

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

TABLE OF CONTENTS FOR PROVISIONS

FORMS and SCHEDULE OF ITEMS PRECEDE SPCNs, SPs and SUPPLEMENTAL SPECS.

(c100ai02)	GENERAL PROJECT REQUIREMENTS, SSs, SPs, & SPCNs	3-5-09c (SPCN)	1
(c100b01)	LABOR	8-6-08 (SPCN)	1
(c105hf1)	SECTION 105.06 SUBCONTRACTING	12-19-08 (SPCN)	1
(c108lg0)	SEC. 108.06(b) LIQUIDATED DAMAGES	1-14-08 (SPCN)	2
(c302h00)	SECTION 302.03(b) PRECAST DRAINAGE STRUCTURES	1-14-08 (SPCN)	2
(c512h00)	CONTRACTOR PROP. ALTERNATIVE TRAFF. CONTR. PLANS	Re. 7-08 (SPCN)	3
(c512i00)	POLICE PATROLS	Re. 7-08 (SPCN)	3
(c518b00)	SECTION 518.02(a) NUMBER OF TRAINEES	Re. 7-08 (SPCN)	4
SECTION 303.06	MEASUREMENT AND PAYMENT	08-25-09(SPCN)	4
SECTION 406.04	MEASUREMENT AND PAYMENT	07-08-09 (SPCN)	4
SECTION 411	PROTECTIVE COATING OF METAL IN STRUCTURES	07-24-09 (SPCN)	5
SECTION 413.02	PROCEDURE	06-18-09 (SPCN)	5
SECTION 513	– MOBILIZATION	08-20-09 (SPCN)	5
SECTION 517	—CONTRACTOR CONSTRUCTION SURVEYING	08-20-09 (SPCN)	5
ANCHOR BOLT REPLACEMENT		07-14-09 (SPCN)	6
DEMOLITION NOTIFICATION		03-18-09 (SPCN)	6
MANDATORY PRE-BID SHOWING CONFERENCE		08-18-09 (SPCN)	7
RICHMOND DISTRICT- DISALLOWANCE OF VERTICAL CLEARANCE REDUCTIONS		05-08-08 (SPCN)	7
REMOVAL OF EXISTING RETAINING STRUCTURES		09-18-09 (SPCN)	7
PERSONNEL REQUIREMENTS FOR WORK ZONE TRAFFIC CONTROL		06-11-09 (SPCN)	8
SF001AF	- PREDETERMINED MINIMUM WAGE RATES VA11	Re. 7-08	9
SF010CF	- FHWA 1273, MEMORANDUM AND CFR CHANGE	1-19-09	13
SF030AF	- NOTICE OF REQUIRE. FOR AFFIRM. ACT. TO ENSURE EEO	Re. 7-08	34
S100B00	- PROJECT COMMUNICATION AND DECISION MAKING	Re. 7-08	40
S102CF1	- USE OF DOMESTIC MATERIAL	2-26-09	44
S107E01	- VOLATILE ORGAN. COMP'ND (VOC) EMISSIONS CONTR'L AREAS	7-15-08	47
S107G01	- C-45—SWPPP GEN. PERMIT—CONTRACTOR & SUB. CERTIF.	2-19-09	49
S107HF0	- SECTION 107.15	1-17-08cc	50
S107I00	- SECTION 107.19—RAILWAY - HIGHWAY PROVISIONS	1-14-08	68
S109F00	- OPTIONAL ADJUSTMENT FOR FUEL	Re. 7-08c	70
S109G03	- ASPHALT MATERIAL PRICE ADJUSTMENT	7-30-08CC	72
S223AG0	- CORROSION RESISTANT REINFORCING STEEL	11-19-09	75
S302G01	- FLOWABLE BACKFILL	7-30-08c	76
SS21201	- SUPP. SECTION 212—JOINT MATERIALS	1-17-08	78
SS21402	- SUPP. SEC. 214—HYDRAULIC CEMENT	1-28-08	79
SS21501	- SUPP. SEC. 215—HYDRAULIC CEMENT CONCRETE ADMIXTURES	1-28-08	80
SS21702	- SUPP. SEC. 217—HYDRAULIC CEMENT CONCRETE	12-4-09c	81
SS22401	- SUPP. SEC. 224—CASTINGS	11-15-07	86
SS22601	- SUPP. SECTION 226—STRUCTURAL STEEL	12-16-08	87
SS23201	- SUPP. SEC. 232—PIPE AND PIPE ARCHES	8-4-09	88
SS23802	- SUPP. SEC. SECTION 238—ELECTRICAL AND SIGNALS COMPONETS	3-4-08	89
SS40701	- SUPP. SEC. 407—STEEL STRUCTURES	1-25-10	91
SS41301	- SUPP. SEC. 413—DISMANTLE/REMOVE ALL/PART OF EXIST. STRUCT.	8-5-08	92
SS41401	- SUPP. SEC. 414—RIPRAP	1-25-10	93
SS50101	- SUPP. SEC. 501—UNDERDRAINS	1-25-10	94
SS51202	- SUPP. SEC. 512—MAINTAINING TRAFFIC	6-11-09	95
SS70003	- SUPP. SEC. 700—GENERAL	6-9-08	97
SS70101	- SUPP. SECTION 701—TRAFFIC SIGNS	1-22-09	102

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

INSPECTION OF BRIDGE STRUCTURES FOR ASBESTOS CONTAINING MATERIALS (ACM)	
02-09-09.....	103
LIGHTWEIGHT AGGREGATE HYDRAULIC CEMENT CONCRETE 10-26-09.....	105
JOINT SEALER RAPID CURE 10-09-09.....	112
REMOVAL OF ASBESTOS FROM BRIDGE STRUCTURES 08-17-09.....	113
POST-TENSIONING GROUT 01-15-09.....	118
HIGH STRENGTH POST-TENSIONING BAR TENDONS 10-07-09.....	121
EPOXY JOINING OF PRECONSTRUCTED COMPOSITE UNITS 10-07-09.....	137
CONCRETE SLOPE PROTECTION REPAIR 08-11-09.....	143
OVERHEAD TRANSMISSION LINES DOMINION VA POWER 08-18-09.....	144
TEMPORARY CONSTRUCTION CROSSING 06-30-09.....	146
TEMPORARY SUPPORT SYSTEM AT B692 10-07-09.....	147
DRILLED SHAFTS 10-07-09.....	148
CASTING YARD 07-10-09.....	171
REMOVAL AND RECONSTRUCTION OF EXISTING MEDIAN BARRIER DROP INLET 08-19-09.....	173
MECHANICALLY STABILIZED EARTH WALLS (SEGMENTAL BLOCK FACING) 07-01-09.....	174
MECHANICALLY STABILIZED EARTH WALLS (CONCRETE PANEL FACING) 07-01-09.....	182
GRINDING CONCRETE IN-PLACE PCUs 03-11-10.....	189
TRAFFIC OPERATIONS 07-28-09.....	190
WORK ZONE TRAFFIC CONTROL MANAGEMENT 06-19-09.....	192
OPEN JOINTS ON BRIDGE SIGN 03-12-10.....	195
PCU TRANSPORT PLAN 07-14-09.....	196
CPM PROGRESS SCHEDULE 12-31-09.....	197
FORMALPARTNERING 07-16-09.....	219
LIMITATION OF OPERATIONS 03-25-10.....	221
“NO EXCUSES” INCENTIVE/ DISINCENTIVE 03-29-10.....	226
CERTIFICATE OF COMPLIANCE WITH ARMY CORPS OF ENGINEERS PERMIT	228
NATIONWIDE PERMIT 3 - Maintenance 03-11-09.....	229
VIRGINIA GENERAL PERMIT (VGP) 03-11-09.....	232
ESCROW OF BID PREPARATION DOCUMENTS 3-19-08.....	234
MAGNESIUM PHOSPHATE Mg NH(4) PO(4) CONCRETE WORK 03-10-10.....	237
EPOXY INJECTION PRESSURE CRACK SEALING 02-05 10.....	241
NOTICE OF AUTHORIZATION FOR EROSION & SILTATION PERMIT (12 PAGES)	242
CSXT RAILWAY WORK REQUIREMENTS 01-05-10.....	254
CSX TRANSPORTATION, INC. PREPARED RAILROAD BALLAST 12-16-09.....	258
CSXT CONSTRUCTION SUBMISSION REQUIREMENTS 12-16-09.....	262
EXECUTED RAILROAD AGREEMENT FOR THE LOMBARDY BRIDGE (20 PAGES)	295
SECTION 217.06 (TABLE II-17) CLASSIFICATION OF CONCRETE MIXTURES 05-12-10 (SPCN).....	296
PRICE ADJUSTMENT FOR STEEL 05-19-10.....	297
CATHODIC PROTECTION OF REINFORCED CONCRETE STRUCTURES 04-12-10.....	306
ELECTROCHEMICAL CHLORIDE EXTRACTION 04-12-10.....	317
SS1D009 - SUPP. DIVISION I—GENERAL PROVISIONS 2-19-10c.....	328
SS21105 - SUPP. SECTION 211—ASPHALT CONCRETE 2-9-10cc.....	337
SS31505 - SUPP. SEC. 315—ASPHALT CONCRETE PLACEMENT 2-9-10c.....	344
TRANSPORTATION MANAGEMENT PLAN (21 PAGES) 6-4-10.....	352
MOVEABLE BARRIER SERVICE 06-14-10.....	373

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(c100ai02-0609) GENERAL PROJECT REQUIREMENTS, SUPPLEMENTAL SPECIFICATIONS (SSs), SPECIAL PROVISIONS (SPs) AND SPECIAL PROVISION COPIED NOTES (SPCNs)

This project shall be constructed in accordance with: the plans; the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007; and the *Virginia Department of Transportation Road and Bridge Standards*, dated 2008; the *Virginia Work Area Protection Manual*, dated May 1, 2005; the 2003 edition of the *MUTCD*; and Supplemental Specifications, Special Provisions and Special Provision Copied Notes in this contract.

Special Provision Copied Notes in this contract are designated with “(SPCN)” after the date.

The information enclosed in parenthesis “()” at the left of each Special Provision Copied Note in this contract is file reference information for Department use only. The information in the upper left corner above the title of each Supplemental Specification and Special Provision in this contract is file reference information for Department use only.

The Department has identified the system of measurement to be used on this particular project as imperial. Any imperial unit of measure in this contract with an accompanying expression in a metric unit shall be referred to hereinafter as a “dual unit” measurement. Such a “dual unit” measurement is typically expressed first in the imperial unit followed immediately to the right by the metric unit in parenthesis “()” or brackets “[]” where parenthesis is used in the sentence to convey other information. Where a “dual unit” of measure appears in this project, only the imperial unit shall apply. The accompanying metric unit shown is not to be considered interchangeable and mathematically convertible to the imperial unit and shall not be used as an alternate or conflicting measurement.

3-5-09c (SPCN)

(c100b01-0908) LABOR—Contact may be made in advance of the starting date with the Job Service Office of the Virginia Employment Commission at a location near you to secure referral of available qualified workers in all occupational categories. The closest office near you may be obtained from the VEC website at <http://www.vec.virginia.gov>. Click on “Work Force Centers”.

8-6-08 (SPCN)

(c105hf1-0309) SECTION 105.06 SUBCONTRACTING of the Specifications is amended to include the following:

Any distribution of work shall be evidenced by a written binding agreement on file at the project site. Where no field office exists, such agreement shall be readily available upon request to Department inspector(s) assigned to the project.

The provisions contained in Form FHWA-1273 specifically, and other federal provisions included with the prime Contract are generally applicable to all Federal-aid construction projects and must be made a part of, and physically incorporated into all contracts, as well as, appropriate subcontracts for work so as to be binding in those agreements.

12-19-08 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(c108lg0-0708) **SECTION 108.06(b) LIQUIDATED DAMAGES** of the Specifications is replaced by the following:

All work for this Contract shall be completed and accepted on or before the time limit established in the Contract. In the event the Contractor fails to complete the work by the time limit, liquidated damages, representing the estimated additional cost of administration, engineering, supervision, inspection and other expenses will be charged against the Contractor in the amount of \$16,000.00 for each calendar day beyond the time limit, including Sundays and Holidays, in which the Contract remains in an incomplete state.

1-14-08 (SPCN)

(c302h00-0708) **SECTION 302.03(b) PRECAST DRAINAGE STRUCTURES** of the Specifications is amended to include the following:

Precast units, excluding concrete pipe, prestressed concrete items and soundwalls, conforming to the requirements herein will only be accepted under a Quality Control/Quality Acceptance Program (QC/QA). The Contractor shall have the producer perform quality control functions in accordance with a Department approved QC/QA plan. Each piece, manufactured under the QC/QA program, in addition to the date and other required markings, shall be stamped with the letters (QC), as evidence that the required QC/QA procedures have been performed. Each shipping document shall be affixed with the following:

We certify that these materials have been tested and conform to VDOT Precast Concrete Products Quality Assurance Program

Signature and Title

1-14-08 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(c512h00-0708) **CONTRACTOR PROPOSED ALTERNATIVE TRAFFIC CONTROL PLANS** - The Contractor may prepare his own Contractor Alternative Traffic Control Plan (CATCP) as an alternative to that shown in the Contract Documents. This alternative plan must be prepared in conformance with the requirements of AASHTO; the latest approved editions of the Manual of Uniform Traffic Control Devices (MUTCD) and the Virginia Work Area Protection Manual. The Contractor must provide, as part of this alternative plan, information and explanations consistent with, and to the same level of detail, as the project-specific Traffic Control plans in the Contract Documents prepared by VDOT or its consultants. The alternative plan must clearly demonstrate coordination with the Contractor's overall, comprehensive plan for prosecuting the work, through its various phases or stages of construction and sequencing. The plan must be supported by a detailed transportation network traffic operations analysis, consistent with the complexity of the project, using a methodology or computer software program approved by the Department. This analysis must satisfactorily demonstrate the operating conditions of the network, and particularly, the work zone given expected traffic volumes during the length of the construction schedule.

As a necessary and integral part of the plan, the Contractor shall be responsible for identifying all utilities and right of way that will be impacted by his proposed CATCP, to include but not be limited to: underground utility designations, securing any additional or supplemental permissions or permits required to construct the project and preparing all analyses, plans, summaries, specifications, special provisions, etc., necessary to secure approvals to construct the project according to his alternative plan. The analyses, plans, summaries, specifications, and special provisions shall be directly prepared by or prepared under the supervision of a Professional Engineer registered to practice civil engineering in the Commonwealth of Virginia who is trained and/or certified in traffic control analysis and design. All such documents shall be signed and sealed by the Professional Engineer.

The Department reserves the right to accept or reject any CATCP developed under the provisions of this specification. The Contractor must obtain the Engineer's written approval before beginning any work using a Contractor Alternative Traffic Control Plan for Maintenance of Traffic. The Engineer's written approval is required for all modifications to the accepted Contractor Alternative Traffic Control Plan. The Engineer will permit changes to the CATCP without proper documentation and authorization only in emergency situations where incident management is critical.

The Engineer's acceptance of the Contractor's Alternative Traffic Control Plan will not relieve the Contractor of his responsibility for all related project impacts, costs, delays, or damages, whether direct or indirect, resulting from Contractor initiated changes in the design or construction activities from those detailed in the original Contract specifications, design plans, including the Department's temporary traffic control plans or other Contract Documents and which effect a change in project work different from that shown in the plans, joint project agreements, or other project construction schedules. No additional compensation or extension of time for contract completion will be considered in conjunction with the Contractor's decision to proceed with use of a Contractor Alternative Traffic Control Plan that is approved by the Engineer.

3-27-08, Reissued 7-2008 (SPCN)

(c512i00-0708) **POLICE PATROLS** - The Contractor is advised that the Department will use Police patrols in construction work zones when traffic flow problems are anticipated, to enhance the safety of both the public and construction personnel, during the life of this contract.

4-25-88c, Reissued 7-2008 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(c518b00-0708) **SECTION 518.02(a) NUMBER OF TRAINEES** is amended to replace the first sentence of the first paragraph with the following:

The number of trainees to be trained for this contract shall be **10**.

6-20-01, Reissued 7-2008 (SPCN)

SECTION 303.06 MEASUREMENT AND PAYMENT of the Specifications is amended as follows:

Section 303.06 15 Drop Inlet Silt Trap is deleted as is its Pay Item and Pay Unit.

Section 303.06 is also amended to add the following:

Inlet Protection Type A will be measured in units of each and will be paid for at the contract unit price per each location shown or specified. The price shall include furnishing and installing temporary filter barrier including posts and top rails, coarse aggregate and, if required, sediment forebay. This price shall also include maintenance until deemed no longer necessary by the Engineer, and removal when no longer required. Silt Cleanout will be paid under Siltation Control Excavation. Inlet Protection Type A will be paid for only one time during the duration of the project.

Inlet Protection Type B will be measured in units of each and will be paid for at the contract unit price per each location shown or specified. The price shall include furnishing and installing hardware mesh cloth, concrete blocks, wooden studs, coarse aggregate, and maintenance until deemed no longer necessary by the Engineer, and removal when no longer required. Silt Cleanout will be paid under Siltation Control Excavation. Inlet Protection Type B will be paid for only one time during the duration of the project.

Inlet Protection Type C will be measured and paid for in accordance with the individual pay items and pay units shown in the Standard Drawing for EC-6, Type C. The individual pay items for Inlet Protection Type C will be paid for only one time during the duration of the project for each location shown or specified. Silt Cleanout will be paid under Siltation Control Excavation.

Payment will be made under:

Pay Item	Pay Unit
Inlet Protection Type A	Each
Inlet Protection Type B	Each

08-25-09(SPCN)

SECTION 406.04 MEASUREMENT AND PAYMENT of the Specifications is amended to add the following after the second paragraph:

Galvanized reinforcing steel will be measured in pounds of uncoated steel and will be paid for at the contract unit price per pound. The weight will be computed from the theoretical weights of the nominal sizes of steel specified and placed in the structure. Measurement will not be made for galvanizing material. This price shall include furnishing steel and galvanizing material; applying galvanizing material; fabricating, shipping, and placing galvanized reinforcement in the structure; and necessary repairing of galvanization.

Payment will be made under:

Pay Item	Pay Unit
Galvanized Reinforcing Steel	Pound

07-08-09 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SECTION 411 PROTECTIVE COATING OF METAL IN STRUCTURES of the Specifications is amended to add the following:

The Contractor shall paint the new PCUs in accordance with Section 411 of the Specifications and this Provision.

All painting of the structural steel elements of the PCUs within CSX Right of Way, shall be completed at the casting yard prior to placement in the field. This shall include the preparation and painting of the beams or girders, bearing stiffeners, web stiffeners, diaphragms, and the bearing assemblies.

Once the PCUs are set in-place, the contractor will only be allowed to “touch-up” sections of the structure that were nicked, scuffed, or gouged during erection procedures.

07-24-09 (SPCN)

SECTION 413.02 PROCEDURE of the Specifications is amended to include the following:

All operations including, but not limited to, heating, welding, cutting, drilling, straightening, other construction operations that are required for jacking operations of a Type B structure (Section 411 of the Specifications) coated with a hazardous material shall have environmental and worker protection in accordance with OSHA, VPOR and the Virginia Department of Labor and Industry requirements and regulations.

A detailed site-specific worker health and protection plan and a detailed environmental plan shall be submitted in accordance with Section 411.08 of the Specifications.

Cost for environmental and worker protection and disposal of hazardous material shall be included in the bid price for other appropriate items.

06-18-09 (SPCN)

SECTION 513 – MOBILIZATION of the Specifications is amended as follows:

Section 513.02—Measurement and Payment is amended to replace the first paragraph with the following:

Mobilization will be paid for at the contract lump sum price. This price shall include demobilization. The lump sum price bid shall be full compensation for mobilization for all structures in this contract.

08-20-09 (SPCN)

SECTION 517—CONTRACTOR CONSTRUCTION SURVEYING of the Specifications is amended as follows:

Section 517.06—Measurement and payment is amended to replace the first paragraph with the following:

Construction surveying will be paid for at the contract lump sum price for the type of project specified, which price shall be full compensation for performing the work prescribed herein, and for all materials, labor, tools, equipment and incidentals necessary to complete the work. The lump sum price bid shall be full compensation for construction surveying for all structures in this contract.

08-20-09 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

ANCHOR BOLT REPLACEMENT - Anchor bolt replacement shall be measured in units of each complete in place and paid for at the contract unit price for each. Replacement shall be in accordance with details shown in the plans. The Contractor shall submit for review and approval, an anchor bolt installation plan for each structure, fully detailing jacking and blocking operations, method for removal of existing anchor bolts, any coring drilling or cutting of the existing structures, and grouting of new anchor bolts. The jacking plan shall be fully engineered and sealed by a professional engineer licensed to practice in the Commonwealth of Virginia. The plan shall be submitted to the Engineer for review and approval. Removal of existing diaphragms and connector or bearing stiffener plates will not be permitted.

Jacking operations may occur under live load conditions as long as the jacking plan indicates that there are either back-ups to the jacks or that the jacks have locking rings with the same capacity of the jacks; should hydraulics be lost. Application of polymer concrete for leveling/repair of concrete seats may occur during the anchor replacement operations or at the time of placement of pre-constructed composite units.

At the conclusion of anchor bolt installation operations, existing superstructure units shall rest firmly and be secured on existing bearing assemblies.

Bid price shall be full compensation for furnishing the installation and jacking plans, environmental containment and disposal, removal of existing anchor bolts, jacking and blocking, furnishing new anchor bolts, washers and nuts, grouting of new anchor bolts and for all engineering, labor, tools, equipment, materials, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Anchor Bolt Replacement	Each

07-14-09 (SPCN)

DEMOLITION NOTIFICATION - The Contractor shall be responsible for the submission of the required demolition notification for bridge projects not containing asbestos containing materials involving whole structure demolition or projects involving the removal of any load-supporting structural member. Demolition notifications shall be sent to the Virginia Department of Labor and Industry (VDLI) and the United States Environmental Protection Agency (USEPA) at least 10 business days before project start.

Notifications should be addressed to:

Virginia Department of Labor and Industry
Asbestos Program
Powers-Taylor Building
13 South Thirteenth Street
Richmond, VA 23219

Land and Chemical Division
EPA Region III
Mail Code LC62
1650 Arch St.
Philadelphia, PA 19103-2029

No pay item is established for these notifications but the cost thereof shall be considered incidental to the demolition of the structure.

03-18-09(SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

MANDATORY PRE-BID SHOWING CONFERENCE Bidders are advised there will be a mandatory Pre-Bid Showing Conference held at the time and place as indicated in the project advertisement. Bids will only be accepted from those Bidders who are represented at this mandatory conference and attendance will be evidenced by the representative's signature on the Department's attendance roster.

All prime contractors and subcontractors will need to fill out and submit a CII/SSI (Critical Infrastructure Information/Sensitive Security Information) Multi-Purpose Non-disclosure Agreement in order to obtain a copy of the most recent bridge inspection report for each structure. Copies of these reports shall not be distributed to any subcontractor without them having first submitted a CII/SSI (Critical Infrastructure Information/Sensitive Security Information) Multi-Purpose Non-disclosure Agreement.

Bridge safety inspection reports are being made available on a "Good Faith" basis and shall in nowise wholly represent the conditions of respective structures at the time that bids are received. As such, Bidders are encouraged to visit each structure in order to make their own site assessments and to be thoroughly familiar with Section 102.04 of the Specifications.

Bidders are invited to bring a copy of the bid proposal to the conference. Any changes resulting from this mandatory Pre-Bid Showing Conference will be issued in a written addendum to the bid proposal.

8-18-09 (SPCN)

RICHMOND DISTRICT- DISALLOWANCE OF VERTICAL CLEARANCE REDUCTIONS

For the purpose of executing work under this contract, the Contractor shall not be allowed to introduce any encroachments that reduce the existing vertical clearance over live traffic. Encroachments include, but are not limited to, the erection of platforms, containment systems, false work, tunnels, scaffolding, walkways, or any other appurtenances that may reduce any existing vertical clearances beneath the structure.

05-08-08 (SPCN)

REMOVAL OF EXISTING RETAINING STRUCTURES –The Contractor shall remove existing retaining structures (retaining wall and crib wall) and the foundations in accordance with the notes shown on the plans. The Contractor shall completely remove the walls, foundations, and all necessary earth to ensure that the proposed MSE wall can be constructed in this area.

Removal of the existing retaining structures (retaining wall and crib wall) and the foundations shall be measured in units of Lump Sum and paid for at the contract unit price for Lump Sum. The Lump Sum price bid shall be full compensation for mobilizing equipment, site preparation, demolition and disposal of the steel and concrete that makes up the retaining structures and foundation, disposal of excess earthen material, protection of utilities, minor pavement repair for sections of the parking lot damaged during removal, and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Removal of Existing Retaining Structure	Lump Sum

09-18-09 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

PERSONNEL REQUIREMENTS FOR WORK ZONE TRAFFIC CONTROL - Section 105 and 512 of the Specifications are amended as follows:

Section 105.14—Maintenance During Construction is amended to add the following:

The Contractor shall provide at least one person on the project site during all work operations who is currently verified either by the Department in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor (TCS).

This person must have the verification card with them while on the project site. This person shall be responsible for the oversight of work zone traffic control within the project limits in compliance with the contract requirements involving the plans, specifications, the VWAPM, and the MUTCD. This person's duties shall include the supervision of the installation, adjustment (if necessary), inspection, maintenance and removal when no longer required of all traffic control devices on the project.

If none of the Contractor's on-site personnel responsible for the supervision of such work has the required verification with them or if they have an outdated verification card showing they are not currently verified either by the Department in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor (TCS) all work on the project will be suspended by the Engineer.

The Contractor shall provide at least one person on site who is, at a minimum, verified by the Department in Basic Work Zone Traffic Control for each construction and/or maintenance operation that involves installing, maintaining, or removing work zone traffic control devices. This person shall be responsible for the placement, maintenance and removal of work zone traffic control devices.

In the event none of the Contractor's on-site personnel of any construction/maintenance operation has, at a minimum, the required verification by the Department in Basic Work Zone Traffic Control, that construction/maintenance operation will be suspended by the Engineer until that operation is appropriately staffed in accordance with the requirements herein.

Section 512.03 Procedures is amended to add (r) **Work Zone Traffic Control** as the following:

(r) **Work Zone Traffic Control**: The Contractor shall provide individuals trained in Work Zone Traffic Control in accordance with the requirements of Section 105.14 of the Specifications.

Section 512.04 Measurement and Payment is amended to add the following:

Basic Work Zone Traffic Control – Separate payment will not be made for providing a person to meet the requirements of Section 105.14 of the Specifications. The cost thereof shall be included in the price of other appropriate pay items.

Intermediate Work Zone Traffic Control - Separate payment will not be made for providing a person to meet the requirements of Section 105.14 of the Specifications. The cost thereof shall be included in the price of other appropriate pay items.

06-11-09 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SF001AF-0708

Reissued July 2008

PREDETERMINED MINIMUM WAGE RATES

GENERAL DECISION: VA20080011 04/17/2009 VA11

Date: April 17, 2009

General Decision Number: VA20080011 04/17/2009

Superseded General Decision Number: VA20070011

State: Virginia

Construction Type: Highway

Counties: Charles*, Chesterfield, Colonial Heights*,
 Dinwiddie, Goochland, Hanover, Henrico, Hopewell*, New Kent,
 Petersburg*, Powhatan, Prince George and Richmond* Counties in
 Virginia.

*INDEPENDENT CITIES

HIGHWAY CONSTRUCTION PROJECTS (Excluding tunnels, building
 structures in rest area projects and railroad construction;
 bascule, suspension and spandrel arch bridges; bridges designed
 for commercial navigation; bridges involving marine
 construction; and other major bridges)

Modification Number	Publication Date
0	02/08/2008
1	04/17/2009

* ELEC0666-008 03/01/2009

	Rates	Fringes
Electricians (Including Traffic Signal Installers/Maintainers).....	\$ 27.48	31.50%

 SUVA1999-011 02/11/1999

	Rates	Fringes
Asbestos Worker/Heat and Frost Insulator.....	\$ 10.10	
BLASTER.....	\$ 10.47	
Carpenters		
Structure.....	\$ 11.31	
Concrete Finisher.....	\$ 11.24	
Deckhand.....	\$ 8.62	
FENCE ERECTOR.....	\$ 9.65	
Flagger.....	\$ 8.71	
Form Setter.....	\$ 9.56	
Guardrail erector.....	\$ 9.51	
Laborers:		
Asphalt Rakers.....	\$ 9.79	
Construction Workers I (Skilled Laborers).....	\$ 9.50	
Construction Workers II (Laborers).....	\$ 7.83	
Landscape Workers.....	\$ 7.42	

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Pipelayers.....	\$ 9.22
Power Tool Operators.....	\$ 8.50
MASON	
Structure.....	\$ 10.00
Painter, Bridge.....	\$ 13.57
Painters:.....	\$ 10.00
Plumbers.....	\$ 14.31
Power equipment operators:	
Air Compressor Operators....	\$ 20.00
Aphalt Distributor	
Operators.....	\$ 10.38
Asphalt Paver Operators.....	\$ 9.71
Backhoe Operators.....	\$ 11.29
Bulldozer Operators,	
Utility.....	\$ 10.31
Bulldozer Operators.....	\$ 10.58
Concrete Finish Machine	
Operators, Utility.....	\$ 11.04
Concrete Finish	
Machine/Screeed Operators	
(Bridge).....	\$ 12.30
Concrete Paving Machine	
Operators.....	\$ 12.15
Concrete Pump Operators.....	\$ 8.33
Concrete Saw Operators.....	\$ 8.25
Crane, Derrick, Dragline	
Operators	
1 yd. & under.....	\$ 12.25
Over 1 yd.....	\$ 13.28
Crusher Tender Operators....	\$ 10.35
Drill Operators.....	\$ 9.13
Excavator Operators	
(Gradall Operators).....	\$ 11.82
Front-End Loader Operators..	\$ 10.37
Fuel and Lubricant Service	
Truck Drivers.....	\$ 10.25
Grade Checkers.....	\$ 7.28
Hydro-Seeder Operators.....	\$ 12.72
Log Skidder Operators.....	\$ 15.00
Mechanics.....	\$ 13.46
Mobile Mixer Operators.....	\$ 10.71
Motor Grader Operators	
Fine Grade.....	\$ 12.50
Rough Grade.....	\$ 11.61
Pavement Marker Operators...\$	9.93
Pavement Marking Truck	
Operators.....	\$ 10.86
Pavement Planing	
Groundman.....	\$ 8.93
Operators.....	\$ 10.49
Pile Driver	
Leadsman.....	\$ 10.65
Operators.....	\$ 11.54
Pipe Boring/Jacking	
Machine Operators.....	\$ 8.38
Plant Operators.....	\$ 18.75
Roller Operators	
Finish.....	\$ 9.75
Rough.....	\$ 8.56

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Scraper Pan Operators.....	\$ 9.82
Shot Blast Machine Operators.....	\$ 7.75
Shovel Operators.....	\$ 10.45
Slip-Form Paver Operators...	\$ 12.85
Slurry Seal Paver Machine Operators.....	\$ 9.38
Truck Drivers.....	\$ 9.00
Stabilizer Operators.....	\$ 9.70
Stone Spreader Operators....	\$ 10.83
Subgrade Machine Operators..	\$ 11.25
Tractor Operators Crawlers.....	\$ 8.02
Utility.....	\$ 9.67
Transit Mix Truck Drivers...	\$ 12.50
Trenching Machine Operators.	\$ 10.46
Vacuum Machine Operators....	\$ 9.25
Reinforcing metal workers.....	\$ 13.94
Sheet Metal Worker.....	\$ 8.90
SIGN ERECTOR.....	\$ 8.90
Structural workers.....	\$ 15.96
Truck drivers: Heavy Duty.....	\$ 9.11
Multi, Tandem and Single Rear Axle.....	\$ 8.89
WATERPROOFER.....	\$ 7.28
Welder.....	\$ 12.99

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

END OF GENERAL DECISION.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

U.S. DEPARTMENT OF LABOR
OFFICE OF THE SECRETARY
WASHINGTON
DECISION OF THE SECRETARY

This case is before the Department of Labor pursuant to a request for a wage predetermination as required by law applicable to the work described.

