

Barrow County Board of Commissioners

30 North Broad Street Winder Georgia 30680 Phone: (770)868-8111 -Fax: (770) 868-8666



MEMORANDUM

To: All Interested Parties

From: Misty Landers

Date: February 17, 2016

Re: RFB2016-15 Concrete Bridge Culvert Repair

RFB2016-15 is attached for your consideration. Anyone accessing this Request for Bid from the Barrow County web site 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 to Barrow County as called for in the RFB.

Thank you.



**Barrow County Board of Commissioners
30 North Broad Street
Winder, GA 30680**

**REQUEST FOR BIDS
RFB2016-15**

**CONCRETE BRIDGE CULVERT REPAIR
(PROJECT #RM008)**

**BARROW COUNTY, GEORGIA
FEBRUARY 17, 2016**

REQUEST FOR BIDS
RFB2016-15
CONCRETE BRIDGE CULVERT REPAIR
(PROJECT #RM008)
BARROW COUNTY, GEORGIA

Date: February 17, 2016

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.

GENERAL:

Barrow County, Georgia (Owner) is in the process of securing sealed bids for concrete bridge culvert repair at structure No. 1 Dee Kennedy Rd. over Rock Creek and concrete culvert repair at structure No. 2 Bill Rutledge Rd. over Yargo Tributary in Barrow County. 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 120 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 5:00 p.m., March 8, 2016. 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 **“RFB2016-15 – Concrete Bridge Culvert Repair”**. 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 **“RFB2016-15 – Concrete Bridge Culvert Repair”**. 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 12:00 Noon, Thursday, March 17, 2016.** 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., March 17, 2016. 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
Clerks 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 B, D, E & G to the Construction Agreement must be completed when submitting the bid.

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)
- Scope of Work (2 Pages)
- GA D.O.T. Standard Drawing 2332 (2 Pages)
- GA D.O.T. Standard Drawing 2327 (2 Pages)
- Location Map Structure No. 1 (1 Page)
- Location Map Structure No. 2 (1 Page)
- Drawing Existing Structure No. 1 (1 Page)
- Drawing Existing Structure No. 2 (1 Page)
- GA D.O.T. Inspection Report Structure No. 1 (1 Page) (No inspection report exists for Structure No. 2)
- Detail of Dowel Bar Implants Structure No. 1 (1 Page)
- Pictures Dee Kennedy Structure No. 1 (3 Pages)
- Pictures Bill Rutledge Structure No. 2 (2 Pages)
- GA D.O.T. Specifications (105 Pages)
- Bid Form (4 Pages)
- Bid Bond (2 Pages)
- Payment Bond (3 Pages)
- Performance Bond (3 Pages)
- Construction Agreement (34 Pages)
- Notice Of Award (1 Page)
- Notice To Proceed (1 Page)
- Barrow County Ethics Policy (30 Pages)

DELIVERABLES: The following are required in bid submittals:

- Bid Form (Submit One Original and Four Copies)
- Bid 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.

GDOT 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.

SCOPE OF WORK

CONCRETE BRIDGE CULVERT REPAIR BARROW COUNTY BOARD OF COMMISSIONERS

DESCRIPTION

STRUCTURE NO. 1 DEE KENNEDY RD. OVER ROCK CREEK

Project shall consist of the removal and disposal for all items necessary for construction and installations, repair of the undermining of the outlet barrels with pressure installed grout, repair of (1) northwest undermined outlet wingwall, install (1) southeast pour-in-place reinforced concrete wingwall with footing, dowel bar implants, a pour-in-place reinforced concrete apron with toewall at outlet end, base stone, rip-rap at both inlet and outlet ends, epoxy pressure injections of (1) crack on Northwest wingwall, erosion control, foundation backfill and permanent turf establishment.

STRUCTURE NO. 2 BILL RUTLEDGE RD. OVER YARGO TRIB

Project shall consist of the removal and disposal for all items necessary for construction and installations, repair of the undermining of the southeast wingwall, epoxy pressure injection of (1) crack on southeast wingwall, foundation backfill, erosion control, and permanent turf establishment.

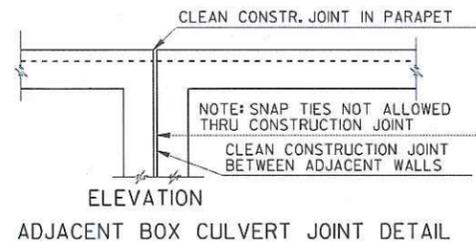
CONTRACTOR RESPONSIBILITY

1) Contractor is responsible for providing and installing all materials necessary for the repair of the (Structure No.1) triple-barrel concrete bridge culvert located on Dee Kennedy Rd. over rock Creek and (Structure No.2) single-barrel concrete culvert located at Bill Rutledge Rd. over Yargo trib. Contractor is responsible for providing and installing all materials as shown on Bid Sheet and Attached Specifications and Drawings, the Georgia Department of Transportation Specifications Standards, and Special Provisions, Georgia Department of Transportation Drawings, Location Maps, Existing Structure Drawings, Georgia Department of Transportation Inspection Report, and Detail of Dowel Bar Implants . Contractor is responsible for providing all labor, satisfactory workmanship and safety precautions associated with the Bid Sheet, and Attached Specifications and Drawings. Contractor is responsible for coordination with the Barrow County Stormwater Department. Contractor is responsible for notifying the Utilities Protection Center and any utility conflicts or cut utilities. Contractor is responsible for erosion and sediment control.

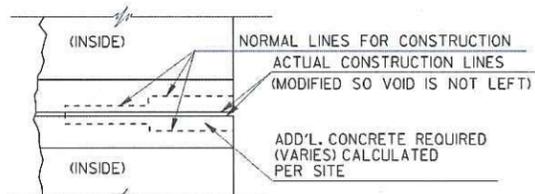
Erosion and sediment control material, as shown on bid sheet, shall be installed prior to and during construction. Contractor is responsible for insuring erosion and sediment control materials are maintained, removed or replaced if required by Barrow County during construction and until project is complete. Contractor is responsible for notifying adjoining landowner of any conflicts with drainage or access if required. Contractor is responsible for insuring traffic control is provided for this project and is satisfactory to Barrow County. Traffic control shall be provided by Contractor for Dee Kennedy Rd. and Bill Rutledge Rd. and shall be in accordance with the current edition of the M.U.T.C.D. (this includes, but is not limited to all permanent and temporary "Construction Ahead" signs, barrels, flagmen, and other safety requirements as required). Barrow County is responsible for road closures and detour signs if required.

2) Contractor is responsible for insuring that all material and labor used for this project is in accordance with current Georgia Department of Transportation standards and specifications. Contractor is responsible for insuring that all materials and installations are in accordance with the current edition of the Department of Transportation, State of Georgia, Standard Specifications Construction of Roads and Bridges.

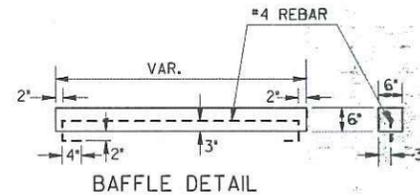
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.			



NOTE: (FOR DETAIL BELOW) WHERE THE NORMAL OUTSIDE WALLS OF ADJACENT BOX CULVERTS ARE ABUTTING AND THE WALL THICKNESSES NORMALLY VARIES DUE TO INCREASING FILL HEIGHTS, THE MAXIMUM WALL THICKNESS (FOR THE HIGHEST FILL) IS TO BE MAINTAINED FOR THE ABUTTING WALLS FOR THE FULL LENGTH OF THE CULVERT WITH A CLEAN CONSTRUCTION JOINT BETWEEN THE TWO WALLS AS SHOWN, REINFORCING STEEL IS TO REMAIN THE SAME AS NORMAL, WITH DIMENSIONS MEASURED FROM INSIDE OF CULVERT WALL. QUANTITY OF CONCRETE IS INCREASED DUE TO THIS CONSTRUCTION AND IS TO BE CALCULATED FOR INDIVIDUAL SITE. STEEL QUANTITIES ARE UNCHANGED.



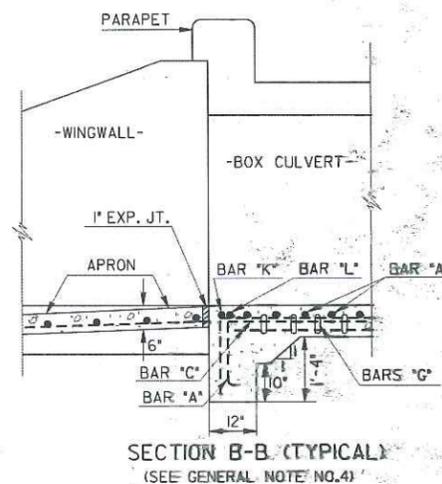
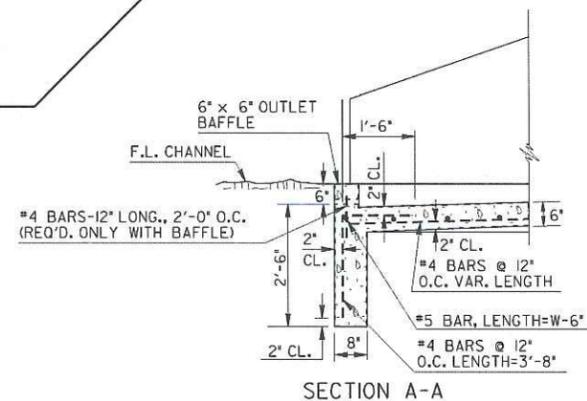
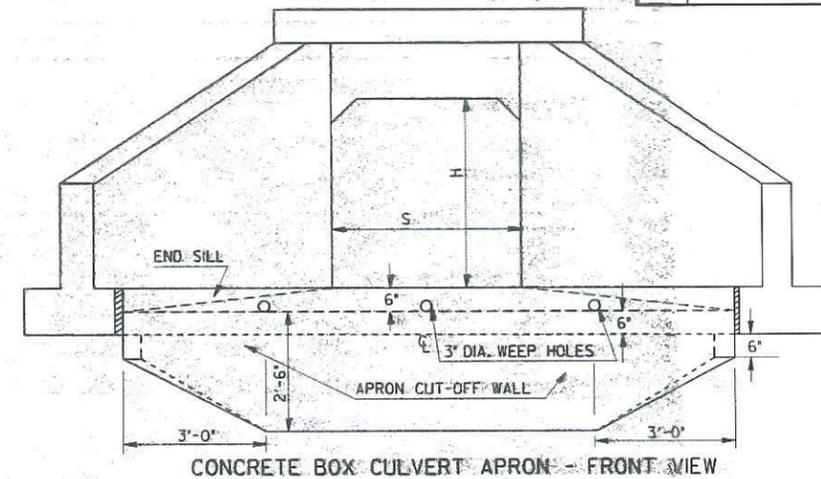
ABUTTING JOINT - TYPICAL PLAN VIEW
(APPLICABLE WHERE NORMAL REQ'D. THICKNESSES OF ABUTTING WALLS WOULD VARY)



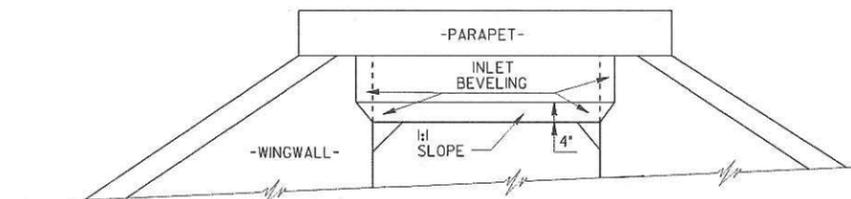
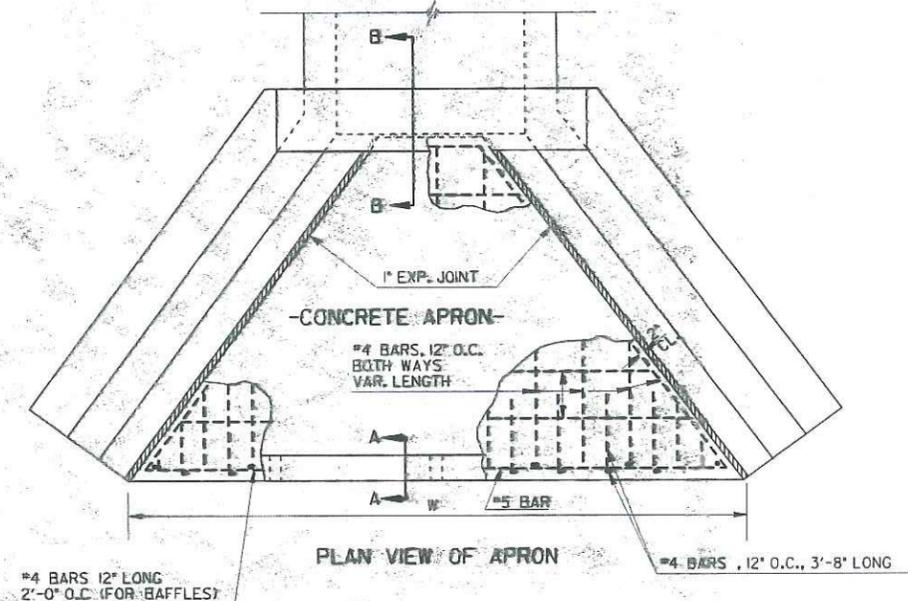
BAFFLE DETAIL

NOTE: BAFFLES SHALL BE CONSTRUCTED FROM CLASS 'A' CONCRETE AND MAY BE PRECAST OR POURED IN PLACE.

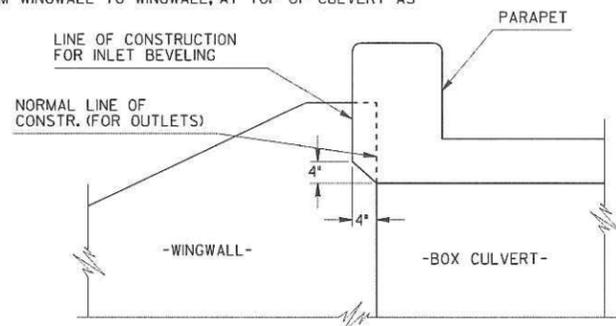
BAFFLES WILL BE USED ON APRONS AT OUTLETS OF PIPES AND BOX CULVERTS AND IN PAVED DITCHES OR ELSEWHERE AT LOCATIONS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.



NOTE: SEE BOX CULVERT STANDARDS FOR DETAILS NOT SHOWN. K, L, & G BARS REQUIRED ONLY WHERE SPECIFIED. BAR 'A' SHOWN BENT INTO CULVERT. TOEWALL APPLIES TO SKEWS.



NOTE: INLET BEVELING IS REQUIRED AT THE INLET OF ALL BOX CULVERTS EXTENDING FROM WINGWALL TO WINGWALL, AT TOP OF CULVERT AS SHOWN.

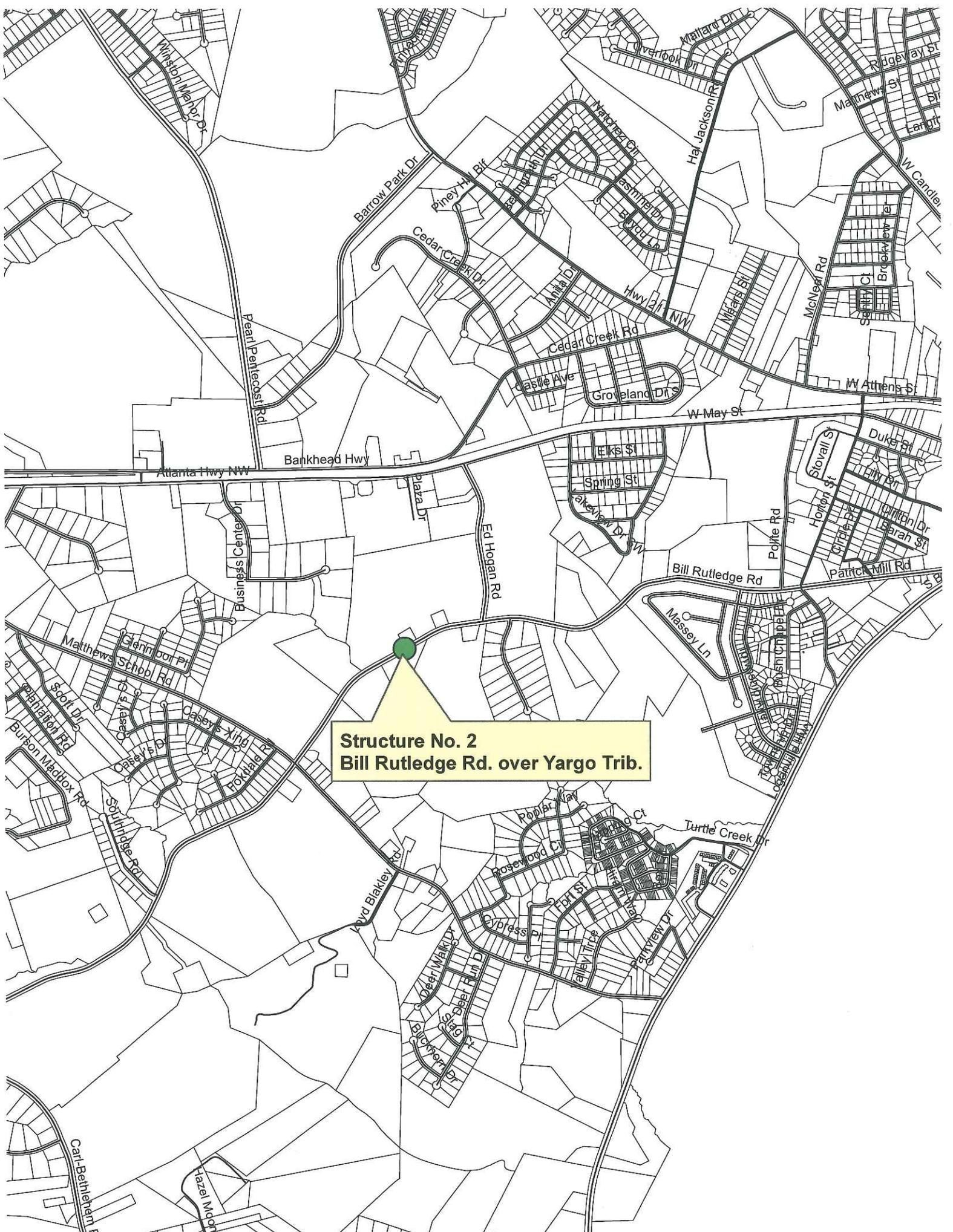


INLET BEVELING DETAIL

6-30-98		DATE		DEPARTMENT OF TRANSPORTATION	
ADD ABUTTING JT.-TYP. PLAN V 7-24-85		8-14-84		STATE OF GEORGIA	
ADD 4' X 5' QUANTITIES		REVISION		STANDARD	
ADD 4' X 5' QUANTITIES		NO SCALE		CONCRETE BOX CULVERT APRONS,	
G.J.P.		REV. R.M.M. (SUBMITTED)		BAFFLES, AND INLET BEVELING DETAIL &	
R.M.M.		TRA. G.M.E.		ADJACENT BOX CULVERTS JOINT DETAIL	
R.M.M.		C.W. J.M.W. (APPROVED)		JULY, 1983	
BY		R.K.C.		STATE ROAD & AIRPORT DESIGN ENGR.	
				STATE HIGHWAY ENGINEER	
				NUMBER	
				2332	
				SHEET 1 OF 2	

