowledge, must set forth such facts as would be admissible in evidence and must show
affirmatively that the affiant is competent to testify to the matters stated therein. All documents referred to in an affidavit(s) should be attached to the affidavit(s).

(C) Within sixty (60) days of receipt of a complaint, the Board of Ethics shall conduct an investigatory review to determine whether specific substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance. If after reviewing the complaint the Board of Ethics by vote determines that no specific, substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance or determines that no violation occurred, it may dismiss the complaint without further proceedings. In the event a complaint is dismissed based upon the merits of the complaint, the complaint may not be re-filed.

(D) If the Board of Ethics determines that specific, substantiated evidence from a credible sources(s) exists to support a reasonable belief that there has been a violation of this Ordinance, certified written notice of a hearing, containing the time, date and place of such hearing, shall be given to each party by the Board of Ethics and a formal public hearing shall be conducted and both parties afforded an opportunity to be heard. Any formal public hearing shall be conducted in accordance with the requirements of due process. The Board of Ethics is authorized to swear witnesses.

(E) Any final determination resulting from the hearing shall include written findings of fact and conclusions of law. The Board of Ethics shall determine if clear and convincing evidence shows any violation of this Ordinance.

(F) Nothing in this section shall be considered to limit or encumber the right of the Board of Ethics to initiate an investigation on its own cognizance as it deems
Necessary to fulfill its obligations under this Ordinance.

**Section Fifteen. Disciplinary Action.**

(A) Upon a determination that an employee has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:

1. Written warning or reprimand;
2. Suspension without pay;
3. Termination of employment; and
4. Repayment to the County of any unjust enrichment.

(B) Upon a determination that a County Official has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:

1. Written warning, censure or reprimand;
2. Removal from office to the extent provided by Georgia law; and
3. Repayment to the County of any unjust enrichment.

(C) Upon direction of the Board of Ethics, a petition may be filed for injunctive relief, or any other appropriate relief, in the county superior court or in any other court having proper venue and jurisdiction, for the purpose of requiring compliance with the provisions of this Ordinance. In addition, the court may issue an order to cease and desist from the violation of the Ordinance. The court also may void an official action that is the subject of the violation, provided that the legal action to void the matter was brought with ninety (90) days of the occurrence of the official action, if the court deems voiding the action to be in the best interest of the public. The Court, after hearing and considering all the circumstances in the case, may grant all or part of the relief sought. However, the court may not void any official action appropriating public funds, levying taxes or providing for the
issuance of bonds, notes or other evidence of public obligation under this Ordinance.

(D) In addition to any other remedy provided herein, upon determination of a Violation of this Ordinance, the Board of Ethics may recommend to the Board of Commissioners in writing that any contract, bid or change order that was the Subject of the violation should be cancelled or rescinded. The Board of Commissioners, however, shall retain the discretion to determine whether such a Cancellation or rescission would be in the best interest of the County and shall not be bound in any way by a recommendation of the Board of Ethics.

(E) The Ethics Board may also forward its findings of fact and conclusions of law to the Barrow County District Attorney's Office and/or the Office of the Governor for appropriate action.

Section Sixteen. Judicial review.

(A) Any party against whom a decision of the Board of Ethics is rendered may obtain judicial review of the decision by writ of certiorari to the superior court of the County. The application for the writ must be filed within thirty (30) days from the date of the written decision. Judicial review shall be based upon the record. No party shall be entitled to a de novo appeal.

(B) Upon failure to timely request judicial review of the decision by writ of certiorari as provided in this section, the decision shall be binding and final upon all parties.

(C) The appellate rights afforded hereunder shall be in lieu of any right to appeal an adverse employment action under the Barrow County Civil Service...
System, to the extent the County Official or employee may be subject to the
Civil Service System.

ARTICLE SIX: MISCELLANEOUS

Section One. Severability.

If any provision of this Ordinance is found by a court of competent jurisdiction to be
invalid or unconstitutional, or if the application of this Ordinance to any person or
circumstances is found to be invalid or unconstitutional, such invalidity or unconstitutionality
shall not affect other provisions or applications of this Ordinance which can be given effect
without the invalid or unconstitutional provision or application.

Section Two. Repealer

All laws, resolution, or ordinances or parts thereof that conflict with the provisions of this
Ordinance are repealed.

Section Three. Effective Date.

The effective date of this Ordinance shall be July 1, 2004.

AMENDED:

Article Five, Section 1, Subparagraph (A) January 25, 2005
Article Five, Section 6, Subparagraph (C) January 8, 2008