A study has been made of wage conditions in the locality and based on information available to the Department of Labor the wage rates and fringe payments listed are hereby determined by the Secretary of Labor as prevailing for the described classes for labor in accordance with applicable law.

This wage determination decision and any modifications thereof during the period prior to the stated expiration date shall be made a part of every contract for performance of the described work as provided by applicable law and regulations of the Secretary of Labor, and the wage rates and fringe payments contained in this decision, including modifications, shall be the minimums to be paid under any such contract and subcontractors on the work.

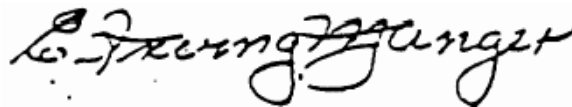
The contracting officer shall require that any class of laborers and mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary for determination.

Before using apprentices on the job the contractor shall present to the contracting officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U.S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U.S. Bureau of Apprenticeship and Training.

The contractor shall submit to the contracting officer written evidence of the established apprentice-journeyman ratios and wage in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

Fringe payments include medical and hospital care, compensation for injuries or illness resulting from occupational activity, unemployment benefits, life insurance, disability and sickness insurance, accident insurance (all designated as health and welfare), pensions, vacation and holiday pay, apprenticeship or other similar programs and other bona fide fringe benefits.

By direction of the Secretary of Labor



E. Irving Manger, Associate Administrator
Division of Wage Determinations
Wage and Labor Standards Administration

**ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02**

SF010CF-0309

FHWA 1273, MEMORANDUM AND CFR CHANGE

January 19, 2009

REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FHWA 1273) shall apply to this contract as well as the following:

- **FHWA memorandum with the subject titled “THE DISCONTINUANCE OF THE FHWA-45, FHWA-47 & FHWA-810”**. In accordance with this memorandum the Contractor shall be governed by the following:

The submission of Form C-50 (FHWA 47) which is used to fulfill the reporting requirements of Section VI, Record of Materials, Supplies, and Labor of **FHWA 1273—Required Contract Provisions Federal-Aid Construction Contracts** is no longer required on Federal Aid Construction Contracts. Only that part of Section VI of **FHWA 1273** is thus eliminated. All the other parts remain in effect.

- **CFR (Code of Federal Regulations) change regarding Employee Social Security Numbers and Addresses on Payrolls**. In accordance with the US Department of Labor regulations change in 29 CFR Parts 3 and 5 the Contractor shall be governed by the following:

Section V, Paragraph 2b of **FHWA 1273—Required Contract Provisions Federal-Aid Construction Contracts** is replaced with the following:

The payroll records shall contain the name, and the last four digits of the social security number of each such employee, his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid.

=====

FHWA-1273 Electronic version -- March 10, 1994

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

	Page
I. General	1
II. Nondiscrimination	2
III. Nonsegregated Facilities	5
IV. Payment of Predetermined Minimum Wage	6
V. Statements and Payrolls	10
VI. Record of Materials, Supplies, and Labor	11
VII. Subletting or Assigning the Contract	11
VIII. Safety: Accident Prevention	12
IX. False Statements Concerning Highway Project	12
X. Implementation of Clean Air Act and Federal Water Pollution Control Act	13
XI. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion	13
XII. Certification Regarding Use of Contract Funds for lobbying	16

ATTACHMENTS

- A. Employment Preference for Appalachian Contracts (included in Appalachian contracts only)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendent and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.
5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
- b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."
2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual will be taken as a minimum:
 - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
 - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
 - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
 - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
 - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
 - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
 - b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
 - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
 - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. **Training and Promotion:**
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
 - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
 - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
 - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
 - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
 - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
 - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.
8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
 - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
 - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.
- a. The records kept by the contractor shall document the following:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
 - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
 - b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).
- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;
 - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
 - c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
 - d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
 - e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.
- 3. Payment of Fringe Benefits:**
- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
 - b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- 4. Apprentices and Trainees (Programs of U.S. DOL) and Helpers:**
- a. Apprentices:
 - (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
 - (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.
 - (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.
- b. Trainees:
- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
 - (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
 - (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. **Helpers:**

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
 - c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project: **NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS**

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:

- 1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- 2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

- 1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
 3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.
-

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

FHWA MEMORANDUM



U.S. Department of
Transportation
**Federal Highway
Administration**

MEMORANDUM

Subject: ACTION: The Discontinuance of the FHWA-45, FHWA-47 & FHWA-810
Date: May 22, 2007

From: /s/ Original signed by
Dwight Horne,
Director Office of Program Administration
In Reply HIPA-10
Refer to:

To: Directors of Field Services
Division Administrators
Federal Lands Administrator

Effective immediately, Divisions and/or our State Transportation Agency (STA) partners will no longer be required to submit data to HIPA-10 that is collected as it relates to:

The FHWA-45, Bid Price Data¹,

The FHWA-47, Statement of Materials and Labor Used by Contractors on Highway Construction Involving Federal Funds², and

The FHWA-810, Bid Tabulation Data³

For several years, STAs have commented that the reports generated from the data collection efforts were of little utility and that there were statistical limitations, statistical significance, and accuracy issues with the data which were felt could result in misleading information. There was also a noted reporting burden on States and contractors. The suggestions have often been to eliminate the reporting requirements all together.

In 2003, the GAO conducted a review of the States' highway construction costs. As part of its review, the GAO reviewed FHWA's cost data collection requirements. In its discussions, the GAO also identified similar issues and concerns with the data series as discussed above. In a December 2003 report GAO made recommendations to FHWA to review the usefulness and accuracy and/or under reporting of the data collected.

As a result, FHWA has determined that it is appropriate to discontinue the reporting requirements for the FHWA 45, 47 and 810 as collection of this data for needed reports such as the "Highway Statistics" publication can be collected through other means. The main reasons for this decision are the strong disinterest in the data collection activities and comments provided to us by our STA partners suggesting that we are not collecting the data extensively enough to be of utility. We will also be going through an abridged regulatory update as appropriate to reflect this action.

Please contact Bob Wright, at 202-366-4630, to answer any questions and/or for additional information on this matter.

The FHWA 45, Bid Price Data, was collected on NHS projects over \$500,000. The FHWA 45 served as a means to compute the highway construction bid price index, which is published in the document "Price Trends for Federal-aid Highway Construction. The data was used in our "Highway Statistics" publication and by other outside sources, including its use by congressional committees in their deliberations on pending new highway legislation.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The FHWA 47, Statement of Materials and Labor Used by Contractors on Highway Construction Involving Federal Funds, was collected on all NHS projects over \$1,000,000. The FHWA 47 served as a means to collect data related to the quantities of materials, supplies and labor used for various types of highway construction. The data reported on this form was used primarily to compute usage factors for these various materials, supplies, and labor. These factors were used to determine the economic impacts of cuts or increases in the cost of Federal-aid highway construction.

FHWA 810, Bid Tabulation Data was collected on all NHS projects. The needs for the FHWA 810 have been to compute national summaries on the largest contract awards and contract size statistics. The data was also used to produce state-by-state summaries on contracts awards, number of bids and average number of bids.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SF030AF-0708

Reissued July 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE
EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals for female and minority participation, expressed in percentage terms of the Contractor's aggregate work force in each trade on all construction works in the covered area, are as follows:

Females- 6.9%

Minorities - See Attachment "A"

The goals are applicable to all the Contractor's construction work performed in the covered area, whether or not it is Federal or federally assisted. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications, set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established herein. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executives Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days the award of any construction subcontract in excess of \$10,000 at any tier for construction works under this contract. The notification shall list the name, address and telephone number of the subcontractor, employer identification number, estimated dollar amount of the subcontract, estimated starting and completion dates of the subcontract and the geographical area in which the contract is to be performed.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

1. As, used in this provision:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941;
 - d. "Minority" includes:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation.
 3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors and Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
 4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the coverer area. Covered construction Contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
 5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
 6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.
 7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, shall assign two or more women to each construction project. The Contractor shall specifically ensure that all foreman, superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites in such facilities.
- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off the street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union, or if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or women sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper or annual report; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents and General Foremen prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.
- h. Disseminate the Contractor's EEO policy externally by including in any news media advertisement that the Contractor is "An Equal Opportunity Employer" for minority and female, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- i. Directs its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of Contractor's workforce.
 - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for such opportunities through appropriate training or other means.
 - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - n. Ensure that all facilities and company activities are nonsegregated, except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
9. Goals for women have been established. However, the Contractor IS required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner, that is even though the Contractor has achieved its goals for women, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or nation origin.
11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director will proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate and make known to the Department a responsible official as the EEO Officer to monitor all employment related activity, to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors will not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

ATTACHMENT A

<u>Economic Area</u>	<u>Goal (Percent)</u>
Virginia:	
021 Roanoke-Lynchburg, VA	
SMSA Counties:	
4640 Lynchburg, VA	19.3
VA Amherst; VA Appomattox; VA Campbell; VA Lynchburg	
6800 Roanoke, VA	10.2
VA Botetourt; VA Craig; VA Roanoke; VA Roanoke City; VA Salem	
Non-SMSA Counties	12.0
VA Alleghany; VA Augusta; VA Bath; VA Bedford; VA Bland; VA Carroll;	
VA Floyd; VA Franklin; VA Giles; VA Grayson; VA Henry; VA Highland;	
VA Montgomery; VA Nelson; VA Patrick; VA Pittsylvania; VA Pulaski;	
VA Rockbridge; VA Rockingham; VA Wythe; VA Bedford City; VA Buena Vista;	
VA Clifton Forge; VA Covington; VA Danville; VA Galax; VA Harrisonburg;	
VA Lexington; VA Martinsville; VA Radford; VA Staunton; VA Waynesboro; WV	
Pendleton.	
022 Richmond, VA	
SMSA Counties:	
6140 Petersburg - Colonial Heights - Hopewell, VA	30.6
VA Dinwiddie; VA Prince George; VA Colonial Heights; VA Hopewell;	
VA Petersburg.	
6760 Richmond, VA	24.9
VA Charles City; VA Chesterfield; VA Goochland, VA Hanover; VA	
Henrico; VA New Kent; VA Powhatan; VA Richmond.	

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Non-SMSA Counties	27.9
VA Albemarle; VA Amelia; VA Brunswick; VA Buckingham, VA Caroline; VA Charlotte; VA Cumberland; VA Essex; VA Fluvanna; VA Greene; VA Greensville; VA Halifax; VA King and Queen; VA King William; VA Lancaster; VA Louisa; VA Lunenburg; VA Madison; VA Mecklenburg; VA Northumberland; VA Nottoway; VA Orange; VA Prince Edward; VA Richmond VA Sussex; VA Charlottesville; VA Emporia; VA South Boston	
023 Norfolk - Virginia Beach - Newport News VA:	
SMSA Counties:	
5680 Newport News- Hampton, VA	27.1
VA Gloucester; VA James City; VA York; VA Hampton; VA Newport News; VA Williamsburg.	
5720 Norfolk - Virginia Beach - Portsmouth, VA - NC	26.6
NC Currituck; VA Chesapeake; VA Norfolk; VA Portsmouth; VA Suffolk; VA Virginia Beach.	
Non-SMSA Counties	29.7
NC Bertie; NC Camden; NC Chowan; NC Gates; NC Hertford; NC Pasquotank; NC Perquimans; VA Isle of Wight; VA Matthews; VA Middlesex; VA Southampton; VA Surry; VA Franklin.	
Washington, DC:	
020 Washington, DC.	
SMSA Counties:	
8840 Washington, DC - MD - VA	28.0
DC District of Columbia; MD Charles; MD Montgomery MD Prince Georges; VA Arlington; VA Fairfax; VA Loudoun; VA Prince William VA Alexandria; VA Fairfax City; VA Falls Church.	
Non- SMSA Counties	25.2
MD Calvert; MD Frederick; MD St. Marys; MD Washington; VA Clarke; VA Culpeper; VA Fauquier; VA Frederick; VA King George; VA Page; VA Rappahannock; VA Shenandoah; VA Spotsylvania; VA Stafford; VA Warren; VA Westmoreland; VA Fredericksburg; VA Winchester WV Berkeley; WV Grant; WV Hampshire; WV Hardy; WV Jefferson; WV Morgan.	
Tennessee:	
052 Johnson City - Kingsport - Bristol, TN - VA	
SMSA Counties:	
3630 Johnson City - Kingsport -Bristol, TN-VA	2.6
TN Carter; TN Hawkins; TN Sullivan; TN Washington; VA Scott; VA Washington; VA Bristol.	
Non-SMSA Counties	3.2
TN Greene; TN Johnson; VA Buchanan; VA Dickenson; VA Lee; VA Russell; VA Smyth; VA Tazewell; VA Wise; VA Norton; WV McDowell; WV Mercer.	
Maryland:	
019 Baltimore MD	
Non-SMSA Counties	
MD Caroline; MD Dorchester; MD Kent; MD Queen Annes; MD Somerset; MD Talbot; MD Wicomico; MD Worchester; VA Accomack; VA Northampton.	

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S100B00-0708

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
PROJECT COMMUNICATION AND DECISION MAKING

January 3, 2005c
Reissued July 2008

I. DESCRIPTION

The intent of this provision is to establish procedures, processes and guidelines for making decisions and managing communications regarding work under contract on construction and maintenance projects. The information contained herein is not meant to be all inclusive but to serve as a minimal general framework for promoting efficient and effective communication and decision making at both the project and, if needed, executive administrative level. It is also not meant to override the decision-making processes or timeframes of specific contract requirements.

II. DEFINITIONS

For the purposes of this provision the following terms will apply and be defined as follows:

Submittals – Documents required by the contract that the Contractor must submit for the Department's review, acceptance or approval. These may include shop drawings, working drawings, material test reports, material certifications, project progress schedules, and schedule updates. The Contractor shall produce submittals as early as practicable when required by the contract so as not to delay review and determination of action.

Confirmation of verbal instructions (COVI) - Contractor requested written confirmation of agreements and instructions developed in negotiations with the Department concerning the Work under contract. Agreements must be able to be quantified using existing contract procedures and will, in the vast majority of cases, not impact contract time and cost. When time and/or cost are impacted, they must be clearly spelled out in the COVI.

Requests for information (RFI) – Requests generated by either the Contractor or the Department that the other party supplies information to better understand or clarify a certain aspect of the Work.

Requests for owner action (ROA) – Requests when the Contractor asks that the Department take certain action(s) the Contractor feels is required for proper completion of a portion of the Work or project completion.

Contract change requests (CCR) - Request where the Contractor asks the Department to make an equitable adjustment to the contract because of excusable and/or compensable events, instructions that have or have not been given or other work requiring time and/or cost beyond that specified or envisioned within the original contract.

Requests for contractor action (RCA) – Request generated by the Department where the Department asks the Contractor to take certain action that is in the best interests of the project and/or is required for proper completion of a portion of the Work or for project completion.

Contract change directives (CCD) – Directive by the Department which instructs the Contractor to perform work beyond that specified or envisioned in the original contract and which may specify instructions, time, and cost(s) to make an equitable adjustment to the original contract.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Responsible Person – The individual in the normal or escalated resolution process, for either the Contractor or the Department, having the direct authority, responsibility and accountability to formulate and respond to each category of information request.

III. PROCESS FOR DECISION MAKING

Project teams composed on responsible individuals directly involved in the administration, prosecution, and inspection of the Work from the Contractor and the Department shall define and agree upon the field decision-making process during the pre-construction conference. This information relative to the process should be written down and distributed to all parties of the process once it is established. Where there are responsibility, authority or personnel changes associated with this process such changes shall be distributed to all affected parties as quickly as practicable after they are effective so as not to delay or impede this process.

The process for making field decisions with respect to the Work detailed in the contract basically requires the following steps:

1. The Contractor and the Engineer agree on the decision-making process, the identity, authority and accountability of the individuals involved and on the cycle times for response for each category of decision.
2. The party requiring the information generates the appropriate request documents, and calls for a decision from the individual who is accountable for the particular facet of the Work under consideration within the agreed period.
3. The responding party has an internal decision-making process that supports the individual who is accountable and provides the information required within the agreed period for each category of request.
4. The party receiving the decision has an internal process for accepting the decision or referring it for further action within an agreed period of time.

The process also requires that clear and well-understood mechanisms be in place to log and track requests, document the age and status of outstanding requests and actions to be taken on requests that have not been answered within the agreed period.

Both the Department and the Contractor shall agree on the following:

- The documentation and perhaps format to be developed for each category of information requested,
- The name (as opposed to organizational position) of all individuals with the responsibility, authority and accountability to formulate and respond to each category of information requested. The District Administrator (DA) or Chief Executive Officer (CEO) of the Contractor may delegate the responsibility and authority for formulating and responding to requests, however, the accountability for meeting the established response time(s) remains with the District Administrator and CEO.
- The cycle times for each stage in the decision-making process,
- The performance measures to be used to manage the process,
- The action to be taken if cycle times are not achieved and information is not provided in a timely manner.

The following general guideline and timeframe matrix will apply to the various requests for action. Again, please note these guidelines are general in scope and may not apply to specific contract timeframes for response identified within the requirements of the Contract documents. In such cases, specific contract requirements for information shall apply.

PROCESS GUIDELINES FOR REQUESTS GENERATED BY THE CONTRACTOR

Process	Situation	Normal resolution process		Escalated process		Final resolution
		By	Within (calendar days)	By	Within	
Submittal	Where the Contractor requests the Department's review, acceptance or approval of shop drawings, materials data, test reports, project progress schedules, or other submittals required by standard Specifications or other contract language.	Department's Designated Project Manager	<ul style="list-style-type: none"> • Acknowledge: 3 days¹ • Accept or Return: 14 days • Final Determination\Approve: 30 days or as outlined in contract documents. 	DA or their designee*	7 days	Submit ROA or CCR
Confirmation of Verbal Instruction (COVI)	Resolving routine field issues, within the framework of the Contract, in negotiation with Owner field personnel.	Department's Appropriate field personnel	<ul style="list-style-type: none"> • Confirmation: 1 day² 	Submit RFI, ROA or CCR	7 days	(See process for RFI, ROA, or CCR)
Request for Information (RFI)	Requests the Department to supply information to better understand or clarify a certain aspect of the work.	Department's Designated Project Manager	<ul style="list-style-type: none"> • Action: 14 days (or appropriate Action Plan) 	DA or their designee*	7 days	Submit ROA or CCR
Request for Owner Action (ROA)	Requests that the Department take certain action the Contractor feels is required for proper completion of a portion of the Work or project completion.	Department's Designated Project Manager	<ul style="list-style-type: none"> • Acknowledge: 3 days¹ • Action: 14 days (or appropriate Action Plan) 	DA or their designee*	7 days	Submit CCR
Contract Change Request (CCR)	Requests the Department to make an equitable adjustment to the contract because of excusable and/or compensable events, instructions that have or have not been given or other work requiring time and/or cost beyond that specified or envisioned within the original contract.	Department's Designated Project Manager	<ul style="list-style-type: none"> • Acknowledge: 3 days¹ • Action: 30 days (45 days if federal oversight project) 	DA or their designee*	7 days	Established dispute resolution and claims process

¹ Process initiated on the last business day of a week shall be acknowledged before 5 pm on the next VDOT business day.

² The absence of a written confirmation from the Owner to a Contractor's written request for confirmation of a verbal instruction shall constitute confirmation of the verbal instruction.

PROCESS GUIDELINES FOR REQUESTS GENERATED BY THE OWNER

Process	Situation	Normal resolution process		Escalated process		Final resolution
		By	Within (calendar days)	By	Within	
1. RFI	Requests the Contractor to supply information to better understand or clarify a certain aspect of the work. (RFI)	Contractor's Project Superintendent	<ul style="list-style-type: none"> Action: 14 days (or appropriate written Action Plan) 	Contractor's Project Manager	7 days	Submit RCA or CCD
2. RCA	Requesting the Contractor take certain action(s) that is in the best interests of the project and/or is required for proper completion of a portion of the work or for project completion. (RCA)	Contractor's Project Superintendent	<ul style="list-style-type: none"> Response or Action to safety and environmental issues: 1 day Otherwise acknowledge: 3 days¹ Action: 14 days (or appropriate Action Plan) 	Contractor's Project Manager	7 days	Submit CCD
3. CCD	Instructs the Contractor to perform work beyond that specified or envisioned in the original contract and undertakes action(s) to make an equitable adjustment to the contract. (CCD)	Contractor's Project Superintendent	<ul style="list-style-type: none"> Acknowledge: 3 days¹ Action: 30 days 	CEO or their designee**	7 days	Established dispute resolution and termination process

¹ Process initiated on the last business day of a week shall be acknowledged before 5 p m on next project business day.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S102CF1-0309

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
USE OF DOMESTIC MATERIAL

February 26, 2009

SECTION 102.05 PREPARATION OF BID of the Specifications is amended to include the following:

In accordance with the provisions of Section 635.410(b) of Title 23 CFR, hereinafter referred to as "Buy America", except as otherwise specified, all iron and steel products (including miscellaneous steel items such as fasteners, nuts, bolts and washers) to be permanently incorporated for use on federal aid projects shall be produced in the United States of America regardless of the percentage they exist in the manufactured product or final form they take. Therefore, "Domestically produced in the United States of America" means all manufacturing processes must occur in the United States of America, to mean, in one of the 50 States, the District of Columbia, Puerto Rico or in the territories and possessions of the United States. Manufacturing processes are defined as any process which alters or modifies the chemical content, physical size or shape or final finish of iron or steel material) such as rolling, extruding, bending, machining, fabrication, grinding, drilling, finishing, or coating whereby a raw material or a reduced iron ore material is changed, altered or transformed into a steel or iron item or product which, because of the process, is different from the original material. For the purposes of satisfying this requirement "coating" is defined as the application of epoxy, galvanizing, painting or any other such process that protects or enhances the value of the material. Materials used in the coating process need not be domestic materials.

For the purposes herein the manufacturing process is considered complete when the resultant product is ready for use as an item in the project (e.g. fencing, posts, girders, pipe, manhole covers, etc.) or is incorporated as a component of a more complex product by means of further manufacturing. Final assembly of a product may occur outside of the United States of America provided no further manufacturing process takes place.

Raw materials such as iron ore, pig iron, processed, pelletized and reduced iron ore, waste products (including scrap, that is, steel or iron no longer useful in its present form from old automobiles, machinery, pipe, railroad rail, or the like and steel trimmings from mills or product manufacturing) and other raw materials used in the production of steel and/or iron products may, however, be imported. Extracting, handling, or crushing the raw materials which are inherent to the transporting the materials for later use in the manufacturing process are exempt from Buy America. The use of foreign source steel or iron billet is not acceptable under the provisions of Buy America. For the purposes of this provision all steel or iron material not meeting the criteria as domestically produced in the United States of America will be considered as "foreign" material. All iron and steel items will be classified hereinafter as "domestic" or "foreign", identified by and subject to the provisions herein.

Domestically produced iron or steel ingots or billets shipped outside the United States of America for any manufacturing process and returned for permanent use in a project would not comply with "Buy America" requirements.

Buy America provisions do not apply to iron or steel products used temporarily in the construction of a project such as temporary sheet piling, temporary bridges, steel scaffolding, falsework or such temporary material or product or material that remains in place for the Contractor's convenience.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 635.410(b) of Title 23 CFR permits a minimal amount of steel or iron material to be incorporated in the permanent work on a federal-aid contract. The cost of such materials or products must not exceed one-tenth of one percent of the contract amount or \$2500, whichever is greater. The cost of the foreign iron or steel material is defined as its monetary value delivered to the job site and supported by invoices or bill of sale to the Contractor. This delivered to site cost must include transportation, assembly, installation and testing.

In the event the total cost of all "foreign" iron and steel product or material does not exceed one-tenth of one percent of the total contract cost or \$2,500, whichever is greater, the use of such material meeting the limitations herein will not be restricted by the domestic requirements herein. However, by signing the bid, the Bidder certifies that such cost does not exceed the limits established herein.

Waivers:

With prior concurrence from Federal Highway Administration (FHWA) headquarters, the Federal Highway Division Administrator may grant a waiver to specific projects provided it can be demonstrated:

- 1 that the use of domestic steel or iron materials would be inconsistent with the public interest; or
2. materials or products requested for use are not produced in the United States in sufficient or reasonably available quantities and are of satisfactory quality for use in the permanent work.

The waiver request shall be submitted with supportive information to include:

1. Project number\description, project cost, waiver item, item cost, country of origin for the product, reason for the waiver, and
2. Analysis of redesign of the project using alternative or approved equal domestic products

In order to grant such a waiver the request for the waiver must be published in the Federal Register for a period not less than 15 days or greater than 60 days prior to waiving such requirement. An initial 15 day comment period to the waiver will be available to the public by means of the FHWA website: <http://www.fhwa.dot.gov/construction/contracts/waivers.cfm>. Following that initial 15 day period of review and comment the request for waiver will be published by the FHWA in the Federal Register. The effective date of the FHWA finding, either to approve or deny the waiver request, will be 15 days following publication in the Federal Register.

Only the FHWA Administrator may grant nationwide waivers which still are subject to the public rulemaking and review process.

Alternative Bidding Procedures:

An alternative bidding procedure may be employed to justify the use of foreign iron and/or steel. To qualify under this procedure the total project is bid using two alternatives, one based on the use of domestic products and the other, the use of corresponding foreign source steel and/or iron materials.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

In accordance with the provisions of Section 103.02 the Contract will be awarded to the lowest responsive and responsible bidder who submits the lowest total bid based on furnishing domestic iron or steel unless such total exceeds the lowest total bid based on furnishing foreign iron and/or steel by more than 25 percent, in which case the award will be made to the lowest responsive and responsible bidder furnishing foreign iron and/or steel based upon furnishing verifiable supportive data. The bidder shall submit a bid based on permanently incorporating only domestic iron and/or steel in the construction of the project. The bidder may also submit a bid for the same proposed contract based on being allowed to permanently incorporate corresponding foreign iron and/or steel materials meeting the other contract requirements into the work on the contract. If he chooses to submit such a bid, that alternate bid shall clearly indicate which foreign iron and/or steel items will be permanently installed in the work as well as contain prices for all other items listed in the corresponding domestic proposal to complete a total "Foreign" bid.

In the event the contract is awarded to the bidder furnishing foreign iron and/or steel materials or items the provision for price adjustment of steel items will be permitted, however, price fluctuations shall use the U.S. index as stated in the Special Provision for Price Adjustment For Steel. The Contractor must indicate which corresponding eligible steel items he chooses price adjustment to apply. In the event the contract is awarded to a bidder furnishing foreign iron and/or steel items and during the life of that contract the Contractor discovers he can not furnish foreign iron and/or steel material as originally anticipated and agreed upon, he shall be responsible to honor the total bid price and furnish such iron and/or steel materials meeting the contract requirements from other sources as necessary to complete the work.

In the event the Contractor proposes to furnish "foreign" iron and steel and can verify a savings in excess of 25 percent of the overall project cost if bid using domestic materials, the Contractor shall submit a second complete paper bid proposal clearly marked "Foreign" including Form C-7 and supportive data supplement on all sheets. Supportive data shall list, but not be limited to, origin of material, best price offer, quantity and complete description of material, mill analysis, evidence or certification of conformance to contract requirements, etc. The "Foreign" bid shall be completed using the best price offer for each corresponding bid item supplying foreign material in the alternative bid and submit the same with the Contractor's "Domestic" bid. The Contractor shall write the word "Foreign" by the bid total shown on Form C-7 as well as last page of Schedule of Items showing the total bid amount. The bidder shall also contact the State Contract Engineer to inform him that he is also submitting an alternate "Foreign" paper bid..

The information listed on the supportive data sheet(s) will be used to provide the basis for verification of the required cost savings. In the event comparison of the prices given, or corrected as provided in Section 103.01 of the Specifications, shows that use of "foreign" iron and steel items does not represent a cost savings exceeding the aforementioned 25 percent, "domestic" iron and/or steel and prices given there for shall be used and the "100 percent Domestic Items Total" shall be the Contractor's bid.

Certification of Compliance:

Where domestic material is supplied, prior to final payment the Contractor shall furnish to the Department a certificate of compliance (such as may be furnished by steel mill test reports) that all steel and/or iron products supplied to the project except as may be permitted (one-tenth of one percent of the total contract cost or \$2,500, whichever is greater) and permanently incorporated into the work satisfies the domestic requirements herein. This certification shall contain a definitive statement about the origin of all products covered under the provisions of Buy America as stated herein.

In lieu of the Contractor providing personal certification, the Contractor may furnish a stepped certification in which each handler of the product, such as supplier, fabricator, manufacturer, processor, etc. furnishes an individual certification that their step in the process was domestically performed.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S107E01-0708

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS CONTROL AREAS

July 15, 2008

VOC Emission Control Area - The Contractor is advised that this project may be located in a volatile organic compound (VOC) emissions control area identified in the State Air Control Board Regulations (9 VAC 5-20) and in Table 1 below. Therefore, the following limitations may apply:

- Open burning is prohibited during the months of May, June, July, August, and September in VOC Emissions Control areas
- Cutback asphalt is prohibited April through October except when use or application as a penetrating prime coat or tack is necessary in VOC Emissions Control areas

Table 1. Virginia Department of Environmental Quality Volatile Organic Compound (VOC) Emissions Control Areas*

VOC Emissions Control Area	VDOT District	Jurisdiction
Northern Virginia	NOVA	Alexandria City Arlington County Fairfax County Fairfax City Falls Church City Loudoun County Manassas City Manassas Park City Prince William County
Northern Virginia	Fredericksburg	Stafford County
Fredericksburg	Fredericksburg	Spotsylvania County Fredericksburg City
Hampton Roads	Fredericksburg	Gloucester County
Hampton Roads	Hampton Roads	Chesapeake City Hampton City Isle of Wight County James City County Newport News City Norfolk City Poquoson City Portsmouth City Suffolk City Virginia Beach City Williamsburg City York County

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VOC Emissions Control Area	VDOT District	Jurisdiction
Richmond	Richmond	Charles City County Chesterfield County Colonial Heights City Hanover County Henrico County Hopewell City Petersburg City Prince George County Richmond City
Western Virginia	Staunton	Frederick County Winchester City
Western Virginia	Salem	Roanoke County Botetourt County Roanoke City Salem City

* Regulations for the Control and Abatement of Air Pollution (9 VAC 5-20-206)

See the Virginia Code (9 VAC 5 Chapter 40 – Article 39 (Emission Standards for Asphalt Paving Operations (Rule 4-39)) and Article 40 (Emission Standards for Open Burning (Rule 4-40)) for further clarification. In addition to the above requirements, the Contractor’s attention is directed to the requirements of Section 107.14 of the Specifications, because other air pollution requirements may also apply.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S107G01-0309

C-45
Rev. 2-19-09

VIRGINIA DEPARTMENT OF TRANSPORTATION

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) GENERAL PERMIT FOR THE
DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES CONTRACTOR AND
SUBCONTRACTOR CERTIFICATION STATEMENT

Order No.: D28 Project Number: (FO)7095-964-115, C502, B601, B602, B603,
B692, B693, B694, B695, B696, B697, B698,
B699
Route: 0095 Contract ID. #: C00018944C02

I certify under penalty of law that I understand the terms and conditions of the project contract, plans, permits, specifications and standards related to the erosion and sediment control, stormwater management and stormwater pollution prevention plan requirements for the affected activities associated with this project, the Virginia Stormwater Management Program (VSMP), and the General Permit for the Discharge of Stormwater from Construction Activities, if applicable to this project, issued by the Virginia Department of Conservation and Recreation. The VSMP Permit authorizes the storm water discharges associated with the construction activities from the project site identified and described in the bid documents and subsequent contract including any off-site support activities required for the complete fulfillment of the work therein.