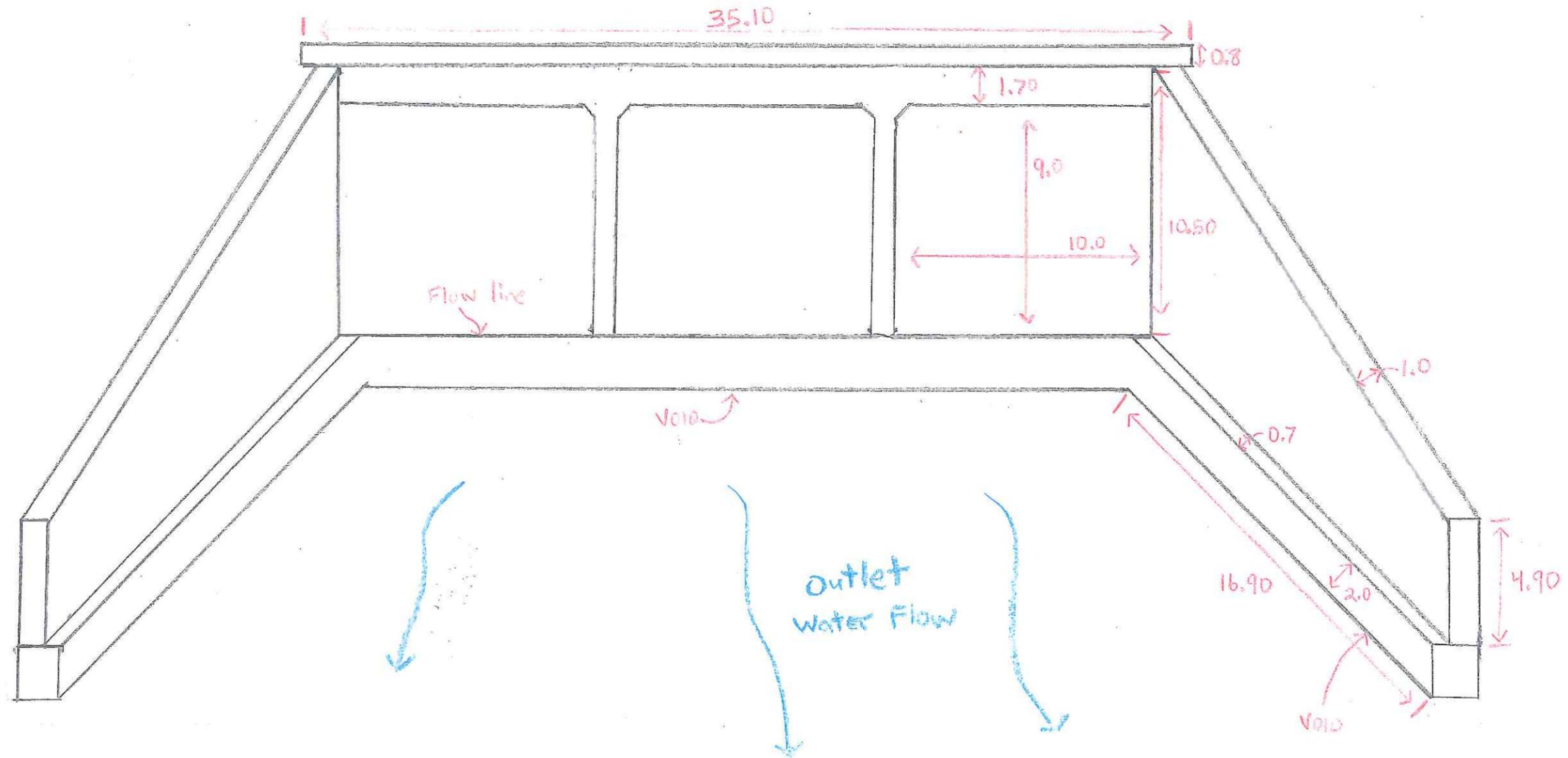


Structure No.1
Dee Kennedy Rd. over Rock Creek

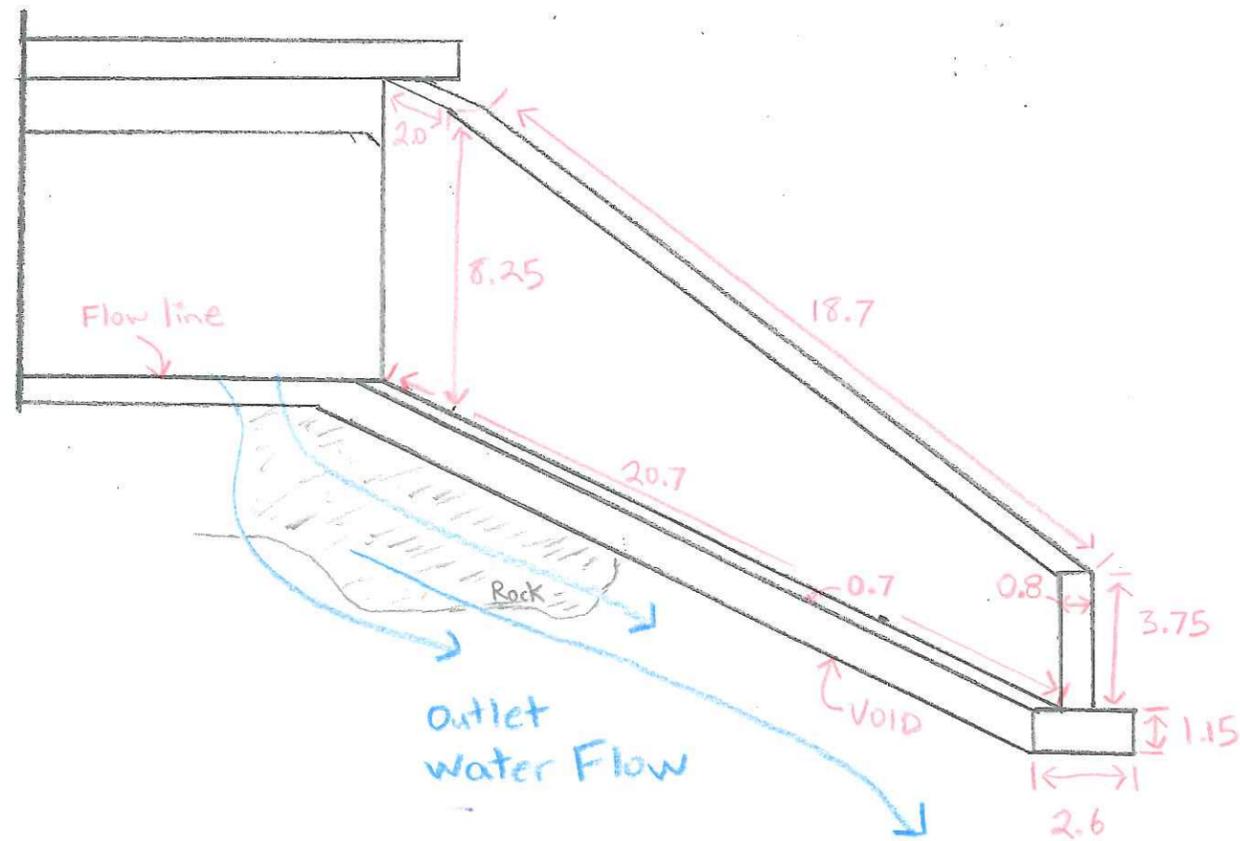


Structure No. 2
Bill Rutledge Rd. over Yargo Trib.

Structure NO. 1 Dee Kennedy Rd. Over Rock Creek
State structure ID 013-5004-0



Structure NO. 2 Bill Rutledge Rd. over Yargo Trib



Structure NO. 1
GA. D.O.T. Inspection Report

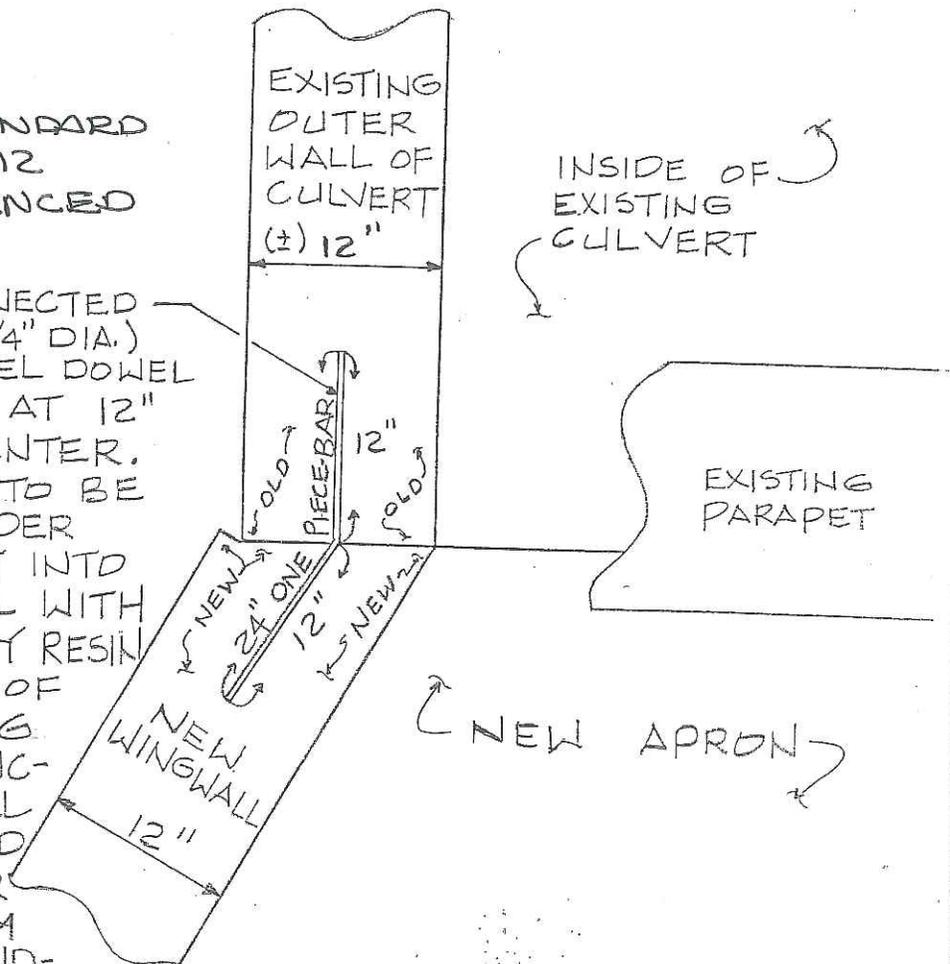
STRUCTURE ID 013-5004-0 / LOCATION ID 013-00038X-002.99W
CR 38, Dee Kennedy Road over Rock Creek

This bridge culvert is in fair condition. Up to 1.5 feet inlet and 5.0 feet outlet scour but has major channel bed scour damage at both the inlet and outlet ends of the structure. The outlet scour is 5 feet deep while the inlet scour is 1.5 feet in depth. The scour at the culvert outlet has begun to undermine the end of the structure. All scour and undermining should be repaired with rip rap before serious structural damage can occur. Drift accumulated at the culvert inlet should also be removed to allow proper stream flow through the structure and reduce the potential for scour. Cracks in the western inlet wing wall and the eastern outlet wing wall extend into the barrels and should be sealed. Exposed steel reinforcement in the roof of barrel #2 should also be covered to prevent corrosion.

GA D.O.T. STANDARD
DRAWING 2312
WAS REFERENCED



WINGWALL CONNECTED
WITH NO. 6 (3/4" DIA.)
24" LONG STEEL DOWEL
BAR IMPLANTS AT 12"
CENTER TO CENTER.
DOWEL BARS TO BE
BENT TO PROPER
ANGLE, IMPLANT INTO
EXISTING WALL WITH
TYPE VIII EPOXY RESIN
ADHESIVE. END OF
BAR EXTENDING
INTO NEW CONCRETE
WINGWALL SHALL BE COATED
WITH THE PROPER
COATING SYSTEM
SEE GA. D.O.T. STAND-
ARD DRAWINGS FOR
NEW WINGWALL
STEEL REINFORCE-
MENT.



DETAIL OF
DOWEL BAR IMPLANTS
N.T.S.

STRUCTURE NO. 1 (Dee Kennedy Rd)