Signature: Andrew G Palahovk
Name: Andrew G Palahovk
Title: Project Manager
Contracting Firm: Archer Western Contractors
Address: 112-A Pheasant Wood Ct, Morrisville, NC 27560
Phone Number: 919-463-6772
Address/Description of Site: _____
(Include off-site areas)
Certified on this date: August 9, 2010

(Note: This form must be returned with performance and payment bonds)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S107HF0-0708

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 107.15

January 17, 2008cc

Section 107.15 of the Specifications is replaced by the following:

Section 107.15—Use of Disadvantaged Business Enterprises (DBEs)

Disadvantaged Business Enterprise (DBE) Program Requirements.

Any Contractor, subcontractor, supplier, DBE firm, and contract surety involved in the performance of work on a federal-aid contract shall comply with the terms and conditions of the USDOT DBE Program as the terms appear in Part 26 of the Code of Federal Regulations (49 CFR as amended), the USDOT DBE Program regulations; and VDOT's Road and Bridge Specifications and DBE Program rules and regulations.

All time frames referenced in this provision are expressed in workdays unless otherwise indicated. Should the expiration of any deadline fall on a weekend or holiday, such deadline will automatically be extended to the next normal workday.

All administrative remedies noted in this provision are automatic unless the Contractor exercises the right of appeal within the required timeframe(s) specified herein. Appeal requirements, processes, and procedures shall be in accordance with guidelines stated herein and current at the time of the proceedings. Where applicable, the Department will notify the Contractor of any changes to the appeal requirements, processes, and procedures after receiving notification of the Contractor's desire to appeal.

Miscellaneous DBE Program Requirements.

In accordance with 49 CFR Part 26 and VDOT's DBE Program requirements, the Contractor, for itself and for its subcontractors and suppliers, whether certified DBE firms or not, shall commit to complying fully with the auditing, record keeping, confidentiality, cooperation, and anti-intimidation or retaliation provisions contained in those federal and state DBE Program regulations. By bidding on this contract, and by accepting and executing this contract, the Contractor agrees to assume these contractual obligations and to bind the Contractor's subcontractors contractually to the same at the Contractor's expense.

Required Contract Provisions.

For the purposes of this provision, Contractor is defined as the Prime Contractor of the contract; and sub-contractor is defined as any DBE supplier, manufacturer, or subcontractor performing work or furnishing material, supplies or services to the contract. The Contractor shall physically include this same contract provision in every supply or work/service subcontract that it makes or executes with a subcontractor having work for which it intends to claim credit.

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award, administration, and performance of this contract. Failure by the Contractor to carry out these requirements is a material breach of this contract, which will result in the termination of this contract or other such remedy, as VDOT deems appropriate

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Bank Services.

The Contractor and each subcontractor are encouraged to use the services of banks owned and controlled by socially and economically disadvantaged individuals. Such banking services and the fees charged for services typically will not be eligible for DBE Program contract goal credit. Such information is available from the VDOT's Internet Civil Rights Division website: www.Virginia-dot.org/business/bu-civil-rights-support-specs.

DBE Certification.

The only DBE firms eligible to perform work on a federal-aid contract for DBE contract goal credit are firms certified as Disadvantaged Business Enterprises by the Department of Minority Business Enterprises or VDOT in accordance with federal and VDOT guidelines. A directory listing of certified DBE firms can be obtained from Department of Minority Business Enterprises Internet website: www.dmb.e.state.va.us

DBE Program-related Certifications Made by Bidders\Contractors.

Bids will be considered non-responsive and will be rejected for failure to comply with the requirements of this Special Provision and the contract specifications. By submitting a bid and by entering into any contract on the basis of that bid, the bidder/Contractor certifies to each of the following DBE Program-related conditions and assurances:

- (1) That the management and bidding officers of its firm agree to comply with the bidding and project construction and administration obligations of the USDOT DBE Program requirements and regulations of 49 CFR Part 26 as amended, and VDOT's Road and Bridge Specifications and DBE Program requirements and regulations.
- (2) Under penalty of perjury and other applicable penal law that it has complied with the DBE Program requirements in submitting the bid, and shall comply fully with these requirements in the bidding, award, and execution of the contract.
- (3) To ensure that certified DBE firms have been given full and fair opportunity to participate in the performance of the contract. The bidder certifies that all reasonable steps were, and will be, taken to ensure that DBE firms had and will have an opportunity to compete for and perform work on the contract. The bidder further certifies that the bidder shall not discriminate on the basis of race, color, age, national origin, or sex in the performance of the contract or in the award of any subcontract.

Any agreement between a bidder and a DBE whereby the DBE promises not to provide quotations for performance of work to other bidders is prohibited.

- (4) As a bidder good faith efforts were made to obtain certified DBE participation in the proposed contract at or above the goal for certified DBE participation established by VDOT. It has submitted as a part of its bid a true, accurate, complete, and detailed written explanation of the good faith efforts it performed to meet the contract goal for certified DBE participation.
- (5) Once awarded the contract, the Contractor shall make good faith efforts to utilize certified DBE firms to perform work designated to be performed by certified DBEs at or above the amount or percentage of the dollar value specified in the bidding documents. Further, the Contractor understands it shall not unilaterally terminate, substitute for, or replace any DBE firm that was designated in the executed contract in whole or in part with another DBE, any non-DBE firm, or with the Contractor's own forces or those of an affiliate of the Contractor without the prior written consent of VDOT as set out within the requirements of this provision.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Once a contract is awarded, the Contractor shall designate and make known to the Department a liaison officer who is assigned the responsibility of administering and promoting an active and inclusive DBE program as required by 49 CFR Part 26 for certified DBEs. The designation and identity of this officer need be submitted only once by the Contractor during any twelve (12) month period at the preconstruction conference for the first contract the Contractor has been awarded during that reporting period. The Department will post such information for informational and administrative purposes at VDOT's Internet Civil Rights Division website.

- (6) Once awarded the contract, the Contractor shall comply fully with all regulatory and contractual requirements of the USDOT DBE Program, and that each DBE firm participating in the contract shall fully perform the designated work items with the DBE's own forces and equipment under the DBE's direct supervision, control, and management. If it is awarded the contract and if VDOT determines that as the Contractor, a DBE or any other firm retained by the Contractor has failed to comply with federal or VDOT DBE Program regulations and/or their requirements on that contract, VDOT has the authority and discretion to determine the extent to which the DBE contract goals have not been met, and will assess against the Contractor any remedies available at law or provided in the contract in the event of such a contract breach.
- (7) In the event a bond surety takes over the completion of work after VDOT has terminated the prime Contractor, the surety shall be obligated to meet the same DBE contract goals as were required of the original prime Contractor in accordance with the requirements of this specification.

Designation of DBE Firms to Perform on Contract.

The bidder, by signing and submitting its bid, certifies the DBE participation information submitted within the stated time thereafter is true, correct, and complete, and that the information provided includes the names of all certified DBE firms that will participate in the contract, the specific line item(s) that each listed certified DBE firm will perform, and the creditable dollar amounts of the participation of each listed certified DBE. The specific line item must reference the VDOT line number and item number contained in the proposal. The bidder further certifies, by signing its bid, it has committed to use each certified DBE firm listed for the specific work item shown to meet the contract goal for certified DBE participation. Award of the contract will be conditioned upon meeting these and other listed requirements of 49 CFR Part 26.53 and the contract documents.

By signing the bid, the bidder certifies on work it proposes to sublet, it has made good faith efforts to seek out and consider certified DBEs as potential subcontractors. The bidder shall contact DBEs to solicit their interest, capability, and prices in sufficient time to allow them to respond effectively, and shall retain on file proper documentation to substantiate its good faith efforts.

When a DBE firm has been removed from eligibility as a certified DBE firm, the following actions will be taken:

- (1) When a Contractor has made a commitment to use a DBE firm that is not currently certified, thereby making the Contractor ineligible to receive DBE participation credit for work performed, and a subcontract has not been executed, the ineligible DBE firm does not count toward either the contract goal or overall goal. The Contractor shall meet the contract goal with a DBE firm that is eligible to receive DBE credit for work performed, or must demonstrate to the Engineer that it has made good faith efforts to do so.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

When a Contractor has executed a subcontract with a certified DBE firm prior to official notification of the DBE firm's loss of eligibility, the Contractor may continue to use the firm on the contract and shall continue to receive DBE credit toward its DBE goal for the subcontractor's work.

When VDOT has executed a prime contract with a DBE firm that is certified at the time of contract execution but that is later ruled ineligible, the portion of the ineligible firm's performance on the contract before VDOT has issued the notice of its ineligibility shall count toward the contract goal.

- (2) If a certified DBE subcontractor is terminated, or fails, refuses, or is unable to complete the work on the contract for any reason, the Contractor must promptly request approval to substitute or replace that firm in accordance with this section of this Special Provision. The Contractor, as aforementioned in (1) above, shall notify VDOT in writing before terminating and/or replacing the certified DBE that was committed as a condition of contract award or that is otherwise being used or represented to fulfill certified DBE contract obligations during the contract performance period. Written consent from the Department for terminating the performance of any DBE shall be granted only when the Contractor can demonstrate that the DBE is unable, unwilling, or ineligible to perform its obligations for which the Contractor sought credit toward the contract DBE goal. Such written consent by the Department to terminate any DBE shall concurrently constitute written consent to substitute or replace the terminated DBE with another DBE. Consent to terminate a certified DBE shall not be based on the Contractor's ability to negotiate a more advantageous contract with another subcontractor whether that subcontractor is, or is not, a certified DBE

(a) Contractor's Written Request to Terminate DBE

All Contractor requests to terminate, substitute, or replace a certified DBE shall be in writing, and shall include the following information:

- (i) The date the Contractor determined the certified DBE to be unwilling, unable, or ineligible to perform;
- (ii) The projected date that the Contractor shall require a substitution or replacement DBE to commence work if consent is granted to the request;
- (iii) A brief statement of facts describing and citing specific actions or inaction by the certified DBE giving rise to the Contractor's assertion that the certified DBE is unwilling, unable, or ineligible to perform;
- (iv) A brief statement of the affected certified DBE's capacity and ability to perform the work as determined by the Contractor;
- (v) A brief statement of facts regarding actions taken by the Contractor which are believed to constitute good faith efforts toward enabling the certified DBE to perform;
- (vi) The current percentage of work completed on each bid item by the certified DBE;
- (vii) The total dollar amount currently paid per bid item for work performed by the DBE;

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (viii) The total dollar amount per bid item remaining to be paid to the certified DBE for work completed, but for which the certified DBE has not received payment, and with which the Contractor has no dispute;
- (ix) The total dollar amount per bid item remaining to be paid to the certified DBE for work completed, but for which the certified DBE has not received payment, and over which the Contractor and/or the certified DBE have a dispute.

(b) Contractor's Written Notice to DBE of Pending Request to Terminate and Substitute With Another DBE

The Contractor shall send a copy of the "request to terminate and substitute" letter to the affected committed DBE firm, in conjunction with submitting the request to the Engineer. The affected DBE firm may submit a response letter to the Department within two (2) working days of receiving the notice to terminate from the Contractor. The affected DBE firm shall explain its position concerning performance on the committed work. The Department will consider both the Contractor's request and the DBE's response and explanation before approving the Contractor's termination and substitution request, or determining if any action should be taken against the Contractor.

If, after making its best efforts to deliver a copy of the "request to terminate and substitute" letter, the Contractor is unsuccessful in notifying the affected DBE firm, the Department will verify the affected, committed DBE firm is unable or unwilling to continue the contract, and the Department will immediately approve the Contractor's request for a substitution.

(c) Proposed Substitution of Another Certified DBE

Upon termination of a certified DBE, the Contractor shall use reasonable good faith efforts to replace the terminated DBE. The termination of such certified DBE shall not relieve the Contractor of its obligations pursuant to this section, and the unpaid portion of the terminated certified DBE's contract would not be counted toward the contract goal.

When a DBE substitution is necessary the Contractor shall submit in writing the name of another certified DBE firm, the proposed work to be performed by that firm, and the dollar amount of the work to replace the unfulfilled portion of the work of the originally committed DBE firm. The Contractor shall furnish all pertinent information including contract I.D. number, project number, bid item, item description, bid unit and bid quantity, unit price, and total price. In addition, the Contractor shall submit documentation for the requested substitute DBE as described in this section of this Special provision.

Should the Contractor be unable to commit the remaining required dollar value to the substitute DBE, the Contractor shall provide written evidence of good faith efforts made to obtain the substitute value requirement. The Department will review the quality, thoroughness, and intensity of those efforts. Efforts that are merely superficial or pro-forma will not be considered good faith efforts to meet the contract goal for certified DBE participation. The Contractor must document the steps taken that demonstrate good faith efforts to obtain participation as set forth in the **Good Faith Efforts Described** section of this Special Provision.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Bidding Procedures.

The following bidding procedures shall apply to the contract for DBE Program compliance purposes:

Contract Goal, Good Faith Efforts Specified.

All bidders evidencing the attainment of DBE goal commitment equal to or greater than the required DBE goal established for the project must submit completed Form C-111 as a part of the bid documents. Form C-111 may be submitted electronically or may be faxed to the Department, but in no case shall the bidder's Form C-111 be received later than 2 hours after the time stated in the bid proposal for the receipt of bids.

If, at the time of submitting its bid the bidder knowingly cannot meet or exceed the required DBE contract goal, it shall submit Form C-111 exhibiting the DBE participation it attained as a part of its bid documents. The bidder shall then submit its good faith efforts within two (2) working days after the bid opening.

The lowest responsive and responsible bidder must submit its properly executed Form C-112 within two (2) working days after the bids have been opened and the determination of apparent lowest bidder. If, after review of the apparent lowest bid, VDOT determines the DBE requirements have not been met, the apparent lowest successful bidder must submit good faith documentation, which must be received by the Contract Engineer within two (2) working days after official notification of such failure to meet the aforementioned DBE requirements.

Good Faith Efforts Described.

Good faith efforts may be determined through use of the following list of the types of actions the bidder may make to obtain DBE participation. This is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts of similar intent may be relevant in appropriate cases:

- (1) Soliciting through reasonable and available means, such as but not limited to, attendance at pre-bid meetings, advertising, and written notices to certified DBEs who have the capability to perform the work of the contract. Examples include: advertising in at least one daily newspaper of general circulation; phone contact with a completely documented telephone log, including the date and time called, contact person, or voice mail status; and internet contacts with supporting documentation, including dates advertised. The bidder shall solicit this interest no less than five (5) business days before the bids are due so that the solicited DBEs have enough time to reasonably respond to the solicitation. The bidder shall determine with certainty if the DBEs are interested by taking reasonable steps to follow up initial solicitations as evidenced by documenting such efforts on Department standard good faith documentation forms;
- (2) Selecting portions of the work to be performed by certified DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items completely or with its own forces;
- (3) Providing interested certified DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner, which will assist the DBEs in responding to a solicitation;

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (4) Negotiating for participation in good faith with interested DBEs;
 - (a) Evidence of such negotiation shall include the names, addresses, and telephone numbers of DBEs that were considered; dates DBEs were contacted, a description of the information provided regarding the plans, specifications, and requirements of the contract for the work selected for subcontracting; and, if insufficient DBE participation seems likely, evidence as to why additional agreements could not be reached for DBEs to perform the work;
 - (b) A bidder using good business judgment should consider a number of factors in negotiating subcontractors, including certified DBE subcontractors, and should take a firm's price, qualifications, and capabilities, as well as contract goals, into consideration. However, the fact that there may be some additional costs involved in finding and using certified DBEs is not sufficient reason for a bidder's failure to meet the contract goal for certified DBE participation, as long as such costs are reasonable and comparable to costs customarily appropriate to the type of work under consideration. Also, the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make diligent good faith efforts. Bidders are not, however, required to accept higher quotes from DBEs if the price difference can be shown by the bidder to be excessive, unreasonable; or greater than would normally be expected by industry standards;
- (5) A bidder cannot reject a certified DBE as being unqualified without sound reasons based on a thorough investigation of the DBE's capabilities. The certified DBE's standing within its industry, membership in specific groups, organizations, associations and political or social affiliations, and union vs. non-union employee status are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal for certified DBE participation;
- (6) Making efforts to assist interested certified DBEs in obtaining bonding, lines of credit, or insurance as required by VDOT or by the bidder/Contractor;
- (7) Making efforts to assist interested certified DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services subject to the restrictions contained in these provisions;
- (8) Effectively using the services of appropriate personnel from VDOT and from the Virginia Department of Minority Business Enterprises, (VDMBE); available minority/women community or minority organizations; contractors' groups; local, state, and Federal minority/ women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and utilization of qualified DBEs.

Bid Rejection.

The failure of a bidder to submit the required documentation within the timeframes specified in the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision may be cause for rejection of that bidder's bid.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

In order to award a contract to a bidder that has failed to meet DBE contract goal requirements, VDOT will determine if the bidder's efforts were adequate good faith efforts, and if given all relevant circumstances, those efforts were to the extent a bidder actively and aggressively seeking to meet the requirements would make. Efforts to obtain DBE participation are not good faith efforts if they could not reasonably be expected to produce a level of DBE participation sufficient to meet the DBE Program and contract goal requirements.

If the lowest bidder is rejected for failure to submit required documentation, the Department may either award the work to the next lowest bidder, or re-advertise and construct the work under contract or otherwise as determined by the Commonwealth Transportation Board (CTB).

Documentation, and Administrative Reconsideration of Good Faith Efforts.

During Bidding

As described in the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision, the bidder must provide certified written documentation of its good faith efforts made to meet the DBE contract goal as proposed by VDOT within the timeframe specified in this section of the provision. No extension of time for submittal of good faith effort documentation will be allowed. The means of transmittal and the risk for timely receipt of this information shall be the responsibility of the bidder. The bidder shall attach additional pages to the certification, if necessary, in order to fully detail specific good faith efforts made to obtain certified DBE firm participation in the proposed contract work.

However, regardless of the DBE contract goal participation level proposed by the bidder or the extent of good faith efforts shown, all bidders shall timely and separately file their completed and executed Forms C-111 and C-112 and good faith efforts as aforementioned, or face potential bid rejection. If a bidder does not submit its completed and executed C-111 or C-112 when required by this Special Provision the bidder's bid will be considered non-responsive and will be rejected.

Where the Department upon initial review of the bid results determines the apparent low bidder has failed or appears to have failed to meet the requirements of the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision and has failed to adequately document that it made a good faith effort to achieve sufficient DBE participation as specified in the bid proposal, that firm upon notification of the Department's initial determination will be offered the opportunity for administrative reconsideration before VDOT rejects that bid as non-responsive. The bidder shall address such request for reconsideration in writing to the Contract Engineer within five (5) days of receipt of notification by the Department and shall be given the opportunity to discuss the issue and present its evidence in person to the Administrative Reconsideration Panel. The Administrative Reconsideration Panel will be made up of VDOT Division Administrators for the Civil Rights, Scheduling and Contract and Procurement divisions, none of who took part in the initial determination that the bidder failed to make the goal or make adequate good faith efforts to do so. After reconsideration, VDOT shall notify the bidder in writing of its decision and explain the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so.

If, after reconsideration, the Department determines the bidder has failed to meet the requirements of the contract goal and has failed to make adequate good faith efforts to achieve the level of DBE participation as specified in the bid proposal, the bidder's bid will be rejected.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

If sufficient documented evidence is presented to demonstrate that the apparent low bidder made reasonable good faith efforts, the Department will award the contract and reduce the DBE requirement to the actual commitment identified by the lowest successful bidder at the time of its bid.

However, such action will not relieve the Contractor of its responsibility for complying with the reduced DBE requirement during the life of the contract or any administrative sanctions as may be appropriate.

During the Contract

If the Contractor fails upon completion of the project to meet the required participation, the Contractor and any prime contractual affiliates, as in the case of a joint venture, may be enjoined from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects for a period of 90 days.

Prior to enjoinder from bidding or denial to participate as a subcontractor for failure to comply with participation requirements, as provided hereinbefore, the Contractor may submit documentation to the Engineer to substantiate that failure was due solely to quantitative underrun(s) or elimination of items subcontracted to DBEs, and that all feasible means have been used to obtain the required participation. The Engineer upon verification of such documentation shall make a determination whether or not the Contractor has met the requirements of the contract.

If it is determined that the aforementioned documentation is insufficient or the failure to meet required participation is due to other reasons, the Contractor may request an appearance before the Administrative Reconsideration Panel to establish that all feasible means were used to meet such participation requirements. The decision of the Administrative Reconsideration Panel shall be administratively final. The enjoinder period will begin upon the Contractor's failure to request a hearing within the designated time frame or upon the Administrative Reconsideration Panel's decision to enjoin, as applicable.

DBE Participation for Contract Goal Credit

DBE participation on the contract will count toward meeting the DBE contract goal in accordance with the following criteria:

- (1) Cost-plus subcontracts will not be considered to be in accordance with normal industry practice and will not normally be allowed for credit.
- (2) The applicable percentage of the total dollar value of the contract or subcontract awarded to the DBE will be counted toward meeting the contract goal for certified DBE participation in accordance with the **Designation of DBE Firms to Perform on Contract** section of this Special Provision for the value of the work, goods, or services that are actually performed or provided by the certified DBE firm itself or subcontracted by the certified DBE to other certified DBE firms.
- (3) When a certified DBE performs work as a participant in a joint venture, the Contractor may count toward the DBE goal only that portion of the total dollar value of the contract equal to the distinctly defined portion of the contract work that the DBE has performed with the DBE's own forces or in accordance with the provisions of this Section. The Department shall be contacted in advance regarding any joint venture involving both a certified DBE firm and a non-DBE firm to coordinate Department review and approval of the joint venture's organizational structure and proposed operation where the Contractor seeks to claim the certified DBE's credit toward the DBE contract goal.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

When a DBE subcontracts part of the work of the contract to another firm, the value of that subcontracted work may be counted toward the DBE contract goal only if the DBE's subcontractor at a lower tier is a VDOT certified DBE. Work that a certified DBE subcontracts to either a non-DBE firm or to a non-certified DBE firm will not count toward the DBE contract goal. The cost of supplies and equipment a DBE subcontractor purchases or leases from the prime Contractor or the prime's affiliated firms will not count toward the contract goal for certified participation.

- (4) The Contractor may count expenditures to a certified DBE subcontractor toward the DBE contract goal only if the certified DBE performs a Commercially Useful Function (CUF) on that contract.
- (5) A Contractor may not count the participation of a certified DBE subcontractor toward the Contractor's final compliance with the DBE contract goal obligations until the amount being counted has actually been paid to the certified DBE. A Contractor may count sixty (60) percent of its expenditures actually paid for materials and supplies obtained from a DBE certified by VDOT as a regular dealer, and one hundred (100) percent of such expenditures actually paid for materials and supplies obtained from a VDOT certified DBE manufacturer.
 - (a) For the purposes of this Special Provision, a regular dealer is defined as a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the material, supplies, articles, or equipment required and used under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a regular dealer, the certified DBE firm shall be an established business that regularly engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions will not be considered regular dealers.
 - (b) A certified DBE firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business where it keeps such items in stock if the certified DBE both owns and operates distribution equipment for the products it sells and provides for the contract work. Any supplementation of a regular dealer's own distribution equipment shall be by a long-term lease agreement and not on an *ad hoc* or contract-by-contract basis to be eligible for credit to meet the DBE contract goal.
 - (c) If a certified DBE regular dealer is used for DBE contract goal credit, no additional credit will be given for hauling or delivery to the project site goods or materials sold by that certified DBE regular dealer. Those delivery costs shall be deemed included in the price charged for the goods or materials by the certified DBE regular dealer, who shall be responsible for their distribution.
 - (d) For the purposes of this Special Provision, a manufacturer will be defined as a firm that operates or maintains a factory or establishment that produces on the premises the material, supplies, articles, or equipment required under the contract and of the general character described by the project specifications. A manufacturer shall include firms that produce finished goods or products from raw or unfinished material, or purchase and substantially alter goods and materials to make them suitable for construction use before reselling them.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (6) A Contractor may count toward the DBE contract goal the following expenditures to certified DBE firms that are not regular dealers or manufacturers for DBE program purposes:
- (a) The entire amount of fees or commissions charged by a certified DBE firm for providing a bona fide service, such as professional, technical, consultant or managerial services, or for providing bonds or insurance specifically required for the performance of the federal-aid contract, if the fee is reasonable and not excessive or greater than would normally be expected by industry standards for the same or similar services.
 - (b) The entire amount of that portion of the construction contract that is performed by the certified DBE's own forces and equipment under the DBE's supervision. This includes the cost of supplies and materials ordered and paid for by the certified DBE for contract work, including supplies purchased or equipment leased by the certified DBE, except supplies and equipment a certified DBE subcontractor purchases or leases from the prime Contractor or its affiliates.
- (7) A Contractor may count toward the DBE contract goal one hundred (100) percent of the fees paid to a certified DBE trucker or hauler for the delivery of material and supplies required on the project job site, but not for the cost of those materials or supplies themselves, provided that the trucking or hauling fee is determined by VDOT to be reasonable, as compared with fees customarily charged by non-DBE firms for similar services. Nor could a Contractor count costs for the removal or relocation of excess material from or on the job site when the certified DBE trucking company is not also the manufacturer of or a regular dealer in those materials and supplies. The certified DBE trucking firm shall also perform a CUF on the project and not operate merely as a pass through for the purposes of gaining credit toward the DBE contract goal. Prior to submitting a bid, the Contractor shall determine, or contact the VDOT Civil Rights Division or its district Offices for assistance in determining, whether a DBE trucking firm will meet the criteria for performing a CUF on the project.
- (8) The Contractor will receive DBE contract goal credit for the fees or commissions charged by and paid to a certified DBE broker who arranges or expedites sales, leases, or other project work or service arrangements provided that those fees are determined by VDOT to be reasonable and not excessive as compared with fees customarily charged by non-DBE firms for similar services. For the purposes of this Special Provision, a broker is defined as a person or firm that arranges for delivery of material, supplies, and equipment, or arranges project services but does not own or operate the delivery equipment necessary to transport materials, supplies, or equipment to or from a job site. A broker typically shall not purchase or pay for the material, supplies, or equipment, and if the broker does purchase or pay for those items those costs will be reimbursed in full. To receive DBE contract goal credit VDOT must determine that the DBE broker has performed a CUF in providing the contract work or service.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Performing a Commercially Useful Function (CUF)

No credit toward the DBE contract goal will be allowed for contract payments or expenditures to a certified DBE firm if that DBE firm does not perform a CUF on that contract. A DBE performs a CUF when the DBE is solely responsible for execution of a distinct element of the contract work and the DBE actually performs, manages, and supervises the work involved with the firm's own forces or in accordance with the provisions of the **DBE Participation for Contract Goal Credit** section of this Special Provision. To perform a CUF the certified DBE alone shall be responsible and bear the risk for the material and supplies used on the contract, selecting a supplier or dealer from those available, negotiating price, determining quality and quantity, ordering the material and supplies, installing those materials with the certified DBE's own forces and equipment, and paying for those materials and supplies. The amount the certified DBE firm is to be paid under the contract shall be commensurate with the work the certified DBE actually performs and the DBE credit claimed for the certified DBE's performance.

Monitoring CUF Performance

It shall be the Contractor's responsibility to ensure that all certified DBE firms selected for subcontract work on the contract, for which he seeks to claim credit toward the contract goal, perform a CUF. Further, the Contractor is responsible for and shall ensure that each certified DBE firm fully performs the certified DBE's designated tasks with the certified DBE's own forces and equipment under the certified DBE's own direct supervision and management or in accordance with the provisions of the **DBE Participation for Contract Goal Credit** section of this Special Provision. For the purposes of this provision the DBE 's equipment will mean either equipment directly owned by the DBE as evidenced by title, bill of sale or other such documentation or leased by the DBE and over which the DBE has control as evidenced by the leasing agreement from a firm not owned in whole or part by the prime Contractor or an affiliate of the Contractor under this contract.

VDOT will monitor the Contractor's DBE involvement during the performance of the contract. However, VDOT is under no obligation to warn the Contractor that a DBE's participation will not count toward the goal.

DBEs Must Perform a Useful and Necessary Role in Contract Completion

A DBE does not perform a commercially useful function if the DBE's role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.

DBEs Must Perform The Contract Work With Their Own Workforces

If a DBE does not perform and exercise responsibility for at least thirty (30) percent of the total cost of the DBE's contract with the DBE's own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, VDOT will presume that the DBE is not performing a commercially useful function and such participation will not be counted toward the contract goal.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Factors Used to Determine if a DBE Trucking Firm is Performing a CUF

The following factors will be used to determine whether a DBE trucking company is performing a CUF:

- (1) To perform a CUF the DBE trucking firm shall be completely responsible for the management and supervision of the entire trucking operation for which the DBE is responsible by subcontract on a particular contract. There shall not be a contrived arrangement, including but not limited to any arrangement that would not customarily and legally exist under regular construction project subcontracting practices for the purpose of meeting the DBE contract goal;
- (2) The DBE must own and operate at least one fully licensed, insured, and operational truck used in the performance of the contract work. This does not include a supervisor's pickup truck or a similar vehicle that is not suitable for and customarily used in hauling the necessary materials or supplies;
- (3) The DBE receives full contract goal credit for the total reasonable amount the DBE is paid for the transportation services provided on the contract using trucks the DBE owns, insures, and operates using drivers that the DBE employs and manages;
- (4) The DBE may lease trucks from another certified DBE firm, including from an owner-operator who is certified as a DBE. The DBE firm that leases trucks from another certified DBE will receive credit for the total fair market value actually paid for transportation services the lessee certified DBE firm provides on the contract;
- (5) The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees, not to exceed the value of transportation services provided by DBE-owned trucks on the contract. For additional participation by non-DBE lessees, the DBE will only receive credit for the fee or commission it receives as a result of the lease arrangement.

EXAMPLE: DBE Firm X uses two (2) of its own trucks on a contract. The firm leases two (2) trucks from DBE Firm Y and six (6) trucks from non-DBE Firm Z. DBE credit would be awarded for the total transportation services provided by DBE Firm X and DBE Firm Y, and may also be awarded for the total value of transportation services by four (4) of the six (6) trucks provided by non-DBE Firm Z. In all, full DBE credit would be allowed for the participation of eight (8) trucks. With respect to the other two trucks provided by non-DBE Firm Z, DBE credit could be awarded only for the fees or commissions pertaining to those trucks that DBE Firm X receives as a result of the lease with non-DBE Firm Z.

- (6) For purposes of this section, the lease must indicate that the DBE firm leasing the truck has exclusive use of and control over the truck. This will not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, provided the lease gives the DBE absolute priority for and control over the use of the leased truck. Leased trucks must display the name and identification number of the DBE firm that has leased the truck at all times during the life of the lease.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VDOT Makes Final Determination On Whether a CUF Is Performed

VDOT has the final authority to determine whether a DBE firm has performed a CUF on a federal-aid contract. To determine whether a DBE is performing or has performed a CUF, VDOT will evaluate the amount of work subcontracted by that DBE firm or performed by other firms and the extent of the involvement of other firms' forces and equipment. Any DBE work performed by the Contractor or by employees or equipment of the Contractor may be subject to disallowance under the DBE Program, unless the independent validity and need for such an arrangement and work is demonstrated.

Verification of DBE Participation and Imposed Damages.

Within fourteen days after contract execution, the Contractor shall submit to the Engineer a fully executed subcontract agreement for each DBE used to claim credit in accordance with the requirements stated on Form C-112. The subcontract agreement shall be executed by both parties stating the work to be performed, the details or specifics concerning such work and the price which will be paid to the subcontractor. Because of the commercial damage that the Contractor and its DBE subcontractor could suffer if their subcontract pricing, terms, and conditions were known to competitors, the Department staff shall treat subcontract agreements as proprietary Contractor trade secrets with regard to Freedom of Information Act requests. In lieu of subcontract agreements, purchase orders may be submitted for haulers, suppliers, and manufacturers. Such purchase orders must contain, as a minimum, the following information: authorized signatures of both parties; description of the scope of work to include contract item numbers, quantities, and prices; and required federal contract provisions.

The Contractor shall also furnish, and shall require each subcontractor to furnish, information relative to all DBE involvement on the project for each month during the life of the contract in which participation occurs and verification is available. The information shall be indicated on Form C-63 and certified on Form C-63A, or by copies of cancelled checks with appropriate identifying notations. Failure to provide the forms to the Engineer by the Contractor's monthly progress estimate date may result in delay of approval of the Contractor's monthly progress estimate for payment. The names and certification numbers of DBE firms provided by the Contractor on the various forms indicated in this Special Provision shall be exactly as shown on the Department's latest list of certified DBEs. Signatures on all forms indicated herein shall be those of authorized representatives of the bidder as shown on Form C-32 or Form C-32A, or authorized by letter from the bidder. If certified DBE firms are used which have not been previously documented with the Contractor's bid and for which the Contractor now desires to claim credit toward the project goal, the Contractor shall be responsible for submitting necessary documentation in accordance with the procedures stipulated in this Special Provision to cover such work prior to the DBE beginning work.

The Contractor shall submit to the Engineer its progress schedule as required by Section 103.06 of the Specifications or other such specific contract scheduling specification that may include contractual milestones, i.e., monthly or VDOT requested updates. The Contractor shall include a narrative of applicable DBE activities relative to work activities of the Contractor's progress schedule, including the approximate start times and durations of all DBE participation to be claimed for credit that shall result in full achievement of the DBE goal required in the contract.

On contracts awarded on the basis of good faith efforts, narratives or other agreeable format of schedule information requirements and subsequent progress determination shall be based on the commitment information shown on the latest Form C-111 as compared with the appropriate Form C-63.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Prior to beginning any major component or quarter of the work, as applicable, in which DBE work is to be performed, the Contractor shall furnish a revised Form C-111 showing the name(s) and certification number(s) of any currently certified DBEs not previously submitted who will perform the work during that major component or quarter for which the Contractor seeks to claim credit toward the contract DBE goal. The Contractor shall obtain the prior approval of the Department for any assistance it may provide to the DBE beyond its existing resources in executing its commitment to the work in accordance with the requirements listed in the **Good Faith Efforts Described** section of this Special Provision. If the Contractor is aware of any assistance beyond a DBE's existing resources that the Contractor, or another subcontractor, may be contemplating or may deem necessary and that have not been previously approved, the Contractor shall submit a new or revised narrative statement for VDOT's approval prior to assistance being rendered.

If the Contractor fails to comply with correctly completing and submitting any of the required documentation requested by this provision within the specified timeframes, the Department will withhold payment of the monthly progress estimate until such time as the required submissions are received VDOT. Where such failures to provide required submittals or documentation are repeated the Department will move to enjoin the Contractor and any prime contractual affiliates, as in the case of a joint venture, from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects until such submissions are received.

Documentation Required for Semi-final Payment.

On those projects nearing completion, the Contractor must submit Form C-63 and appropriate Form C-63A(s) marked "Semi-Final" within twenty (20) days after the submission of the last regular monthly progress estimate to the Engineer. The forms must include each certified DBE used on the contract work and the work performed by each certified DBE. The forms shall include the actual dollar amount paid to each certified DBE for the accepted creditable work on the contract and monies owed the certified DBE subcontractor. The forms shall be certified under penalty of perjury, or other applicable law, to be accurate and complete. VDOT will use this certification and other information available to determine applicable DBE credit allowed to date by VDOT and the extent to which the DBEs were fully paid for that work. The Contractor shall acknowledge by the act of filing the forms that the information is supplied to obtain payment regarding a federal participation contract. A letter of certification, signed by both the prime Contractor and appropriate certified DBEs, will accompany the forms, indicating the amount, including any retainage that remains to be paid to the certified DBE(s).

Documentation Required for Final Payment.

On those projects that are complete, the Contractor shall submit a final Form C-63 and Form C-63A(s) marked "Final" to the Engineer within thirty (30) days of final acceptance. The forms must include each certified DBE used on the contract and the work performed by each DBE. The forms shall include the actual dollar amount paid to each DBE for the creditable work on the contract and monies owed the DBE subcontractor. VDOT will use these forms and other information available to determine if the Contractor and DBEs have satisfied the DBE contract goal percentage specified in the contract and the extent to which the DBEs were paid for that work. The Contractor shall acknowledge by the act of signing and filing the forms that the information is supplied to obtain payment regarding a federal participation contract.

Prompt Payment Requirements.

The Contractor shall make prompt and full payment to the subcontractor(s) of any retainage held by the prime Contractor after the subcontractor's work is satisfactorily completed.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

For purposes of this Special Provision, a subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished, documented, and accepted as required by the contract documents by VDOT. When VDOT has made partial acceptance of a portion of the prime contract, the Department will consider the work of any subcontractor covered by that partial acceptance to be satisfactorily completed. Payment will be made in accordance with the requirements of Section 107.01, Section 109.08(a), and Section 109.10 of the Specifications.

Upon VDOT's payment of the subcontractor's portion of the work as shown on the monthly progress estimate and the receipt of payment by the Contractor for such work, the Contractor shall make compensation in full to the subcontractor for that portion of the work satisfactorily completed and accepted by the Department. For the purposes of this Special Provision, payment of the subcontractor's portion of the work shall mean the Contractor has issued payment in full, less agreed upon retainage, if any, to the subcontractor for that portion of the subcontractor's work that VDOT paid to the Contractor on the monthly progress estimate.

The Contractor shall make payment of the subcontractor's portion of the work within seven (7) days of the receipt of payment from VDOT in accordance with the requirements of Section 109.08(b) of the Specifications.

If the Contractor fails to make payment of the subcontractor's portion of the work within the timeframe specified herein, the subcontractor shall contact the Engineer and the Contractor's bonding company in writing. The bonding company and VDOT will investigate the cause for non-payment and, barring mitigating circumstances that would make the subcontractor ineligible for payment, ensure payment in accordance with the requirements of Section 109.08(b) of the Specifications.

The Department will withhold payment of the Contractor's monthly progress estimates until the Contractor ensures that the subcontractors have been promptly paid for the work that they have performed successfully and for which the Department has accepted and paid the Contractor.

By bidding on this contract, and by accepting and executing this contract, the Contractor agrees to assume these contractual obligations, and to bind the Contractor's subcontractors contractually to those prompt payment requirements.

Nothing contained herein shall preclude the Contractor from withholding payment to the subcontractor in accordance with the terms of the subcontract in order to protect the Contractor from loss or cost of damage due to a breach of agreement by the subcontractor.

Data Collection

In accordance with 49CFR Section 26.11, all firms bidding on prime contracts and bidding or quoting subcontracts on federal-aid projects shall provide the following information to the Contract Engineer annually.

- Firm name;
- Firm address;
- Firm's status as a DBE or non-DBE;
- The age of the firm; and
- The annual gross receipts of the firm.

The above information can be submitted by means of the Annual Gross Receipts Survey as required in the Prequalification/Certification application.

All bidders, including DBE prime Contractor bidders, shall complete and submit to the Contract Engineer the Subcontractor/Supplier Solicitation and Utilization Form C-48 for each bid submitted within ten (10) days after the bid opening. Failure of bidders to submit this form in the timeframe specified will be cause for rejection of the bid.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Summary of Remedies Available to VDOT

Failure of any bidder\Contractor to comply with the requirements of this Special Provision for Section 107.15 of the Virginia Road and Bridge Specifications, which is deemed to be a condition of bidding, or where a contract exists, is deemed to constitute a breach of contract shall be remedied in accordance with the following:

Disadvantaged Business Enterprise (DBE) Program Requirements.

All administrative remedies noted in this provision are automatic unless the Contractor exercises the right of appeal within the required timeframe(s) specified herein.

DBE Program-related Certifications Made by Bidders\Contractors

Bids will be considered non-responsive and will be rejected for failure to comply with the requirements of this Special Provision and the contract specifications. Where a contract exists and where the Contractor, a DBE or any other firm retained by the Contractor has failed to comply with federal or VDOT DBE Program regulations and/or their requirements on that contract, VDOT has the authority and discretion to determine the extent to which the DBE contract goals have not been met, and will assess against the Contractor any remedies available at law or provided in the contract in the event of such a contract breach.

Bid Rejection

The failure of bidders to submit the required documentation within the timeframes specified in the Contract Goal, Good Faith Efforts Specified section of this Special Provision may be cause for rejection of the bid.

If the lowest bidder is rejected for failure to submit required documentation, the Department may either award the work to the next lowest bidder, or re-advertise and construct the work under contract or otherwise as determined by the Commonwealth Transportation Board (CTB).

Documentation and Administrative Reconsideration of Good Faith Efforts

During Bidding

Regardless of the DBE contract goal participation level proposed by the bidder or the extent of good faith efforts shown, all bidders shall timely and separately file their completed and executed Forms C-111 and C-112 and good faith efforts as aforementioned or face potential bid rejection. If a bidder does not submit its completed and executed C-111 or C-112 when required by this Special Provision the bidder's bid will be considered non-responsive and will be rejected.

If, after reconsideration, the Department determines the bidder has failed to meet the requirements of the contract goal and has failed to make adequate good faith efforts to achieve the level of DBE participation as specified in the bid proposal, the bidder's bid will be rejected.

If sufficient documented evidence is presented to demonstrate that the apparent low bidder made reasonable good faith efforts, the Department will award the contract and reduce the DBE requirement to the actual commitment identified by the lowest successful bidder at the time of its bid. However, such action will not relieve the Contractor of its responsibility for complying with the reduced DBE requirement during the life of the contract or any administrative sanctions as may be appropriate.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

During the Contract

If the Contractor fails upon completion of the project to meet the required participation, the Contractor and any prime contractual affiliates, as in the case of a joint venture, may be enjoined from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects for a period of 90 days.

Verification of DBE Participation and Imposed Damages for Non-compliance

If the Contractor fails to comply with correctly completing and submitting any of the required documentation requested by this provision within the specified timeframes, the Department will withhold payment of the monthly progress estimate until such time as the required submissions are received by VDOT. Where such failures to provide required submittals or documentation are repeated, the Department will move to enjoin the Contractor and any prime contractual affiliates, as in the case of a joint venture, from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects until such submissions are received.

Prompt Payment Requirements

The Department will withhold payment of the Contractor's monthly progress estimates until the Contractor ensures that the subcontractors have been promptly paid for the work that they have performed successfully, and for which the Department has accepted and paid the Contractor.

In addition to the remedies described heretofore in this provision VDOT also exercises its rights with respect to the following remedies:

Suspect Evidence of Criminal Behavior.

Failure of a bidder, Contractor, or subcontractor to comply with the Virginia Department of Transportation Road and Bridge Specifications and these Special Provisions wherein there appears to be evidence of criminal conduct shall be referred to the Attorney General for the Commonwealth of Virginia and/or the FHWA Inspector General for criminal investigation and, if warranted, prosecution.

Suspected DBE Fraud

In appropriate cases, VDOT will bring to the attention of the U. S. Department of Transportation (USDOT) any appearance of false, fraudulent, or dishonest conduct in connection with the DBE program, so that USDOT can take the steps, e.g., referral to the Department of Justice for criminal prosecution, referral to the USDOT Inspector General, action under suspension and debarment or Program Fraud and Civil Penalties rules provided in 49CFR Part 31.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S107100-0708

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
SECTION 107.19—RAILWAY - HIGHWAY PROVISIONS

January 14, 2008

Rte. 0095 Project (FO)7095-964-115, C502, B601, B602, B603, B692, B693, B694, B695, B696, B697, B698, B699

SECTION 107.19—RAILWAY - HIGHWAY PROVISIONS of the Specifications is amended as follows:

Section 107.19—Railway - Highway Provision is amended to include the following:

The Contractor shall notify the Brian Harrison, Manager of Constr. Services of the AECOM, Inc. for CSX Transportation Railway Company, Philadelphia PA 19102
(City or Town) (State) (Zip)
215-966-4846 at least 72 hours before starting any work on or over the Railway (Telephone No.) (No.)
right-of-way. A vertical clearance above the highest rail of at least 23 feet and a horizontal clearance from the centerline of the track of at least 15 feet shall be maintained, unless otherwise authorized by the Railway Company. The approximate number and type of trains per day per track is as follows:

Track	<u>15 trains\day</u>		Track		
Track	_____	_____	Track	_____	_____
Track	_____	_____	Track	_____	_____

Upon starting work a slow order of N/A will be in effect.

The following Railway utilities are known to be on the Railway's right of way:
Communication and Signal Facilities

The Contractor shall promptly notify the Railway's duly authorized representative as noted above of any loss, damage, injury or death arising out of or in connection with the project work performed on or over the Railway right-of-way.

Section 107.19(a)—Flagger or Watchperson Services is amended to include the following:

The Contractor shall coordinate all construction operations on or over railway right-of-way with the Railway Company and make all arrangements for necessary flagger and watchperson service. Any flaggers or watchpersons required by the Railway Company for the safety of railway operations, because of work being performed by the Contractor or incidental thereto, will be provided by the Railway Company. No work shall be undertaken on or over the Railway right-of-way until the watchpersons or flaggers are present at the project site.

Flagger or watchperson service will be required whenever work is accomplished within 30 feet of the railroad's track or whenever any machinery or heavy equipment encroaches within 30 feet of the track. Also, flagger or watchperson service will be required whenever construction activities endanger the railroad signal and communication facilities. The jacking or boring of pipes or utility lines under the track will also require flagger service.

Contractor shall provide flaggers with a heated shelter and suitable sanitation facility.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

To procure or terminate flagger or watchperson services, the Contractor shall notify in writing,

Name Kevin Critzer
Title CSXT Roadmaster
Address 1 CSX Road
Richmond, VA 23230
Telephone No. 804-226-7443

On projects that will require these services for longer than a 30 day duration, it will require the posting of the position in accordance with union regulations. Consequently, it will require 30 days before a flagger can be assigned to the project. To terminate the service, it is necessary to allow 2 weeks from the receipt of such notification.

For flagger or watchperson services of less than 30 days duration, you must provide a 5 day advance notification. For termination of this service, allow 5 days from the receipt of the notification.

The Department has estimated that 2400 hours of flagging service will be required for this project. If the Department is required to reimburse the Railway Company for cost of flagging service in excess of the cost associated with the established hours, the amount of excess will be deducted from monies due the Contractor.

Sections 107.19 (c) 1. and 107.19 (c) 2. are replaced by the following:

Contractor's public liability and property damage insurance: With respect to operations performed by the contractor, this insurance shall provide coverage with a combined single limit of not less than \$5,000,000.00 each occurrence for bodily injury and/or property damage liability. This insurance shall include explosion, collapse, and underground hazard coverage. If the Contractor subcontracts any portion of the work, the Contractor shall also secure insurance protection in its own behalf under its Public Liability and Property Damage Insurance policies of cover any liability imposed on him by law for damages because of bodily injury and/or property damage liability as a result of work undertaken by the subcontractor(s). A certificate of insurance shall be provided to the railway company as evidence that the Contractor has in full force and effect the insurance coverage hereinbefore specified. Said certificate shall provide railway company with at least 30 days advance written notice of any material change in or cancellation of the required policies.

Railroad protective liability insurance: With respect to the operations the Contractor or any of its subcontractors perform, the Contractor must provide in the name of the railway company a policy providing coverage with a combined single limit of \$5,000,000.00 each occurrence and \$10,000,000.00 aggregate for bodily injury and property damage. This policy shall be written on the ISO/RIMA Form of Railroad Protective Insurance or its equivalent. The original of the policy shall be submitted to the Department for the railway company's approval and retention.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S109F00-0708

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
OPTIONAL ADJUSTMENT FOR FUEL

December 20, 2005c
Reissued July 2008c

The Department will adjust monthly progress payments up or down as appropriate for cost changes in fuel used on specific items of work identified in this provision. The Department will provide a master listing of standard bid items eligible for fuel adjustment on its website.

Included with this proposal is a listing of standard bid items the Department has identified as eligible for fuel adjustment on this project(s) as well as the respective fuel factors per pay unit for those items. Only items on this listing will be eligible for adjustment. The fuel usage factor for each item is considered inclusive of all fuel usage. Generally, non-standard pay items are not eligible for fuel adjustment.

The listing of eligible items applicable to this particular project is shown on Form C-21B "Bid Items Eligible for Fuel Adjustment" included with the bidding documents. The Bidder may choose to have fuel adjustment applied to any or all eligible items on this project's listing by designating the items for which the fuel adjustment will apply. The Bidder's selection of items for fuel adjustment may not be changed once he has submitted Form C-21B to the Department.

In order to be eligible for fuel adjustment under this provision, the apparent lowest responsive and responsible Bidder shall clearly identify on Form C-21B those pay items he chooses to have fuel adjustment applied on. Within 21 days after the receipt of bids the apparent successful Bidder shall submit his designated items on Form C-21B to the Contract Engineer. Items the successful Bidder chooses for fuel adjustment must be designated by writing the word "Yes" in the column titled "Option" by each bid item chosen for fuel adjustment. The successful Bidder's designations on Form C-21B must be written in ink or typed, and signed by this Bidder to be considered complete. Items not properly designated or left blank on the Bidder's C-21B "Bid Items Eligible for Fuel Adjustment" form will automatically not be considered for adjustment. If the apparent successful Bidder fails to return his Form C-21B within the timeframe specified, items will not be eligible for fuel adjustment on this project.

The monthly index price to be used in the administration of this provision will be calculated by the Department from the Diesel fuel prices published by the U. S. Department of Energy, Energy Information Administration on highway diesel prices, for the Lower Atlantic region. The monthly index price will be the price for diesel fuel calculated by averaging each of the weekly posted prices for that particular month.

For the purposes of this provision, the base index price will be calculated using the data from the month preceding the receipt of bids. The base index price will be posted by the Department at the beginning of the month for all bids received during that month.

The current index price will be posted by the Department and will be calculated using the data from the month preceding the particular estimate being vouchered for payment.

The current monthly quantity for eligible items of work selected by the Contractor for fuel adjustment will be multiplied by the appropriate fuel factor to determine the gallons of fuel to be cost adjusted. The amount of adjustment per gallon will be the net difference between the current index price and the base index price. Computation for adjustment will be made as follows:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

$$S = (E - B) QF$$

Where; S = Monetary amount of the adjustment (plus or minus)
B = Base index price
E = Current index price
Q = Quantity of individual units of work
F = Appropriate fuel factor

Adjustments will not be made for work performed beyond the original contract time limit unless the original time limit has been changed by an executed Work Order.

If new pay items are added to this contract by Work Order and they are listed on Department's master listing of eligible items, the Work Order must indicate which of these individual items will be fuel adjusted; otherwise, those items will not be fuel adjusted. If applicable, designating which new pay items will be added for fuel adjustment must be determined during development of the Work Order and clearly shown on Form C-10 Work Order. The Base Index price on any new eligible pay items added by Work Order will be the Base Index price posted for the month in which bids were received for that particular project. The Current Index price for any new eligible pay items added by Work Order will be the Index price posted for the month preceding the estimate on which the Work Order is paid.

When quantities differ between the last monthly estimate prepared upon final acceptance and the final estimate, adjustment will be made using the appropriate current index for the period in which that specific item of work was last performed.

In the event any of the base fuel prices in this contract increase more than 100 percent (i.e. fuel prices double), the Engineer will review each affected item of work and give the Contractor written notice if work is to stop on any affected item of work. The Department reserves the right to reduce, eliminate or renegotiate the unit price for remaining portions of affected items of work.

Any amounts resulting from fuel adjustment will not be included in the total cost of work for determination of progress or for extension of contract time.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S109G03-1109

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
ASPHALT MATERIAL PRICE ADJUSTMENT

July 30, 2008cc

All asphalt material contained in the attached master listing of eligible bid items and designated by pay items in the contract will be price adjusted in accordance with the provisions as set forth herein. Other items will not be adjusted, except as otherwise specified in the contract. If new pay items which contain asphalt material are established by Work Order, they will not be subject to Price Adjustment unless specifically designated in the Work Order to be subject to Price Adjustment.

Each month, the Department will publish an average state-wide PG 64-22 f.o.b. price per ton developed from the average terminal prices provided to the Department from suppliers of asphalt cement to contractors doing work in Virginia. The Department will collect terminal prices from approximately 12 terminals each month. These prices will be received once each month from suppliers on or about the last weekday of the month. The high and low prices will be eliminated and the remaining values averaged to establish the average statewide price for the following month. That monthly state-wide average price will be posted on the Scheduling and Contract Division website on or about the first weekday of the following month.

This monthly statewide average price will be the Base Index for all contracts on which bids are received during the calendar month of its posting and will be the Current Index for all asphalt placed during the calendar month of its posting. In the event an index changes radically from the apparent trend, as determined by the Engineer, the Department may establish an index which it determines to best reflect the trend.

The amount of adjustment applied will be based on the difference between the contract Base Index and the Current Index for the applicable calendar month during which the work is performed. Adjustment of any asphalt material item designated as a price adjustment item which does not contain PG 64-22, except PG 76-22, will be based on the indexes for PG 64-22. The quantity of asphalt cement for asphalt concrete pavement to which adjustment will be applied will be the quantity based on the percent of asphalt cement shown on the appropriate approved job mix formula.

The quantity of asphalt emulsion for surface treatments to which adjustment will be applied will be the quantity based on 65 percent residual asphalt.

Price adjustment will be shown as a separate entry on the monthly progress estimate; however, such adjustment will not be included in the total cost of the work for progress determination or for extension of contract time.

Any apparent attempt to unbalance bids in favor of items subject to price adjustment or failure to submit required cost and price data as noted hereinbefore may result in rejection of the bid proposal.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
MASTER LISTING OF
ASPHALT MATERIAL ITEMS ELIGIBLE FOR PRICE ADJUSTMENT
(10-27-09)

ITEM	DESCRIPTION	UNITS	SPECIFICATION
10062	Asphalt-Stab. Open-Graded Material	Ton	313
10416	Liquid Asphalt	Gal	311 312
10420	Blotted Seal Coat Ty. B	Sy	ATTD
10422	Blotted Seal Coat Ty. C	Sy	ATTD
10423	Blotted Seal Coat Ty. C-1	Sy	ATTD
10424	Blotted Seal Coat Ty. D	Sy	ATTD
10598	Ns Asphalt Concrete	Ton	315
10606	Asphalt Concrete Ty. SM-9.5	Ton	315
10607	Asphalt Concrete Ty. SM-12.5A	Ton	315
10608	Asphalt Concrete Ty. SM-12.5D	Ton	315
10609	Asphalt Concrete Ty. SM-12.5E (76-22)	Ton	315
10610	Asphalt Concrete Ty. IM-19.0A	Ton	315
10611	Asphalt Concrete Ty. IM-19.0D	Ton	315
10612	Asphalt Conc. Base Cr. Ty. BM-25.0	Ton	315
10613	Asphalt Concrete Ty. BM-37.5	Ton	315
10635	Asphalt Concrete Ty. SM-9.5A	Ton	315
10636	Asphalt Concrete Ty. SM-9.5D	Ton	315
10637	Asphalt Concrete Ty. SM-9.5E (76-22)	Ton	315
10639	Asphalt Concrete Ty. SM-19.0	Ton	315
10642	Asphalt Concrete Ty. BM-25.0A	Ton	315
10643	Asphalt Concrete Ty. BM-25.0D	Ton	315
10650	Stone Matrix Asphalt SMA-9.5(70-22)	Ton	317
10651	Stone Matrix Asphalt SMA-9.5(76-22)	Ton	317
10652	Stone Matrix Asphalt SMA-12.5(70-22)	Ton	317
10653	Stone Matrix Asphalt SMA-12.5(76-22)	Ton	317
10654	Stone Matrix Asphalt SMA-19.0(70-22)	Ton	317
10655	Stone Matrix Asphalt SMA-19.0(76-22)	Ton	317
10701	Liquid Asphalt Coating	Sy	ATTD
12505	Asphalt Concrete Curb Backup Material	Ton	315
13240	Asphalt Concrete Sidewalk	Ton	504
16110	Emul. Asph. Slurry Seal Type A	Sy	ATTD
16120	Emul. Asph. Slurry Seal Type B	Sy	ATTD
16130	Emul. Asph. Slurry Seal Type C	Sy	ATTD
16144	Latex Mod. Emul. Treat. Type B	Ton	ATTD
16145	Latex Mod. Emul. Treat. Type C	Ton	ATTD
16146	Latex Mod. Emul. Treat. Rutfilling	Ton	ATTD
16161	Modified Single Seal	Sy	ATTD
16162	Modified Double Seal	Sy	ATTD
16249	Nontracking Tack Coat	Gal.	ATTD
16250	Liquid Asphalt Matl. CMS-2 (Mod)	Gal	ATTD
16251	Liquid Asphalt Matl. CMS-2	Gal	ATTD
16252	Liquid Asphalt Matl. CRS-2	Gal	ATTD

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

16253	Liquid Asphalt Matl. CRS-2H	Gal.	ATTD.
16254	Liquid Asphalt Matl. RC-250	Gal	ATTD
16256	Liquid Asphalt Matl. RC-800	Gal	ATTD
16257	Ns Liquid Asphalt Matl.	Gal	ATTD
16260	Liquid Asphalt Matl. CRS-2L	Gal	ATTD
16325	NS Asphalt Concrete	Ton	N/A
16330	Asphalt Concrete Ty. SM-9.0A	Ton	315
16335	Asphalt Concrete Ty. SM-9.5A	Ton	315
16337	Asph. Conc. Ty. SM-9.5ASL (Spot Level)	Ton	315
16340	Asphalt Concrete Ty. SM-9.5D	Ton	315
16342	Asph. Conc. Ty. SM-9.5DSL (Spot Level)	Ton	315
16345	Asphalt Concrete Ty. SM-9.5E (76-22)	Ton	315
16350	Asphalt Concrete Ty. SM-12.5A	Ton	315
16352	Asph. Con. Ty. SM-12.5ASL (Spot Level)	Ton	315
16355	Asphalt Concrete Ty. SM-12.5D	Ton	315
16357	Asph. Con. Ty. SM-12.5DSL (Spot Level)	Ton	315
16360	Asphalt Concrete Ty. SM-12.5E (76-22)	Ton	315
16365	Asphalt Concrete Ty. IM-19.0A	Ton	315
16370	Asphalt Concrete Ty. IM-19.0D	Ton	315
16373	Asphalt Concrete Ty. IM-19.0A (T)	Ton	315
16374	Asphalt Concrete Ty. IM-19.0D (T)	Ton	315
16377	Asphalt Concrete Ty. BM-37.5	Ton	315
16379	Asphalt Concrete Ty. IM-19.0T	Ton	315
16390	Asphalt Concrete Ty. BM-25.0A	Ton	315
16392	Asphalt Concrete Ty. BM-25.0D	Ton	315
16395	Asphalt Concrete Ty. BM-25.0A (T)	Ton	315
16397	Asphalt Concrete Ty. BM-25.0D (T)	Ton	315
16400	Stone Matrix Asphalt SMA-9.5(70-22)	Ton	ATTD
16401	Stone Matrix Asphalt SMA-9.5(76-22)	Ton	ATTD
16402	Stone Matrix Asphalt SMA-12.5(70-22)	Ton	ATTD
16403	Stone Matrix Asphalt SMA-12.5(76-22)	Ton	ATTD
16404	Stone Matrix Asphalt SMA-19.0(70-22)	Ton	ATTD
16405	Stone Matrix Asphalt SMA-19.0(76-22)	Ton	ATTD
16490	Hot Mix Asphalt Treatment	Ton	ATTD
16500	Surf.Preparation & Restoration Type I	Ton	ATTD
16502	Surf.Preparation & Restoration Type li	Ton	ATTD
16504	Surf.Preparation & Restoration Type lii	Ton	ATTD
67201	NS Asphalt Concrete Overlay	Ton	315
67210	NS Asphalt Concrete	Ton	315
68240	NS Asphalt Concrete	Ton	315

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S223AG0-0210

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
CORROSION RESISTANT REINFORCING STEEL

November 19, 2009

SECTION 223—STEEL REINFORCEMENT of the Specifications is revised as follows:

Section 223.02 Materials is amended to add the following:

- (e) **Low-carbon, Chromium, reinforcing steel: Steel** shall conform to the requirements of ASTM A1035/A1035M – Standard Specification for Deformed and Plain, Low-carbon, Chromium, Steel Bars for Concrete Reinforcement.
- (f) **Solid Stainless reinforcing steel: Steel** shall conform to the requirements of ASTM A955/A955M - Standard and Specification for Deformed and Plain Solid Stainless Steel Bars for Concrete Reinforcement. UNS* Designations: S24000, S24100, S30400, S31603, S31653, S31803, S32101,
- (g) **Steel Clad reinforcing steel: Steel** shall conform to the requirements of AASHTO Designation: MP 13M/MP 13-04, Standard Specification for Stainless Steel Clad Deformed and Plain Round Steel Bars for Concrete Reinforcement.

* Unified Numbering System for Metals and Alloys

SECTION 406—REINFORCING STEEL is amended as follows:

Section 406.02 Materials is amended to add the following:

- (e) **Corrosion resistant steel used for reinforcement** shall conform to the requirements of Section 223.

Section 406.04 Measurement and Payment of the Specifications is amended add the following:

Corrosion resistant reinforcing steel, when a pay item, will be measured in pounds and paid for at the contract unit price per pound of the designated type of steel indicated and placed in the structure in the location(s) shown on the plans. This price shall include fabricating, shipping, furnishing and placement.