Structure NO. 1 Dee Kennedy over Rock Creek
Outlet



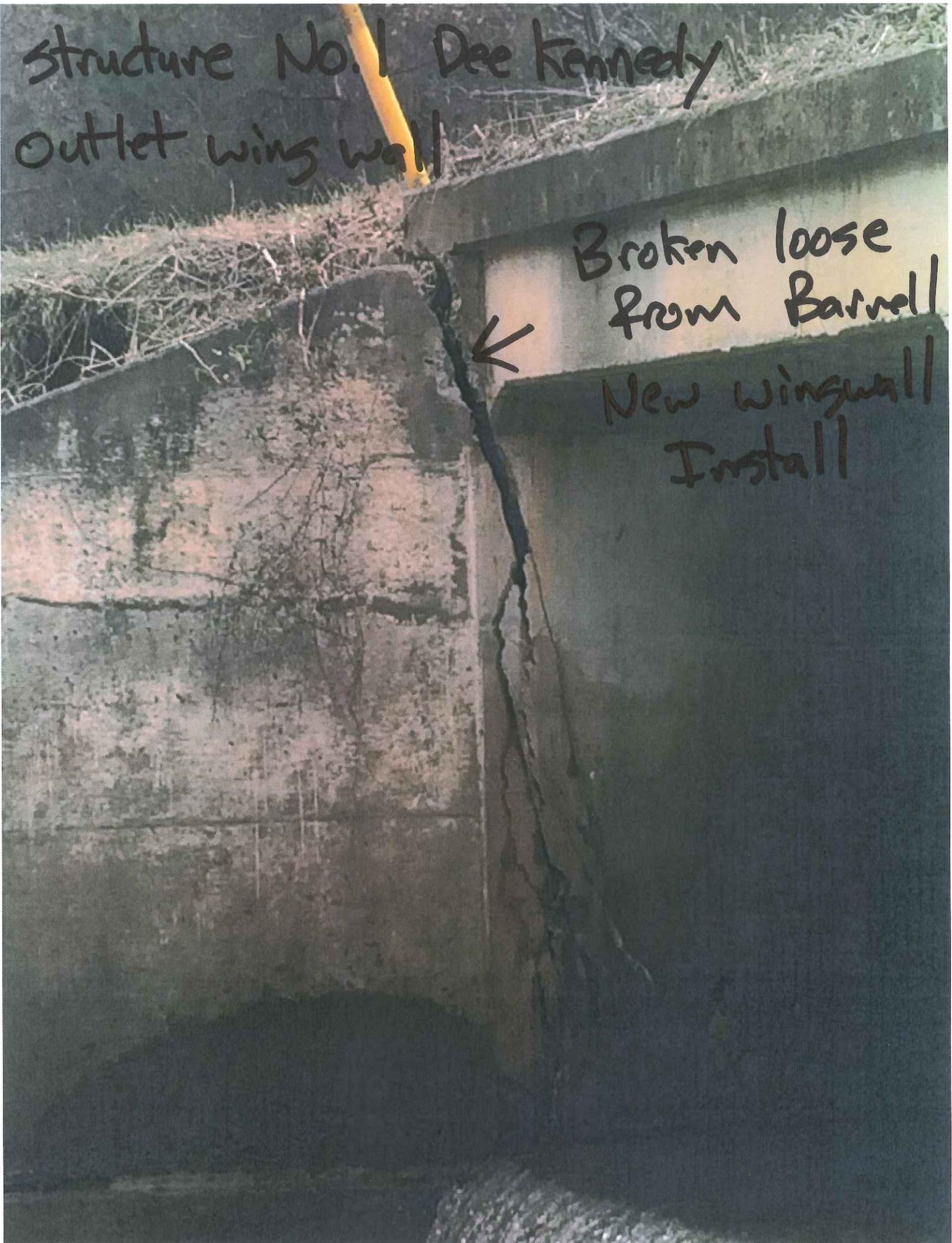
Undermining
New Apron Install

Structure No. 1 Dee Kennedy
Outlet wing wall

Broken loose
from Barrell



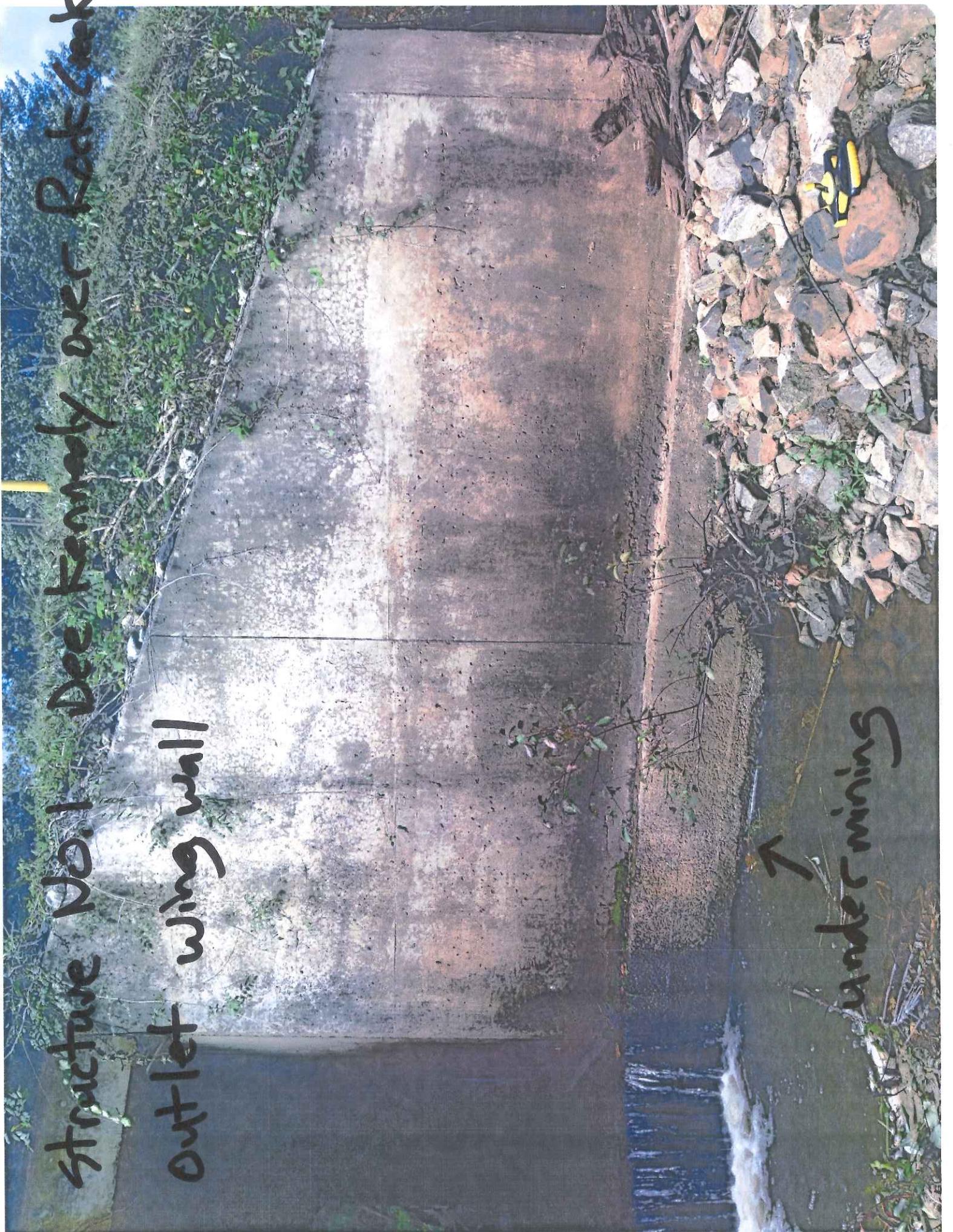
New wingwall
Install



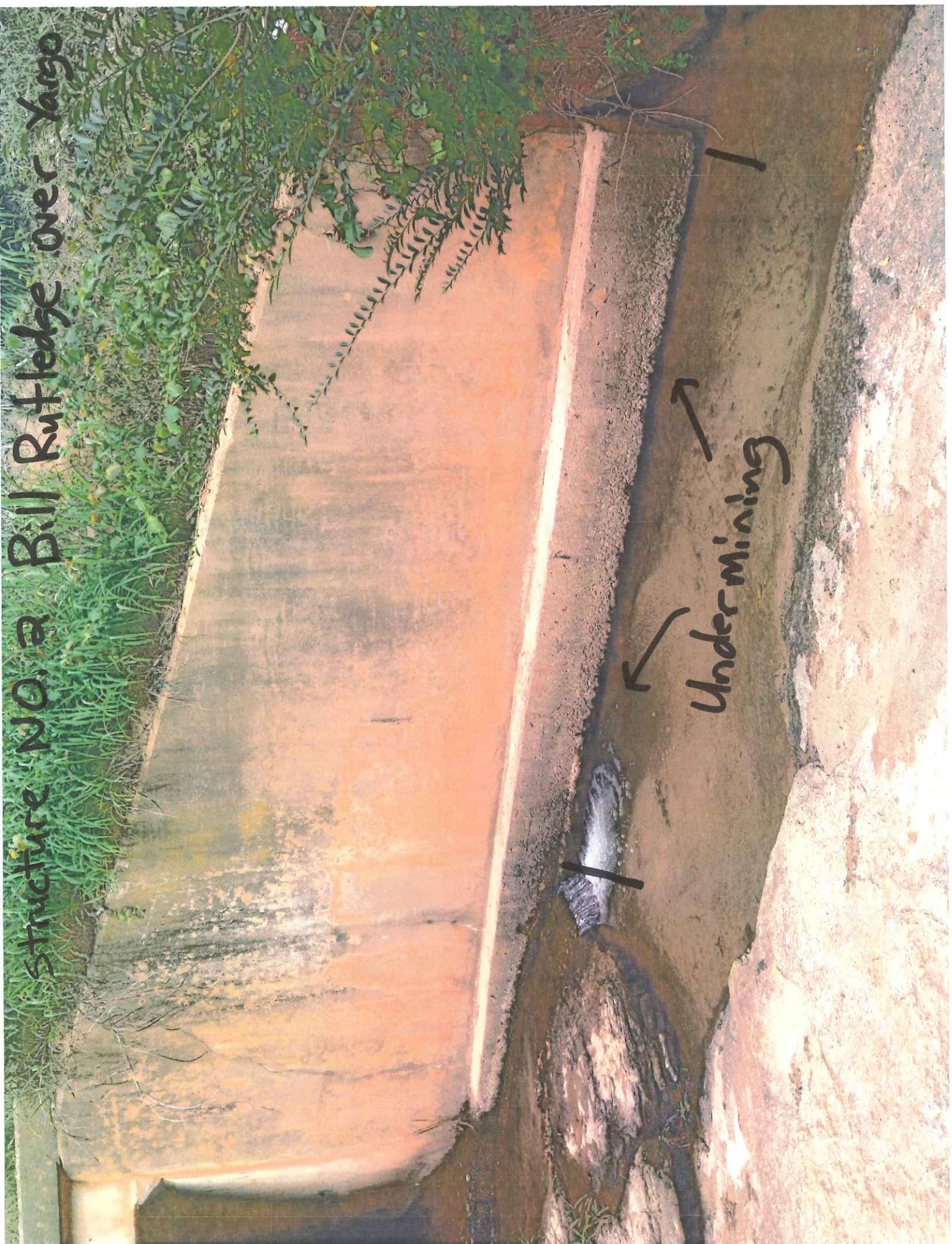
Structure No. 1 Dee Kennedy over Rock Creek

Outlet wing wall

↑
undermining



Structure NO. 2 Bill Rutledge over Yargo



Undermining

structure No. 2 Bill R. Hodge over Yugo

wing wall crack



Section 886—Epoxy Resin Adhesives

886.1 General Description

This section includes the requirements for all epoxy adhesives used in highway construction or maintenance.

886.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

AASHTO T 237

ASTM 2240

Federal Hazardous Products Labeling Act

GDT 58

QPL 15

886.2 Materials

886.2.01 Epoxy Resin Adhesives

A. Requirements

1. Use the types of epoxy adhesives below:
 - a. Type I-R: Rapid-setting marker adhesive for bonding raised pavement markers to pavement.
 - b. Type I-S: Standard setting marker adhesive for bonding raised pavement markers to pavement.
 - c. Type II: Epoxy adhesive for bonding plastic concrete to hardened concrete.
 - d. Type III: Epoxy adhesive for bonding hardened concrete to hardened concrete, or for bonding miscellaneous materials such as metals.
 - e. Type IV: Epoxy adhesive for creating an epoxy mortar for use with clean concrete or mortar sand.
 - f. Type V: Epoxy adhesive for repairing cracks in concrete by intrusion grouting.
 - g. Type VI: Epoxy adhesive for a complete application or as a component in the application of a skid resistant or protective coating on hardened Portland cement concrete or asphaltic concrete.
 - h. Type VII: Discontinued.
 - i. Type VIII: Epoxy adhesive used for anchors and dowel bar implants. Either mix this epoxy by machine to the proper ratio or package it in a two-component cartridge with a mixing nozzle that thoroughly mixes the two components as they are dispensed. Use a nozzle at least 8 in (200 mm) long.
2. Furnish the epoxy adhesive as two separate components.
3. Viscosity

Ensure that the viscosities of the separate components are similar and conducive to easy blending of the epoxy adhesive system.

 - a. Submit the viscosity for the epoxy adhesive system to the Engineer.
 - b. Ensure that the viscosity of the mixed system is compatible with the intended use of the system.

4. Labeling

Clearly label each container of the separate components of an epoxy adhesive system with the following information:

- Specification number and type
- Component designation (A or B)
- Manufacturer's batch number—a batch is a single charge of all components in a mixing chamber
- Expiration date (shelf life for separate components in original containers)
- Mixing ratio and directions (by volume or weight as designated by the manufacturer)
- Potential hazards and precautions according to the Federal Hazardous Products Labeling Act

5. Stencil the component designation on the top of each container.

6. Physical Requirements

Ensure that the mixed epoxy adhesive system meets the applicable requirements of Table 1.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Each epoxy adhesive system shall meet the requirements of this Section.

If the Department qualifies or disqualifies a system for one of the types specified, it will not affect the qualification or disqualification of any other type.

The Department will reject any epoxy adhesive system that meets all the requirements of this Section, but fails in actual use. For a list of sources, see QPL 15.

D. Materials Warranty

General Provisions 101 through 150.

Table 1
Mixed Epoxy Adhesive Systems Requirements

Property	Type Designation									Test Method
	I-R	I-S	II	III	IV	V	VI	VII	VIII	
Pot Life at 77 °F (25 °C) (minutes)	6-11	8-13	30	10-45	30-60	10-45	30-60	—	3-10	GDT 58
Elongation at 77 °F (25 °C) (percent)	—	—	—	—	30**	—	30**	—	5% Max.	GDT 58
Bond Strength, psi (MPa) at 1 hr and 77 °F (25 °C)	180 (1.2)	—	—	—	—	—	—	—	—	GDT 58
at 3 hr and 77 °F (25 °C)	—	180 (1.2)	—	—	—	—	—	—	250 (1.7)	
at 24 hr and 77 °F (25 °C)	400 (2.8)	400 (2.8)	400 (2.8)	400 (2.8)	250 (1.7)	400 (2.8)	250 (1.7)	—	400 (2.8)	
Shore D Hardness at 77 °F (25 °C)	—	—	—	—	75 Max.	—	35-65	—	—	ASTM: 2240

Type Designation										
SAG Test	—	—	—	—	—	—	—	—	No Sag	AASHTO: T 237
Wet Bond Test ,psi (MPa)	—	—	400 (2.8)	—	—	—	—	—	—	AASHTO: T 237 Section 31
Shelf Life*** (months)	6	6	6	24	12	24	6	—	6	

Note: * Values are minimums except where a range is shown, or otherwise noted.

** Epoxy adhesive system only. *** For separate components in original containers.

1123

Section 528—Epoxy Pressure Injection of Concrete Cracks

528.1 General Description

This work consists of labor, material, equipment, and services necessary for repairing concrete cracks. The Plans will specify or the Engineer will determine the extent of repair. The work shall comply with the Specifications including Special Provisions where applicable.

528.1.01 Definitions

General Provisions 101 through 150.

528.1.02 Related References

A. Standard Specifications

[Section 886—Epoxy Resin Adhesives](#)

B. Referenced Documents

General Provisions 101 through 150.

528.1.03 Submittals

General Provisions 101 through 150.

528.2 Materials

Ensure epoxy used for crack repair complies with the requirements of [Section 886](#), Type V epoxy adhesive.

Ensure epoxy used for sealing cracks at the surface is strong enough to withstand injection pressures up to 250 psi (2 MPa).

528.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

528.3 Construction Requirements

528.3.01 Personnel

General Provisions 101 through 150.

528.3.02 Equipment

A. Injection Equipment

Ensure that dispensing equipment for the injection complies with the following performance requirements:

- Self-monitor pressures of 250 psi (2 MPa) for extended periods under flow.
- Maintain a ratio of accuracy of one percent at the required pressures.
- Mix in-line using a static mixing head.

When using screen wire, wire brushes, or other elements for mixing, provide independent certification that the material is mixing thoroughly at the flow rate and temperatures for the job. Also demonstrate that the unit will not dispense resin if the material line is blocked on the supply or dispense side of the system.

528.3.03 Preparation

Before repairing the cracks specified on the Plans, prepare the concrete surfaces next to the cracks by exposing clean and sound concrete.

The exact procedures for exposing clean and sound concrete shall be the Contractor's option and responsibility. However, the procedures must comply with any traffic handling and construction sequencing requirements for the Project.

Section 528—Epoxy Pressure Injection of Concrete Cracks

528.3.04 Fabrication

General Provisions 101 through 150.

528.3.05 Construction

Seal concrete cracks as follows:

1. After preparing the concrete surfaces, seal the cracks at the surface with epoxy.
Port spacing, location, and port type shall be the Contractor's option and responsibility.
2. If the voids are not thoroughly penetrated, use the following procedure:
 - a. Wet core on 8 in (200 mm) centers the holes that are 1/2 in (13 mm) diameter and 3/4 in (19 mm) to 1 in (25 mm) depth.
 - b. Insert into the cored holes to the full depth copper or plastic tubes 1/2 in (13 mm) diameter and notched at the base.
 - c. Seal the circumference of the ports at the surface.
 - d. Inject the epoxy at a constant pressure not to exceed 250 psi (2 MPa) for at least 10 minutes or until penetration occurs.
3. After the injection operation is complete, clean the sealed cracks to the original concrete surface.
4. Remove nipple devices and surface sealers over the injection holes.

528.3.06 Quality Acceptance

General Provisions 101 through 150.

528.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

528.4 Measurement

No measurement for payment will be made for any material, equipment, or labor necessary to accomplish this Work.

528.4.01 Limits

General Provisions 101 through 150.

528.5 Payment

All costs for material, equipment, or labor shall be included in the Lump Sum price bid for Epoxy Pressure Injection of Concrete Cracks.

Payment will be made under:

Item No. 528	Epoxy Pressure Injection of Concrete Cracks, Bridge No. ____	Per lump sum
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528.5.01 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:

Material	Section
Filter Fabrics	881
Fencing	894
Wood Posts and Bracing	862

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 A, B, and C 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 (60 °C).

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 (100 to 150 mm) 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 (200 to 300 mm) deep to receive the silt fence. Ensure that the width of the slice is not more than 3 in (75 mm). 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 (1.8 m) apart for Types A and B fence and 4 ft (1.2 m) apart for Type C fence.
3. Bury the posts at least 18 in (450 mm) 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 A fence and four per post for Type B 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 (150 mm) of the fabric.
 - c. Install the filter fabric so that 6 to 8 in (150 to 200 mm) of fabric is left at the bottom to be buried. Provide a minimum overlap of 18 in (450 mm) at all splice joints.
 - d. For Type C 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 (100 to 150 mm) of fabric is against the side of the trench with 2 to 4 in (50 to 100 mm) 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 the Department.

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 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 the Department'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 the Department.

171.4 Measurement

The quantity of silt fence, silt fence ditch checks to be paid for is the actual number of linear feet (meters) 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 A, B, or C measured as defined in Subsection 171.4, "Measurement," is paid for at the Contract Unit Price bid per linear foot (meter).

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 (meter) 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 the Department.

Payment will be made under:

Item No. 171	Silt fence, type__	Per linear foot (meter)
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171.5.01 Adjustments

General Provisions 101 through 150.

Section 881—Fabrics

881.1 General Description

This section includes the requirements for the following fabrics:

- Plain cotton duck
- Rubber-impregnated cotton duck
- Burlap and cotton bags
- Plastic filter fabric
- Pavement reinforcement fabric
- Silt fence filter fabric

881.1.01 Related References

A. Standard Specifications

Section 106—Materials Certification

B. Referenced Documents

Federal Specification CCC-C 419 Type III

ASTM D 36

ASTM D 146

ASTM D 412

ASTM D 1777

ASTM D 3786

ASTM D 4355

ASTM D 4632, GRAB

ASTM D 4751

ASTM D 4833

GDT 87

GDT 88

GDT 95

QPL 28

QPL 36

QPL 40

QPL 47

881.2 Materials

881.2.01 Plain Cotton Duck

A. Requirements

1. Use plain cotton duck meeting the requirements of Federal Specification CCC-C 419 Type III.
2. Ensure the duck weighs at least 8 oz./yd² (270 g/m²).

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

881.2.02 Rubber-Impregnated Cotton Duck

A. Requirements

1. Use preformed rubber-impregnated fabric pads made of multiple layers of 8 oz (270 g) cotton duck, impregnated and bound with high quality natural rubber, or made of equivalent materials compressed into resilient pads of uniform thickness.
2. Use enough plies to reach the specified thickness after compression and vulcanizing.
3. Ensure the finished pad withstands compression loads of not less than 10,000 psi (70 MPa) when applied perpendicular to the plane of the laminations. Ensure the pad does not extrude or harmfully reduce in thickness.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

881.2.03 Burlap Bags

A. Requirements

1. Use burlap bags made of at least 95 percent jute and manila fibers.
2. Use burlap weighing 8 to 18 oz/10 ft² (250 to 550 g/m²).
3. Use bags with a capacity of 1 to 2 ft³ (0.03 to 0.06 m³).

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

881.2.04 Cotton Bags

A. Requirements

1. Use cotton bags with Osnaburg 40 x 26 thread count and a nominal fabric weight of 6.8 oz/yd² (230 g/m²).
2. Use bags having 1/2 in (13 mm) sewn seams with at least 1 stitch per 1/5 in (5 mm).
3. Use 4 or 5 ply, 12 cotton yarn or equivalent for the stitches.
4. Ensure seam efficiency is at least 80 percent. Ensure the inside measurements tolerance is \pm 1/2 in (13 mm).

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

881.2.05 Plastic Filter Fabric

A. Requirements

1. Use pervious sheets of plastic yarn made from a long-chain synthetic polymer. Use polymer composes of at least 85 percent by weight of propylene, ethylene, amide, ester, or vinylidene chloride.
Use a sheet of plastic yarn containing stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and/or heat exposure.
2. Ensure the fabric is finished so that the filaments will retain their relative position with respect to each other.
3. Use fabric without defects, rips, holes, or flaws.
4. Use fabric meeting the following physical requirements for woven and non-woven fabric:

Woven Fabrics	
Tensile strength (any direction)	200 lbs (890 N) minimum
Bursting strength	500 psi (3.5 MPa) minimum
Elongation before breaking	10% to 35%
Percent open area	4.0% to 6.5%
Non-woven Fabrics	
Puncture resistance	30 lbs (135 N) minimum
Grab tensile strength	65 lbs (290 N) minimum
Grab elongation	40% minimum
Flow rate [H from 3 to 1 in (75 to 25 mm)]	50 gal/min/ ft ² (34 liters/second/m ²) (minimum) to 350 gal/ min/ft ² (240 liters/second/m ²) (maximum)

Use fabric evaluated by the National Transportation Product Evaluation Program (NTPEP).

5. Seams
 - a. Get approval on the seams from the Engineer before use on a Project.
 - b. Use fabric sewn with thread of the same chemical requirements as the fabric, or use fabric bound with cement or heat. Either have the fabric bound or sewn at the point of manufacture or at a location approved by the Engineer.
 - c. Seam Uses: You may use one seam in edge drain and underdrain applications.
You may bond or sew fabric together to form sections at least 6 ft (1.8 m) wide for use under rip rap or behind retaining walls.
6. Fabric Use
 - a. Use woven fabrics beneath rip rap when dropping stone from 3 ft (1 m) or less.
 - b. You may use woven fabrics that meet the flow rate for edge drains.
 - c. Use non-woven fabrics to line edge drains, underdrains, or behind retaining walls, where specified.
 - d. Do not use non-woven fabrics for filter beneath rip rap.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test according to the following:

Test	Method
Puncture resistance	ASTM D 4833
Tensile strength, elongation, grab strength	ASTM D 4632
Bursting strength	ASTM D 3786
Percent open area	GDT 88
Flow rate	GDT 87

1. See [QPL 28](#) for acceptable woven and non-woven fabrics meeting the requirements of this Specification. See [QPL 47](#) for acceptable Geocomposite wall drains.
2. The Department will reject any fabrics that meet this Specification but fail to perform in actual use.

D. Materials Care and Warranty

Wrap fabric in burlap or similar heavy duty protection during shipment and storage to protect it from mud, dirt, dust, and debris.