Payment will be made under:

Pay Item	Pay Unit
Corrosion resistant reinforcing steel, low carbon\chromium	Pound
Corrosion resistant reinforcing steel, Stainless clad	Pound
Corrosion resistant reinforcing steel, Solid stainless	Pound

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

S302G01-0908

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
FLOWABLE BACKFILL

July 30, 2008c

I. DESCRIPTION

This work shall consist of furnishing and placing flowable backfill for use as backfill material in pipe installations or in other uses at locations as designated on the plans, and as backfill material for plugging designated abandoned pipes and culverts.

II. MATERIALS

Hydraulic Cement shall conform to the requirements of Section 214 of the Specifications.

Fly Ash shall have no specific requirement for fineness, loss of ignition, or reactivity.

Water shall conform to the requirements of Section 216 of the Specifications.

Aggregates shall conform to the requirements of Sections 202 and 203 of the Specifications with a combined gradation as determined by the Contractor.

Admixtures shall conform to the requirements of Section 215 of the Specifications.

Granulated Iron Blast Furnace Slag shall conform to the requirements of Section 215 of the Specifications.

III. MIX DESIGN

Mix design for flowable backfill shall be provided by the Contractor. When used as backfill material in pipe installations or in other uses at locations as designated on the plans flowable backfill shall have a design compressive strength of 30 to 200 pounds per square inch. When used as backfill material for plugging designated abandoned pipes and culverts flowable backfill shall have a design compressive strength of 30 to 1200 pounds per square inch. The design compressive strength requirement shall be at 28 days when tested in accordance with ASTM D 4832. Mix design shall result in a fluid product having no less than an 8-inch slump at time of placement. The Contractor shall submit a mix design for approval supported by laboratory test data verifying compliance with 28 day compressive strength requirements. Mix design shall be approved by the Engineer prior to placement.

IV. PROCEDURES

Mixing and transporting shall be in accordance with Section 217 of the Specifications or by other methods approved by the Engineer.

Temperature of flowable backfill shall be at least 50 degrees F at time of placement. Material shall be protected from freezing for 24 hours after placement.

When used as backfill for pipe installation and floatation or misalignment occurs, correct alignment of the pipe shall be assured by means of straps, soil anchors or other approved means of restraint.

When used to fill the voids in abandoned pipes and culverts, they shall be plugged and backfilled in accordance with the plan details or as directed by the Engineer. The plugs shall be in accordance with the plan details. The backfill material shall be flowable backfill placed into the abandoned pipe or culvert without voids. The opening for culvert backfill installation shall be sealed with masonry or Class A-3 concrete at completion of backfilling.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

V. MEASUREMENT AND PAYMENT

Flowable Backfill will be measured and paid for in cubic yards complete-in-place. When used as backfill material in pipe installations or in other uses at locations as designated on the plans this price shall be full compensation for furnishing and placing flowable backfill, securing the pipe alignment, and for all materials, labor, tools, equipment and incidentals necessary to complete the work. When used as backfill material for plugging designated abandoned pipes and culverts the price bid shall include furnishing and placing of backfill material and furnishing and installing plugs.

Payment will be made under:

Pay Item	Pay Unit
Flowable Backfill	Cubic yard

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS21201-0908

January 17, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 212—JOINT MATERIALS

SECTION 212—JOINT MATERIALS of the Specifications is amended as follows:

Section 212.02(h)—Gaskets for pipe is amended by deleting the third paragraph.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS21402-0908

January 28, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 214—HYDRAULIC CEMENT

SECTION 214—HYDRAULIC CEMENT of the Specifications is amended as follows:

Section 214.02(b) Portland cements is amended by replacing 1. with the following:

1. The SO₃ content as specified in AASHTO M85 will be permitted, provided supporting data specified in AASHTO M85 are submitted to the Department for review and acceptance prior to use of the material.

Section 214.02(b) Portland cements is amended by deleting 3., 4., and 5.

Section 214.02—Detail Requirements is amended by adding the following:

- (c) **Expansive hydraulic cement** shall conform to the requirements of ASTM C 845 Type K.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS21501-0908

January 28, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 215—HYDRAULIC CEMENT CONCRETE ADMIXTURES

SECTION 215—HYDRAULIC CEMENT CONCRETE ADMIXTURES of the Specifications is amended as follows:

Section 215.02(g) Fly ash is replaced with the following:

(g) **Pozzolan** shall conform to Section 241 of the Specifications.

Section 215.02—Materials is amended by adding the following:

(k) **Metakaolin** shall conform to the requirements of AASHTO M321

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS21702-1209

December 4, 2009c

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 217—HYDRAULIC CEMENT CONCRETE

SECTION 217—HYDRAULIC CEMENT CONCRETE of the Specifications is amended as follows:

Section 217.02(a) Cementitious Materials is replaced with the following:

Cementitious materials shall be a blend of mineral admixtures and Portland cement or a blended cement. In overlay concretes, expansive hydraulic cement is permitted in lieu of Portland cement. Portland cement (Types I, II, III) blended cements (Type IP, Type IS) or expansive cement (Type K) shall comply with Section 214 of the Specifications. Flyash, ground granulated iron blast-furnace slag (GGBFS), silica fume or metakaolin shall conform to Section 215 of the Specifications. As a portion of the cementitious material, Table 1 lists the minimum percents of specific pozzolans required by mass of the cementitious material depending on the alkali content of the cement. Any other mineral admixture or any other amount or combination of mineral admixtures may be used if approved by the Engineer. As a portion of the cementitious material, the fly ash content shall not exceed 30 percent for Class F, the ground granulated blast-furnace slag content shall not exceed 50 percent and the silica fume content shall not exceed 10 percent unless approved by the Engineer. Class C Flyash or other pozzolans may be used provided the contractor demonstrates that the percent usage of Class C Flyash or other pozzolans have a maximum expansion of 0.15% according to ASTM C227 at 56 days using borosilicate glass as aggregate. Blended cements require no further pozzolan additions to meet minimum pozzolan content to compensate for the alkali-silica reaction.

Up to 7 percent silica fume may be added to all combinations of cementitious materials to reduce early permeability without approval by the Engineer. Other silica fume additions must be approved by the Engineer.

Table 1 – Minimum percent pozzolan required by mass of cementitious material as a portion of the total cementitious materials and are based upon the alkali content of the cement.

	Total Alkalies of Cement is less than or equal to 0.75%	Total Alkalies of Cement is greater than 0.75% and less than or equal to 1.0%
Class F Flyash	20%	25%
GGBF Slag	40%	50%
Silica Fume	7%	10%
Metakaolin	7%	10%

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

TABLE II-17 Requirements for Hydraulic Cement Concrete is replaced with the following:

TABLE II-17 Requirements for Hydraulic Cement Concrete		Air Content (percent) ¹	Consistency (in of slump)	Max. Water /Cementitious Mat. (lb. Water/lb. Cement)	Min. Cementitious Content (lb./cu yd)	Min. Grade Aggregate	Nominal Max. Aggregate Size (in)	Design Max. Laboratory Permeability at 28 days - Over tidal water (Coulombs) ⁵	Design Max. Laboratory Permeability at 28 Days (Coulombs) ⁵	Aggregate Size No. ⁶	Design Min. Laboratory Compressive Strength at 28 Days (f'c) (psi)	Class of Concrete
		4 1/2 ± 1 1/2	0-4	0.40	635	A	1	1,500	1,500	57 or 68	5,000 or as specified on the plans	A5 Prestressed and other special designs ²
		6 1/2 ± 1 1/2	2-4	0.45	635	A	1	2,000	2,500	56 or 57	4,000	A4 General
		7 ± 2	2-5	0.45	635	A	0.5	2,000	2,500	7,8 or 78	4,000	A4 Post & rails
		6 ± 2	1-5	0.49	588	A	1	2,000	3,500	56 or 57	3,000	A3 General
		6 ± 2	0-3	0.49	564	A	1	3,500	3,500	56 or 57	3,000	A3a Paving
		6 ± 2	0-3	0.49	N.A	A	2	3,500	3,500	357	3,000	A3b Paving
		4 ± 2	0-4	0.58	494	B	1	N.A.	N.A.	57	2,200	B2 Massive or lightly Reinforced
		4 ± 2	0-3	0.71	423	B	1	N.A.	N.A.	57	1,500	C1 Massive Unreinforced
		4 ± 2	3-6	0.49	635	A	1	N.A.	N.A.	56 or 57	3,000	T3 Tremie seal
		5 ± 2	4-6	0.40	658	A	0.5	1,500	1,500	7,8 or 78	3,500	Latex hydraulic cement concrete overlay ³
		6 ± 2	4-7	0.40	658	A	0.5	1,500	1,500	7,8 or 78	5000	Silica fume, silica fume /Class F Fly Ash or silica fume/slag concrete overlay ⁴
		6 ± 2	4-7	0.40	658	A	0.5	1,500	1,500	7,8 or 78	4000	Class F Fly Ash or slag overlay

(See next page for notes on TABLE II-17).

(See next page for notes on TABLE II-17).

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

----- (TABLE II-17 Notes) -----

- ¹ When a high-range water reducer is used, the upper limit for entrained air may be increased by 1% and the slump shall not exceed 7 inches.
- ² When Class A5 concrete is used as the finishing bridge deck riding surface, or when it is to be covered with asphalt concrete with or without waterproofing, the air content shall be $5 \frac{1}{2} \pm 1 \frac{1}{2}$ percent.
- ³ The latex modifier content shall be 3.5 gallons per bag of cement. Slump shall be measured approximately 4.5 minutes after discharge from the mixer.
- ⁴ Silica fume with a minimum of 7% by weight of cementitious material; silica fume with a range of 2.5-5 % shall be combined with Class F Fly Ash in range of 15-20% and minimum cement of 77.5% by weight of cementitious material; silica fume with a range of 2.5-5% shall be combined with Ground Granulated Blast Furnace Slag in the range of 30-35% and a minimum cement of 67.5% by weight of cementitious material.
- ⁵ The permeability testing does not apply to small bridges identified on the bridge plans and to concrete structures and incidental concrete as described in Sections 219, 232, 302, 415, 502, 504, 506 and 519. Curing and testing of test cylinders for permeability will be in accordance with VTM 112.
- ⁶ The contractor may use different aggregate sizes or a combination of sizes to increase the coarse aggregate content of the concrete as approved by the Engineer. The maximum size of the coarse aggregate shall not exceed 2.5 inches.

Note: With the approval of the Engineer, the Contractor may substitute a higher class of concrete for that specified at the Contractor's expense.

Section 217.02(b) Formulated latex modifier is amended by adding the following:

For latex-modified concrete, Type I, Type II, Type III or Type K, cement shall be used without mineral admixtures.

Section 217.04(a)4. Admixtures is replaced with the following:

4. **Admixtures** shall be dispensed and used according to the manufacturer's recommendations. They shall be added within a limit of accuracy of 3 percent, by means of an approved, graduated, transparent, measuring device before they are introduced into the mixer. If more than one admixture is to be used, they shall be released in sequence rather than in the same instant. Once established, the sequence of dispensing admixtures shall not be altered. However, when the amount of admixture required to give the specified results deviates appreciably from the manufacturer's recommended dosage, use of the material shall be discontinued.

Section 217.05(a) Batching Equipment is amended to replace the second paragraph with the following:

Scales used for weighing aggregates and cement shall be approved and sealed in accordance with the requirements of Section 109 of the Specifications.

Section 217.07—Proportioning Concrete Mixtures is amended to replace the first paragraph with the following:

The Contractor is responsible for having a Certified Concrete Plant Technician available during batching operations, and a Certified Concrete Field Technician shall be present during placing operations.

Section 217.07—Proportioning Concrete Mixtures is amended to delete the third paragraph beginning with **A Certified Concrete Batcher**.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 217.08(a) Air Consistency Tests is amended to replace the first paragraph with the following:

Air Consistency Tests: Air and consistency tests will be performed by the Department prior to discharge of concrete into the forms to ensure that specification requirements are consistently being complied with for each class of concrete. The sample secured for the tests shall be taken after at least two cubic feet of concrete has been discharged from the delivery vehicle. The two cubic feet discharged is not to be used as part of the test sample. Any deviation from sampling and testing procedures must be approved by the Engineer. The Contractor shall provide a receptacle conforming to the requirements of ASTM C31, Section 5.9, for the Department's use in obtaining the sample. If either determination yields a result that is outside of the allowable range for air content or consistence, the following procedure will be used:

1. The Engineer will immediately perform a recheck determination. If the results confirm the original test results, the load will be rejected.
2. The Contractor's representative will be immediately informed of the test results.
3. The Contractor's representative shall notify the producer of the test results through a pre-established means of communication.

Section 217.08(b) Strength Test is amended to replace the first and second paragraphs with the following:

Strength Tests: The 28-day strengths specified in Table II-17 are strengths used in the design calculations. The Engineer will verify design strengths by tests made during the progress of the work in accordance with the requirements of ASTM C39 and C31 with the exception that the fresh concrete sample used for testing is secured after at least two cubic feet has been discharged from the delivery vehicle. The two cubic feet discharged is not to be used as part of the test sample. Any deviation from sampling and testing procedures must be approved by the Engineer. If the test results do not conform to the strengths specified in Table II-17, immediate steps shall be take to adjust the design mixture and an investigation will be initiated by the Engineer to determine the acceptability of the concrete. Use of ASTM C42 will be at the Engineer's discretion.

The Contractor shall provide a storage chamber at his expense for temporary storage of the Department's concrete cylinders before concrete is placed. The contractor shall be responsible for the chamber maintaining the concrete test cylinders in a continuously moist condition within a temperature range of 60 degrees F to 80 degrees F and shall be equipped with a continuously recording thermometer accurate to ± 2 degrees F for the duration of concrete field cylinder curing period. The chamber shall be located in an area where the test cylinders will not be subject to vibration and shall be of sufficient size or number to store, without crowding or wedging, the required number of test cylinders as determined by the Contractor based on his plan of operations. The Chamber and location of the chamber must be approved by the Engineer.

Section 217.08—Acceptance is amended by adding the following:

(c) **Concrete Temperature** shall be measured in accordance with the requirements of ASTM C1064.

(d) **Quality Assurance** for Low Permeability Concrete:

General:

At least two trial batches, using job materials, with permissible combination of cementitious materials shall be prepared, and test specimens shall be cast by the Contractor and tested by the Department for permeability and strength at least a month before the field application. The permeability samples shall be cylindrical specimens with a 4-inch diameter and at least 4-inches in length. Cylinders will be tested at 28 days in accordance with VTM 112. The test value shall be the result of the average values of tests on two specimens from each batch.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Permeability values obtained from trial batches shall be 500 coulombs below the maximum values specified in Table II-17 of the Specifications to be acceptable.

Acceptance Tests:

For each set of cylinders made for compressive strength tests, two additional cylinders shall be made for the permeability test. The Department will be responsible for making and testing all permeability test specimens.

If the average permeability test result is equal to or less than the value for the specified class of concrete in Table II-17, then full payment will be made for the lot the average permeability test result represents. However, if the average permeability test result exceeds the coulomb value in Table II-17, payment for that lot of concrete shall be reduced by 0.005 percent for each coulomb above the coulomb value in Table II-17 multiplied by the bid item cost of the concrete times the number of cubic yards or cubic meters of concrete in the lot. The reduction in price will not exceed 5 percent of the bid price of the concrete. Any concrete with a coulomb value that exceeds the maximum required in Table II-17 by 1000 coulomb will be rejected. However, bridge deck concrete with any coulomb value exceeding the maximum required by over 1000 coulomb may be accepted by the Engineer at 95 percent of the bid price if the concrete in question has the required strength and meets other specification requirements, and the Contractor applies, at his own expense, an approved epoxy concrete overlay to the top of the entire deck. In such case deck grooving will not be required. Epoxy overlays over latex overlays will not be permitted. The adjustment to the roadway grade shall be made as required by the Engineer at the Contractor's expense.

Similarly, concrete in abutments and pier caps with coulomb value exceeding the maximum required in Table II-17, by more than 1000 coulomb may be accepted at 95 percent of the bid price if it has the required strength and meets other specification requirements, and the Contractor applies at his own expense, one coat of Type EP-3B and one coat of EP-3T in conformance with the requirements of Section 243.02 of the Specifications, on top of the pier cap or abutment seat.

Section 217.09(b) Ready Mixed Concrete is amended to replace the second paragraph with the following:

Each load of transit or shrink-mixed concrete shall be accompanied by Form TL-28 signed by the VDOT Certified Concrete Field Technician or a designated company representative working under the direction of the VDOT Certified Concrete Field Technician. The form shall be delivered to the Inspector at the site of the work. Loads that do not carry such information or that do not arrive in satisfactory condition shall not be used.

Section 217.09(b) Ready-Mixed Concrete is amended to replace the fourth paragraph and the table with the following:

Each batch of concrete shall be delivered to the site of work and discharged within 90 minutes of the time the cement is introduced into the mixture unless approved otherwise by the Engineer.

Section 217.09(b)1. Transit mixing is amended to replace the first paragraph with the following:

1. **Transit mixing:** Concrete shall be mixed in a truck mixer. Mixing shall begin immediately after all ingredients are in the mixer and shall continue for at least 70 revolutions of the drum or blades at the rate of at least 14 but no more than 20 revolutions per minute.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS22401-0908

November 15, 2007

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 224—CASTINGS

SECTION 224—CASTINGS of the Specifications is amended as follows:

Section 224.02—Materials is amended as follows:

The following is added as the first paragraph:

All casting suppliers/manufacturers shall have an approved QA/QC plan on file with the Department. Junction boxes that are to be installed within that portion of the roadway not protected by a guardrail or barrier shall be designed in accordance with the requirements of AASHTO M306 and M105, Class 35B.

Section 224.02(b) is replaced with the following:

(b) **Gray iron castings** used in that portion of the roadway not protected by a guardrail or barrier shall conform to the requirements of AASHTO M306 and M105, Class 35B. All other castings shall conform to AASHTO M105, Class 35B.

Section 224.02(c) is replaced with the following:

(c) **Ductile iron castings** used in that portion of the roadway not protected by a guardrail or barrier shall conform to AASHTO M306. All other ductile iron castings shall conform to ASTM A536, Grade 60-40-18.

Section 224.03—Detail Requirements is replaced with the following:

If castings are supplied from materials conforming to sections 224.02 (a), (d) and (e), all tolerances and workmanship requirements for castings shall conform to AASHTO M306. If used in that portion of the roadway not protected by a guardrail or barrier, the load testing shall conform to the requirements of AASHTO M306. When the alternate load test is used, test bars shall be present and fully identifiable with regard to the casting lot. Each casting in a lot must have the same markings as all of the other castings in the lot; if not, each group of castings with the same markings within the original lot, becomes a new lot.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS22601-0609

December 16, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 226—STRUCTURAL STEEL

SECTION 226—STRUCTURAL STEEL of the Specifications is amended as follows:

Section 226.02(b) Other Structural Steel is replaced with the following:

- (b) **Other Structural Steel:** Unless otherwise specified, steel for other structural members except H-piles shall conform to the requirements of ASTM A36. H-piles shall conform to the requirements of ASTM A572 or ASTM A992. One copy of the mill analysis shall accompany steel piles shipped to the project site. Three copies of the mill analysis for structural steel members shall be submitted to the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS23201-0710

August 4, 2009

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 232—PIPE AND PIPE ARCHES

SECTION 232—PIPE AND PIPE ARCHES of the Specifications is amended as follows:

Section 232.02 Detail Requirements of the specifications is amended to replace the first paragraph with the following:

Concrete, corrugated steel and polyethylene pipe shall only be supplied from manufacturers currently having an approved Quality Control Plan on file with the Department.

Section 232.02(a)1.b.(6) is replaced with the following:

- (6) **Strength tests** shall be performed by the three-edge bearing method in accordance with the requirements of AASHTO T280 or by control cylinders tested in accordance with ASTM C31 and C39 or by the testing of cores in accordance with ASTM C42. Control cylinders for acceptance testing shall be cured under the same conditions as the concrete the cylinders represent. Hand cast pipe and end sections may be tested in accordance with the requirements of ASTM C31 and C39. Concrete pipe may be shipped after reaching 85 percent of design strength as determined by control cylinders or cores.

Section 232.02(a)1.b.(7) is replaced with the following:

- (7) **Absorption tests** shall be performed in accordance with the requirements of AASHTO T280 on specimens of broken pipe or cores.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS23802-0609

March 4, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 238—ELECTRICAL AND SIGNALS COMPONENTS

SECTION 238 ELECTRICAL AND SIGNAL COMPONENTS of the Specifications is amended as follows:

Section 238.02(f) Electrical and Signal Junction Boxes is replaced with following:

(f) Electrical and Signal Junction Boxes:

Boxes, frames and covers shall be water resistant. Covers shall be secured with stainless steel bolts and fasteners. Covers shall be flush with surface of the junction box and not protrude above the top of the junction box flange.

Junction box bolt attachment holes shall be drilled through to prevent debris from collecting in the threaded bolt holes.

Junction boxes shall be tested and certified by an independent testing laboratory as meeting the requirements indicated herein for approval for use. Independent testing laboratory shall be approved by VDOT Materials Division prior to testing. The Contractor shall furnish the Engineer documentation of such test results.

Testing reports shall provide complete test results for the type of design testing indicated for the respective type of junction box.

Junction Boxes for deliberate traffic in the roadway applications:

- Concrete shall conform to the requirements of Section 217 and shall be designed to meet the provisions of AASHTO's *Standard Specifications for Highway Bridges for HS20* loading. Concrete shall have a design minimum compressive strength of 4000 psi.
- Gray Iron frame and covers shall conform to the requirements of Section 224.

Junction Boxes for off roadway applications:

- Shall conform to the requirements of ANSI/SCTE 77 2007 and tier 15 loading. Boxes shall be open bottom.
- Shall be Polymer concrete with straight sides or Polymer concrete with flared or straight fiberglass sides.
- Other materials may be submitted for the sidewalls provided they conform to the requirements of ANSI/SCTE 77 2007 and tier 15 loading.

Junction Boxes frames and covers for bridge structures encasements shall be one of the following types:

1. Steel castings conforming to the requirements of Section 224, galvanized inside and out.
2. Welded sheet steel having a thickness of at least 3/16 inch or 7 gage, galvanized inside and out.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3. Polymer concrete with fiberglass sides or all polymer concrete.

Section 238.02(h)6.f. Light Emitting Diode (LED) traffic signal head sections is amended to replace the third paragraph with the following:

LED arrow traffic signal modules shall conform to the requirements of the *ITE Vehicle Traffic Control Signal Heads – Light Emitting Diode Vehicle Arrow Traffic* issued April 3, 2006 (inclusive of any ITE documents that amend, revise and/or supersede it).

And to replace the seventh paragraph with the following:

The LED's shall be mounted and soldered to a printed circuit board. Modules shall be provided with an external in-line fuse or internal fusing of the 120 VAC (+) input. The fuse shall be rated in accordance with the LED module manufacturer. The LED signal module shall utilize the same mounting hardware used to secure the incandescent lens and gasket assembly and shall only require a screwdriver or standard installation tool to complete the mounting.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS40701-0310

January 25, 2010

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 407—STEEL STRUCTURES

SECTION 407—STEEL STRUCTURES of the Specifications is amended as follows:

Section 407.06(c)3.b.—Direct tension indicators is amended to replace the first paragraph with the following:

- b. **Direct tension indicators:** When direct tension indicators are used, installation shall be in accordance with the requirements of Section 407.06(c)3 of the Specifications. However, the indicator washer shall not be considered a substitute for the required hardened washer under the turned element but may be considered a substitute for the hardened washer required under the unturned element when bolts conforming to the requirements of ASTM A 490 are used with steel conforming to the requirements of ASTM A 709, Grade 36. Direct tension-indicator washers shall not be painted or coated with any epoxy or similar material prior to installation. The normal installation shall consist of the load indicator being placed under the unturned bolt head or unturned nut. However, if conditions required installation under the turned bolt portion, a hardened flat washer or nut face washer shall be fitted against the tension-indicating protrusions. Tension-indicating washers shall not be substituted for the hardened washers required with short-slotted or oversized holes but may be used in conjunction with them.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS41301-0609

August 5, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

**SUPPLEMENTAL SECTION 413—DISMANTLING AND REMOVING EXISTING STRUCTURES OR
REMOVING PORTIONS OF EXISTING STRUCTURES**

SECTION 413—DISMANTLING AND REMOVING EXISTING STRUCTURES OR REMOVING PORTIONS OF EXISTING STRUCTURES of the Specifications is amended as follows:

Section 413.02(b) Removing Portion of Existing Structure is replaced with the following:

- (b) **Removing Portion of Existing Structure:** The portions to be removed shall be the areas designated on the plans. No portion of the structure shall be removed by blasting or other methods that may damage any portion of the structure that will remain in place. When pneumatic hammers are used to remove concrete, the weight of the hammer alone shall be not more than a nominal 90 pounds for widening work or a nominal 35 pounds for deck repair work. The use of tractor-mounted demolition hammers with a maximum manufacturer's rated striking energy of 1,000 foot-pounds will be permitted for the removal of concrete parapets down to the top of deck and for that portion of the deck where the reinforcing steel will be removed. The use of tractor-mounted demolition hammers or pneumatic hammers weighing more than a nominal 35 pounds shall not be allowed for the removal of that portion of the deck that is within 6 inches of the top flange of the beams/girders to remain in the structure. With the written approval of the Engineer, hydraulically actuated, jaw type, concrete crushers may be used for the removal of concrete parapets down to the top of the deck. The approval of hydraulically actuated, jaw type, concrete crushers shall be contingent upon continuous satisfactory results with no damage to any portion of the structure that is to remain in place. The removal of concrete parapet on prestressed concrete slab spans or prestressed concrete box beam spans shall be limited to nominal 35-pound pneumatic hammers within 2 inches of the deck and not more than nominal 90-pound pneumatic hammers for the remainder of the parapet unless otherwise approved by the Engineer.

Disturbed areas shall be uniformly graded to natural ground contours in a manner that will facilitate drainage and prevent impoundment of water.

Materials or portions of existing structures removed shall be handled in accordance with the requirements of (a)1. herein.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS41401-0310

January 25, 2010

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 414—RIPRAP

SECTION 414—RIPRAP of the Specifications is amended as follows:

Section 414.04—Measurement and Payment is amended to replace the ninth and tenth paragraphs with the following:

Riprap will be paid for at the contract unit price. This price shall include furnishing and placing riprap, including welded wire fabric, mortar, or grout; excavation; and riprap bedding. These prices shall include geotextile bedding material when required. The price bid shall include preparing the surface, furnishing and installing geotextile bedding material, overlaps, repair work, and excavating and backfilling toe-ins.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS50101-0310

January 25, 2010

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 501—UNDERDRAINS

SECTION 501—UNDERDRAINS of the Specifications is amended as follows:

501.04—Measurement and Payment is amended to replace the first through fourth paragraphs with the following:

Underdrains and combination underdrains will be measured in linear feet, complete-in-place, and will be paid for at the contract unit price per linear foot. The contract unit price for underdrains installed at depths greater than those shown in the standard drawings will be increased 20 percent for each 1-foot increment of increased depth. No adjustment in the contract unit price will be made for an increment of depth of less than 6 inches. When drains are to be placed under pavement that is not constructed under the Contract, the contract unit price shall include removing and replacing pavement.

Outlet pipe for underdrains will be measured in linear feet, complete-in-place, and will be paid for at the contract unit price per linear foot.

These prices shall include furnishing and installing geotextile drainage fabric, excavating, furnishing and installing aggregate, backfilling, compaction, splicing, inspection ports, if any, disposing of surplus and unsuitable materials, and installing outlet markers.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS51202-0909

June 11, 2009

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 512—MAINTAINING TRAFFIC

SECTION 512—MAINTAINING TRAFFIC of the Specifications is amended as follows:

Section 512.03(a) Signs is amended to replace the last paragraph with the following:

When construction signs are covered to prevent the display of the message, the entire sign shall be covered with silt fence or other materials approved by the Engineer such that no portion of the message side of the sign shall be visible. Plywood shall be used on ground-mounted construction signs only. Attachment methods used to attach the covering material to the signs shall be of a durable construction that will prevent the unintentional detachment of the material from the sign. At no times shall a construction sign and/or post be rotated to prevent the display of the message. In addition, the posts where the signs are being covered shall have two ED-3 Type II delineators mounting vertically on the post below the signs at a height of 4 feet to the top of the topmost delineator. The bottom delineator shall be mounted 6 inches below the top delineator.

Section 512.03(b) Flagger Service and Pilot Vehicles is amended to replace the last paragraph with the following:

Portable traffic control signals conforming to the requirements of Section 512.03(h)2 of the Specifications may be used in lieu of flagger service when specified or approved by the Regional Traffic Engineer. When portable traffic control signals are used in lieu of flagger service, the portable traffic control signals will be measured and paid for separately.

Section 512.03(e)b. Group 2 devices is amended to replace the first paragraph with the following:

- b. **Group 2 devices** shall be drums or vertical panels. Drums shall be round, or partially round with no more than one flat side; made from plastic; have a minimum height of 36 inches, have a cross-sectional width no less than 18 inches in any direction; and conform to the requirements of the *Virginia Work Area Protection Manual*. Drums shall be designed to allow for separation of ballast and drum upon vehicular impact but not from wind and vacuum created by passing vehicles. Drums of two-piece design, i.e., drum and associated base, shall utilize sufficient amounts of enclosed sand at the base in accordance with the manufacturer's recommendations to provide stable drum support. The base shall be not greater than 5 inches in height. Two-piece drums may also utilize a flared drum foundation and collar of not more than 5 inches in height and of suitable shape and weight to provide stable support. One-piece drums may be used provided they comply with these above requirements.

Section 512.03 Procedures is amended to add (r) **Work Zone Traffic Control** as the following:

- (r) **Work Zone Traffic Control:** The Contractor shall provide individuals trained in Work Zone Traffic Control in accordance with the requirements of Section 105.14 of the Specifications.

Section 512.04 Measurement and Payment is amended to add the following:

Basic Work Zone Traffic Control – Separate payment will not be made for providing a person to meet the requirements of Section 105.14 of the Specifications. The cost thereof shall be included in the price of other appropriate pay items.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Intermediate Work Zone Traffic Control - Separate payment will not be made for providing a person to meet the requirements of Section 105.14 of the Specifications. The cost thereof shall be included in the price of other appropriate pay items.

Section 512.04 Measurement and Payment is amended to replace the pay item and corresponding pay unit for “**Eradication of existing pavement markings**” with the following:

Eradication of existing pavement markings will be measured in linear feet of a 6-inch width or portion thereof as specified herein. Widths that exceed a 6-inch increment by more than 1/2 inch will be measured as the next 6-inch increment. Measurement and payment for eradication of existing pavement markings specified herein shall be limited to linear pavement line markings. Eradication of existing pavement markings will be paid for at the contract unit price per linear foot. This price shall include removing linear pavement line markings and disposing of residue.

Eradication of existing nonlinear pavement markings will be measured in square feet based on a theoretical box defined by the outermost limits of the nonlinear pavement marking. Nonlinear pavement markings shall include but not be limited to stop bars, arrows, images and messages. Eradication of existing nonlinear pavement markings will be paid for at the contract unit price per square foot. This price shall include removing nonlinear pavement markings and disposing of residue.