881.2.06 Pavement Reinforcement Fabric

A. Requirements

Type I and Type II Pavement Reinforcement Fabric

1. Use pavement reinforcement fabric that has the following properties:
 - Is non-woven, heat-resistant material composed of polypropylene or polyester fibers
 - Can be saturated with asphalt cement
 - Can be placed smooth with mechanical devices and be without wrinkles
 - Can withstand the heat of asphaltic concrete mixes during paving operations
 - Can withstand normal field handling and construction operations without damage
 - Meets the following physical requirements. The bid item or Plans will indicate which type of fabric is required for a Project.

	Type I	Type II
Tensile strength, minimum	90 lbs (400 N)	125 lbs (555 N)
Elongation at break	40% min., 100% max.	40% min., 100% max.
Asphalt retention, minimum	0.18 gal/yd ² (0.8 L/m ²)	0.28 gal/yd ² (1.3 L/m ²)

2. Submit a certificate from the manufacturer showing the physical properties of the material used and how it meets this Specification. Submit the certificate according to [Subsection 106.05, "Materials Certification."](#)
3. Demonstrate to the Department that fabric meeting the physical properties requirements of this Specification has been used successfully in installations with similar environmental and Project conditions.
 - For a list of sources, see [QPL 40](#).

High Strength Pavement Reinforcement Fabric

1. Use pavement reinforcement fabric with the following properties:
 - Is a flexible, water-resistant, high-density asphaltic membrane laminated between two layers of high strength, heat resistant polypropylene or polyester fabric.
 - Can be placed smooth with mechanical devices and be without wrinkles.
 - Can withstand the heat of asphaltic concrete mixes during paving operations.
 - Can withstand normal field handling and construction operations without damage.
 - Has a self-adhesive backing adhered to a film release liner.
 - Meets the following physical requirements. The bid item or Plans will indicate which type of fabric is required for a Project.

Width, minimum	18 in (450 mm)
Tensile strength, minimum	1,800 lbs/in ² (12 MPa)
Elongation	20% to 50%
Softening Point (Asphaltic membrane), minimum	190 °F (87 °C)
Caliper	0.135 inch (3.43 mm) 95% retained after loading
Pliability (Cold Flex) 2" (50 mm) X 5" (125 mm) specimen, condition specimen at 0 °F (-18 °C) for 1 hour, 180° bend on 2" (50 mm) mandrel	No Separation

2. Submit a certificate from the manufacturer showing the physical properties of the material used and how it meets this Specification. Submit the certificate according to [Subsection 106.05, "Materials Certification."](#)
3. Demonstrate to the Department that fabric meeting the physical properties requirements of this Specification has been used successfully in installations with similar environmental and Project conditions.
 - For a list of sources, see [QPL 40](#).

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Type I and Type II Pavement Reinforcement Fabric

Test according to the following:

Test	Method
Tensile strength	ASTM D 4632 Grab
Elongation	ASTM D 4632 Grab
Asphalt retention	GDT 95

High Strength Pavement Reinforcement Fabric

Test according to the following:

Test	Method
Tensile strength	ASTM D 412
Elongation	ASTM D 412
Softening Point	ASTM D 36
Caliper	ASTM D 1777
Pliability (Cold Flex)	ASTM D 146

D. Materials Warranty

General Provisions 101 through 150.

881.2.07 Silt Fence Filter Fabric

A. Requirements

1. Use approved silt fence from [QPL 36](#).
 - a. Type “A” and “B” Fences: Use either woven or nonwoven filter fabric for Type “A” and “B” fences. If using woven fabric, the fabric may have slit tape yarns in one direction (warp or fill) only.
 - b. Type “C” Fences: Use non-calendered woven fabric constructed with monofilament yarns only.

NOTE: Approved fabrics must consistently exceed the minimum requirements of this Specification as verified by the Office of Materials and Research. If a fabric is removed from the Qualified Products List, do not use it in the work until the Department has reestablished the product’s acceptability.

2. Ensure silt fence filter fabrics have the following characteristics:
 - Has strong rot-proof synthetic fibers formed into either a woven or non-woven fabric
 - Has no treatment or coating that might significantly alter its physical properties after installation
 - Contains stabilizers and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat
 - Makes a pervious sheet of synthetic fibers oriented into a stable network so that the fibers retain their relative position with respect to each other under normal handling, installation, and service conditions
 - Has finished fabric edges to prevent the outer yarn from pulling away from the fabric
 - Has no defects or flaws that would significantly affect its physical and/or filtering properties
 - Meets the following physical or dimensional requirements:

Type Fence	A	B	C
Minimum tensile strength, pounds (newtons) (1)	Warp – 120 (530) Fill – 100 (445)	Warp – 120 (530) Fill – 100 (445)	Warp– 260 (1155) Fill – 180 (800)
Elongation (% Max.)	40	40	40
Apparent opening size (max. sieve size)	No. 30 (600 um)	No. 30 (600 um)	No. 30 (600 um)
Flow rate, gal/ min./ft² (L/min./m²)	25 (1015)	25 (1015)	70 (2850)
Ultraviolet stability (2)	80	80	80
Bursting strength, psi (kPa)	175 (1200)	175 (1200)	175 (1200)
Minimum fabric width	36 in (914 mm)	22 in (559 mm)	36 in (914 mm)
1. Minimum roll average of five specimens.			
2. Percent of required initial minimum tensile strength.			

3. Use silt fence filter fabrics evaluated by the National Transportation Product Evaluation Program (NTPEP).

B. Fabrication

The fabric may be manufactured with pockets for posts, hems with cord, or with posts pre-attached using staples or button head nails.

Ensure the fabric has the manufacturer’s name and product trade name labeled on the fabric at a minimum of 25 ft (7.6 m) intervals. Ensure the fabric has a color yarn mark in the fabric 14 inches (355 mm) ± 0.5 inch (12 mm) from both top and bottom ends for Type A and C and 8 inches (203 mm) ± 0.5 inch (12 mm) from both top and bottom ends for Type B fabric.

C. Acceptance

Test according to the following:

Test	Method
Tensile strength	ASTM D 4632
Elongation	ASTM D 4632
Apparent opening size	ASTM D 4751
Flow Rate	GDT 87
Ultraviolet stability	ASTM D 4632 (after 300 hours weathering according to ASTM D 4355)
Bursting strength	ASTM D 3786, Diaphragm Bursting Strength Tester

D. Materials Care and Warranty

Wrap fabric in a heavy-duty protective covering during shipment and storage to protect it from mud, dirt, dust and debris.

Do not expose fabric to temperatures greater than 140 °F (60 °C).

881.2.08 Filter Fabric for Embankment Stabilization

See Special Provision.

Section 894—Fencing

894.1 General Description

This section includes the requirements for the following types of fence and fencing accessories:

- Chain link fence
- Woven wire fence
- Barbed wire
- Ground rods
- Field fencing
- Silt fabric fencing

894.1.01 Related References

A. Standard Specifications

Section 862—Wood Posts and Bracing

Section 881—Fabrics

B. Referenced Documents

ASTM		AASHTO
A 116	A 239	M 111
A 121	A 584	M 181
A 123/ A 123M	A 585	M 232/ M 232M
A 153/ A 153M	A 702	
	F 1043	

894.2 Materials

894.2.01 Chain Link Fence

A. Requirements

Use zinc or aluminum coated steel fabrics, fittings, accessories, and posts for chain link fence conforming to the following requirements:

1. Fence Fabric

Use woven wire with reasonably uniform 2 in (50 mm) square mesh. Ensure that the mesh has parallel sides and horizontal and vertical diagonals of uniform dimensions. Use the wire size specified on the Plans or in the Proposal.

- a. Zinc Coated: Use steel fabric that conforms to AASHTO M 181. Ensure that the wire and hot-dip coating conform to AASHTO M 181, Type I, Class C.
- b. Aluminum Coated: Use steel fabric conforming to AASHTO M 181. Ensure the wire and coating conform to AASHTO M181, Type II.

2. Fittings and Accessories

- a. Tension Wire: Use wire that conforms to AASHTO M 181. Use wire coated according to AASHTO M 181, Section 25.2 for aluminum coated fabric. Use wire coated according to AASHTO M 181, Section 3.5.2 for zinc-coated fabric.
- b. Fittings: Use fittings conforming to AASHTO M 181.
 - 1) Ensure fittings or accessories not included in AASHTO M 181 conform to industry standards for heavy, industrial-type fences.
 - 2) Hot-dip the materials in zinc with AASHTO M 111 Grade 50 Coating. For aluminum coated fabric, you may use materials made from Aluminum Alloy 360, die-cast, or Sand Alloy 356, ZG61A, or Tenzalloy.
 - 3) Use bolts and nuts that conform to industry standards and are zinc coated with the hot-dip process according to AASHTO M 232/ M 232M.

3. Posts, Rails, and Braces

Use posts, rails, and braces that conform to AASHTO M 181 and ASTM F 1043. Diameter, wall thickness, and weight must conform to ASTM F 1043, Figure 2, Summary of Requirements for Industrial Fence, and the physical tolerance and material requirements must conform to AASHTO M 181. Do not use Light Industrial/Commercial Fence as detailed in ASTM F 1043, Figure 3. Check the Plans for specifications on posts used for special applications. Use special posts that conform to AASHTO M 181 or that are approved by the Office of Materials and Research.

4. Gates

Use support posts and gate frames as designated on the Construction Detail or Project Plans. Use gate materials that meet the requirements of Subsection 894.2.01.A.3.

- a. Use the same coating requirements as for the fence posts. Coat gate frames after completing all welding.
- b. Use fittings and hinges conforming to Subsection 894.2.01.A.2.b.

B. Fabrication

Ensure that the chain link fence fabric is produced by recognized, good commercial practices.

1. Apply the zinc or aluminum coating to the fabric in a continuous process. Do not apply in roll form.
2. Carefully inspect the coated fabric visually, both before and after weaving, to determine the coating quality.

C. Acceptance

The Department will reject chain link fabric that has excessive roughness, blisters, sal ammoniac spots, bruises, flaking, bare spots, or other obvious defects to any considerable extent.

D. Materials Warranty

General Provisions 101 through 150.

894.2.02 Woven Wire Fence

A. Requirements

1. Fabric

Use fabric that meets the requirements of ASTM A 116, Design Number 1047-6-11, with Class 3 coating.

- a. Ensure that the galvanizing is uniform.
- b. Ensure that less than 5 percent of the joints are deficient in zinc coating, as determined by ASTM A 239.
- c. You may use aluminum coated steel that meets the requirements of ASTM A 584, Design Number 1047-6-11, for the woven wire fence fabric.

2. Posts

Use steel or wood posts of the sizes shown on the Plans.

- a. Use wood posts that meet the requirements of Subsection 862.2.01.
- b. Use steel posts and bracing that meet the requirements of ASTM A 702. Galvanize posts and braces with the hot-dip method according to ASTM A 123/A 123M.

3. Certification

Furnish a certification to the Engineer from the manufacturer that shows the physical properties of the materials.

4. Accessories

Galvanize the following accessories according to ASTM A 153/ A 153M. Use 0.80 oz./ft² (245 g/m²) as the galvanizing minimum. Galvanize other accessories as necessary or specified on the Plans.

- a. Wire Fasteners: Use fasteners that meet the requirements of ASTM A 702.
- b. Tension Wire: Use No. 11 gauge wire.
- c. Staples: Use No. 9 gauge staples 1-1/2 in (38 mm) long.
- d. Nails: Use 1 in (25 mm) roofing nails to fasten metal caps to wooden posts.

5. Gates

Use support posts and gate frames of the size designated on the Construction Detail or Project Plans.

- a. Use a frame that is an all welded unit. Ensure that the gate is galvanized after welding with 2 oz./ft² (610 g/m²) of spelter coating.
- b. Use hinges, latches, and other accessories of good commercial quality that are coated as in Subsection 894.2.02.A.4.

B. Fabrication

1. Ensure that the woven wire fence fabric is produced by methods recognized as good commercial practices.
2. Carefully inspect the galvanized fabric to determine the zinc coating quality.

C. Acceptance

The Department will reject woven wire fabric that has excessive roughness, blisters, sal ammoniac spots, bruises, flaking, bare spots, or other obvious defects to any considerable extent.

D. Materials Warranty

General Provisions 101 through 150.

894.2.03 Barbed Wire

A. Requirements

1. Galvanized Steel Barbed Wire
Use wire that meets the requirements of ASTM A 121 and has a Class 3 zinc coating.
2. Aluminum Coated Steel Barbed Wire
Use wire that meets the requirements of ASTM A 585.
3. Posts
Use posts as specified in Subsection 894.2.02.A.2 for barbed wire fence.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

894.2.04 Ground Rods

A. Requirements

1. Use ground rods that are 9/16 to 5/8 in (14 to 16 mm) diameter and at least 8 ft (2.4 m) long, unless otherwise shown on the Plans.
2. Ensure that the ground rods are galvanized steel with a minimum coating of 2 oz./ft² (610 g/m²) according to the requirements of ASTM A 153/ A 153M.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

894.2.05 Field Fencing (Woven Wire and Barbed Wire)

A. Requirements

1. Definition
Field fencing designates replacement fencing outside the Right of Way or temporary fencing inside the Right of Way, provided you do not reuse the materials for permanent fencing inside the Right of Way.
2. Fence fabric
Use woven wire fabric that meets the requirements of ASTM A 116 Design No. 939-6-12-1/2, and has a Class I coating, unless otherwise designated.
3. Barbed wire
Use wire that meets the requirements of ASTM A 121 and has a Class I coating. Use the same number of barbed wire strands as the existing or replaced fence, or as specified in the Plans.

4. Posts
Use either galvanized steel, painted steel, or treated timber of the dimensions and spacing shown on the Construction Detail or Plans.
5. Gates
Use posts, frame material, hinges, and fittings of acceptable commercial quality. Get approval from the Engineer before use.
6. Use the Special Plan Details and/or Special Provisions for any special design of the field fence.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

1. Get approval from the Engineer for all materials. Ensure that the materials are of an acceptable commercial quality and are equivalent in quality to the fence being replaced or to the existing fence, as applicable.
2. Do not send materials to the laboratory unless requested by the Engineer or required by the Plans.

D. Materials Warranty

General Provisions 101 through 150.

894.2.06 Silt Fabric Fencing

A. Requirements

1. Fabric
 - a. See Subsection 881.2.07, "Silt Fence Filter Fabric," for the types of fabric available.
 - b. Use a woven wire support fence or a polypropylene support mesh with Type "C" fence.
 - 1) Woven Wire Support Fence
 - a. Ensure the woven wire support fence is at least 26 inches (660 mm) high with at least 6 horizontal wires.
 - b. Ensure the vertical wires have a maximum spacing of 12 in (155 mm).
 - c. Ensure the top and bottom wires are at least 10 gauge (2.49 mm) and all other wires are at least 12-1/2 gauge (2.03 mm). Use Washburn and Moen Standard requirements for determining wire gauge.
 - d. You may use other designs subject to approval by the Office of Materials and Research.
 - 2) Polypropylene Support Mesh
 - a. Ensure the polypropylene support mesh is sewn to the fabric 2 in (50 mm) \pm 1 in (25 mm) from top and bottom of fabric and 11 in (279 mm) \pm 1 in (25 mm) from top and bottom of fabric. Use a T-90 black polyester thread to sew mesh to fabric with a lock stitch at 5 to 7 stitches per inch.
 - b. Ensure the height of the polypropylene support mesh is at least 36 in (914 mm) with a plus tolerance of 1 in (25 mm).
 - c. Ensure the polypropylene support mesh minimum tensile strength in the machine direction is 60 lb/3 inches and 72 lb/3 inches in the transverse direction.
 - d. Ensure minimum average weight of the polypropylene support mesh is 10.3 lb/1000 ft².
 - e. Ensure the average strand count of the polypropylene support mesh in the machine direction is 9.0 \pm 1.5 per 10 inches and 14.5 \pm 0.7 per 10 inches in the transverse direction.
 - f. Ensure the polypropylene support mesh contains stabilizers and/or inhibitors that make the mesh resistant to deterioration from exposure to sunlight or heat.
2. Posts
Use post sizes and types as determined by the type of fence being installed. Generally hardwood posts will be limited to ash, hickory, or oak. Other hardwoods may be acceptable if approved by the Office of Materials and Research.

- a. Type "A" Fence: Use either wood or steel posts that are at least 4 ft (1.2 m) long.
 - 1) If using soft wood, use posts that are at least 3 in (75 mm) in diameter or nominal 2 x 4 in (33 x 89 mm) and straight enough to provide a fence without noticeable misalignment.
 - 2) If using hardwood, use posts that are 1-1/2 x 1-1/2 in (38 x 38 mm) with a minus tolerance of 3/8 in (9 mm) providing the cross sectional area is at least 2.15 in² (1385 mm²).
 - 3) If using steel, use posts that are "U," "T," or "C" shaped with a minimum weight of 1.15 lb/ft (1.7 kg/m), and have projections for fastening the fence to the posts.
- b. Type "B" Fence: Use either wood or steel posts that are at least 3 ft (900 mm) long.
 - 1) If using soft wood, use posts that are at least 2 in (50 mm) in diameter or nominal 2 x 2 in (33 x 33 mm).
 - 2) If using hardwood, use posts that are 1 x 1 in (25 x 25 mm) with a minus tolerance of 1/4 in (6 mm) providing the cross sectional area is at least 0.95 in² (610 mm²).
 - 3) If using steel posts, use types "U," "T," or "C" shapes with a minimum weight of 0.75 lb/ft (1.1 kg/m).
- c. Type "C" Fence:
 - 1) Woven Wire Supported: Use only steel posts with a minimum length of 4 ft (1.2 m). Use "U," "T," or "C" shaped posts with a minimum weight of 1.15 lb/ft (1.7 kg/m). Use posts that have projections for fastening the woven wire and filter fabric.
 - 2) Polypropylene Mesh Supported: Use either wood or steel posts that are at least 4 ft (1.2 m) long.
 - a. If using soft wood, use posts that are at least 3 in (75 mm) in diameter or nominal 2 x 4 in (33 x 89 mm) and straight enough to provide a fence without noticeable misalignment.
 - b. If using hardwood, use posts that are 2 x 2 in (50 x 50 mm) with a minus tolerance of 1/4 in (6 mm) providing the cross sectional area is at least 3.28 in² (2120 mm²).
 - c. If using steel posts, use "U," "T," or "C" shaped posts with a minimum weight of 1.15 lb/ft (1.7 kg/m). Use posts that have projections for fastening the woven wire and filter fabric.

NOTE: You must use woven wire or polypropylene mesh to provide extra support for Type "C" fence installations.

3. Fasteners for Wooden Posts
 - a. Wire Staples: Use staples that are at least 17 gauge (1.37 mm), legs at least 1/2 in (13 mm) long, and a crown at least 3/4 in (19 mm) wide.
 - b. Nails: Use nails that are at least 14 gauge (2.03 mm), 1 in (25 mm) long, with button heads of at least 3/4 in (19 mm).

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

Section 862—Wood Posts and Bracing

862.1 General Description

This section includes the requirements for wood fence posts and bracing, and wood sign posts.

862.1.01 Related References

A. Standard Specifications

Section 859—Guard Rail Components

Section 863—Preservative Treatment of Timber Products

B. Referenced Documents

ASTM A 525M

QPL 50

862.2 Materials

862.2.01 Wood Fence Posts and Bracing

A. Requirements

1. Type

Use Southern Pine for wood posts and bracing. Use the dimensions specified on the Plans.

2. Physical Characteristics

Use posts and bracing that have the following characteristics:

- Be round or sawed, but all posts on a single Project shall be the same.
- Be cut from sound and solid trees and contain no unsound knots. Accept sound knots if the diameter of the knot does not exceed 1/3 of the diameter of the piece at the point where it occurs.
- Be free from decayed wood, rot, and red heart, and a ring shake and season checks that penetrate at any point more than 1/4 the diameter of the piece, or are greater than 1/4 in (6 mm) wide.
- Show at least four annual rings per 1 in (25 mm), and at least 1/3 summerwood unless using Southern Pine veneer cores.
- Have no short or reverse bends.

3. Draw a line from the center of the top to the center of the butt. The line shall not fall outside the body of the post, nor be more than 2 in (50 mm) from the geometric center of the post at any point.

Section 862-Wood Posts and Bracing

4. The maximum allowable change in diameter of the post shall not exceed 1-1/2 in (38 mm) in 10 ft (3 m).
5. Accessories
Use metal caps to cover the tops of the posts. Use caps that are at least 0.008 in (0.20 mm) thick.
Use material that is aluminum or galvanized steel with 1.25 oz/ft² (380 g/m²) coating according to ASTM A 525M.
Use caps only when required by the Plans.

B. Fabrication

1. Peel all posts and bracing for their full length. Remove all bark and inner skin.
2. Trim knots close to the body of the post before treatment.
3. Saw all butts and tips square. For posts that will be driven, you may make the butt end pointed before treatment.
4. Seasoning and Preservative Treatment
Treat all posts according to the requirements of Section 863.

C. Acceptance

Check QPL 50 for pre-approved manufacturers that supply materials compliant with this Specification.

D. Materials Warranty

General Provisions 101 through 150.

862.2.02 Wood Sign Posts

A. Requirements

1. Unless otherwise specified, surface wood sign posts on all four sides to the dimensions specified.
 - a. Ensure wood sign posts meet the same quality requirements as wood guard rail posts in Subsection 859.2.04, "Wood Guard Rail Posts and Offset Blocks."
 - b. Ensure posts do not vary from the specified length by more than ± 1 in (25 mm).
 - c. Trim both ends of the posts.
2. Accessories
Use metal caps to cover the tops of the posts. Use caps that are at least 0.008 in (0.20 mm) thick.
Use material that is aluminum or galvanized steel with 1.25 oz/ft² (380 g/m²) coating according to ASTM A 525M.
Use caps only when required by the Plans.

B. Fabrication

1. Seasoning and Preservative Treatment
Bore and frame posts before treating them. Treat the posts according to the requirements of Section 863.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

Section 805—Rip Rap and Curbing Stone

805.1 General Description

This section includes the requirements for rip rap and curbing stone. Construction and material will be covered under the Special Provisions.

805.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

AASHTO T 96

AASHTO T 104

ASTM C 295

ASTM D 5519

805.2 Materials

805.2.01 Rip Rap

A. Requirements

1. Aggregate Quality

All rip rap stone shall be made of sound, durable rock pieces that meet these requirements:

Aggregate Quality	Maximum Percent
Abrasion loss "B" grading	65
Soundness loss	15
Flat and slabby pieces (length five times more than the average thickness)	5
Weathered and/or decomposed pieces and shale	5

2. Gradation for Stone-Dumped rip rap Type 1 and Type 3:

Severe Drainage Conditions or Moderate Wave Action (Type 1)*		
Size By Volume	Approx. Weight	Percent Smaller Than
4.2 ft ³ (0.12 m ³)	700 lbs (320 kg)	100%
1.8 ft ³ (0.05 m ³)	300 lbs (135 kg)	50% - 90%
0.8 ft ³ (0.02 m ³)	125 lbs (55 kg)	20% - 65%
*Between 0% and 15% of the Type 1 rip rap shall pass a 4 in (100 mm) square opening sieve.		

General Use Normal Drainage Conditions (Type 3)*		
Size By Volume	Approx. Weight	Percent Smaller Than
1.0 ft ³ (0.03 m ³)	165 lbs (75 kg)	100%
0.1 ft ³ (0.003 m ³)	15 lbs (7 kg)	10% - 65%
*Between 0% and 15% of the Type 3 rip rap shall pass a 2 in (50 mm) square opening sieve.		

3. Stone for Plain Rip Rap

The stones shall be clean and free of rock dust and fines.

- a. Process the stone so that the largest pieces have a volume of 2 ft³ (0.06 m³) or less.
- b. Ten percent or less of the total rip rap weight can consist of spalls that pass a 5 in (125 mm) sieve.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Percent wear	AASHTO T 96
Petrographic analysis	ASTM C 295
Soundness (magnesium sulfate)	AASHTO T 104

D. Materials Warranty

General Provisions 101 through 150.

805.2.02 Curbing Stone

A. Requirements

4. Type A:

Provide Type A curb that meets these requirements:

- a. Curb thickness and height as shown on the Plans
- b. Cut in lengths of not less than 5 ft (1.5 m) nor more than 10 ft (3 m)
- c. Tops dressed to an even, smooth surface for the full length
- d. Have straight, even edges
- e. Top sloped ¼ in (6 mm) from back to front
- f. Have squared ends to permit joints to be constructed not more than ½ in (13 mm) wide for the full depth of the curb.
- g. Backface hand dressed at least 4 in (100 mm) below that part of the back that will be exposed
- h. Front face hand dressed to a depth of 1 in (25 mm) below the indicated elevation of the base course, pavement or gutter
- i. Have ends of circular curb sections cut along radial lines to permit joints to be constructed not more than ½ in (13 mm) wide
- j. Circular curb conforms accurately to the required radius
- k. Dressed surfaces do not contain projections or depressions more than 3/8 in (10 mm) from the plane surface of the curb

5. Type B:

Provide Type B curb that meets these requirements:

- a. Dimensions shall be 5 in (125 mm) thick, 17 in (425 mm) deep, and 5 ft (1.5 m) long, unless otherwise specified.
- b. Front face to have a top margin draught with a smooth face 10 in (250 mm) deep
- c. Have a smooth face (Note: A quarry face may be considered a smooth face if free from holes and all bumps exceeding allowed tolerances are pointed level)
- d. Tops of curbs present even, smooth faces for the full length
- e. Have squared joints that when abutted with adjacent sections, present no crack or joint exceeding ½ in (13 mm) in width
- f. Have ends of circular curb sections cut along radial lines to permit joints to be constructed not more than ½ in (13 mm) wide
- g. Circular curb conforms accurately to the required radius
- h. The allowable tolerances for Type B Curb dimensions are as follows:

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:

Material	Specification
Portland cement	830.2.01
Rip Rap (Stone)	805.2.01
Membrane Curing Compound	832.2.03

Material	Specification
Stone Filter Blanket	815.2.01 or 800.2.01_(Size No. 467*)
Fine Aggregate for Sand Cement Rip Rap	801.2.03
Water	880.2.01
Woven Plastic Filter Fabric	881.2.05
*Except that up to 10% is allowed to pass the No. 4 (4.75 mm) sieve.	

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 (0.02 m³) but not greater than 2 ft³ (0.5 m³).

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.

- 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.
- 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 (600 mm) 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 (300 mm) with no under-tolerance. If the Plans do not show a thickness, place stone rip rap to at least 12 in (300 mm) thick, but no greater than 2 ft (600 mm) 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 (150 mm) and plus 12 in (300 mm). If the Plans or Proposal do not specify a thickness, place the course to at least 2 ft (600 mm) 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.

Use recycled concrete only when materials do not contain steel after processing.

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 (300 mm) 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 (75 mm) 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 (1 m) 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 the Department.

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.

- a. Obtain a minimum compressive strength of 500 psi (3 MPa) in 7 days.
- b. 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.
- c. 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.

- a. Place the bagged rip rap by hand with the tied ends facing the same direction. Produce close, broken joints.
- b. Place header courses when directed by the Engineer or required by the Plans.
- c. After placing the bags, ram or pack them against one another to produce the required thickness and form a consolidated mass.
- d. Do not allow the top of each bag to vary more than 3 in (75 mm) 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 (± 15 mm).

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 (meters) 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. (300 by 450 by 150 mm) thick.

When filled bags are less than Plan dimensions or are of varying lengths or width, Plan square yards (meters) 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 (meter) of material complete in place.

Payment will be made under:

Item No. 603	Stone plain rip rap ____ in (mm) thick	Per square yard (meter)
Item No. 603	Stone dumped rip rap (type) ____ in (mm) thick	Per square yard (meter)

Section 603-Rip Rap

Item No. 603	Stone grouted rip rap (<u>thick</u>)	Per square yard (meter)
Item No. 603	Filter blanket	Per square yard (meter)
Item No. 603	Sand-cement bag rip rap, ____ in (mm) thick	Per square yard (meter)
Item No. 603	Stone blanket protection, ____ in (mm)	Per square yard (meter)
Item No. 603	Plastic filter fabric	Per square yard (meter)

603.5.01 Adjustments

General Provisions 101 through 150.

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Section 812—Backfill Materials

812.1 General Description

This section includes the requirements for four types of material used as backfill: foundation backfill, Types I and II, imperfect trench backfill, Type III, and mechanically stabilized wall backfill.

812.1.01 Related References

A. Standard Specifications

Section 810—Roadway Materials

B. Referenced Documents

AASHTO T 27

GDT 4

GDT 6

GDT 7

GDT 67

SOP 1

812.2 Materials

812.2.01 Foundation Backfill, Type I

A. Requirements

1. Use natural or artificial mixtures of materials consisting of hard, durable particles of sand or stone, mixed with silt, clay and/or humus material for Type I backfill.
2. Have the final blend of material meet the requirements of Class I or II soils in Subsection 810.2.01.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Soil gradation	GDT 4
Volume change	GDT 6
Maximum density	GDT 7 or GDT 67

D. Materials Warranty

General Provisions 101 through 150.

812.2.02 Foundation Backfill, Type II

A. Requirements

1. Type

Use material meeting the requirements of Section 800, Class A or B aggregate, and SOP 1. Crushed concrete may be used provided it meets the requirements of Section 800 that are applicable to Group 2 Aggregates.

Do not use backfill aggregate containing soil or decomposed rock.

2. Gradation

Use material meeting the following gradation requirements:

Sieve Size	% Passing by Weight
1-1/2 in (37.5 mm)	100
1 in (25 mm)	80-100
No. 8 (2.36 mm)	0-5

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Sieve analysis	AASHTO T 27

D. Materials Warranty

General Provisions 101 through 150.

812.2.03 Imperfect Trench Backfill, Type III

A. Requirements

1. Type

Use material made from either of the following for Type III backfill:

- A natural soil with a density of less than 95 lb/ft³ (1520 kg/m³) when tested with GDT 7
- An artificial mixture of soil and organic material, such as hay, leaves, or straw

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:

Section 207-Excavation and Backfill for Minor Structures

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 (300 mm) 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 (50 mm).
- Dispose of surplus and unsuitable materials as directed by the Engineer.
- Consider excavated material as unclassified excavation according to Section 205, except that the Department will not pay for excavation for minor structures.
- Include the cost of fulfilling these requirements in the price bid for the pipe.

Section 207-Excavation and Backfill for Minor Structures

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, the Department 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 (150 mm) 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. Class IIIC1 material may be used in Districts 6 and 7. Place and compact according to Section 208 except as follows:

- a. Do not place rock more than 4 inches (100 mm) in diameter within 2 ft (600 mm) 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 (100 mm) in diameter within 2 ft (600 mm) 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

Section 207-Excavation and Backfill for Minor Structures

- 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 (1 m)

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 (1 m), the Contractor will be compensated for the extra depth excavated below the 3 ft (1 m) 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 (600 mm).

The length of extra depth excavation is equal to the length of that portion of the structure that is lowered more than 3 ft (1 m) 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 (meters) compacted.

Lateral measurements are confined to an area bounded by vertical planes lying not more than 1 ft (300 mm) 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

The Department measures Type III material (complete, in place, and accepted) in cubic yards (meters).

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.

Section 207-Excavation and Backfill for Minor Structures

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.

The Department will pay for Types II and III separately at the Contract Unit Price per cubic yard (meter). 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 (meter)
Item No. 207	Imperfect trench backfill material, type III	Per cubic yard (meter)

207.5.01 Adjustments

General Provisions 101 through 150.

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Section 706—Turf Establishment

706.1 General Description

This work includes providing a hardy and permanent ground cover at designated locations. The cover is subject to the Engineer's approval.

706.1.01 Definitions

General Provisions 101 through 150.

706.1.02 Related References

A. Standard Specifications

Section 700—Grassing

B. Referenced Documents

General Provisions 101 through 150.

706.1.03 Submittals

General Provisions 101 through 150.

706.2 Materials

Select a viable ground cover according to Section 700.

706.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

706.3 Construction Requirements

706.3.01 Personnel

General Provisions 101 through 150.

706.3.02 Equipment

General Provisions 101 through 150.

706.3.03 Preparation

General Provisions 101 through 150.

706.3.04 Fabrication

General Provisions 101 through 150.

706.3.05 Construction

General Provisions 101 through 150.

706.3.06 Quality Acceptance

Refer to Subsection 700.3.06 "Quality Acceptance" and Subsection 700.3.07 "Contractor Warranty and Maintenance" for acceptance of a viable ground cover.

706.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

706.4 Measurement

No field measurements are required. Measurement is calculated from known dimensions as follows:

A. Type A—Grading and Drainage Projects

[Project length (PL) minus bridge and exception* length (BL)] times [right-of-way width or Engineer-specified width (RW) minus roadbed width (RBW)] equals ____ square feet divided by 43,560 ft²/acre equals pay quantity in acres.

[Project length (PL) minus bridge and exception* length (BL)] times [right-of-way width or Engineer-specified width (RW) minus roadbed width (RBW)] equals ____ square meters divided by 10,000 m² equals pay quantity in hectares.

$(PL - BL) \times (RW - RBW) = \text{___ ft}^2 \div 43,560 \text{ ft}^2/\text{acre} = \text{pay quantity in acres}$

$(PL - BL) \times (RW - RBW) = \text{___ m}^2 \div 10,000 \text{ m}^2 = \text{pay quantity in hectares}$

B. Type B: Base and Paving Projects

[Project length (PL) minus bridge and exception* length (BL)] times [unpaved shoulder width (SW) plus 6 ft for each roadway side (RS)] = ____ square feet divided by 43,560 ft²/acre= pay quantity in acres.

[Project length (PL) minus bridge and exception* length (BL)] times [unpaved shoulder width (SW) plus 1.8 m for each roadway side (RS)] = ____ square meters divided by 10,000 m² = pay quantity in hectares.

$(PL - BL) \times (SW + 6RS) = \text{___ ft}^2 \div 43,560 \text{ ft}^2/\text{acre} = \text{pay quantity in acres}$

$(PL - BL) \times (SW + 1.8RS) = \text{___ m}^2 \div 10,000 \text{ m}^2 = \text{pay quantity in hectares}$

C. Type C: Complete Project

[Project length (PL) minus (bridge and exception* length (BL))] times [right-of-way width or Engineer-specified width (RW) minus plan paved surface width (PPW)] equals square feet divided by 43,560 ft²/acre= pay quantity in acres.

[Project length (PL) minus (bridge and exception* length (BL))] times [right-of-way width or Engineer-specified width (RW) minus plan paved surface width (PPW)] equals square meters divided by 43,560 ft²/acre= pay quantity in hectares.

$(PL - BL) \times (RW - PPW) = \text{___ ft}^2 \div 43,560 \text{ ft}^2/\text{acre} = \text{pay quantity in acres}$

$(PL - BL) \times (RW - PPW) = \text{___ m}^2 \div 10,000 \text{ m}^2 = \text{pay quantity in hectares}$

*Exception means major road intersections and Plan exceptions, not side roads, drives, etc.

706.4.01 Limits

General Provisions 101 through 150.

706.5 Payment

The turf establishment area will be paid for at the Contract Price per acre (hectare). Payment is full compensation for equipment, labor, seed, fertilizer, and any other materials necessary to complete the Item.

Payment will be made under:

Item No. 706	Turf establishment, type ____	Per acre (hectare)
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706.5.01 Adjustment

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:

Material	Section
Wood Fiber Mulch	718.2
Agricultural Lime	882.2.01
Seed	890.2.01
Sod	890.2.02
Fertilizer	891.2.01
Plant Topsoil	893.2.01
Mulch	893.2.02
Inoculants	893.2.04
Tackifiers	QPL 33
Anionic Polyacrylamide	QPL 84 & Section 895

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.

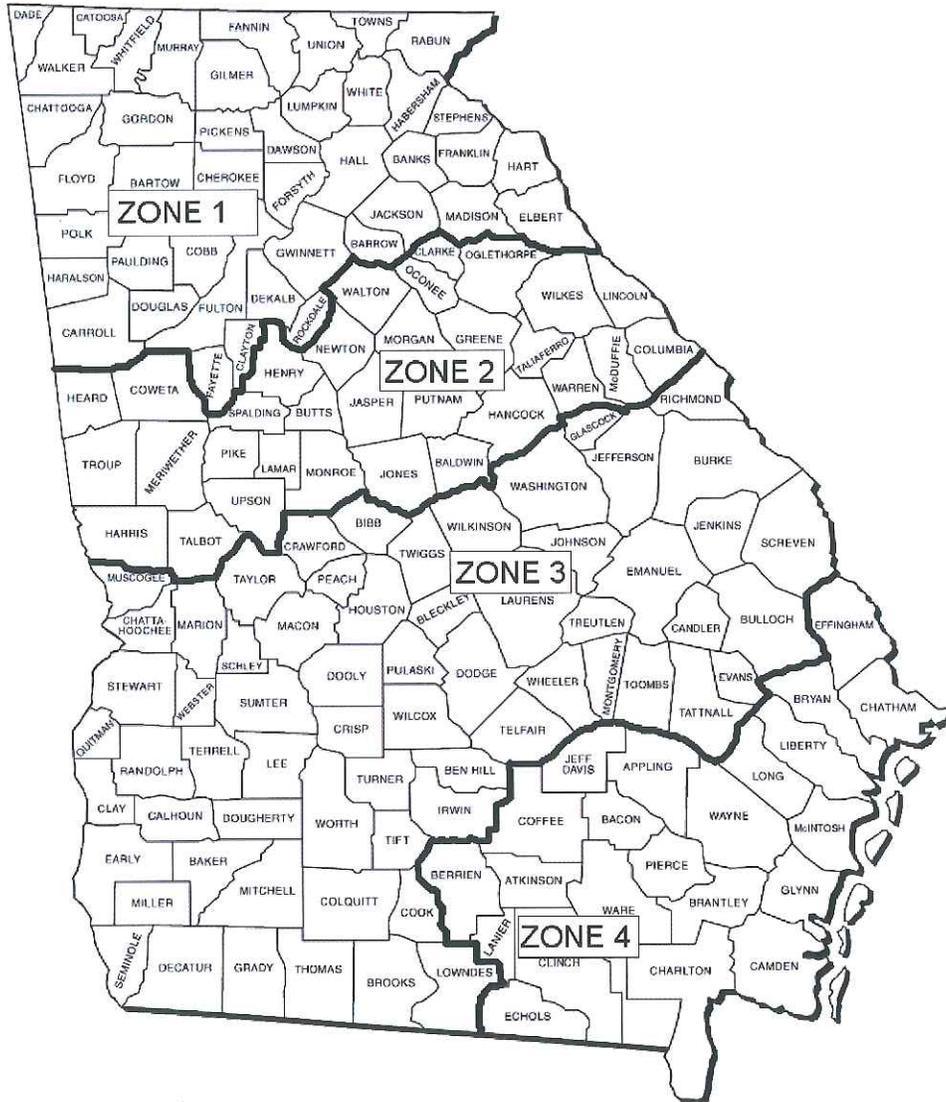
700.3.05 Construction

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 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.