Payment will be made under:

Pay Item	Pay Unit
Eradication of existing pavement marking	Linear foot
Eradication of existing nonlinear pavement marking	Square foot

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS70003-0609

June 9, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 700—GENERAL

SECTION 700—GENERAL of the Specifications is amended as follows:

Section 700.02(i) the first sentence is replaced with the following:

Poles, posts, and overhead sign structures shall conform to the following:

Section 700.02(i)2. is replaced with the following:

2. **Overhead sign structures, signal poles (mast arm and strain), and high-mast lighting poles** shall be steel.

Section 700.02(i)4. Poles, posts, and overhead sign structures is replaced with the following:

4. **Sign posts** shall be wood or steel. Square tube post shall be hot-rolled, carbon sheet steel, structural steel quality, conforming to the requirements of ASTM A 1011, Grade 50 except the yield strength after cold-forming shall be 60,000-psi minimum. Steel mounting brackets shall conform to the requirements of ASTM A36. Posts (inside and outside) shall be galvanized in accordance with the requirements of ASTM A653, Coating Designation G-90.

Section 700.02(i) the first and second paragraph is replaced with the following:

Lighting, signal, pedestal poles; sign posts; and overhead sign structures not designed to support variable message signs shall conform to the requirements of the 1994 Edition of AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*.

Overhead sign structures, including "butterfly" structures, designed to support variable message signs shall conform to the requirements of the 2001 Edition of AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* and the following clarifications:

- Basic wind speed shall be used in the designs. The alternate method for wind pressures provided in Appendix C shall not be used.
- When the installation location of the structures lies between isotachs, the basic wind speed shall be determined by using the higher adjacent isotach.
- Any optional design parameters indicated in the AASHTO specification that are "allowed when acceptable to the owner" shall not be used for the designs.

Steel poles, posts, and overhead sign structures shall be hot-dip galvanized after fabrication. Except when shop painting is required, steel poles and posts shall be given one shop coat of primer and two field coats of paint and the galvanization finish of overhead sign structures shall be field treated for paint retention and two coats of paint applied.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 700.04(a)1. Grounding Electrodes is amended to replace the seventh paragraph with the following:

- The Contractor shall install a junction box at the primary grounding electrode location for access to the electrode for connection and testing. Grounding electrode conductors shall be installed under the bottom flange of the junction box. The grounding electrode shall be centered in the bottom of the junction box with a minimum of 6 inches exposed. The junction box cover shall have the letters "VDOT ELEC" cast in the depression on the top.

Section 700.04(a)2. Grounding electrode testing is replaced with the following:

2. **Grounding electrode testing:** Primary grounding electrodes shall be tested after each 10-foot grounding electrode and/or section thereof is installed using the fall of potential (three-point measurement) method. After the primary grounding electrode is installed and tested, the Contractor shall connect to the augmented electrode(s) to conduct a system test. The Contractor shall disconnect the grounding electrode conductor from the service equipment ground bus and bonding bushing before testing the grounding electrodes/system. The Contractor shall test the grounding electrode as required by the manufacturer's instructions for the type of earth testing equipment. The Contractor shall record the readings on a form provided by the Regional Traffic Engineering Office. The completed form shall be signed and submitted to the Engineer after installation of the electrical service grounding.

Section 700.04(e) Poles, Posts, and Sign Structures is amended to include the following:

Square tube sign post shall have 7/16-inch (+/- 1/64-inch) openings or knockouts spaced 1-inch on centers on all four sides. When specified on the plans a 2 3/16-inch inner-post shall be used with the 2 1/2-inch post for additional strength. The inner-post shall be no less than 6 feet long.

Where posts are to be mounted on a retaining wall or barrier, the Contractor shall provide a mounting bracket, fabricated from steel conforming to the requirements of ASTM A36 and hot dipped galvanized in accordance with ASTM A123. Mounting bracket shall be designed so no connection to the barrier is made on the traffic side of the barrier and shall be secured to the barrier and wall using stainless steel chemically adhesive anchors.

Section 700.04(g)1. Electrical service and lighting conductor identification is amended to replace the fifth paragraph with the following:

Color-coding shall be as follows:

2-wire circuits, 120 Volts; 3-wire circuits, 120/240 Volts; 3-phase, 4-wire wye circuits, 208/120 Volts and; 3-phase, 4-wire delta circuits, 240 Volts

Circuit Designation	Color Code
Phase A or Line A	Black
Phase B or Line B	Red or orange*
Phase C	Blue
Grounded Conductor (Neutral)	White or gray** (see exception above)
Equipment Grounding Conductor	Bare, green, or green with one/more yellow stripes

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3-phase, 4-wire wye circuits, 480/277 Volts; 3-phase, 3-wire delta circuits, 480 volts

Circuit Designation	Color Code
Phase A	Brown
Phase B	Orange
Phase C	Yellow
Grounded Conductor (Neutral)	White or gray** (see exception above)
Equipment Grounding Conductor	Bare, green, or green with one/more yellow stripes

* For 3-phase, 4-wire delta circuits, Phase B shall be the high leg and shall be orange.

** For outer covering of conductors of different systems that is contained within the same enclosure, refer to Article 200 of the NEC.

Section 700.04(h) Conduit Systems is amended to include the following:

When a conduit enters a box, fitting, or other enclosure, a bushing shall be provided to protect the conductor cable from abrasion unless the design of the box, fitting, or enclosure is such to afford equivalent protection of the conductor cable.

Section 700.04(h)2. Buried conduit systems is amended to replace the second paragraph with the following:

When conduit is to be installed under an existing roadway, entrance, or fixed object and open cutting is not permitted, conduit shall be installed by an approved directional boring method. Conduit for the directional boring method shall be PVC designed specifically for the directional boring operation or high-density PE. When the plans show more than one conduit at a location to be installed by directional boring, with the Engineers approval the Contractor may elect to install multiple conduits into a single bore at no additional cost to the Department.

MAXIMUM PILOT OR BACK REAMER BIT DIAMETER WHEN ROATED 360⁰	
NOMINAL INSIDE PIPE DIAMETER INCHES	BIT (REAMER) DIAMETER INCHES
1 - 2"	4" BORE HOLE
2 - 2"	5" BORE HOLE
3 - 2"	8" BORE HOLE
1 - 3"	5" BORE HOLE
2 - 3"	6 ½ " BORE HOLE
3 - 3"	8" BORE HOLE
1 - 4"	6 ½ " BORE HOLE

The Contractor shall use an approved stabilizing agent mixed with potable water to create the drilling fluid (mud slurry) for lubrication and soil stabilization. The fluid viscosity may vary to best fit the soil conditions encountered. Do not use any chemicals or polymer surfactants in the drilling fluid without written consent from the Engineer. The Contractor shall certify to the Engineer in writing that any chemical added to the drilling fluid is environmentally safe and not harmful or corrosive to the conduit system.

The Contractor may elect to use the jacked method to install a pipe sleeve for installation of the required conduit at no additional cost to the Department.

If an obstruction is encountered during the directional boring or jacking operation that requires abandonment of the hole (tunnel), it shall be backfilled with a flowable fill immediately, at no additional cost to the Department.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 700.04(i) Junction Box Covers is replaced with the following:

(i) **Junction Boxes** shall be installed as follows:

The junction box site shall be excavated such that the depth of the excavation shall be the height of the junction box plus at least twelve inches to allow for bedding aggregate material and such that the width shall be six to eight inches wider than the junction box.

Bedding material shall be No. 68, No. 78, or No. 8 aggregate or Crushed Glass conforming to No. 78, or No. 8 gradation requirements. Aggregate shall be a minimum of twelve inches in depth and entirely cover the bottom of the junction box excavation. The bedding aggregate shall be leveled and tamped prior to installing the junction box.

Junction box shall be installed and leveled to grade prior to backfilling.

Prior to backfilling the interior of polymer concrete junction boxes (JB-S1, JB-S2 and JB-S3) shall be braced with 2 inch by 4 inch lumber using two braces across the width and one brace across the length of the box or as required by the manufacturer. Bracing shall be installed to facilitate removal once back filling and compaction have been completed. The Contractor shall remove internal bracing after the backfilling and compacting operation has been completed.

The cover of the junction box shall be installed prior to backfilling.

The junction box shall be backfilled and compacted around its perimeter utilizing six to eight inch horizontal lifts to where the concrete collar is to begin. Once the concrete collar has cured the remaining area around the collar shall be backfilled and compacted as stated above. Compaction shall be at least ninety percent of the theoretical maximum density as defined in Section 101.02 of the Specifications. A mechanical tamping device shall be used to compact the backfill and soil layer by layer around the perimeter of the junction box. The wheel of a backhoe or other type vehicle shall not be used for compaction of backfill and soil.

The internal bracing shall be removed after backfilling and compaction has been completed. The area around the junction box shall be graded and restored as stated in the Specifications.

Junction boxes shall not be installed or backfilled in standing water. Backfill material shall be free of large stones, wood or other debris and shall not be saturated with water.

If a special tool or wrench is required to remove the cover, the Contractor shall furnish the Engineer with five such tools.

Section 700.05—Measurement and Payment for Concrete foundations is replaced with the following:

Concrete foundations will be measured and paid for in units of each or cubic yards of concrete as applicable. When paid for in cubic yards of concrete, no payment will be made for concrete in excess of the cubic yards of concrete required by the foundation design unless otherwise approved by the Engineer. This price shall include foundation design, concrete, reinforcing steel, stub poles, slip base, anchor sleeve, anchor bolts, bolt circle templates, grounding equipment, conduits, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 700.05—Measurement and Payment for Overhead and bridge-mounted sign structures is replaced with the following:

Overhead sign structures will be measured in units of each and will be paid for at the contract unit price per each. This price shall include structural units and supports, hand holes and covers, grounding lugs, electrical systems including conduit and fittings, and identification tags.

Section 700.05—Measurement and Payment for, Junction boxes is replaced with the following:

Junction boxes will be measured in units of each and will be paid for at the contract unit price per each. This price shall include concrete collars, frames and covers, tools to remove the cover, ground rods, ground conductors, grounding lugs, knockouts, cable racks, bracing, aggregate, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS70101-0609

January 22, 2009

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 701—TRAFFIC SIGNS
SECTION 701—TRAFFIC SIGNS

SECTION 701—TRAFFIC SIGNS of the Specifications is amended as follows:

Section 701.03—Procedures is amended as follows:

Section 701.03(a)2. Sign panels is amended to include the following:

Extruded sign panels shall be in accordance the drawings and Section 229.02(c) of the Specifications.

Section 701.03(a)3. Applying reflective background sheeting is amended to include the following:

Sheeting applied to extruded sign panel sections shall extend over the top edge and down side legs a minimum of 1/16 inch.

Section 701.03(a)5. Joining sign base panels is amended to include the following:

Extruded sign panels shall be assembled in accordance with the drawings.

When extruded panels receive a non-micro-prismatic reflective sheeting background, fabricate the panels with rounded corners at a radius of 0.031 inch and chamfer on the edge to facilitate wrapping the reflective sheeting around the edge and fitting the panels together.

When extruded panels receive a micro-prismatic reflective sheeting background, fabricate the panels with square corners. Apply the reflective sheeting to the face and cut flush with the edge of the extrusion.

Section 701.03(d) Erection is amended to replace the first sentence of the first paragraph with the following:

Vertical clearance for overhead sign structures shall be no less than 19 feet 0 inch and no more than 21 feet 0 inch from the bottom of the lowest mounted sign panel to the crown of the roadway unless otherwise specified on the plans

Section 701.03(d) Erection is amended to delete the last sentence of the first paragraph:

Section 701.03(d) Erection is amended to delete the last paragraph:

Section 701.03(d) Erection is amended to include the following:

Overlay panels shall be preformed on a flat surface with no protruding bolts or bolt heads on the existing sign panel.

Overlay of overhead sign panels shall be in accordance with the plan details.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
INSPECTION OF BRIDGE STRUCTURES FOR ASBESTOS CONTAINING MATERIALS (ACM)

February 9, 2009

PART I – GENERAL

1. Description of Work:

The Contractor is hereby advised that the structure(s) scheduled for demolition, renovation, reconstruction or replacement may contain asbestos. The Contractor shall assume that the bridge structure(s) may contain asbestos in a quantity sufficient to be a health hazard when disturbed or found in a degraded state or friable condition.

The Contractor shall employ a licensed asbestos inspection firm to conduct asbestos inspection activities on bridge structure(s). The firm shall furnish all labor, materials, supplies, and equipment necessary to perform the work. The Contractor shall submit the asbestos inspection report(s) to the Department upon completion.

2. Contract Limitations

An asbestos inspection firm is not eligible to perform work on projects if the asbestos inspection will be performed by individuals or firms with an employer/employee relationship or financially affiliated with the asbestos abatement firm performing abatement activities.

3. Definitions and Abbreviations:

All definitions and abbreviations used in this specification are consistent as defined under OSHA; the USEPA Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP); the Virginia Department of Labor and Industry (VDLI); the Virginia Department of Professional and Occupational Regulation (VDPOR); and the Virginia Department of Environmental Quality (VDEQ).

PART II –WORK PRACTICES

- A. The Contractor and inspection firm shall comply with all applicable EPA, OSHA, VDEQ, VDLI and DPOR regulations, and shall follow all applicable EPA and VDLI/OSHA workplace guidelines. EPA workplace guidelines include, but are not limited to, the NESHAP demolition practices and applicability to road construction projects (40 CFR Part 61). OSHA workplace guidelines include, but are not limited to, any currently applicable OSHA compliance directives or instructions. In any instance of conflict between the VDLI and OSHA requirements, the VDLI requirements shall take precedence. Any “de minimus” quantity exemptions that are provided in the aforementioned references shall not apply to VDOT asbestos removal activities.
- B. The asbestos inspection firm is required to maintain at the job site copies of EPA, VOSHA/OSHA and applicable state and local government regulations.
- C. The firm and its employees shall be licensed to perform asbestos inspection activities in accordance with Virginia Department of Professional and Occupational Regulation (DPOR) requirements.
- D. The asbestos inspection firm shall employ sample collection techniques that prevent cross-contamination from airborne sources of asbestos fibers.
- E. Representative samples of each homogeneous area of suspect ACM shall be collected to determine asbestos content.
- F. For Department facilities to be re-occupied (e.g. bridge tender’s office), the Contractor shall ensure that:
 - i. Care is taken to minimize fiber release during sample collection and any debris and residue that is generated shall be thoroughly cleaned up.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- ii. Sample locations are adequately patched by the inspector to prevent fiber release, deterioration of the material, or leakage. Any damage created as a result of the improper or incomplete patching of a material after sampling will be the responsibility of the Contractor.

PART III – SUBMITTALS

An inspection report shall be received by the Department before any asbestos abatement work is started. Copies shall be submitted as requested to the Project Manager. At a minimum, the inspection report shall include:

1. Name, address, and telephone number of the inspection firm.
2. Copies of licenses for the firm and employees performing work under this specification.
3. Virginia and Federal identification numbers of the structures inspected.
4. Summary of results individually listed for each structure. The results shall include the exact location of the ACM along with the sample identification number, description, percent of asbestos in each material sampled, type of ACM, NESHAP Category, condition of ACM, and quantity of ACM.
5. Site map identifying the location of each sample.
6. Photo documentation
7. Copy of the laboratory analyses results, chain of custody forms and laboratory license.

PART IV – OTHER REQUIREMENTS

1. Additional Contractor Responsibilities

The Contractor shall ensure that the inspection firm and its employees performing work under this specification have an established medical surveillance program in compliance with OSHA regulations 29 CFR 1926.1101 and a written respirator program in compliance with OSHA regulation 29 CFR 1910.134.

2. Site Inspection

VDOT (or its representative) reserves the right to inspect all asbestos inspection activities at any time. If any aspect of the work is found inconsistent with this special provision, a stop work order will be issued and operations will be immediately suspended. Until the inconsistency is corrected, any standby time and costs for corrective actions shall be at the Contractor's expense.

PART V - MEASUREMENT AND PAYMENT

Payment for asbestos inspection will be made on a lump sum basis for each structure and shall include full compensation for inspection, testing, reporting, and all other associated costs.

Payment will be made under:

Pay Item
NS Environmental Protection HAZMAT Inspection

Pay Unit
Lump Sum (per Structure)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
LIGHTWEIGHT AGGREGATE HYDRAULIC CEMENT CONCRETE

October 26, 2009

SECTION 217 - HYDRAULIC CEMENT CONCRETE of the Specifications is amended as follows:

I. DESCRIPTION

Lightweight aggregate hydraulic cement concrete shall be composed of portland cement, lightweight coarse aggregates, fine aggregates, admixtures, and water, proportioned and mixed in accordance with the requirements of ACI 211.2, "Standard Practice for Selecting Proportions for Structural Lightweight Concrete", and as amended by these special provisions.

II. MATERIALS

Lightweight aggregate – Low-density aggregate shall be expanded slate produced by the rotary kiln method conforming to ASTM C330.

Section 217.04 - Measurement of Materials is deleted and replaced with:

Quality Control: The Contractor shall provide process Quality Control adequate to produce work of acceptable quality. The Contractor shall perform process Quality Control sampling, testing and inspection during all phases of the work at a rate sufficient to ensure that the work conforms to the contract requirements and the minimum guidelines specified for that item.

The Contractor shall provide and maintain a process Quality Control Plan, hereinafter referred to as the "Plan." The Plan shall include a list and function of all personnel, equipment, supplies, and facilities necessary to obtain Quality Control samples, perform tests, and otherwise control the quality of the product to meet specified requirements.

Quality Control testing shall be performed by the Contractor using certified technicians, as defined in Section 217.07, and in laboratories approved by the Materials Division. Laboratory facilities shall be kept clean and all equipment shall be maintained in proper working condition. The Engineer shall be permitted unrestricted access to inspect and review the Contractor's laboratory facility and all Quality Control data.

The Plan shall describe the random sampling procedure that will be used for obtaining Quality Control samples. The Contractor shall maintain a complete record of all Quality Control tests and inspections. All Quality Control samples shall be obtained in accordance with Department, AASHTO, or ASTM procedures using a random sampling procedure except for check samples that can be obtained if the Quality Control sample result indicates that the process is Out-of-Control. In the event a check sample is obtained, both the results from the original test and that from the check sample shall be noted as such and retained in the Contractor's database.

As a minimum a Control Chart of Unit Weight shall be one part of the Plan and it shall be kept current, i.e., data shall be plotted within one working day of testing and displayed in a location designated by the Contractor. The location shall be accessible to the Engineer at all times. As a minimum, the Control Chart shall identify the test number, test date, upper and lower control limits and the Contractor's test results. The Control Chart shall plot individual results and the moving average of 3 test results.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Plan shall address all elements that affect the quality of the concrete including but not limited to the following:

- (a) Mix designs
- (b) Aggregate source
- (c) Quality of all components including aggregates, water, admixtures, and cementitious materials
- (d) Stockpile management
- (e) Mix properties, including temperature, air content, consistency, unit weight, and water/cementitious material ratio
- (f) Process Quality Control testing, including type of test and frequency
- (g) Compressive strength
- (h) Modulus of Elasticity
- (i) Creep
- (j) Shrinkage
- (k) Unit Weight

Section 217.06 - Classification of Concrete Mixtures

Table II-17 is replaced with Table II-17 Rev. as follows:

TABLE II-17 Rev.
Requirements for Lightweight Aggregate Hydraulic Cement Concrete

Class of Concrete	Design Min. Laboratory Compressive Strength at 28 Days (f'_c) (psi)	Creep Notional Coefficient	Shrinkage Notional Coefficient (microstrain)	Unit Weight (lb/cubic foot)	Air Content (%)	Modulus of Elasticity (kips/square inch)
A5 Deck Slabs	5,000	3.5	550	115	6 1/2 ± 1 1/2	2,700

Notes:

1. When a High Range Water Reducing Admixture (HRWRA) is used, the upper limit air content shall be increased 1 percent.
2. The values for unit weight exclude the weight of reinforcing and prestressing steel.
3. Values in Table II-17 Rev are design values. Additional Mix Design acceptance values are shown in Table II-17a.

Section 217.07 Proportioning Concrete Mixtures is amended to delete paragraphs 8, 14, and 15.

Section 217.07-Proportioning Concrete Mixtures is amended to add the following:

Mix Design Verification: Water cementitious materials ratios shall be established by trial mixtures in accordance with ACI 211.2.

An air entraining admixture meeting ASTM C 260 shall be used to produce an air content in the fresh concrete between 4 and 8 percent.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Mixture proportions, modulus of elasticity, creep and shrinkage of low density concrete produced from the approved expanded aggregate shall be made available to the Engineer for prior approval. The manufacturer of the expanded aggregate proposed for the project shall make available to the Engineer results of splitting tensile strength tests conducted in accordance with ASTM C496. The splitting tensile strength obtained on concrete composed of coarse expanded aggregate and natural stone should yield values in excess of 0.85 times those called for in ACI for compressive strength specified. The tests should give values exceeding 0.75 times those called for in ACI 318 when the concrete is composed of fine and coarse expanded aggregate (i.e., natural stone is not included). A linear interpolation between 0.75 and 0.85 can be used when natural sand is included with fine expanded aggregates.

The Contractor shall submit Mix Designs for the classes of lightweight aggregate concrete shown in Table II-17 Rev to the Engineer for review, along with documentation indicating that the proposed mix design will meet the verification requirements. The documentation shall be based on trial batches and testing as defined in Section 217.08.

Mix design documentation shall consist of the following as a minimum:

- (a) Description and amount of cementitious material.
- (b) Description of individual coarse aggregate sizes, aggregate source, bulk specific gravity, absorption, and gradation. A combined coarse aggregate blended gradation may be required.
- (c) Target water content by weight
- (d) Type and quantity of all admixtures.
- (e) Description of fine aggregate, aggregate source, bulk specific gravity, absorption gradation, and fineness modulus (FM).
- (f) Target water/cementitious material ratio
- (g) Target air content, consistency, and concrete temperature
- (h) Target concrete unit weight.
- (i) Target compressive strength
- (j) Target permeability

Mix design documentation using trial batches shall be based on the same materials and proportions proposed for use on the project. These tests shall be performed by the Contractor and submitted to the Engineer for approval.

The approval of the mix design shall be a two-step process:

The first step shall consist of the submission of the proposed mix design and documentation listed above.

Second, following the approval of the Engineer, the Contractor shall undertake the creep, shrinkage, and modulus tests and submit the results for approval. The timing of the submissions shall be accommodate the 180 day duration of the tests, as well as allow 30 days for the Engineer's approval of the initial mix design, and an additional 30 days for the approval of the test results. Only after the Engineer's approval of the test results is the Contractor permitted to cast any lightweight concrete. The average compressive strength of a minimum of three cylinders (one strength sample) taken from the trial batch shall be at least 1200 psi greater than the LSL for compressive strength in Table II-17 Rev.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Tests required for demonstrating that the proposed lightweight aggregate concrete mix meets the design requirements of Table II-17 Rev and Table II-17a are:

- (a) **Creep Tests for Proposed Mix Design:** Two sets of samples shall be taken from the test mix submitted for approval for the lightweight aggregate concrete prestressed girders and two sets of samples shall be taken from the test mix submitted for approval of the lightweight aggregate concrete deck slab. The samples shall be tested in accordance with the requirements in ASTM Designation: C512, "Standard Test Method for Creep of Concrete in Compression". Creep data shall be presented both as specific creep (creep strain/applied creep load) and creep coefficient (creep deformation as a ratio to initial elastic deformation). The test cylinders shall be loaded at 28 days to a stress of 20 to 40% of the 28-day design compressive strength shown on the plans. Ages of cylinders at time of initial loading shall be 3, 28, and 90 days. Duration of the loading shall be 90 days.
- (b) **Shrinkage Tests for Proposed Mix Design:** Two sets of samples shall be taken from the test mix submitted for approval for the lightweight aggregate concrete prestressed girders and two sets of samples shall be taken from the test mix submitted for approval of the lightweight aggregate concrete deck slab. The samples shall be tested for shrinkage in accordance with the requirements of ASTM C157.
- (c) **Modulus of Elasticity Tests for Proposed Mix Design:** Two sets of samples shall be taken from the test mix submitted for approval for the lightweight aggregate concrete prestressed girders and two sets of samples shall be taken from the test mix submitted for approval of the lightweight aggregate concrete deck slab. The modulus of Elasticity shall be tested in accordance with ASTM C 469, "Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression".

TABLE II-17a
Acceptance Values for Mix Design

Class of Concrete	Minimum Laboratory Compressive Strength at 28 days, psi	Maximum Value of Creep Test ASTM C512 (microstrain/psi)	Unit Weight ASTM C567 (lb/cubic foot)	Maximum Value of Shrinkage Test ASTM C157 (microstrain)	Minimum Value of Modulus of Elasticity Test ASTM C 469 (kips/square inch)
A5 Deck Slab	5,000	0.75	115	530	2,400

Notes:

1. Creep test acceptability limit based upon data at 90 days after initial loading with an age at initial loading of 3 days. Contractor shall submit data up through 90 day loading with an initial age of loading of 90 days.
2. Shrinkage test acceptability limit based upon data at 90 days after initial loading with an age of initial loading of 3 days. Contractor shall submit data up through 90 day loading with an initial age of loading of 90 days.

Section 217.07 Proportioning Concrete Mixtures, is amended to replace paragraph 10 with the following:

Concrete shall be air entrained. The air content shall conform to the requirements of Table II-17 Rev.

Section 217.08 - Acceptance is replaced by the following:

Acceptance tests shall be either screening tests or other acceptance tests. The Contractor shall provide concrete for cylinders prepared by the Engineer or other samples for tests to be performed by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Acceptance of structural, bridge deck, prestressed, and incidental concrete will be on a lot-by-lot basis as defined below:

(a) **Definition of a Lot**

For the purposes of this Special Provision a lot is a quantity of concrete manufactured during a single condition of production that is considered to be uniform and where the source and proportions of all major ingredients are the same. A lot shall consist of a complete class of concrete. Normally, each lot shall consist of sublots defined as one day's placement or a maximum of 100 yd³ of a class of concrete. One compressive strength sample shall be obtained from each subplot on a randomly selected basis. A strength sample is defined as the average of 3 cylinders and permeability sample 2 cylinders.

(b) **Acceptance Sampling and Testing**

Acceptance tests shall be both screening tests and other tests used to determine the acceptability of the lightweight aggregate hydraulic cement concrete. Screening tests shall be for air content and temperature and shall be sampled from each truck load by the Engineer. These tests are to determine whether or not the truck can discharge its contents on the project. Other tests made to determine the acceptability of the concrete shall be made on a subplot basis by the Department for different construction activities. These tests are described as follows:

1. **Screening Tests**

Sampling and Testing for Air Content and Temperature: Each load of structural and bridge deck concrete during each production day shall be sampled and tested by the Engineer for air content and temperature. The Contractor is responsible for furnishing concrete within the air content and temperature ranges established in Section 217. All batches with either air content or temperature not in compliance with Section 217 shall be rejected and removed from the job.

- a. **Air Content Tests:** Air content tests shall be performed by the Engineer to assure that specification requirements are consistently being complied with for each class of concrete.

Air content shall be determined after all the mix water has been added in accordance with the requirements of AASHTO T152 or T196. The sample secured for the tests shall be taken after at least 2 ft³ of concrete has been discharged from the delivery vehicle.

If the determination of any test yields a result that is outside the allowable range for air content, the following procedure will be used:

- (1) The Contractor has the option of (1) immediately performing a recheck determination or (2) adding sufficient material to bring the air content within specification limits while also meeting the time, temperature and number of revolutions constraints. For option (1), if the average of the two air content results is within the specification limits for air content the material can be used; if the average of the two tests is outside this limit the material shall be rejected. For option (2), the concrete with the additional material, shall be sampled as a new truckload and the above acceptance procedure used. If the test result is outside this limit the material shall be rejected.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (2) If the load is rejected, the Contractor's representative shall notify the producer of the test results through a pre-established means of communication.

- b. **Temperature Tests:** Temperature tests shall be performed by the Engineer at the same time as air content tests to assure that specification requirements are consistently being complied with for each class of concrete. All temperature tests shall meet the specification requirements or the load shall be rejected.

2. **Other Tests for Acceptability**

The Engineer will perform the following additional tests for acceptance. The Engineer will prepare samples from concrete provided by the Contractor.

- a. **Compressive Strength Tests:** The 28-day strengths specified in Table II-17 Rev. shall be the strengths used in the design calculations. The Engineer will verify design strengths by tests made in accordance with the requirements of AASHTO T22, T23, or T24.

The Contractor shall provide a storage chamber at his expense for temporary storage of the concrete cylinders. The chamber shall be designed to maintain test cylinders in a continuously moist condition within a temperature range of 68⁰F to 78⁰F for concrete strengths at or above 6000 psi, and 60⁰F to 80⁰F for concrete strengths below 6000 psi. The storage chamber shall be equipped with a maximum/minimum thermometer. The chamber shall be located near the concrete placement site in an area where test cylinders will not be subject to vibration and shall be of sufficient size or number to store, without crowding or wedging, the required number of test cylinders as determined by the Contractor based on his plan of operations.

When use of high-early-strength hydraulic cement concrete is authorized, it shall conform to the requirements of Table II-17 Rev. except that the 28-day strength shall be obtained in 7 days. Types I, II, or III cements may be used to produce high-early-strength concrete except that the total cementitious material content may not exceed 850 lbs/yd³.

Normally, one strength sample shall be taken randomly for each subplot. Each strength sample is to be taken according to AASHTO T 141 (ASTM C 172), from the middle 1/3 of the load. Where conditions warrant and at the option of the Engineer, more than one strength sample may be taken from each subplot. When so taken, all results shall be used in judging the acceptability of the lot, except where a cylinder or set of cylinders is obviously faulty.

3. **Conflict Resolution**

In any case in which the Contractor and the Department disagree on the acceptability of the concrete, and in which a technical reason for the disagreement is known, the Conflict Resolution system shall be used. For this system, additional inspection and tests on the hardened concrete may be made and the Engineer may base the acceptance of the concrete on results obtained from cores.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The core compressive strength, based on three or more cores (at an age no longer than 56 days from the time of placement), shall be used in lieu of the cylinder compressive strengths.

The core permeability shall be tested and used in lieu of the cylinder permeabilities. All cores shall be subjected to 3 weeks of 100⁰F curing prior to testing. A relationship between age and permeability must be established for cylinders in the trial batch and this relationship used with the age of the core to predict the permeability. In lieu of cores, the Engineer may decide to test the lower section of the permeability cylinder for the presence of anomalies that may adversely affect the test result. If the Engineer confirms that anomalies are present, that test value shall be discarded.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
JOINT SEALER RAPID CURE

October 9, 2009

I. DESCRIPTION

This work shall consist of cleaning and sealing expansion joints in accordance with the contract documents and as directed by the Engineer.

II. MATERIALS

Expansion joint filler and sealer materials shall conform to the requirements of Section 212 of the Specifications.

III. PROCEDURES

Expansion joints shall be cleaned and shall be free of oil, grease, existing joint material or any other foreign material. Loose material shall be removed from the joint with oil-free compressed air delivered with not less than 120 cubic feet of air per minute and a nozzle pressure of not less than 90 pounds per square inch and not more than 200 pounds per square inch.

The Contractor shall protect the edges of pavement adjacent to the joints to be cleaned.

The Contractor shall install joint filler and sealer materials in strict accordance with the manufacturer's written instructions.

Expansion joints shall be filled and sealed in accordance with the requirements of Section 404.05 of the Specifications. Joints to be filled shall be completely dry and the ambient air temperature shall be at least 45 degrees F. The applied sealer and finished joint shall be free of entrapped air. Finished sealer shall conform to the lines and grades of existing pavement surfaces.