PLANTING ZONE MAP



NON-NATIVE GRASS SEEDING TABLE 1
(Temporary and Permanent Seed Types for Shoulders, Medians and Slopes 3:1 or Flatter)

Common Name	Botanical Name	Class/Type	Rate/Acre	Planting Zone	Planting Dates
Common Bermuda Grass (Hulled)	<i>Cynodon dactylon</i>	Required Permanent Grass	10 (11)	1	April 16 – August 31
Common Bermuda Grass (Unhulled)			10 (11)		
Common Bermuda Grass (Hulled)	<i>Cynodon dactylon</i>	Required Permanent Grass	10 (11)	2,3,4	April 1 – October 15
Common Bermuda Grass (Unhulled)			10 (11)		
Bahaia Grass	<i>Paspalum motatum</i>		10 (11)		
Rye Grass, Millet, Cereal Grass (Oats)	<i>Lolium penne</i> spsp. <i>Multiflorum</i> , <i>Echinochloa cursgalli</i> , <i>Avena sativa</i>	Temporary Grass	50 (56)	1	September 1- April 15
Rye Grass, Millet, Cereal Grass (Oats)	<i>Lolium penne</i> spsp. <i>Multiflorum</i> , <i>Echinochloa cursgalli</i> , <i>Avena sativa</i>	Temporary Grass	50 (56)	2,3,4	October 16- March 31

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)

Common Name	Botanical Name	Class/Type	Rate/Acre	Planting Zone	Planting Dates
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	50(56)	1,2	March 1 – August 31
Weeping Lovegrass	<i>Eragrostis curvula</i>	Temporary Grass	10(11)		
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	75(84)	1,2	September 1- February 28
Tall Fescue	<i>Festuca arundinacea</i>	Temporary Grass	50(56)		
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	50(56)	3,4	April 1 – October 31
Weeping Love Grass	<i>Eragrostis curvula</i>	Temporary Grass	10(11)		
Interstate Lespedeza	<i>Lespedeza sericea</i>	Permanent Grass	50(56)	3,4	November 1 – March 31
Weeping Love Grass	<i>Eragrostis curvula</i>	Temporary Grass	10(11)		

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).

Common Name	Botanical Name	Class/Type	Rate/Acre	Planting Zone	Planting Dates
Canada Wild Rye	<i>Elymus canadensis</i>	Cool Season	Minimum 2 (2)	1,2,3,4	October 31 - March 31
Virginia Wild Rye	<i>Elymus virginicus</i>	Cool Season	Minimum 2 (2)	1,2,3,4	October 31 - March 31
Bottle-brush Grass	<i>Hystrix patula</i>	Cool Season	Minimum 2 (2)	1,2,3,4	October 31 - March 31
Little Bluestem	<i>Schizachyrium scoparium</i> (<i>Andropogon scoparius</i>)	Warm Season	Minimum 2 (2)	1,2,3,4	March 31- August 31
Indiangrass	<i>Sorghastrum nutans</i>	Warm Season	Minimum 2 (2)	1,2,3,4	March 31- August 31
Eastern Gama Grass	<i>Tripsacum dactyloides</i>	Warm Season	Minimum 2 (2)	1,2,3,4,1,2,3,4	March 31- August 31
Rice Cut Grass	<i>Leersia oryzoides</i>	Warm Season	Minimum 2 (2)	1,2,3,4	March 31- August 31
Deertongue	<i>Panicum clandestinum</i>	Warm Season	Minimum 2 (2)	1,2,3,4	March 31- August 31
Switchgrass	<i>Panicum virgatum</i>	Warm Season	Minimum 2 (2)	1,2,3,4	March 31- August 31
Woolgrass	<i>Scirpus cyperinus</i>	Cool Season	Minimum 2 (2)	1,2,3,4	October 31 - March 31
River Oats	<i>Chasmanthium latifolium</i>	Cool Season	Minimum 2 (2)	1,2,3,4	October 31 - March 31
Purple Top	<i>Tridens flavus</i>	Warm Season	Minimum 2 (2)	1,2,3,4	March 31- August 31

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 (11) lbs per acre (kg/hectare) 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)

Common name	Botanical name	Class/type	Rate/Acre	Planting Zone	Planting Dates
Joe Pye Weed	<i>Eupatorium fistulosum</i>	Herbaceous Pe	Minimum 2 (2)	1,2,3,4	September 1 – May 1
Ironweed	<i>Vernonia novaboracensis</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	March 1 - August 31,
White snakeroot	<i>Ageratina altissima (Eupat rugosum)</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Swamp milkweed	<i>Asclepias incarnata</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	March 1 - August 31,
Frost aster	<i>Aster pilosus (Symphyotric</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Partridge pea	<i>Chamaecrista fasciculata (fasciculata)</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	March 1 - August 31,
Lance-leaf coreopsis	<i>Coreopsis lanceolata</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Tall coreopsis	<i>Coreopsis tripteris</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Boneset	<i>Eupatorium perfoliatum</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Sneezeweed	<i>Helenium autumnale</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Swamp sunflower	<i>Helianthus angustifolius</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	March 1 - August 31,
Fringed loosestrife	<i>Lysimachia ciliata</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Wild bergamot	<i>Monarda fistulosa</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Mountain mint	<i>Pycnanthemum tenuifolium</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Black-eyed susan	<i>Rudbeckia hirta</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Goldenrod	<i>Solidago nemoralis</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	September 1 – May 1
Butterfly Weed	<i>Aesclepias tuberosa</i>	Herbaceous Perennial	Up to 10(11)	1,2,3,4	March 1 - August 31,

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 (11) lbs per acre (kg/hectare) for each combined mix.

TABLE 5: TEMPORARY GRASS - SPECIES, SEEDING RATES AND PLANTING DATES

Species	Rates per 1000 sq. ft.	Rates per Acre	Planting Date By Zone		
			1 & 2	2	3 & 4
Rye (Grain)	3.9 lbs	168 lbs	8/1 - 11/30	8/15 - 12/1	9/1 - 2/28
Ryegrass	0.9 lbs	40 lbs	8/1 - 11/30	9/1 - 12/15	9/15 - 1/1
Rye & Annual Lespedeza	0.6 lbs 0.6 lbs	28 lbs 24 lbs	3/1 - 4/1	2/1 - 3/1	2/1 - 3/1
Weeping Lovegrass	0.1 lbs	4 lbs	3/15 - 6/15	3/15 - 7/15	3/15 - 7/15
Sudangrass	1.0 lbs	60 lbs	4/1 - 8/31	4/1 - 8/31	3/15 - 8/1
Browntop Millet	1.1 lbs	50 lbs	4/1 - 6/30	4/1 - 7/15	4/1 - 7/15
Wheat	3.9 lbs	168 lbs	9/1 - 12/31	9/1 - 12/31	9/15 - 1/31

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 ¾ 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 (100 mm and 150 mm) deep.

Plow front and back slopes in cuts to no less than 6 in (150 mm) 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 clefted 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.

4. Native Restoration Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas.

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.

- a. 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 (100 mm) 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, Multitrophic 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 (560 kg/ha).
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 (20 mm and 40 mm) 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.

- e. 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 (*Cynodon 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 (200 mm) in length and not more than 1 in (25 mm) wide.
- Drive the stakes flush with the top of the sod. Use a minimum of 8 stakes per square yard (meter) 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 (56 kg/ha) when specified by the Engineer after plants have grown to 2 inches (50 mm) 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 (75 mm) 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 (224 kg/ha/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 (0.1 m²). 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 (hectare).

B. Mulches

Straw or hay mulch applied to permanent grassing areas will be measured by the ton (megagram). 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 (meters) , 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 (megagram). Lime used as a filler in fertilizer is measured by the ton (megagram).

F. Quantity of Nitrogen Used for Permanent Grassing

Nitrogen is measured in pounds (kilograms) 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 (hectare) 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 (hectare) 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 (hectare), 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 (megagram). Payment is full compensation for furnishing and applying the material.

D. Lime

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

E. Nitrogen

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

F. Sod

Sod will be paid by the square yard (meter) 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 (hectare), complete and in place. Payment is full compensation for preparing the ground, seeding, and providing plant establishment and other incidentals and included under the pay item "Native Restoration and Riparian Seeding".

Payment will be made under:

Item No. 700	Permanent grassing	Per acre (hectare)
Item No. 700	Agricultural lime	Per ton (megagram)
Item No. 700	Fertilizer mixed grade	Per ton (megagram)
Item No. 700	Fertilizer nitrogen content	Per pound (kilogram)
Item No. 700	Sod	Per square yard (meter)

Section 700-Grassing

Item No. 700	Native Restoration and Riparian Seeding	Per acre (hectare)
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700.5.01 Adjustments

General Provisions 101 through 150.

1030

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 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

English								
Class of Concrete	(2) Coarse Aggregate Size No.	(1 & 6) Minimum Cement Factor lbs/yd ³	Max Water/Cement ratio lbs/lb	(5) Slump acceptance Limits (in)		(3 & 7) Entrained Air Acceptance Limits (%)		Minimum Compressive Strength at 28 days (psi)
				Lower	Upper	Lower	Upper	
"AAA"	67,68	675	.440	2	4	2.5	6.0	5000
"AA1"	67,68	675	.440	2	4	2.5	6.0	4500
"AA"	56,57,67	635	.445	2	4	3.5	7.0	3500
"A"	56,57,67	611	.490	2	4	2.5 (3)	6.0	3000
"B"	56,57,67	470	.660	2	4	0.0	6.0	2200
"CS"	56,57,67 Graded Agg.*	280	1.400	-	3½	3.0	7.0	1000 (4)
metric								
Class of Concrete	(2) Coarse Aggregate Size No.	(1 & 6) Minimum Cement Factor kg/m ³	Max Water/Cement ratio kg/kg	(5) Slump acceptance Limits (mm)		(3 & 7) Entrained Air Acceptance Limits (%)		Minimum Compressive Strength at 28 days (MPa)
				Lower	Upper	Lower	Upper	
"AAA"	67,68	400	.440	50	100	2.5	6.0	35
"AA1"	67,68	400	.440	50	100	2.5	6.0	30
"AA"	56,57,67	375	.445	50	100	3.5	7.0	25
"A"	56,57,67	360	.490	50	100	2.5 (3)	6.0	20
"B"	56,57,67	280	.660	50	100	0.0	6.0	15
"CS"	56,57,67 Graded Agg.	165	1.400		90	3.0	7.0	7 (4)

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 (7 MPa) + 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/yd³ (30 kg/m³) 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 Office of Materials (OM) for review. The Department 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 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 the Department 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 (10 °C) 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

Protection Procedure	Expected Temperatures Within 48 Hours
Heated enclosures	Below 25 °F (-4 °C)
Commercial blankets	Below 25 °F (-4 °C)
Batt insulation	Below 25 °F (-4 °C)
Heavy-duty polyethylene	25 °F (-4°C) or above

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

Material	Section
Coarse Aggregate (1)	800.2.01
Fine Aggregate Size No. 10	801.2.02
Dampproofing or Waterproofing Material (Bituminous)	826.2.01
Portland Cement (2)	830.2.01
Portland-Pozzolan Cement (2)	830.2.03
Admixtures:	
Air-Entraining Admixtures	831.2.01
Retarding Admixtures	831.2.02
Water Reducing Admixtures	831.2.02
Granulated Iron Blast-Furnace Slag	831.2.03.A.3
Fly Ash	831.2.03.A
Curing Agents	832
Joint Fillers and Sealers	833
Special Surface Coating	836
Linseed Oil	870.2.06.A.
Mineral Spirits	870.2.06.A.4
Water	880.2.01
Graded Aggregate (3)	815.2.01
Graffiti Proof Coating	838.2.01

Section 500-Concrete Structures

Material	Section
Concrete used in Bridge Construction	500.3.04.F
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 (2.00 mm) 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 (10 MPa).
2. Do not transport or erect the units until they reach a strength of at least 3,000 psi (20 MPa).
3. Restrict live loads (including erection equipment) on the units until they reach a minimum strength of 4,500 psi (30 MPa).

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 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 (meters) for mixing and agitating.

c. Concrete Production

The mixer shall produce concrete that meets the requirements in the Table 1—Concrete Mix Table .

d. 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 by the OMR:

- 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 (50 mm), 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 (50 mm) 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 the Department.

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 (meters) 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 (15 m) 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 (1.5 m). 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 [8 m³] 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 (25 mm) slump through at least a 18 in (450 mm) 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 (20 m) 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 (20 m).

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 (3 m) deep. Ensure that tremie is:

- At least 8 inches in (200 mm) 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 (3 m) 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 (7.6 L) of water per minute to a 0.062 in (1.6 mm) diameter tip at an air pressure of 100 psi (700 kPa).

An example of a suitable pump is the Alemite Pump 7878-A.

- The ability to consume approximately 22 ft³/min (0.6 m³/min) of compressed air
- A 3/8 in (10 mm) 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.
4. Conduct batching control tests according to the procedures in the Sampling, Testing, and Inspection Manual.

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 (18 °C) (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.

The laboratory 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 M 194) water reducer as approved by the laboratory.

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 (1.0 to 1.5 kg) of fly ash to 1.0 lb (1.0 kg) 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 cementitious 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 (1.0 kg) of slag to 1.0 lb (1.0 kg) 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 (1 m³) 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 (meter) or fraction thereof.
- For mixers with a capacity above 3 yd³ (2 m³), 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: The Department 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 (150- to 200-mm) 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:

$f'c$ = 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 4—Standard Deviations for Calculating Acceptance Strength

Class of Concrete	Standard Deviation (s)	
	Psi	(MPa)
B	370	(2.5)
A	650	(4.5)
AA	620	(4.3)
AA1	540	(3.7)
AAA	500	(3.4)

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 the Department.
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 (23.6 kN/m³) for vertical loading
- 85 lbs/ft³ (13.4 kN/m³) for horizontal loading
- 75 lbs/ft² (3.6 kN/m²) 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 (25 mm) thick.
- c. Use lumber for header forms used as screed supports and for curb face forms at least 2 in (50 mm) 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 (16 mm) thick, use it in place of 1 in (25 mm) 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 (6 mm) thick.
- c. When nailing plywood directly to form studs, do not space the studs more than 16 in (400 mm) 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 (6 mm) thick. Use tempered fiberboard 1/8 in (3 mm) 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 (25 mm) 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 $\frac{3}{4}$ in (19 mm) 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.
9. When shown on the Plans, splice water stops to form continuous water-tight joints. Hold stops in position while placing concrete.
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 the Department 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 (2.4 kN/m²) 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 (250 MPa).
 - 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 (13 mm), whichever is less, use intermediate supports.
- 2) Do not base deflection on a total load of less than 120 lbs/ft² (5.7 kN/m²).
- 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 (50 mm), 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 (25 mm) as shown in Figure 1 (Figure 1 metric).

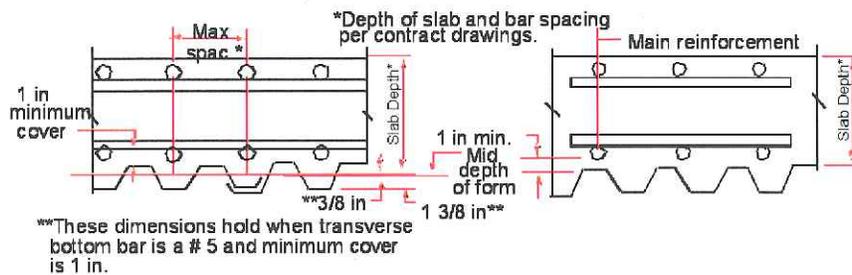


Figure 1

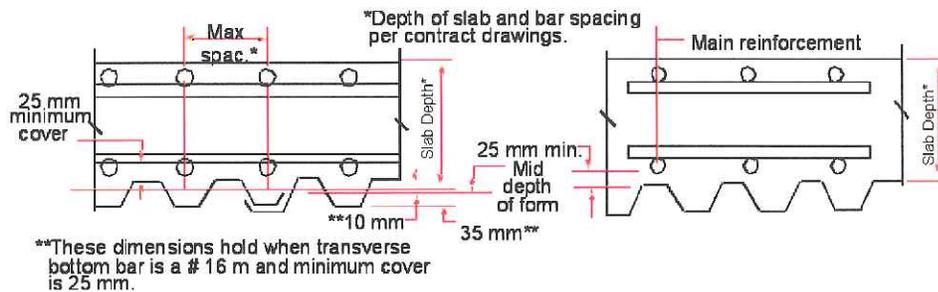


Figure 1 (metric)

- 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 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 (6mm) weep holes no less than 12 in (300 mm) 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 (25 mm) minimum clearance between the top of the form and the bottom of the main deck reinforcement. See Figure 1 (Figure 1 metric).

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 (25 mm) 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 (3 mm) 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

Pour Size in Cubic Yards (Meters)	Minimum Placement Rate in Cubic Yards (Meters) per Hour
0-25 (0-19)	10 (8)
26-50 (20-39)	15 (12)
51-75 (40-59)	20 (15)
76-100 (60-75)	25 (20)
101 and over (76 and over)	30 (25) or as designated on the Plans or in the Special Provisions

The minimum placement rate for columns shall be the same as for culvert sidewalls and wingwalls.

2. Bridge Superstructure

Pour Size in Cubic Yards (Meters)	Minimum Placement Rate in Cubic Yards (Meters) per Hour
0-25 (0-19)	15 (12)
26-50 (20-39)	20 (15)
51-75 (40-59)	25 (20)
76 and over (60 and over)	30 (25) or as designated on the Plans or in the Special Provisions

Pour handrail, parapet, curb, and barriers at a rate satisfactory to the Engineer.

3. Culverts

Structure	Minimum Placement Rate in Cubic Yards (Meters) per Hour
Footings and slabs	Same as for bridge substructures
Sidewalls and wingwalls	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.

4. Retaining Walls

Structure	Minimum Placement Rate in Cubic Yards (Meters) per Hour
Footings	Same as for bridge substructures
Walls	Same as for culvert sidewalls and wingwalls

Q. Place Concrete

Place concrete as follows:

- Do not allow aluminum to touch the concrete while mixing, transporting, handling, or placing it.
- 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."
- Manipulate the delivery or conveyance unit to avoid vibration damaging to partially set concrete.
- Immediately before placing the concrete, thoroughly clean and wet the forms.
- Place concrete as close as possible to its final position in the forms.
- Use chutes, troughs, or tubes to pour the concrete in the forms, without displacing reinforcement steel.
- Modify or stop using the equipment if chutes, troughs, or tubes cause honeycombed or otherwise inferior concrete.
- 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 (1.5 m), use pipes or tubes to place the concrete.
Do not allow concrete to free-fall more than 5 ft (1.5 m) from the pipe or tube.
10. Place concrete in horizontal layers no more than 18 in (0.5 m) 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.
16. Compact concrete using suitable tools and vibration.
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 (15 MPa) 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 (13 mm), 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 (12 m).
 - 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 (3 mm) wide, 0.125 in (3 mm) deep, and 0.50 in (13 mm) apart, center-to-center.
 - 4) Extend the grooves across the slab to within 1ft (300 mm) 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 (20 mm/m) 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 (13 mm) 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 (0.2 mm) thick with an overlap of at least 6 in (150 mm).
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 (10 °C). 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 (65 °C).
 - If aggregates or water temperatures are above 100 °F (40 °C), 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 (10 °C) 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 (32.2 °C) when measured at the point of discharge from the delivery unit.
- b. If the concrete temperature might exceed 90 °F (32.2 °C) 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 (kilogram) 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 (50 mm) of sand. Cover with at least 3 in (75 mm) 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 (150 mm).
- 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, Type 1-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 (1 L) for each 150 ft² (3.7 m²) 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 (25 mm) 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 (450 mm).
 - 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.
 - l. 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 6—Concrete Finish Types

Surface	Finish Type
Formed	Type I—Ordinary Formed Surface Finish
	Type II—Special Formed Surface Finish
	Type III—Rubbed Finish
Unformed	Type III—Special Surface Coating Finish
	Type IV—Floated Surface Finish
	Type V—Sidewalk Finish
	Type VI—Stair Tread Finish

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.

Bridge Areas Requiring a Type III Finish (X)								
	Single Bridge Over Stream	Multiple Bridges Over Stream	Single Bridge Over Railroad	Multiple Bridges Over Railroad	Single Bridge Over Traffic Artery	Multiple Bridges Over Traffic Artery	Railroad Bridge Over Traffic Artery	Pedestrian Bridge Over Traffic Artery
All exposed substructure areas, except tops and bottoms of caps. (5)					X	X	X	X
Outside surface of any exterior concrete beam, Lt. or Rt. (1), (2)		X		X				
Outside surface of any exterior concrete beam, Lt. and Rt. (1), (3)					X	X	X	X
Vertical surfaces of overhangs, curb, or sidewalk.	X	X	X	X	X	X	X	X
All vertical surfaces outside of exterior beam, Lt. or Rt. (2)		X		X				
All vertical surfaces outside of exterior beam, Lt. or Rt. (3)					X	X	X	X
End bent cap beyond outside beam or girder.	X	X	X	X				
End bent end walls beyond outside beam or girder.	X	X	X	X	X	X	X	X
End posts and end bent wingwalls all exposed surfaces.	X	X	X	X	X	X	X	X
Traffic face of curbs.	X	X	X	X	X	X		X
Entire handrails and posts, hand rail parapet, and barriers. (4), (5)	X	X	X	X	X	X	X	X
All other locations specified on Special Provisions.	X	X	X	X	X	X	X	X

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 (4 °C), unless the cold weather concrete protective measures described in Subsection 500.1.03.G, “Cold Weather Concrete Curing and Protection Plan” were used.

Table 7—Estimate of Form Removal Time

Form	Time Required
Bottom of beams	10 days
Bottom of caps, trestle pile bents	4 days
Bottom of all other caps	7 days
Overhangs and slabs, including culverts	7 days
Columns and retaining walls	18 to 48 hours
Sides of beams, posts, rails, caps, footings, wingwalls, and parapets	12 to 24 hours
Bottoms of cast-in-place rails and diaphragms	48 hours
Front face of curbs	3 hours

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 at 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 (10 °C).
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 (1 L) of mixture per 37.5 yd² (8.5 m²).
 - a. Thoroughly clean the inside of spraying equipment before putting the surface treatment in.
 - b. Keep spray nozzles within 18 in (600 mm) 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 (17 MPa).

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 (10 MPa) 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 (10 MPa) 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 (14 515 kg) axle when the bridge design loading is HS 20-44 and/or Military Loading
- Single 24,000 lb (10 886 kg) axle when the bridge design loading is HS 15-44 or H 15-44

Table 8—Weight Limits for Hauling on New Bridges

Axle Criteria	Bridge Design Loading	
	HS 20-44 and/or Military Loading	HS 15-44 or H 15-44
Maximum Axle Load Per Axle	60,000 lbs (27 216 kg)	44,000 lbs (19 958 kg)
Maximum Axle Load on Dual Axles Per Axle	45,000 lbs (20 412 kg)	33,000 lbs (14 969 kg)
Maximum Total Load	100,000 lbs (45 360 kg)	73,000 lbs (33 113 kg)

- 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 (20 MPa).
- 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 (8 km/hr) when the following loads occur:
 - Bridges designed for HS 20-44 and/or Military Loading:
 - Loads on single axles exceed 32,000 lbs (14 515 kg)
 - Loads on each dual axle exceed 24,000 lbs (10 886 kg)
 - Bridges designed for HS 15-44 or H 15-44 loading:
 - Loads on single axles exceed 24,000 lbs (10 886 kg)
 - Loads on each dual axle exceed 16,000 lbs (7257 kg)

When axle loads do not exceed these loads, ensure that vehicle speeds are 15 mph (24 kph) 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 the Department) with crushed stone or other suitable material for at least 10 ft (3 m) 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 (100 mm) 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 the Department 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 the Department 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 (13 mm).
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 (1.5 m) 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 the Office of Materials. 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 9—Planning Responsibilities

Area Planed	Person Responsible
Bridge decks	Bridge Contractor
Approach slabs constructed under the bridge Contract	Bridge Contractor
Approach slabs constructed under the roadway Contract	Roadway Contractor

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 (30 m) 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 (150 m) per day.

Omit the drainage blanket and stone for retaining walls only when the height does not exceed 6 ft (1.8 m).

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, the Department 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 (3 m) 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 (3 mm in 3 m) straightedge check made longitudinally and transversely.

E. Ride Quality Test

After the bridge decks and approach slabs are completed, the Department will perform a Ride Quality Test using the Lightweight Profiler and a profile index value determined according to GDT 134.

The Department 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 (1.8 m) 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 (235 mm/km) for each lane.

After the test is complete, correct individual bumps or depressions that exceed 2/10 in (5 mm) from the blanking band on the profiler trace.

The deck surface must then meet a 1/8 inch in 10 ft (3 mm in 3 m) 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 (meter), 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 (meter). 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 (meter) 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 (Meter)

Measurement limits on payment per cubic yard (meter) 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 (meter).

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 (1 m), with 18 in (600 mm) 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 handrailing
- 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 (meter), per Lump Sum, or per linear foot (meter), 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:

Item No.	Item	Payment
500	Superstructure concrete class____, Bridge no.____	Per lump sum
500	Concrete handrailing (designation)	Per linear foot (meter)
500	Class____concrete	Per cubic yard (meter)
500	Class____concrete, high-early strength	Per cubic yard (meter)
500	Seal concrete	Per cubic yard (meter)
500	Class B concrete base or pavement widening	Per cubic yard (meter)
500	Class____concrete including reinforcement steel	Per cubic yard (meter)
500	Class A concrete—filler	Per cubic yard (meter)
500	Class____concrete—retaining wall	Per cubic yard (meter)
500	Grooved concrete	Per square yard (meter)
500	Concrete barrier	Per linear foot (meter)

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 the Department
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

The Department will conduct ride quality testing of bridge decks and approach slabs only twice per bridge at no cost to the Contractor.

The Department will conduct additional ride quality testing at the cost of \$500 per test.

C. Plastic Shrinkage Crack Repair

The Engineer will determine how to repair cracks caused by plastic shrinking. Repair cracks at no cost to the Department.

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 (625 mm²).
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 (0.07 m³/linear meter) of pile.
4. No deduction will be made for the volume of concrete displaced by the following:
 - Steel reinforcement
 - Shear connectors

Section 500-Concrete Structures

- Floor drains (unless they are paid for as separate Pay Items)
- Incidentals 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 (meter), 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 (meter) 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.

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Structure No. 1, Dee Kennedy Rd. Over Rock Creek

<u>Line Item</u>	<u>Item</u>	<u>Unit</u>	<u>Unit No.</u>	<u>Total</u>
1	Erosion Control: To Include Type "C" Woven Filter Fabric Silt Fence, Temporary Seed and Mulch, Baled Straw, Prior To And During Construction For All Disturbed Areas	Lump Sum	100%	\$ _____
2	Remove And Dispose All Items Necessary For Construction And Installations. This Includes, But Is Not Limited To, Vegetation, Silt-Sand, Embankment Material, "Old" Southeast Concrete Wingwall, Concrete Debris	Lump Sum	100%	\$ _____
3	Shoring Along With The Construction Of A Diversion Channel If Diversion Of The Creek Is Required	Lump Sum	100%	\$ _____
4	Provide And Pressure Install Grout Into Undermining Damage Of Existing Culvert Barrels	Lump Sum	100%	\$ _____
5	Provide And Install Crushed Granite Bedding With Type II Granite Foundation Backfill Material, 12" Compacted Depth, To Be Placed On Compacted Subgrade Under (1) Southeast Concrete Wingwall Footing and Concrete Apron At Outlet End Of Existing Culvert	Lump Sum	100%	\$ _____
6	Provide And Install 3/4" No. 6, 24" Long Steel Dowel Bar Implants With Type VIII Epoxy Resin Adhesive Into Outer Wall End Of Outlet End Of Existing Culvert At 12" Center-To-Center For Wingwall Connection.	Lump Sum	100%	\$ _____
7	Provide, Form, Pour-In-Place, And Finish Class "A" Reinforced Concrete For Undermining of One Existing Northwest Wing Wall, One "New" Southeast Wingwall With Footing And For A New Apron With Toe Wall And Baffles At Outlet End Of Existing Culvert.	Lump Sum	100%	\$ _____

8	Remove And Dispose Concrete Forms And Provide And Install Foundation Backfill Material, Type I, For New Southeast Wingwall Embankment At Outlet End Of Existing Culvert	Lump Sum	100%	\$ _____
9	Epoxy Pressure Injection For (1) Crack Where Northwest Wingwall Meets Barrel At Outlet End	Lump Sum	100%	\$ _____
10	Provide & Install Type 1 Granite Stone Plain Rip Rap At Inlet End Of Existing Culvert & At Outlet End For New Apron Protection. Also Include Woven Plastic Filter Fabric With Securing Pins & A Cushioning Layer Of Concrete Sand Under Rip Rap	Lump Sum	100%	\$ _____
11	Permanent Turf Establishment At Disturbed Areas	Lump Sum	100%	\$ _____
12	Traffic Control (Barrow County Will Perform Closure Of The Road And Detour Signs If Required)	Lump Sum	100%	\$ _____
			Subtotal NO.1	\$ _____

Structure No.2, Bill Rutledge Rd. Over Yargo Tributary

<u>Line Item</u>	<u>Item</u>	<u>Unit</u>	<u>Unit No.</u>	<u>Total</u>
1	Erosion Control: To Include Type "C" Woven Filter Fabric Silt Fence, Temporary Seed and Mulch, Baled Straw, Prior To And During Construction For All Disturbed Areas	Lump Sum	100%	\$ _____
2	Remove And Dispose All Items Necessary For Construction And Installations. This Includes, But Is Not Limited To, Vegetation, Silt-Sand, Embankment Material	Lump Sum	100%	\$ _____
3	Shoring Along With The Construction Of A Diversion Channel If Diversion Of The Creek Is Required	Lump Sum	100%	\$ _____

4	Provide, Form, Pour-In-Place, And Finish Class "A" Reinforced Concrete into the Undermining Damage of Existing Southeast Wing Wall, Outlet End	Lump Sum	100%	\$ _____
5	Epoxy Pressure Injection for (1) Crack In Southeast Wingwall, Outlet End.	Lump Sum	100%	\$ _____
6	Permanent Turf Establishment At Disturbed Areas	Lump Sum	100%	\$ _____
7	Traffic Control (Barrow County Will Perform Closure Of The Road And Detour Signs If Required)	Lump Sum	100%	\$ _____
8	Remove and Dispose Of Concrete Forms and Provide and Install Foundation Backfill Material, Type 1, For Southeast Wingwall Embankment At Outlet End	Lump Sum	100%	\$ _____
Subtotal NO.2				\$ _____
Bid Total				\$ _____

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
30 North Broad Street
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

SURETY

_____(Seal)
Bidder's Name and Corporate Seal

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title:

By: _____
Signature and Title:
(Attach Power of Attorney)

Attest: _____
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.

PAYMENT BOND

BARROW COUNTY, GEORGIA

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 (as OWNER, 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, dated _____, which is incorporated herein by reference in its entirety (hereinafter referred to as the “CONTRACT”), for the construction of a project known as RFB2016-15 (PROJECT #RM008) Concrete Bridge Culvert Repair, (hereinafter referred to as “the PROJECT”).

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 on this ____ day of _____, 20____.

(Name of Principal)

By: _____ (Print/Type)

_____ (Signature)

Title: _____ (SEAL)

(Signatures Continued on Next Page)

Attest:

_____ (Print/Type)

_____ (Signature)

Title: _____

Date: _____

(Name of Contractor's Surety)

By: _____ (Print/Type)

_____ (Signature)

Title: _____ (SEAL)

Attest:

_____ (Print/Type)

_____ (Signature)

Title: _____

Date: _____

(ATTACH SURETY'S POWER OF ATTORNEY)

PERFORMANCE BOND

BARROW COUNTY, GEORGIA

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 (as OWNER, 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, dated the ____ of _____, 20__ which is incorporated herein by reference in its entirety (hereinafter referred to as the “CONTRACT”), for the construction of a project known as RFB2016-15 (Project # RM008) – Concrete Bridge Culvert Repair, (hereinafter referred to as “the PROJECT”).

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 of 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) 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, this _____ day of _____, 20____.

(Name of Principal)

By: _____ (Print/Type)

_____ (Signature)

Title: _____ (SEAL)

Attest:

_____ (Print/Type)

_____ (Signature)

Title: _____

Date: _____

(Name of Contractor's Surety)

By: _____ (Print/Type)

_____ (Signature)

Title: _____ (SEAL)

Attest:

_____ (Print/Type)

_____ (Signature)

Title: _____

Date: _____

(ATTACH SURETY'S POWER OF ATTORNEY)

CONSTRUCTION SERVICES AGREEMENT
FOR CONCRETE BRIDGE CULVERT REPAIR

This Construction Services Agreement (the "Agreement") is made and entered into this ____ day of _____, 20__, 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"), 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, the County desires to employ a contractor to perform services for the construction of a Project, as defined below; and

WHEREAS, the County solicited bids for construction of the Project pursuant to Barrow County Request for Bid 2016-15, Project Number RM008, dated February 17, 2016; (the "RFB" a copy of which is maintained in the files of the Barrow County Purchasing Department); and

WHEREAS, the Contractor submitted a complete and timely bid and met all bid requirements such that the County awarded Project Number RM008 to the Contractor; and

WHEREAS, the County finds that specialized knowledge, skills, and training are necessary to perform the Work 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 to perform the construction services described herein, 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 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

The following documents, attached hereto and incorporated herein by reference, constitute the Contract Documents:

- A. This Agreement;
- B. Request for Bid (maintained on file with the Purchasing Department);
- C. Bid Documents from Contractor, dated _____, _____, with portions attached hereto as Exhibit “A”;
- D. Performance Bond and Payment Bond (included in the RFB maintained on file with the Purchasing Department);
- E. Noncollusion Affidavit of Prime Bidder, attached hereto as Exhibit “B”;
- F. Final Affidavit, attached hereto as Exhibit “C”;
- G. Alien Employment affidavits attached hereto as Exhibits “D” and “E”;
- H. Plans and specifications, including but not limited to the Specifications, the Georgia Department of Transportation Specifications Standards, and Special Provisions, Georgia Department of Transportation Drawings, Location Maps, Existing Structure Drawings, Georgia Department of Transportation Inspection Report, and Detail of Dowel Bar Implants (included in the RFB maintained on file with the Purchasing Department), with any modifications (if issued) attached hereto as Exhibit “F”;
- I. Key Personnel, attached hereto as Exhibit “G”;
- J. Notice of Award, attached hereto as Exhibit “H”;
- K. Barrow County Code of Ethics;
- L. The following, which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All 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 follows: RFB2016-15 Project #RM008, concrete bridge culvert repair at structure No. 1 Dee Kennedy Rd. over Rock Creek and concrete culvert repair at structure No.2 Bill Rutledge Rd. over Yargo Tributary (the “Project”).

Section 3. The Work

Contractor is responsible for providing and installing all materials necessary for the repair of the (Structure No.1) triple-barrel concrete bridge culvert located on Dee Kennedy Rd. over Rock Creek and (Structure No.2) single-barrel concrete culvert located at Bill Rutledge Rd. over Yargo Tributary. Contractor is responsible for providing and installing all materials as shown on Bid Sheet and Attached Specifications and Drawings, the Georgia Department of Transportation Specifications Standards, and Special Provisions, Georgia Department of Transportation Drawings, Location Maps, Existing Structure Drawings, Georgia Department of Transportation Inspection Report, and Detail of Dowel Bar Implants. Contractor is responsible for providing all labor, satisfactory workmanship and safety precautions associated with the Bid Sheet, and Attached Specifications and Drawings. Contractor is responsible for coordination with the Barrow County Stormwater Department. Contractor is responsible for notifying the Utilities Protection Center and any utility conflicts or cut utilities. Contractor is responsible for erosion and sediment control. Erosion and sediment control material, as shown on bid sheet, shall be installed prior to and during construction. Contractor is responsible for insuring erosion and sediment control materials are maintained, removed or replaced if required by Barrow County during construction and until project is complete. Contractor is responsible for notifying adjoining landowner of any conflicts with drainage or access if required. Contractor is responsible for insuring traffic control is provided for this project and is satisfactory to Barrow County. Traffic control shall be provided by Contractor for Dee Kennedy Rd. and Bill Rutledge Rd. and shall be in accordance with the current edition of the M.U.T.C.D. (this includes, but is not limited to all permanent and temporary “Construction Ahead” signs, barrels, flagmen, and other safety requirements as required). Barrow County is responsible for road closures and detour signs if required.