IV. MEASUREMENT AND PAYMENT

Joint Sealer Silicone will be measured in linear feet and will be paid for at the contract unit price per linear foot along the pavement surface from out to out of the deck slab, complete-in-place. This price shall be full compensation for cleaning joints, furnishing and installing joint filler, joint sealer, removal and disposal of debris, and for all material, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Joint Sealer Silicone	Linear foot

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
REMOVAL OF ASBESTOS FROM BRIDGE STRUCTURES

August 17, 2009

PART I – GENERAL

1. Description of Work:

This Special Provision applies to the removal of asbestos containing materials (ACM) from bridge structures scheduled for demolition, renovation, reconstruction or replacement. The Contractor is hereby advised that the bridge structure(s), as identified in the plans contains, or may contain, asbestos. The Contractor shall assume that any ACM contain asbestos in a quantity sufficient to be a health hazard when disturbed or found in a degraded state or friable condition.

Where asbestos inspection results indicate the presence of ACM, the Contractor shall employ a licensed asbestos abatement firm and a licensed project designer to conduct asbestos abatement and project design activities, respectively, on bridge structure(s), as appropriate. The firms shall furnish all labor, materials, supplies, and equipment necessary to legally remove and dispose of ACM identified in the asbestos inspection report and as-built construction plans as required by Federal and State regulations. For renovation projects, only the ACM identified in the asbestos inspection report that will be removed or disturbed as part of the renovation must be removed. All quantities are estimates. The bidder shall be responsible for ascertaining the exact amount of material to be removed and removing it in accordance with the provisions herein.

Where no asbestos inspection report is available, the Contractor shall comply with the *Special Provision for Inspection of Bridge Structures for ACM*. Asbestos removal from any bridge appurtenance that will be re-occupied (e.g. bridge tender's office) shall comply with the *Special Provision for the Removal of Asbestos for Re-Occupied Structures*.

2. Contract Limitations

- A. An asbestos abatement firm is not eligible to perform work on projects if asbestos abatement activities were or will be performed by individuals or firms with an employer/employee relationship or financially affiliated with the asbestos inspection firm performing inspection activities.
- B. An asbestos abatement firm is not eligible to perform asbestos abatement activities if the asbestos sample analyses were performed by individuals or firms with an employer/employee relationship or financially affiliated with the laboratory performing sample analysis.

3. Definitions and Abbreviations:

All definitions and abbreviations used in this specification are consistent as defined under OSHA; the USEPA Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP); the Virginia Department of Labor and Industry (VDLI); the Virginia Department of Professional and Occupational Regulation (VDPOR); and the Virginia Department of Environmental Quality (VDEQ).

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

PART II –WORK PRACTICES

1. Regulations

- A. The Contractor and its subcontractor(s) shall comply with all applicable EPA, OSHA, VDEQ, VDLI and DPOR regulations, and shall follow all applicable EPA and VDLI/OSHA workplace guidelines. EPA workplace guidelines include but are not limited to: (1) Parts I and II of EPA guideline document 560/5-85-024, "Guidance for Controlling Asbestos Containing Materials in Buildings"; (2) EPA regulations 40 CFR Part 61 Subparts A and M; and (3) "*Demolition Practices Under the Asbestos NESHAP*" (TRC Environmental Corporation Work Assignment No. IA2-19). OSHA workplace guidelines include, but are not limited to, any currently applicable OSHA compliance directives or instructions. In any instance of conflict between the VDLI and OSHA requirements, the VDLI requirements shall take precedence. Any "de minimus" quantity exemptions that are provided in the aforementioned references shall not apply to VDOT asbestos removal activities.
- B. The asbestos abatement firm is required to maintain at the job site copies of EPA, VOSHA/OSHA and applicable state and local government regulations regarding the handling of ACM.
- C. The firms and their employees shall be licensed to perform asbestos activities in accordance with Virginia Department of Professional and Occupational Regulation (DPOR) requirements.

2. Notifications

The Contractor shall make all required notifications at least twenty (20) days prior to beginning removal of asbestos-containing materials. Pursuant to § 61.145(b), the Contractor shall also provide the requisite ten (10) day demolition notification irrespective of minimum quantity or other exclusions. The Contractor shall also provide written notice to the Asbestos Project Monitor, VDOT Area Construction Engineer and the VDOT Project Engineer or Project Manager prior to work being performed. Notifications should be addressed to:

Virginia Department of Labor and Industry
Asbestos Program
Powers-Taylor Building
13 South Thirteenth Street
Richmond, VA 23219

Land and Chemical Division
EPA Region III
LC62
1650 Arch Street
Philadelphia, PA 19103

- B. The twenty (20) day notification is only required for the removal of Regulated Asbestos Containing Materials (RACM). RACM are friable asbestos material, Category I non-friable ACM that has become friable, Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, Category II non-friable ACM that has a high probability of becoming crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation. If any Category I or Category II non-friable ACM becomes friable during removal, the Contractor shall stop work and make all notifications.

3. Competent Person:

- A. The asbestos abatement firm shall have a "competent person" present at all times while work on this contract is in progress. The competent person shall be thoroughly familiar and experienced with asbestos removal and related work, and shall monitor and enforce the use of all safety procedures and equipment and shall be knowledgeable of all EPA, OSHA, NIOSH, Virginia DPOR and VDLI/VOSHA requirements and guidelines.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- B. The competent person shall have a valid asbestos supervisor's license issued by the Virginia DPOR in accordance with the provisions of Chapter 7.01 (54-145.4 et seq.) of Title 54.

4. Additional Contractor Responsibilities

The Contractor shall ensure that:

- A. The landfill selected for disposal is approved for disposal of friable ACM and/or for disposal of non-friable ACM by the USEPA and appropriate state.
- B. The abatement firm and its employees performing work under this specification have been trained in the proper procedures to follow in case of an emergency.
- C. The abatement firm and its employees performing work under this specification have an established medical surveillance program in compliance with OSHA regulations 29 CFR 1926.1101 and a written respirator program in compliance with OSHA regulation 29 CFR 1910.134.
- D. Copies of Material Safety Data Sheets are obtained for any chemical solvents that will be used.

5. Materials, Work Areas and Support Equipment

- A. Personnel of other trades not engaged in the removal of asbestos materials shall be excluded by the Contractor from areas where there is potential exposure to airborne concentrations of asbestos; the abatement firm shall erect appropriate signage and/or barricades.

All air handling equipment, if required, shall arrive at the job site in a clean (uncontaminated) condition and will be compliant with ANSI 29.2 specifications.

- B. The abatement firm is responsible for providing all equipment necessary to access areas containing ACM.
- C. The abatement firm shall provide appropriate decontamination facilities and shall be responsible for providing any necessary electrical and water sources and disposal of all contaminated materials.
- D. Work areas shall be prepared in accordance with EPA NESHAP 40 CFR Part 61 Subpart M regulations (as amended), applicable EPA guidance, OSHA 1926.1101 standards; any currently applicable OSHA compliance instructions; and any other applicable guidance.

6. ACM Management

- A. All RACM shall be removed prior to demolition or renovation.
- B. Any Category I or Category II non-friable ACM that during demolition or renovation or post-demolition or renovation activities will be subject to sanding, grinding, cutting, or abrading, including but not limited to the use of a bulldozer, jack hammer, grinder, or other mechanical device to break ACM into smaller pieces, shall be treated as RACM and shall be removed and disposed accordingly.
- C. Category I and Category II non-friable ACM that are not in poor condition and cannot be removed prior to demolition or renovation shall be separated from the demolition debris or the entire debris mass shall be considered Category I or Category II non-friable ACM in good condition and shall be handled accordingly.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- D. Category I non-friable ACM that is not in poor condition prior to demolition but where the structure and the ACM can be expected to burn as a result of explosive demolition shall be treated as RACM and therefore shall be removed from the structure before demolition.
- E. All Category II ACM found in or on structures scheduled for explosion must be removed before such demolition.
- F. Asbestos Cement (A/C) pipe shall not be ground, broken, crushed, sawed, abraded or handled in a manner which would cause asbestos material to become friable or airborne. Saw-cutting will only be allowed provided that specifically designed saws equipped with high efficiency particulate air filtered vacuums are used. Cuts shall be continuously sprayed with amended water during cutting and the water shall be collected and properly filtered or disposed of. With the approval of the Engineer, A/C pipe that will be removed and that is encased in concrete, such as end walls, shall be cut flush with the concrete surface. With approval of the Engineer, the Contractor may pump grout into the buried lines that are no longer in service to maintain the structural bearing capacity of the area. No on-site burial of crushed A/C pipe shall be allowed.

7. Cleanup

- A. All work areas shall be cleared of all construction debris and left in a neat and orderly condition.
- B. All visible accumulations of asbestos material and debris shall be removed and all surfaces within the work area shall be wet cleaned.
- C. Sealed drums or equipment used in the work area shall be cleaned and subsequently removed from the work areas.
- D. If the results of the air or surface dust samples indicate that contamination has occurred as the result of Contractor negligence and/or poor work practices, the Contractor shall clean the site at no additional cost to the Department. In addition, the Contractor shall be liable for any damage claims or other legal actions brought against VDOT or its employees or brought by VDOT and/or any persons exposed to such contamination.
- E. The Contractor shall be held responsible for the cost of re-inspections if the work is determined to not be substantially complete.

8. Disposal of Asbestos Waste

The abatement contractor shall remove, transport and dispose of the ACM from the job site in accordance with all federal and state regulations and this special provision. The Contractor shall be responsible for generating and maintaining a waste shipment record in accordance with applicable local, state, federal, and disposal facility requirements and shall provide a copy to the Engineer for the Department's records.

All asbestos waste, scrap, debris containers, asbestos contaminated clothing and equipment that may produce airborne concentrations of asbestos fibers shall be collected and placed in sealed and properly labeled, 6 mil impermeable bags. Sealed impermeable bags of asbestos waste shall be temporarily stored in asbestos waste containers (drums, trailers, etc.). Uncontaminated containers may be recycled.

PART III – SUBMITTALS

1. Pre-Work Submittals

Prior to commencing work, the Contractor shall submit to the Department two copies of the required notifications submitted to the Asbestos Clerk, VDLI.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2. Work/Post-Work Submittals

The Contractor shall submit to the Department:

- A. Copies of licenses for the firms and employees performing work under this specification.
- B. Within thirty-five (35) days of the deposit of a load of ACM waste from this project at the designated landfill, the Contractor shall submit a copy of the certificates of disposal from the landfill to the Department. The Department shall have received all acceptable waste manifests and certificates of disposal prior to making any payments to the Contractor.

PART IV – SITE INSPECTION

VDOT (or its representative) reserves the right to inspect all asbestos abatement operations at any time. If any aspect of the work is found inconsistent with this special provision, a stop work order will be issued and operations will be immediately suspended. Until the inconsistency is corrected, any standby time and costs for corrective actions shall be at the Contractor's expense.

PART V - MEASUREMENT AND PAYMENT

Where the Department has not provided an asbestos inspection report, payment for removal and disposal of all ACM will be made under Section 109.05 of the Road and Bridge Specifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
POST-TENSIONING GROUT

January 15,2009

I. DESCRIPTION

Grout to fill the voids between post-tensioning steel and their conduits shall conform to this Specification. The ingredients intended for use in bonded, post-tensioning work can include Portland cement, mineral additives, admixtures, aggregates, and water. Grout shall be prebagged in plastic lined or coated bags. Grout bags shall be stamped with the date of manufacture, lot number, and mixing instructions. Any change of materials or material sources requires the retesting and certification of the conformance of the grout with the physical properties requirements. A copy of the Quality Control Data Sheet for each lot and shipment shall be submitted to the Engineer. Materials with an age from date manufacturer in excess of 180 days shall be retested and certified before use or removed and replaced.

II. MATERIALS

Portland cement and blended hydraulic cement shall conform to the requirements of Section 214. Blended cements, if used, shall be compatible with other ingredients of the grout.

Concrete Admixtures shall conform to the requirements of Section 215. Compatibility with the cement, mineral additives, and other admixtures being considered shall be established during the grout trial mixes.

Aggregates, if used, shall have a maximum size passing a No. 50 sieve (300 micron) and shall conform to ASTM C33 except for gradation.

Water shall conform to the requirements of Section 216.

III. DETAIL REQUIREMENTS

High Range Water Reducing Admixtures shall not be used in excess of 45 oz. per 100 lb. of Portland cement.

Anti-bleed admixtures may be used in grout if the requirements of testing outlined in this section are satisfied. The anti-bleed admixture's performance in post-tensioning grouts shall conform to the acceptable criteria for the bleed tests using both the modified ASTM C940 test and the Pressure Bleed Test using a Gelman filter funnel with a test pressure of 50 psi (refer to Appendix C of Post-Tensioning Institute's Specification for Grouting of Post-Tensioned Structures, 2000).

Pre-hardening expansive admixtures based on gas information that are potentially harmful to the grout or the prestressing steel shall not be used. For inert gas forming materials, the level of vertical height change shall be no greater than 2.0 percent for up to 3 hours when measured in conformance with ASTM C940.

Testing Requirements: Grout manufacturer shall submit certified test reports from an audited and independent Cement Concrete Research Laboratory (CCRL) that shows the material conforms to the requirements specified herein. The test reports, detailing the types and number of tests performed, test procedures, results, and comparison of results with specified values, shall be submitted to the Engineer for approval at least eight weeks prior to the scheduled start of production grouting. Any change in the type, brand or manufacturing source throughout the duration of the grouting will require submittal of certified test results at least eight weeks prior to use of the new materials.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

PHYSICAL PROPERTY REQUIREMENTS: Grout shall achieve a non-bleed characteristic and shall conform to the following physical properties. Grout shall be tested at the temperature and humidity conditions expected on-site, but at temperatures not to exceed 90 degrees F or less than 40 degrees F. Grout shall be used only within the range of conditions tested successfully.

Property	Test Value	Test Method
Total Chloride Ions by Weight of Cementitious Material, Maximum	0.08%	ASTM 1152
Water/Cementitious Materials Ratio, Maximum	0.45	---
Volume Change @ 24 Hours and 28 Days	0.0% to +0.3%	ASTM C1090 (1)
Expansion, Up to 3 Hours	2.0%	ASTM C940
Compressive Strength, Average of 3 Cubes, at 28 Days, Minimum	7,000 psi	ASTM C942
Initial Set of Grout	Minimum - 90 minutes	ASTM C953
Fluidity Test ⁽²⁾ Efflux Time from Flow Cone (a) Immediately After Mixing	Minimum - 20 seconds Maximum - 30 seconds or Minimum - 9 seconds Maximum - 20 seconds	ASTM C939 ASTM C939(3)
(b) 30 Minutes After Mixing with Remixing for 30 Seconds	Maximum - 30 seconds or Maximum - 30 seconds	ASTM C939 ASTM C939(3)
Bleeding @ 3 Hours	Maximum - 0.0 percent	ASTM C940 ⁽⁴⁾ and Schupack Pressure Bleed Test (at 50 psi)
Permeability @ 28 Days	Maximum 2500 coulombs at 30 V for 6 hours	ASTM C1202

- (1) Modify ASTM C1090 to include verification at both 24 hours and 28 days.
- (2) Adjustments to flow rates shall be achieved by strict compliance with the manufacturer's recommendations.
- (3) Grout fluidity shall conform to the standard ASTM C939 flow cone test for non-thixotropic grouts or the modified test described herein for thixotropic grouts. Modify the ASTM C939 test by filling the cone to the top instead of to the standard level. The efflux time is the time to fill a 1 liter container placed directly under the flow cone.
- (4) Modify ASTM C940 to conform with the wick induced bleed test specified in the C940 Modifications herein.

ASTM C 940 Modifications:

- (a) Condition dry ingredients, mixing water, prestressing strand and test apparatus overnight at 70 to 76 degrees F (21 to 25 degrees C).
- (b) Insert 800 ml of mixed conditioned grout with conditioned water into the 1000 ml graduated cylinder. Mark the level of the top of the grout.
- (c) Use a wick made of 20 inch length of ASTM A416 seven wire 0.5 inch diameter strand. Wrap the strand with 2-inch wide duct or electrical tape at each end prior to cutting to avoid splaying of the wires when it is cut. Degrease with acetone or hexane solvent and wire brush to remove any surface rust on the strand before temperature conditioning.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (d) Completely insert the strand wick into the 1000 ml graduated cylinder. Using a centralizer or other means, center and fasten the strand so it remains essentially parallel to the vertical axis of the cylinder. Mark the level of the top of the grout.
- (e) Store the mixed grout at the temperature range listed above in (a).
- (f) Measure the level of the bleed water every 15 minutes for the first hour and hourly afterward for 2 hours.
- (g) Calculate the bleed water, if any, at the end of the 3 hour test period and the resulting expansion per the procedures outlined in ASTM C940, with the quantity of bleed water expressed as a percent of the initial grout volume. Note if the bleed water remains above or below the top of the grout.

IV. MEASUREMENT AND PAYMENT

The preparation, testing, furnishing and installation of the post-tensioning grout will not be measured, but the cost will be incidental to the unit price of the Post-Tensioning Tendons item.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
HIGH STRENGTH POST-TENSIONING BAR TENDONS

October 7, 2009

I. DESCRIPTION

This work shall consist of furnishing, installing, stressing, grouting of post-tensioning bars. This also includes furnishing and installing all the hardware and any other appurtenant items necessary for the particular post-tensioning system used, including but not limited to ducts, anchorage assemblies, couplers, supplementary steel reinforcing bars for anchorages, grout used for pressure grouting ducts, cleaning of all ducts prior to grouting, stressing and grouting bar tendons, and all associated operations. This work shall be performed in accordance with the contract plans, the Standard Specifications, and these Special Provisions.

II. MATERIALS

High Strength Post-Tensioning Bar
Galvanized Steel Duct

ASTM A 722, Type II
ASTM A 653

Post-Tensioning Bar: Post-tensioning bars shall be Grade 150, high strength, deformed bars conforming to the requirements of ASTM A 722.

Bar Couplers: Bar couplers shall meet the requirements of A 722. Bar couplers shall be used only at locations specifically shown on the plans or approved by the Engineer. A bar coupler shall develop at least 100 percent of the required guaranteed ultimate strength of the bar with a minimum elongation of 2 percent when tested in the unbonded condition measured in 10-foot gauge lengths, without failure either of the coupler or the thread bar. Testing of bar couplers shall be performed using samples of the prestressing bar to be used on the project. The test specimen shall be assembled in an unbonded state and in testing the anticipated set shall not be exceeded. Results of three separate tests shall be submitted to the Engineer for approval. Only threaded type couplers shall be used with post-tensioning thread bars. Bar couplers and coupler components shall be enclosed in housings or form pockets long enough to accommodate movements during stressing. Post-tensioning bars shall be threaded into the coupler to one-half the length of the coupler 1/4-inch so that when two bars are coupled in a coupler, the length of each bar positively engaged in the coupler shall be half the coupler's length within acceptable tolerances.

Prestress Anchorages: All prestressing steel shall be secured at the ends by means of permanent type anchoring devices meeting the approval of the Engineer. Prestress anchorages other than special anchorage devices shall be designed to develop at least 120 percent of the guaranteed ultimate tensile strength of the prestressing steel.

Testing of anchorage devices shall be performed using samples representing the type of prestressing steel and concrete strength to be used on the project. The test specimen shall be assembled in an unbonded state and, in testing, the anticipated anchor set shall not be exceeded. Certified copies of test results for the anchorage system shall be supplied to the Engineer at no additional cost. The anchorage system shall be so arranged that the prestressing force in the tendon may be verified prior to the removal of the stressing equipment.

For tendon anchorages, the design, furnishing, installation, and all costs associated with any reinforcement (in addition to the reinforcement shown on the plans) which is needed to resist bursting and splitting stresses imposed on the concrete by the proposed anchorage system shall be the responsibility of the Contractor. The anchorage device supplier shall specify auxiliary and confinement reinforcing, minimum edge distance, minimum anchor spacing and minimum concrete strength at the time of stressing, required for proper performance of the local anchorage zone.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Prestress anchorage devices shall effectively distribute prestressing loads to the concrete and shall conform to the requirements of Section 9.21 (Division I) of the AASHTO Standard Specifications for Highway Bridges, 17th Edition

Ducts: Duct shall be corrugated galvanized steel.

All duct material shall be sufficiently rigid to withstand loads imposed during placing of concrete and internal pressure during grouting while maintaining its shape, remaining in proper alignment and remaining watertight.

The duct system, including splices, joints, and connections to anchorages shall effectively prevent entrance of cement paste or water into the system and shall effectively contain pressurized grout during grouting of the tendon. The duct system shall also be capable of withstanding water pressure during flushing of a duct in the event the grouting operation is aborted.

The interior diameter of ducts for single bar tendons shall be at least 1/4-inch greater than the nominal diameter of the bar tendon.

Duct installed and cast into concrete prior to prestressing steel installation, must be capable to withstand at least 10 feet of concrete fluid pressure. Also, such duct shall not dent more than 1/8-inch under 100 lbs. concentrated forces applied between corrugations. The concentrated force shall be applied by a No. 4 reinforcing bar.

Duct for use with preinstalled prestressing steel, prior to concreting, shall be capable of withstanding the equivalent of 5 feet of concrete fluid pressure. Resistance to denting is not applicable.

Duct shall have adequate longitudinal bending stiffness for smooth, wobble free placement:

- (a) Duct with more than 2-inch diameter shall, under its own weight, not deflect more than 3 inches, when a 20-foot duct segment is supported at its ends.
- (b) Duct of 2-inch or small diameter shall, under its own weight, not deflect more than 3 inches, when a 10-foot duct segment is supported at its ends.
- (c) Where duct must be bent in a tight radius, more flexible duct is permitted.

Galvanized Steel Duct: The steel ducts shall be corrugated and fabricated with either welded or interlocked seams and shall be bent without crimping or flattening. Section of duct shall be connected with positive ferrous metal connectors which prevent angles changes at joints. Duct and metal connectors shall be fabricated from galvanized sheet steel meeting the requirements of ASTM A653, Coating Designation G90. Areas of zinc coating damage by welding or in fabricating interlocked seams shall be repaired by painting with zinc dust-zinc oxide paint conforming to Federal Specifications TT-P-640 or MIL-P-21035. Joints between sections of duct shall have no sharp edges within contact of the prestressing steel. The duct shall not be less than 31 gauge.

Sampling and Testing: All testing shall be done by the Contractor, his subcontractor, or his supplier in accordance with the appropriate ASTM Specifications. Material shall be sampled in accordance with Virginia Department of Transportation requirements.

The Contractor at his expense shall furnish the following samples of materials and devices selected as designated by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- Three samples of 5-foot long prestressing bar for each size from each heat number or production lot.

Samples shall be furnished well in advance of the time they are to be incorporated into the work.

The Engineer reserves the right to reject for use at any time any material or device which is obviously defective or was damaged subsequent to testing.

Manufacturer's Lots: The manufacturer of prestressing steel, prestress anchorages, and bar couplers shall assign an individual number to each lot of bar, or devices at the time of manufacture. Each bundle, or package shipped to the project shall be identified by tag or other acceptable means as to manufacturer's lot number. The Contractor shall be responsible for establishing and maintaining a procedure by which all prestressing materials and devices can be continuously identified with the manufacturer's lot number. Items which at any time cannot be positively identified as to lot number shall not be incorporated into the work.

The Contractor shall furnish manufacturer's certified reports covering the tests required by this Special Provision. A certified test report stating the breaking strength, yield strength, elongation and modulus of elasticity shall be furnished for each lot of prestressing steel. When requested, typical stress-strain curves for prestressing steel shall be furnished. A certified test report stating strength when tested using the type prestressing steel to be used in the work shall be furnished for each lot of prestress anchorage devices.

Grout: Grout shall conform to the requirements of the Special Provision, Post-Tensioning Grout.

A technical representative of the grout manufacturer shall be present on-site during the first grouting operations and up to three other times at the request of the Engineer.

Grouting Attachments: All grouting accessories shall be capable of withstanding at least a 200 psi pressure. All connections to ducts shall be made with metallic or plastic structural fasteners.

All anchorage end caps (i.e., grout caps) shall be made of plastic and shall remain in place after grouting unless otherwise directed by the Engineer.

Plastic components, if selected and approved, shall not react with the concrete or enhance corrosion of the post-tensioning steel, and shall be free of water-soluble chlorides.

Records of all tests required herein shall be submitted to the Engineer for approval.

Grout Vents, Injection, and Ejection Pipes: Vents shall be 1/2-inch minimum diameter plastic pipe. Plastic components shall not react with the concrete or enhance corrosion of the prestressing steel. Plastic components shall be free of water soluble chlorides. Grout injection pipes shall be fitted with positive mechanical-shut-off valves. Vents and ejection pipes shall be fitted with valves or other devices capable of withstanding the grout pumping pressures.

III. CONSTRUCTION

The post-tensioning steel and ducts shall be installed, stressed and grouted as noted on the plans and in accordance with these Special Provisions or an Alternate Post-Tensioning Design as approved by the Engineer.

Alternate Post-Tensioning Designs: Alternate designs using a post-tensioning scheme other than that shown on the plans may be submitted by the Contractor for the Engineer's approval provided that the proposed alternate scheme fulfills the following requirements:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- The net compressive stress in the concrete after all losses is at least as large as that provided by the scheme shown on the plans.
- The distribution of individual tendons at each cross section generally conforms to the distribution shown on the plans.
- The ultimate strength of the structure with the proposed post-tensioning scheme meets the requirements of Section 9 of the *AASHTO Standard Specifications for Highway Bridges*, latest edition, including all Interim Specifications; and shall be equivalent to the ultimate strength provided by the original design.
- Stresses in the concrete and prestressing steel at all sections and at all stages of construction meet the requirements of 2nd edition of *AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges*.
- All provisions of the design criteria noted on the plans shall be satisfied.
- The Contractor fully redesigns and details, as required, the elements where the alternate post-tensioning scheme is proposed to be used.
- The Contractor submits complete shop drawings including post-tensioning scheme and system, reinforcing steel, and concrete cover; and design calculations (including short- and long-term prestress losses) for the Engineer's approval.
- Any alternate post-tensioning scheme or system approved by the engineer, which results in a change in quantity from that shown on the plans, shall be paid based on the quantity actually used and accepted or the plan quantity, whichever is less, and at the unit price bid.
- Evidence that the post-tensioning system proposed has been successfully used on projects of similar magnitude for the last five years.

Submittals: Shop drawings and calculations shall be prepared by or under the supervision of a qualified Professional Engineer registered in the Commonwealth of Virginia.

The Contractor shall submit detailed shop drawings which include, but are not necessarily limited to, the following:

- (a) A complete description of, and details covering, the post-tensioning system to be used. This shall include:
 - (1) Designation of the specific post-tensioning steel, anchorage devices, bar couplers, duct material, and accessory items.
 - (2) Properties of each of the components of the post-tensioning system.
 - (3) Equipment to be used in the post-tensioning sequence.
 - (4) Procedure and sequence of operations for post-tensioning and securing tendons.
 - (5) Parameters to be used to calculate the typical tendon force such as: expected friction coefficients, anchor set and post-tensioning steel relaxation curves.
 - (6) Details covering assembly of each type of post-tensioning tendon.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (7) Complete details of the Contractor's proposed method for preventing water and debris from entering the post-tensioning ducts. Methods shall address the protection from the time the ducts are installed until the tendons are grouted.
- (b) A table detailing the post-tensioning jacking sequence, jacking forces, and initial elongations of each tendon.
- (c) Complete details of the anchorage system for post-tensioning including certified copies of the reports covering tests performed on prestress anchorage devices and details for any additional reinforcing steel needed due to stresses imposed in the concrete by anchorage plates. Certified tests shall include the lightweight concrete being used and epoxy coated reinforcing steel.
- (d) For the operation of grouting post-tensioning tendons, the materials and proportions for grout, details of equipment for mixing and placing grout and methods of mixing and placing grout.
- (e) Calculations to substantiate the post-tensioning system and procedures to be used including stress-strain curves typical of the post-tensioning steel to be furnished, required jacking forces, and elongation of tendons during tensioning. These calculations shall show a typical tendon force after applying the expected friction coefficient and anticipated losses. Elongation calculations shall be revised when necessary to properly reflect the modulus of elasticity of the tendon material as determined from in place friction tests.
- (f) Complete horizontal and vertical geometric layouts for each post-tensioning duct and tendon. Integrated shop drawings shall not be submitted until the Engineer has approved these layouts. This drawing shall show all air vents and water/fluid drains in the ducts for approval of the Engineer. Duct and tendon layout shall be accomplished so as to cause no curvature within the longitudinal limits of the trumpet component of a tendon anchorage device.
- (g) Fully integrated drawings showing reinforcing steel, post-tensioning duct, post-tensioning hardware, inserts, and any other items to be embedded in a segment. Details of mild steel reinforcing shall be clearly shown as to size, spacing, and location including any anchorage reinforcing not shown in the Plans, which may be required by the post-tensioning anchorage system selected by the Contractor. Details of post-tensioning ducts shall clearly indicate the size, type, horizontal and vertical profiles, duct supports, grout pipes, and concrete covers. Any drawing not showing all items to be embedded in the concrete will be returned to the Contractor for resubmittal as a part of an integrated drawing. Prior to submittal, the Contractor shall review these drawings to determine the absence of reinforcement and tendon or embedment conflicts. Any unresolved conflicts shall be called to the attention of the Engineer at the time of submittal. The Contractor shall be solely responsible for any and all effects of conflicts found during fabrication.
- (h) Duct supports, grout tubes, vents and drains shall be clearly designed and detailed on the shop drawings, including the size, type, and locations.
- (i) Calculations prepared under the direction of, and signed and sealed by, a Professional Engineer registered in the Commonwealth of Virginia which show that the loads imposed on the permanent structure by the erection equipment will not adversely affect the structural adequacy of the permanent structure, nor exceed allowable stresses during the construction process.

Execution: The post-tensioning duct and tendons shall be installed, capped, tensioned and grouted in accordance with these Special Provisions, 16th edition of *AASHTO Standard Specifications for Highway Bridges* (and all interim addenda), 2nd edition of *AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges*, Post-Tensioning Institute (PTI) Acceptance Standards for Post-Tensioning Systems and 5th edition of PTI *Post-*

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Tensioning Manual. If there are any conflicts between these requirements, the more stringent will control.

Protection of Prestressing Steel

During Shipping, Handling, and Storage: All prestressing steel shall be protected against physical damage and corrosion at all times from manufacture to final grouting. Prestressing steel that has sustained physical damage at any time shall be rejected.

Prestressing steel shall be packaged in containers or shipping forms for protection of the steel against physical damage and corrosion during shipping and storage. Packaging or forms damaged from any cause shall be immediately replaced or restored to the original condition. The shipping package or form shall be clearly marked with a statement that the package contains high-strength prestressing steel, the care to be used in handling.

During Installation in the Structure: At the time the prestressing steel is installed in the work, it shall be free from loose rust, loose mill scale, dirt, paint, oil, grease, or other deleterious material. Removal of tightly adhering rust or mill scale will not be required. Prestressing steel, which has experienced rusting to the extent that it exhibits pits visible to the naked eye, shall not be used in the work.

Cutting of Post-Tensioning Steel. Post-tensioning steel shall be cut by an abrasive saw within 3/4 to 1½ inches away from the anchoring device. Flame cutting of post-tensioning steel is not allowed. If tendons are not capped within 4 hours of stressing, the tails and anchorages shall be adequately protected from precipitation and runoff.