Contractor is responsible for insuring that all material and labor used for this project is in accordance with current Georgia Department of Transportation standards and specifications. Contractor is responsible for insuring that all materials and installations are in accordance with the current edition of the Department of Transportation, State of Georgia, Standard Specifications Construction of Roads and Bridges.

The County will issue a Notice to Proceed, which Notice to Proceed shall state the dates for beginning Work and for achieving Final Completion of Work. Work shall commence within five (5) days of County’s issuance of the Notice to Proceed.

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.

Section 4. Contract Periods; Liquidated Damages

- A. Contract Periods/Contract Term. 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 on or before a date to be specified on a written “Notice to Proceed” provided by the County (the “Commencement Date”), and the Parties intend that all Work shall be completed on or before the date **120 days following the of commencement specified in the Notice to Proceed**. Every effort will be made by Contractor to shorten this period. If the Term of this Agreement is longer than one year, 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 December 31 each calendar year of the Term, and further, that this Agreement shall automatically renew on January 1 of each subsequent calendar year absent the County’s provision of written notice of non-renewal to Contractor at least five (5) days prior to the end of the then current calendar year. Title to any supplies, materials, equipment, or other personal property shall remain in Contractor until fully paid for by the County.
- B. Liquidated Damages. The County and Contractor recognize 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 Fifty and 00/100 Dollars (\$150.00)** for each and every day that expires after the deadlines provided herein, or agreed to in writing by both Parties in a change order.
- C. Expediting Completion. The Contractor is accountable for completing the Work within the time period provided in the Contract Documents, or as otherwise amended by a change order. 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 insure 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.

Section 5. Contractor's Compensation; Time and Method of Payment

- A. The total amount paid under this Agreement as compensation for Work performed and reimbursement for costs incurred shall not, in any case, exceed \$_____.__, except as outlined in Section 6 below (the "Contract Price"). The compensation for Work performed shall be based upon the unit price shown on the Contractor's Bid Form and actual quantities installed.
- B. County agrees to pay the Contractor for the Work performed and costs incurred by Contractor upon certification by the County that the Work was actually performed and costs actually incurred in accordance with this Agreement. 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, actual quantities installed and costs incurred. Invoices shall be submitted on a monthly basis, and such invoices shall reflect charges incurred versus charges 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.
- C. 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 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 Final Completion. Once fifty percent (50%) of the 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. 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 Final Completion of the Work and as the County determines the Work to be reasonably satisfactory, the County shall, within 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, an amount equal to 200 percent of the value of each item as determined by the County shall be withheld until such item or items 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.

Neither final payment nor any retained percentage shall become due until the Contractor submits to the County: (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 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.

- D. 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 change orders, as described in Section 6 below. The County shall pay the Contractor within thirty (30) days after approval of the invoice by County staff, less any retainage as described in this Section. No payments will be made for unauthorized work. Upon the County's certification of Completion of the Project, an invoice should be submitted to the Barrow County Engineering Department, 30 North Broad Street, Winder, Georgia 30680 for approval, with a copy submitted electronically to payables@barrowga.org. 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.

Section 6. Change Orders

- A. "Change order" means a written modification of the Contract Documents, signed by the County and the Contractor.
- B. 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. 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. 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 total amount to be paid under this Agreement, as set forth in Section 5 above. Any such change orders materially altering the terms of this Agreement, or increasing the total amount to be paid under this Agreement in excess of \$25,000.00, must be approved by the resolution of the Barrow County Board of Commissioners.

Section 7. Covenants of Contractor.

A. Ethics Code

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.

B. Time is of the Essence

Contractor specifically acknowledges that TIME IS OF THE ESSENCE for completion of the Project.

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.

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. Contractor further 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. Contractor represents that it has given the County written notice of all conflicts, errors, or discrepancies that the Contractor has discovered in the Contract Documents, and the written resolution thereof by the County is acceptable to the 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 applicable federal, state, and local laws, regulations, codes, ordinances, or orders applicable to the Project. Further, the Contractor agrees to bear the full cost of correcting the Contractor's negligent or improper Work, the negligent or improper work of its contractors and subcontractors, and any harm caused by such negligent Work.

The Contractor's duties shall not be diminished by any approval by the County of Work completed or produced; nor shall the Contractor be released from any liability by any approval by the County of Work completed or produced, 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.

In the event that during the course of performing the Work, the Contractor discovers or reasonably should discover that there exists in any drawings, specifications, plans, sketches, instructions, information, requirements, procedures, and other data supplied to the Contractor (by the County or any other party) that is, in the Contractor's opinion, unsuitable, improper, or inaccurate for the purposes for which the document or data is furnished, Contractor shall promptly inform the County of such inaccuracies, impropriety, issues or concerns.

D. 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.

E. 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 principals.

F. 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.

G. Contractor's Representative

_____ shall be authorized to act on Contractor's behalf with respect to the Work as Contractor's designated representative.

H. Assignment of Agreement

The Contractor covenants and agrees not to assign or transfer any interest in, nor 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.

I. 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. Contractor shall defend, indemnify, and hold harmless the County, its officers, boards, commissions, elected and appointed officials, employees, servants, volunteers and agents (hereinafter referred to as "County Parties") from and against any and all claims, injuries, suits, actions, judgments, damages, losses, costs, expenses, and liability of any kind whatsoever, including but not limited to, attorney's fees and costs of defense (hereinafter "Liabilities"), which may be the result of willful, negligent, or tortious conduct 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 negligent act 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 the County or County Parties. 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 the County or County Parties, by any employee of 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, 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 County and County Parties shall survive expiration or termination of this Agreement, provided that the claims are based upon or arise out of actions that occurred during the performance of this Agreement.

J. 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. The Contractor agrees to be solely responsible for its own matters relating to the time and place the services are performed; 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 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. 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. 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.

K. 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 Attorney to form and content. These requirements are subject to amendment or waiver if so approved in writing by the County Manager.
- (2) Minimum Limits of Insurance: Contractor shall maintain the following insurance policies with limits no less than:
 - (a) Comprehensive General Liability policy of \$1,000,000 (one million dollars) combined single limit per occurrence \$2,000,000 (two million dollars) aggregate for bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom.
 - (b) Comprehensive Automobile Liability policy (covering owned, non-owned, and hired automobiles) of \$1,000,000 (one million dollars) combined single limit per occurrence \$2,000,000 (two million dollars) aggregate for bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom.
 - (c) Workers' Compensation policy with limits as required by the State of Georgia and Employers Liability limits of \$1,000,000 (one million dollars) per accident.

- (3) Deductibles and Self-Insured Retentions: Any deductibles or self-insured retentions must be declared to and approved by the County in writing.
- (4) Other Insurance Provisions: The policy is to contain, or be endorsed to contain, the following provisions:
 - (a) General Liability and Automobile Liability Coverage.
 - (i) The County and County Parties are to be covered as 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 County or County Parties.
 - (ii) The Contractor's insurance coverage shall be primary noncontributing insurance as respects to any other insurance or self-insurance available to the County or County Parties. Any insurance or self-insurance maintained by the County or County Parties shall be in excess of the Contractor's insurance and shall not contribute with it.
 - (iii) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the County and County Parties.
 - (iv) Coverage shall state that the Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought.
 - (v) 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) The insurer shall agree to waive all rights of subrogation against the County and County 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 County and County Parties for losses arising from work performed by the Contractor for the County.

- (c) Builder's Risk Insurance. Contractor shall provide a Builder's Risk Insurance Policy to be made payable to the County and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract price, written on a Builder's Risk "All Risk," or its equivalent. The policy shall provide, or be endorsed to provide, as follows: "The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy: i) Equipment may be delivered to the insured premises and installed in place ready for use; and ii) Partial or complete occupancy by Owner; and iii) Performance of Work in connection with construction operations insured by the Owner, by agents or lessees, or other Contractors of the Owner or Using Agency."
- (d) All Coverages:
- (i) Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the County.
- (ii) Policies shall have concurrent starting and ending dates.
- (5) Acceptability of Insurers: Insurance is to be placed with insurers licensed to do business in Georgia and with an A.M. Best's rating of no less than A:VII.
- (6) Verification of Coverage: Contractor shall furnish the County with certificates of insurance and endorsements to the policies evidencing coverage required by this Section prior to the start of Work. The certificate of insurance and endorsements shall be on a form utilized by Contractor's insurer in its normal course of business and shall be received and approved by the County prior to execution of this Agreement by the County. 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 at least two (2) weeks prior to the expiration of the coverage.
- (7) Subcontractors: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated in this Agreement, including but not limited to naming the County and County 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.
- (9) County as Additional Insured and Loss Payee: The County and County Parties shall be named as additional insureds and loss payees on all policies required by this Agreement, except the County need not be named as an additional insured and loss payee on any Professional Liability policy or Workers' Compensation policy.

L. Bonds

The Contractor shall provide Performance and Payment bonds on the forms attached 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 the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

M. Employment of Unauthorized Aliens Prohibited

(1) E-Verify Affidavit

It is the policy of the County that unauthorized aliens shall not be employed to perform work on County contracts involving the physical performance of services. Therefore, the County shall not enter into a contract for the physical performance of services within the State of Georgia unless the Contractor shall provide evidence on County-provided forms, attached hereto as Exhibits "D" and "E" (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 Contractor's subcontractors have conducted a verification, under the federal Employment Eligibility Verification ("EEV" or "E-Verify") program, of the social security numbers, or other identifying information now or hereafter accepted by the E-Verify program, of all employees who will perform work on the County contract to ensure that no unauthorized aliens will be employed. The Contractor hereby verifies that it has, prior to executing this Agreement, executed a notarized affidavit, the form of which is provided in Exhibit "D", and submitted such affidavit to County. 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 "E", and such subcontractor affidavit shall become part of the contractor/subcontractor

agreement. Further, Contractor agrees to provide completed copies of Exhibit “E” to the County within five (5) business days of receipt from any subcontractor.

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 three (3) years following completion of the contract.

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 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 Rule 300-10-1-.02. Contractor’s compliance with the requirements of O.C.G.A. § 13-10-91 and Rule 300-10-1-.02 shall be attested by the execution of the contractor’s affidavit, attached hereto as Exhibit “D” and incorporated herein by this reference.

Contractor agrees that the employee-number category designated below is applicable to the Contractor.

_____ 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, 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.

N. Records, Reports and Audits

(1) Records:

(a) Records shall be established and maintained by the Contractor in accordance with requirements prescribed by the County with respect to all matters covered by this Agreement. Except as otherwise authorized, such records shall be maintained for a period of three years from the date that final payment is made under this Agreement. Furthermore, records that are the subject of audit findings shall be retained for three years or until such audit findings have been resolved, whichever is later.

(b) All costs 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 statements, records, reports, data, and information related to matters covered by this Agreement in the form requested by the County.

(3) Audits and Inspections: At any time during normal business hours and as often as the County may deem necessary, there shall be made available to the County for examination all records with respect to all matters covered by this Agreement. The Contractor will permit the County to audit, examine, and make excerpts or transcripts from such records, and to audit all contracts, invoices, materials, payrolls, records of personnel, conditions of employment, and/or data relating to all matters covered by this Agreement.

O. 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 Record's 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.

P. Licenses, Certifications and Permits

The Contractor covenants and declares that it has obtained all diplomas, certificates, licenses, permits, or the like required by any and all national, state, regional, county, 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. All work performed by Contractor under this Agreement shall be in accordance with applicable legal requirements and shall meet the standard of quality ordinarily expected of competent professionals. The Contractor shall furnish copies of all such permits, licenses, or approvals to the County within ten (10) days after issuance.

Q. Key Personnel

All of the individuals identified in Exhibit "G" 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 "G", 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 Section shall constitute a material breach of Contractor's obligations under this Agreement and shall be grounds for termination. Contractor shall not subcontract with any third party for the performance of any portion of the Work without the prior written consent of the County. Contractor shall be solely responsible for any such subcontractors in terms of performance and compensation.

R. 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.

S. Ownership of Work

All reports, designs, drawings, plans, specifications, schedules, work product, and other materials 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 such materials. Any such materials remaining in the hands of the Contractor or subcontractor upon completion or termination of the Work shall be delivered immediately to the County. The Contractor assumes all risk of loss, damage or destruction of or to such 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.

T. 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 the contract at no additional cost to the County. Meetings will occur as problems arise and will be coordinated by the County. The Contractor will be given a minimum of three full working 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 to make a good faith effort to resolve problems, may result in termination of the contract.

U. 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

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.

Section 8. Covenants of the County

A. Right of Entry

The County shall provide for right of entry for Contractor to enter the respective property in order for Contractor to complete the Work.

Section 9. Warranty

The Contractor shall repair or replace all defects in materials, equipment, or workmanship appearing within one year from the date of Final Completion at no additional cost to the County. Further, Contractor shall provide all maintenance services, including parts and labor, for one year 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 one-year general warranty period to identify any issues that must be resolved by the Contractor. After the expiration of such warranty period, County shall be responsible for repairing issues resulting from normal wear and tear and shall be responsible for general maintenance of the Work; however, expiration of such warranty period shall not affect the Contractor's continued liability under an implied warranty of merchantability and fitness. All other warranties implied by law, including fitness for a particular purpose and suitability, are hereby preserved and shall apply in full force and effect beyond the one-year period.

Section 10. Termination

A. The County may terminate this Agreement for convenience at any time upon providing written notice thereof to Contractor at least seven (7) calendar days in advance of the termination date. In the event of a termination for convenience, Contractor shall take immediate steps to terminate work as quickly and effectively as possible and shall terminate all commitments to third-parties, unless otherwise instructed by the County. Provided that no damages are due to the County for Contractor's failure to perform in accordance with this Agreement, the County shall pay Contractor for work performed to date in accordance with Section 5 herein.

The County shall have no further liability to Contractor for such termination. Further, 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 Contract Price.

- B. The County may terminate this Agreement for cause if Contractor breaches any material provision of this Agreement. The County shall give Contractor seven (7) days written notice of its intent to terminate the Agreement and the reasons therefore, 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. The County will make no payment to the Contractor or its Surety until 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 will pay the difference to the County.

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.

- C. 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 treated as a termination for convenience under the terms of Section 10(A) above.
- D. Upon termination, the Contractor shall: (1) promptly discontinue all services affected, unless the notice 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.
- E. The Contractor shall have no right to terminate this agreement prior to completion of the Work, except in the event of the County's failure to pay the Contractor within thirty (30) days of Contractor providing the County with notice of a delinquent payment and an opportunity to cure.
- F. 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. Miscellaneous

- A. Defined Terms. Terms used in this Agreement shall have their ordinary meaning, unless otherwise defined below or elsewhere in the Contract Documents.
- (i) “Final Completion” means when the Work has been completed in accordance with terms and conditions of the Contract Documents.
- B. Complete Agreement. This Agreement, including 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 and binding. This Agreement may be modified or amended only by a written document signed by representatives of both Parties with appropriate authorization.
- C. Governing Law. This Agreement shall be governed by and construed under the laws of the State of Georgia. Any action or suit related to this Agreement shall be brought in the Superior Court of Barrow County, Georgia.
- D. 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.
- E. Invalidity of Provisions; Severability. Should any article(s) or section(s) of this Agreement, or any part thereof, later be deemed 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 which may for any reason be hereafter declared invalid.
- F. 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.
- G. 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 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 Parties at the addresses given below, or at a substitute address previously furnished to the other Parties by written notice in accordance herewith:

NOTICE TO THE COUNTY shall be sent to:

County Manager
c/o Barrow County Board of Commissioners
30 North Broad Street
Winder, Georgia 30680

NOTICE TO CONTRACTOR shall be sent to:

Future changes in address shall be effective only upon written notice being given by the County to the Contractor or by the Contractor to the County Manager via one of the delivery methods described in this Section.

- H. 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.
- 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 County Party. No County Party 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. 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 employee, officer, director, or elected or appointed official.

- 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, nor 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. 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.

IN WITNESS WHEREOF, the County and the Contractor have executed this Agreement effective as of the date first above written.

[SIGNATURES ON FOLLOWING PAGE]

CONTRACTOR: _____

BARROW COUNTY, GEORGIA

By: _____

_____, _____
[NAME AND TITLE]

_____, _____
[NAME AND TITLE]

[CORPORATE SEAL]

[COUNTY SEAL]

SIGNED, SEALED, AND DELIVERED
in the presence of:

SIGNED, SEALED, AND DELIVERED
in the presence of:

Witness

Witness

Notary Public

Notary Public

[NOTARY SEAL]

[NOTARY SEAL]

My Commission Expires:

My Commission Expires:

EXHIBIT “A”

[BID DOCUMENTS]

EXHIBIT "B"

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

**STATE OF GEORGIA
COUNTY OF BARROW**

_____, 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 or 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 to or refrain from bidding in connection with such Contract, or has in any 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 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, included in this affidavit.

(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 "C"

FINAL AFFIDAVIT

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 Project #RM008 Concrete Culvert Repairs 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 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 "D"

STATE OF GEORGIA

COUNTY OF BARROW

CONTRACTOR AFFIDAVIT AND AGREEMENT

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:

Federal Work Authorization User Identification
Number

Date of Authorization

Name of Contractor

Name of Project

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.
Executed on _____, ____, 20__ 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 _____,
20__.

Notary Public

[NOTARY SEAL]

My Commission Expires:

EXHIBIT "E"

STATE OF GEORGIA

COUNTY OF BARROW

SUBCONTRACTOR AFFIDAVIT

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

Name of Public Employer

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

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

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF
_____,201__.

NOTARY PUBLIC

[NOTARY SEAL]

My Commission Expires:

EXHIBIT "F"

EXHIBIT “H”

[INSERT NOTICE OF AWARD]

NOTICE OF AWARD

TO: _____

PROJECT TITLE: RFB2016-15 (Project #RM008) – Concrete Bridge Culvert Repair

Barrow County Board of Commissioners (Owner) has considered the Bid submitted by you for the above described Project which was opened and read on _____, 2016. 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 insure Project is completed on schedule.

Please acknowledge a copy of this Notice of Award and return it to: Misty Landers, Finance Department, Barrow County Board of Commissioners, 30 North Broad Street, Winder, GA 30680.

Dated this _____ day of _____, 2016.

BARROW COUNTY BOARD OF COMMISSIONERS (OWNER)

By: _____

Jimmy Terrell, Interim County Manager

ACCEPTANCE OF NOTICE OF AWARD:

RECEIPT OF THIS NOTICE OF AWARD IS HEREBY ACKNOWLEDGED:

BY: _____ TITLE: _____

DATED THIS THE _____ DAY OF _____, 2015.

NOTICE TO PROCEED

TO: _____

PROJECT DESCRIPTION: RFB2016-15 (Project #RM008) – Concrete Bridge Culvert Repair

You are hereby notified to commence Work in accordance with the Agreement dated _____ on or before _____ and you are to complete the Work in accordance with Agreement.

Date this ___ day of _____, 2016.

BY: _____, Jimmy Terrell, Interim County Manager
BARROW COUNTY BOARD OF COMMISSIONERS (OWNER)

Receipt of the above "Notice to Proceed" is hereby acknowledged by _____
_____ this the _____ day of
_____, 2016.

BY: _____ (CONTRACTOR)
TITLE: _____

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

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 an 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 affidavits(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 within 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