Installing Tendons: Post-tensioning tendons may be pushed or pulled through the ducts to make up a tendon. Pushing shall be done with care so as to avoid snagging on any lips or joints in the ducts. The Contractor shall take precautions by rounding off the end of the bars or fitting it with a smooth protective cap for this purpose. Cutting shall be done with an abrasive saw or similar. Flame cutting shall not be allowed.

Fabrication

General: All post-tensioning anchorages, ducts, vent pipes, miscellaneous hardware, reinforcing bars, and other embedments shall be accurately and securely fastened at the locations shown on the plans or on the approved shop drawings or as otherwise approved by the Engineer.

Ducts: Duct shall be accurately aligned and positioned at the locations shown on the plans or according to the approved shop drawings or as otherwise approved by the Engineer. All internal ducts shall be securely fastened in position at regular intervals not exceeding 2'-0" to prevent movement, displacement or damage from concrete placement and consolidation operations. Ducts shall be attached to supporting chairs or reinforcement in such a way that the duct is not damaged. The method and spacing of duct supports shall be shown on appropriate shop drawings. All alignments of ducts, including curve and straight portions, splices, joints, and connections to anchorages shall be watertight, smooth and continuous with no lips, kinks, or dents. All splices, joints, and connections to anchorages shall be watertight and of sufficient strength to prevent distortion or displacement of the ducts during concrete placement. All ducts shall be carefully checked and repaired as necessary before the placing of any concrete commences. After installation in the forms, all ends of ducts, connections to anchorages, splices, vents, and the like shall at all times be sealed to prevent the entry of water and debris. The Contractor at no expense to the Department shall supply any additional mild reinforcing required to support post-tensioning ducts. The tolerance on the location of the tendons shall be plus or minus 1/4-inch at any point in respect to the vertical, linear, and transverse position as shown on the plans. After installation in the forms, the ends of ducts shall at all times be sealed to prevent entry of water and debris.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The duct system, including splices and joints shall effectively prevent entrance of cement paste or water into the system and shall effectively contain pressurized grout during grouting of the tendon. The duct system shall also be capable of withstanding water pressure during flashing of a duct in the event the grouting operation is aborted.

The ducts shall be the size as shown on the plans. If the size is not shown, the interior diameter of ducts for single bar shall be at least 1/4-inch greater than the nominal diameter of the tendon.

Grout Vents, Injection, and Ejection Pipes: All ducts or anchorage assemblies for permanent post-tensioning shall be provided with pipes or other suitable connections at each end for the injection of grout after prestressing. As a minimum, ducts shall be vented at the high points of the tendon profile when there is more than a 6-inch variation in the vertical position of the duct. The Contractor may use additional injection and vent pipes when shown on the shop drawings. All connections to ducts shall be made with plastic structural fasteners. Waterproof tape or other method approved by the Engineer shall be used at all connections to include vent and grouting pipes. Vents shall be mortar tight, taped as necessary, and shall provide means for injection of grout through the vents and for sealing the vents.

Placing Concrete

Precautions: The Contractor shall exercise great care when placing and consolidating concrete so as not to displace or damage any of the post-tensioning ducts, anchorage assemblies, splices and connections, reinforcement or other embedments.

Proving of Post-Tensioning Ducts: Upon completion of concrete placement, the Contractor shall prove that the post-tensioning ducts are free and clear of any obstructions or damage and will be able to accept the intended post-tensioning tendons by passing a torpedo through the ducts. The torpedo shall have the same cross-sectional shape as the duct, and shall be 1/4-inch smaller all around than the clear, nominal inside dimensions of the duct. No deductions to the torpedo section dimensions shall be made for tolerances allowed in the manufacture or fixing of the ducts. For straight ducts, it shall be at least 2 feet long. For curved ducts, the length shall be determined by the Contractor such that when both ends touch the outermost wall of the duct, the torpedo is 1/4-inch clear of the innermost wall. If the torpedo will not travel completely through the duct, the member shall be rejected, unless a workable repair can be made to clear the duct, to the satisfaction of the Engineer. The torpedo shall be passed through the duct easily, by hand, without resorting to excessive effort or mechanical assistance.

Problems and Remedies: If the ducts or any part of the work is found to be deficient, it will be rejected. No remedial or repair work will be permitted without the approval of the Engineer.

Post-Tensioning Operations

General: All post-tensioning stressing operations shall be conducted under supervision of a person experienced in segmental construction techniques. The Contractor shall identify the experienced person and shall provide documentation showing previous experience for at least two similar projects totaling not less than two years duration. Post-tensioning forces shall not be applied until the concrete has attained the minimum compressive strength as specified on the contract plans determined by cylinder tests.

Stressing Tendons: All post-tensioning steel shall be tensioned by means of hydraulic jacks so that the post-tensioning force shall not be less than that required by the plans or approved shop drawings, or as otherwise approved by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The maximum temporary stress (jacking stress) in the post-tensioning steel shall not exceed 80 percent of its specified minimum ultimate tensile strength. Tendons shall not be overstressed to achieve the expected elongation. The post-tensioning steel shall be anchored at initial stresses that will result in the long term retention of permanent stresses or forces of not less than those shown on the Plans or the approved shop drawings. Unless otherwise approved by the Engineer, the initial stress at the anchorage after anchor set shall not exceed 70 percent of the specified ultimate tensile strength of the post-tensioning steel.

Permanent stress and permanent force are the stress and force remaining in the post-tensioning steel after all losses, including long-term creep and shrinkage of concrete, elastic shortening of concrete, relaxation of steel, losses in the post-tensioning steel from the sequence of stressing, friction and unintentional wobble of the ducts, anchor set, friction in the anchorages, and all other losses peculiar to the post-tensioning system.

Stressing Sequence: All bar tendons shall be stressed at one end.

Stressing Equipment: Equipment for tensioning the tendons shall be furnished by the manufacturer of the post-tensioning system (tendons, hardware, anchorages, etc.). Each jack used to stress tendons shall be equipped with a pressure gauge for determining the jacking pressure. The pressure gauge shall have an accurate reading dial at least 6 inches in diameter. The pressure gauge shall be installed at the stressing ram. Prior to use for stressing on the project, each jack and its gauge shall be calibrated as a unit by a testing laboratory approved by the Engineer.

Calibration of Jacks and Gauges: Each jack and its gauge shall be calibrated as a unit with the cylinder extension in the approximate position it will be in at the final jacking force. Calibration shall be done when the jack is connected to the equipment (pumps and gages) in the identical configuration as it will be used on the job site, e.g. with the same length hydraulic lines. Initial calibration of the jacks and gauges shall be performed by an independent laboratory using a proven load cell. For each jack and gauge unit used on the project, certified calibration charts shall be furnished by the Contractor from the independent laboratory prior to stressing the first tendon.

Certified calibration shall be made at the start of the work and at every six months thereafter, or as requested by the Engineer. At the option of the Contractor, calibrations subsequent to the initial calibration with a load cell may be accomplished by the use of a master gauge. The master gauge shall be supplied by the Contractor in a protective waterproof container capable of protecting the calibration of the master gauge during shipment to a laboratory. The Contractor shall provide a quick-attach coupler next to the permanent gauge in the hydraulic lines which enables the quick and easy installation of the master gauge to verify the permanent gauge readings. The master gauge shall be calibrated by and shall remain in the possession of the Engineer for the duration of the project.

Any repair of the jacks, such as replacing seals or changing the length of the hydraulic lines, is cause for recalibration of the jacks using a load cell. No extra compensation shall be allowed for the initial or subsequent calibrations or for the use and required calibrations of the master gauge.

Elongations and Agreement with Forces: The post-tensioning operation shall be so conducted that the forces being applied to the tendon and the elongation of the post-tensioning tendon can be measured at all times.

Elongations shall be measured to the nearest 1/16-inch.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

For the required tendon force, the observed elongation shall agree within 5 percent of the theoretical elongation or the entire operation shall be checked and the source of error determined and remedied to the satisfaction of the Engineer before proceeding further. The tendon shall not be overstressed to achieve the theoretical elongation.

In the event that agreement between the observed and theoretical elongations at the required force falls outside the acceptable tolerances, the Engineer may, at his discretion and without additional compensation to the Contractor, require additional tests for "Tendon Modulus of Elasticity" and/or "In-Place Friction."

Friction: The Contract Plans were prepared based on the assumed friction and wobble coefficients and anchor set noted on the plans. The Contractor shall submit calculations and show a typical tendon force diagram, after friction, wobble, and anchor set losses, on the shop drawings based upon the expected actual coefficients and values for the post-tensioning system to be used. These coefficients and values shall be given on the shop drawings.

If, in the opinion of the Engineer, the actual friction significantly varies from the expected friction, the Contractor shall revise his post-tensioning operation such that the final tendon force is in agreement with the plans.

When friction must be reduced, water soluble oil or graphite may be used as a lubricant subject to the approval of the Engineer. Lubricants shall be flushed from the duct as soon as possible after stressing is completed by use of water pressure. These ducts shall be flushed again just prior to the grouting operations. Each time ducts are flushed, they shall be immediately blown dry with oil-free air.

Record of Stressing Operations: The Contractor shall keep a record of the following post-tensioning operations for each tendon installed:

- (a) Project name, number.
- (b) Contractor and/or subcontractor name.
- (c) Tendon location, size, and type.
- (d) Date tendon was first installed in ducts.
- (e) Heat number for bar tendons.
- (f) Assumed and actual cross-sectional area.
- (g) Assumed and actual modulus of elasticity.
- (h) Date stressed.
- (i) Jack and gauge numbers per end of tendon.
- (j) Required jacking force.
- (k) Gauge pressures.
- (l) Elongations (anticipated and actual).
- (m) Anchor sets (anticipated and actual).

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (n) Stressing sequence (i.e., tendons before and after this).
- (o) Stressing mode (one end/two ends/simultaneous).
- (p) Witnesses to stressing operation (Contractor and inspector).
- (q) Date grouted, days from stressing to grouting, and grouting pressure applied at injection end.

Any other relevant information shall also be recorded. The Contractor shall provide the Engineer with a complete copy of all stressing and grouting operations.

Grouting Operations

General: When stressing has been completed and the stressed tendons have been accepted by the Engineer, the annular space between the tendons and the duct shall be grouted. Grouting shall take place within 20 calendar days after installation and stressing of the post-tensioning steel. Ducts shall be grouted in accordance with these Specifications. Immediately after stressing and prior to grouting, tendons shall be protected against corrosion or harmful effects of debris, by temporarily plugging or sealing all openings and vents to prevent entrance of air or water and left in place until just prior to tendon grouting.

Duct shall be flushed prior to grouting. Water used for flushing ducts may contain slack lime (calcium hydroxide) or quick lime (calcium oxide) in the amount of 0.1 lb. per gallon. After flushing, all water shall be blown out of the duct with oil-free compressed air.

The Contractor shall determine the exact kinds of admixtures and proportions of materials to be used to meet the requirements set under Materials, and which, from prior documented experience with similar materials, equipment and placing conditions, will result in grout which does not bleed and can be effectively placed. The quantity of water in the grout shall be as low as possible, consistent with the fluidity needed for placing.

The grouting for any tendon shall be completed a minimum of 4 hours prior to placing live loads on the spans. Immediately after post-tensioning, all grout vents of each tendon shall be temporarily sealed with plugs

Written Grouting Procedures: At least four weeks prior to the start of construction of prestressed elements, written procedures for grouting operations shall be submitted to the Engineer for approval. The grouting procedures shall be devised to ensure that the ducts will be properly filled by grout and shall cover in detail the following:

- (1) type, quantity, and brand of materials used in grouting including all certification required;
- (2) type of equipment needed, including capacity in relation to demand and working condition, as well as provisions for back-up equipment and spare parts;
- (3) types and locations of inlets and outlets;
- (4) types and sizes of grout hoses and connections;
- (5) duct cleaning methods and air pressure testing methods prior to grouting;
- (6) mixing and pumping procedures;
- (7) direction of grouting;

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (8) sequence of use of the inlets and outlets;
- (9) procedures for handling blockages, including flushing of ducts;
- (10) procedures for possible regrouting;
- (11) procedures for post-grouting operations and inspections; and
- (12) the names of the persons in charge and the other personnel who will perform the grouting operation, including their relevant experience and skill.

Mixing and Pumping Procedures: The mixing and pumping procedures required in Item (6) above shall include:

- (1) inspection to ensure that all materials are of the specified type and quantity;
- (2) inspection to ensure that all equipment is in satisfactory condition;
- (3) detailed plan for production testing of grout;
- (4) inspection of ducts to ensure that they are free of water, debris, and other obstructions.
- (5) inspection of ducts to ensure that there will be no grout leakage between adjacent ducts in joint areas (i.e., air pressure testing);
- (6) temperature measurement of air, water, cement, grout, and concrete elements to ensure that they are within the acceptable limits as specified in Post-Tensioning Grout Special Provision;
- (7) procedures for cold and hot weather grouting; and
- (8) inspection of all cement or grout mixture packages for evidence of age and dampness, such as lumps and hardened pieces.

Grouting operations shall commence only after Engineer has approved the grouting procedures.

Records of Grouting Operations: The Contractor shall record the progress of grouting operations for each duct and submit a written report to the Engineer within 72 hours after grouting.

Information to be noted in the records shall include but shall not necessarily be limited to the following:

- (1) identification of tendons grouted, injection end and maximum applied grouting pressure;
- (2) date grouted;
- (3) number of days from stressing to grouting;
- (4) type of grout mix used and lot number of prebagged grout;
- (5) volume of grout pumped into the duct compared to the volume of the duct adjusted for the grout displaced by the prestressing stand; and
- (6) summary of any problems encountered and corrective action taken.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Grouting Personnel: All grouting operations shall be carried out by experienced superintendents, foremen, and workers. Grouting shall be performed under the immediate control of a person skilled in all aspects of grouting and has received certification as an American Segmental Bridge Institute Certified Grouting Technician or as approved by the Engineer. The person shall provide close observation and control of all grouting operations, as necessary for full compliance with specified requirements. This person shall be named and shall furnish proof of at least three years experience as approved by the Engineer.

Ducts: Care shall be taken to ensure that all ducts, anchorages, block-outs, openings, inlets, and vents are kept clean and free of water, debris, fuel, oils, other contaminants and trash at all times prior to and after installing tendons. Temporary plugs, seals and covers shall be used as needed. Minor damage to ducts shall be satisfactorily and effectively repaired and sealed or by removing the locally damaged duct and splicing duct or couplers onto the damaged section prior to placing any concrete. Major damage shall require the removal and replacement of duct.

Prior to grouting, the ducts shall be blown with oil free compressed air to remove water and debris. Each tendon duct shall be air pressure tested to 50 psi to locate potential grout leaks. All cross-overs between tendons, blockages, and leaks shall be repaired to the satisfaction of the Engineer.

Supplies: Before grouting operations begin, an adequate supply of water and compressed air shall be available for clearing the ducts, mixing, and pumping the grout, and flushing out grouted ducts in the event of breakdowns or incomplete operations. All necessary materials shall be checked and made conveniently available for mixing.

Production Testing: Testing equipment for flow-cone testing, and temperature measurements shall be available on-site during grouting operations. Fluidity of the grout shall be strictly maintained within the limits established by the grout manufacturer. In addition to the fluidity tests required for each tendon (see "Grouting Operations below"), one fluidity test (flow cone) in accordance with C939 or C939 Modified shall be performed every two hours of grouting operations. One test shall be taken at the mixer and one at the duct outlet. The efflux times shall be within 5 seconds of the values established during laboratory testing. No grout which tests outside the allowable flow rate shall be used.

Storage of Materials: Grout shall be delivered in prepackaged bags and stored in a building or other location that is weatherproof. Storage in the open may be permitted by the Engineer, if a raised platform and adequate waterproof covering are provided. Care should be taken with the storage of dry grout mixtures in temperatures below 32 degrees F or as recommended by the manufacturer, whichever is more stringent.

Equipment: Grouting equipment consists of measuring devices for water, a high speed shear colloidal mixer, a storage hopper (holding reservoir) and a pump with all the necessary connecting hoses, valves, and pressure gauges. Provide air compressor and hoses with sufficient output to perform the required functions.

Provide equipment with sufficient capacity to ensure that the post-tensioning ducts to be grouted can be filled and vented without interruption at the required rate of injection. Under normal conditions, the grout equipment shall be capable of continuously grouting the longest tendon on the project in not more than 20 minutes.

- (1) Mixer, Storage, Hopper and Screen: Provide a two-speed high shear (colloidal) mixer capable of continuous mechanical mixing. The mixer will produce a homogeneous and stable grout free of lumps and undispersed cement and will be able to deliver a continuous supply of grout to the pumping equipment.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The colloidal grout machinery will have charging and agitating tanks. One unit is a blender and the other a holding tank. The blending tank shall be equipped with a two-speed high shear (colloidal) mixer.

The storage hopper must be kept agitated and at least partially full at all times during the pumping operation to prevent air from being drawn into the post-tensioning duct.

Add water to the mix by use of a flow meter or calibrated water reservoir with measuring accuracy of at least 0.1 gallon.

The grouting equipment shall contain a screen having clear openings of 1/8-inch maximum size to screen the grout prior to introduction into the pump. If the grout is thixotropic, a maximum screen opening of 3/16-inch is satisfactory. The screen shall be inspected periodically during grouting operations. If lumps of cement remain on the screen, the mixture is not suitable for grouting.

Grout shall be gravity fed from hopper into pump inlet.

- (2) Grout Pumping Equipment. Provide pumping equipment capable of continuous operation which will include a system for recirculating the grout when actual grouting is not in progress.

The equipment will be capable of maintaining pressure on completely grouted ducts and will be fitted with a valve that can be closed off without loss of pressure in the duct.

Grout pumps will be positive displacement type, will provide a continuous flow of grout and will be able to maintain an outlet pressure of at least 150 psi.

Pumps will be so constructed and have seals adequate to prevent oil, air or other foreign substances from entering the grout and to prevent loss of grout or water. The capacity will be such that an optimal rate of grouting can be achieved.

A pressure gauge having a full-scale reading of no more than 300 psi will be placed at some point in the grout line between the pump outlet and the duct inlet. If hoses longer than 100 feet are used, two gauges shall be used, one for at the pump and one at the inlet.

The diameter and rated pressure capacity of the grout hoses must be compatible with the pump output. Grout hoses will be firmly connected to pump outlets and the duct inlets.

- (3) Stand-by Equipment. During grouting operations, provide a high pressure water pump rated at 250 psi for adequate flushing to facilitate complete removal of the grout in the event of a breakdown of the grouting equipment or other disruption before the grouting operation has been completed. At the request of the Engineer, demonstrate that this equipment is in full working order. Where water is not supplied through the public water supply system, a water storage tank of sufficient capacity is required.

As well, a backup grout mixer/hopper and pump shall be available on-site during all grouting operations to allow continuous grouting in the case of failure of the primary pump or mixer and to have the capability to run two independent grouting operations, if needed.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Grouting Operations: Grout tendons in accordance with the procedures outlined in the approved grouting procedures when the ambient temperature is at or above 40 degrees F. If temperatures fall below 40 degrees F within 24 hours of completion of grouting operations, the Contractor shall provide means of and maintain the temperature of grouted ducts above 40 degrees F until a strength of 2500 psi is achieved. Ducts shall be dried with compressed air to remove standing water.

Maximum grout temperature will not exceed 90 degrees F to avoid flash set and rapid stiffening in the duct. Use chilled water and/or pre-cooling of the bagged material to maintain mixed grout temperature below the maximum allowed temperature. Grouting operations are prohibited air to remove any standing water, if freezing temperatures are forecast. If grout manufacturer's temperature restrictions are more stringent than those above, they shall be followed.

Mix the grout with the metered amount of water. The materials shall be mixed to produce a homogeneous grout. Continuously agitate the grout until it is pumped. Check the fluidity of the grout in accordance with C939 or C939 Modified.

Open all grout outlets before starting the grouting operation. Unless otherwise approved by the Engineer, grout the tendons from the lowest inlet. Pump grout from the lowest inlet location of the tendon in an uphill direction. Use the grout within 30 minutes of mixing to ensure the flowability of the grout.

Maintain a continuous one-way flow of grout.

Unless approved by the Engineer, pump grout at a rate of between 15 linear feet and 30 linear feet of duct per minute.

The approved method of pumping grout will ensure complete filling of the ducts and complete encasement of the steel. Grout shall flow from the first and subsequent outlets until any residual flushing water or entrapped air has been removed, then expel an additional 2 gallons of grout prior to closing the outlet.

Close all outlets in a similar manner one after another in the direction of the flow except at intermediate crests. Outlets placed a short distance downstream of the crest will be closed before their associated crest outlet pipe.

Pump grout through the duct and continuously discharge it at the anchorage and grout cap outlets until all free water and air are discharged and the consistency of the grout is equivalent to that of the grout being pumped at the inlet. In addition, discharge a minimum of 2 gallons of grout into a clean receptacle to perform a fluidity test. Close the anchorage outlet.

For each tendon, immediately after discharge, perform a fluidity test using the flow cone on the grout discharged from the anchorage outlet. Acceptable measured grout efflux time will not be less than the efflux time measured at the pump nor the minimum acceptable efflux time as established in Post-Tensioning Grout Section. If the grout efflux time is not acceptable, discharge additional grout from the anchorage outlet. Test grout efflux time. Continue this cycle until acceptable grout fluidity is achieved. Discard grout used for fluidity testing. Conduct normal grouting operations at a pressure range of 10 psi to 50 psi measured at the grout inlet. Do not exceed the maximum pumping pressure of 150 psi at the grout inlet.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

After all outlets have been bled and sealed, terminate grouting by the following procedure. Elevate the grout pressure to 75 psi and maintain for 1 minute. If leaks are present, fix the leaks. If no leaks are present, lower the pressure to 50 psi and seal the inlet valve.

If the actual grouting pressure exceeds the maximum allowed, the inlet will be closed and the grout will be pumped at the next outlet that has just been or is ready to be closed as long as a one-way flow is maintained. Grout shall not be pumped into a succeeding outlet from which grout has not yet flowed. If this procedure is used, the outlet/inlet that is to be used for pumping shall be fitted with a positive means of shut-off.

When one-way flow of grout cannot be maintained or when grouting is interrupted, immediately flush the grout from the duct with potable water.

Post-Grouting Operations and Inspection: Fully grouted tendons will not be subjected to vibration within 4 hours of grouting.

Valves, caps, and pipes at the inlets and outlets will not be removed or opened until the grout has cured for 4 to 8 hours. After the grout has cured for 4 to 8 hours, remove the ends of plastic inlets and outlets 1 inch below the surface of the concrete and fill the hole with freshly mixed post-tensioning grout or epoxy grout.

At all anchorages and, where possible, high points, drill into the grout vent to expose the duct contents within 7 days of grouting. Care shall be exercised to avoid drilling into post-tensioning steel. Jointly with the Engineer visually inspect for voids in the grout using a videoscope probe (supplied by the Contractor). If no voids are found, immediately fill the drill hole with freshly mixed post-tensioning grout or epoxy grout. If voids are detected, seal the hole until a repair procedure can be implemented. Repair procedures shall utilize the vacuum grouting method, unless otherwise approved by the Engineer. Contractor shall prepare a repair procedure and submit to the Engineer for approval. Repairs shall be implemented at no additional cost to the Administration. A written report on all inspections and repairs shall be submitted to the Engineer.

If problems with grout bleed or voids in grouted ducts are discovered, the Contractor shall immediately stop all grout operations, determine the cause of the problem and submit a revised grouting procedure for approval by the Engineer. The revised procedure shall identify the causes of the problems and how the revised procedures will correct these problems.

Protection of End Anchorages: Within 54 hours after grouting is completed, exposed end anchorages, bars and other metal accessories shall be cleaned of rust, misplaced mortar, grout and other such materials. Once completed a heavy unbroken coating of an epoxy bonding compound shall be applied to all such dry metal surfaces. Epoxy bonding compound shall conform to AASHTO M 235, class III.

Tight fitting forms shall be installed and held in place securely against the previously placed concrete. After applications of the epoxy bonding agent, the void between the form and the anchorage shall be filled with non-shrink grout mix to protect the anchorage. The non-shrink grout shall be placed within the "tack time" period of the epoxy agent/compound. All work described in this and the preceding paragraph shall be accomplished within the designated 54 hour time period.

Only non-chloride bearing non-shrink grout mixes shall be used for anchorage protection.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Quality Assurance

Installer Qualifications: Engage an experienced installer who has completed prestress concrete work similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

Fabricator Qualifications: Engage a firm experienced in producing prestress hardware similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to supply hardware without delaying the work.

Professional Engineer Qualifications: A Professional Engineer, registered in the Commonwealth of Virginia and experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for design and installation of prestressing for precast concrete units that are similar to that indicated for this project in material, design, and extent.

IV. MEASUREMENT AND PAYMENT

Payment will be made at the unit price per pound for the permanent post-tensioning steel bar tendons entered into the completed structure and accepted. Measurement shall be the theoretical plan length measured from anchor plate bearing face to anchor plate bearing face with no allowance made for waste or extension past the anchor plate faces.

For quantity determination, the following unit weights shall be used:

Prestressing System	Weight Per Unit Length
1 ¼" High Strength Deformed Bar	4.39 lb/ft

The unit price bid per pound of high strength prestressing bar tendons shall include the cost of furnishing, installing, stressing, and grouting all permanent post-tensioning tendons. Payment shall also include anchorage assemblies and post-tensioning system hardware, duct material and installation, grout and grouting, all testing, anchorage protection systems, and all labor, materials, tools, equipment, and incidentals necessary for completing the work in accordance with these Specifications and the plans. This payment shall also include lubricants in the tendon ducts for friction control and flushing the lubricant from the tendon ducts after stressing. No separate measurement and payment will be made for anchorage components, couplers, local anchorage zone reinforcement supplied as an integral part of a proprietary anchorage system, nor ducts for similar post-tensioning system hardware.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Post-Tensioning Tendons	Pound

In the event that the Contractor constructs the structure with an accepted alternate not detailed on the plans, the payment shall be based on the unit price bid extended by either the quantities shown on the plans or the actual quantities used and accepted, whichever is less.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
EPOXY JOINING OF PRECONSTRUCTED COMPOSITE UNITS

October 7, 2009

I. DESCRIPTION

This work shall consist of furnishing, mixing, and applying a two component epoxy bonding system to the match cast faces of joints between preconstructed composite units through which embedded post-tensioning tendons pass in accordance with details shown in the plans and requirements of this specification. The work covered by this section shall also include temporary post-tensioning across a joint, if required, by provisions contained elsewhere in this specification.

This specification covers use of normal setting epoxy bonding agents.

In its workable state, the epoxy bonding agent must provide lubrication along the keys as the preconstructed composite units are brought together. In its hardened state, the epoxy bonding agent must provide a watertight seal between the preconstructed composite units. The hardened epoxy bonding agent is not a stress carrying component, however, it must provide a friction mechanism to transfer shearing stresses across the joint at the shear keys.

II. MATERIALS

Epoxy Material: Epoxy bonding agents for match-cast joints between preconstructed composite units shall be thermosetting 100 percent solid compositions that do not contain solvent or any non-reactive organic ingredient except for pigments required for coloring. Epoxy bonding agents shall be of two components, a resin and a hardener. The two components shall be distinctly pigmented, so that mixing produces a third color similar to the concrete in the segments.

Epoxy bonding agents shall be insensitive to damp conditions during application and, after curing, shall exhibit high bonding strength to cured concrete, good water resistance, low creep characteristics, and tensile strength greater than the concrete.

The components shall be packaged in two parts in sealed containers, pre-proportioned in the proper reacting ratio, ready for combining and mixing in accordance with the manufacturer's instructions. Each container shall bear a label designating the manufacturer's name, the type component (resin or hardener), the range of substrate (surface of concrete) temperature over which application is suitable, the date of formulation, the shelf life of the material, and the manufacturer's lot number. Material from containers which are damaged or have been previously opened shall not be used. Combining of epoxy bonding agent components from bulk supplies will not be permitted. Only full buckets of components will be mixed immediately after opening.

Instructions shall be furnished by the manufacturer for the safe storage, handling, mixing, and application of the material. The Contractor shall furnish to the Engineer samples of the material for testing upon request, and certified reports of tests performed by an independent laboratory approved by the Engineer.

Classification of Epoxy Material: This specification provides for epoxy bonding agents which remain workable for a short time referred to herein as normal-set epoxy bonding agents.

Formulation for Temperature Range: An epoxy bonding agent shall be formulated to provide application temperature ranges which are suitable for erection of segments with substrate temperatures between 20 degrees F and 105 degrees F. There shall be a minimum of three, and preferably four, formulations dividing the overall range into equal subranges which overlap by 5 degrees F. Such epoxy bonding agents shall conform to the physical requirements with minimum temperature of the range equal to 20 degrees F.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Physical Requirements: Epoxy bonding agents proportioned as designated by the manufacturer and mixed in accordance with the manufacturer's recommendations, as modified herein for a specific test, shall meet the physical requirements set out below. The components of the epoxy bonding agent shall be conditioned to the temperature at which testing is to be done prior to mixing the test specimen.

For quality control purposes the Contractor shall furnish to the Engineer certified test reports from a testing laboratory approved by the Engineer indicating that the epoxy bonding agent material has passed all required tests for each manufactured lot. Upon request, the Contractor shall also furnish to the Engineer samples of the epoxy bonding agent material for independent quality assurance testing.

- (a) Consistency: This property determines the application workability of the epoxy bonding agent. Mixed epoxy bonding shall be tested and conform to the prescribed consistency in accordance with ASTM C 881-99 at the maximum temperature of the temperature range for the formulation being tested.
- (b) Gel Time: This property is the period of time during which the epoxy bonding agent will remain workable in the mixing container and must be applied to the match cast joint surfaces. The mixed epoxy bonding agent shall be tested and conform to the prescribed gel time in accordance with ASTM C 881-99 at the maximum temperature of the temperature range for the formulation being tested.
- (c) Contact Time: This property is the allowable workable period of time between mixing of the components of the epoxy bonding agent and the application of a minimum of 40 psi compression over the cross section of the joining segments. The contact time of the epoxy bonding agent, determined in accordance with the test procedure set out below, shall be as follows:

Normal-Set Epoxy 60 Minutes, Minimum

The test procedure for determining contact time shall be in accordance with the test procedure used for determining the compressive and shear strength of the cured epoxy bonding agent modified as follows:

- (1) Soaking of the concrete specimens prior to application of the epoxy bonding agent shall be for 24 hours in water which is at the maximum temperature of the application temperature range for the formulation being tested.
- (2) Joining of the sloped surfaces shall be delayed for the period of time, measured from the time the epoxy was mixed, set out below:

Normal-Set Epoxy 60 Minutes

- (3) During the delay period between mixing of the epoxy and joining of the sloped surfaces, the specimens shall be uncovered and maintained at the maximum temperature of the application range for the formulation being tested.
- (4) The joined specimen shall be cured at the maximum temperature of the application range for the formulation being tested.
- (5) Specimens shall be press together and held in position for 24 hours then wrapped in a damp cloth and kept wet for an additional 24 hours.
- (6) The joined specimen shall be cured at the maximum temperature of the application range for the formulation being tested.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (7) The formulation of epoxy bonding agent being tested will be acceptable if the specimen when tested sustains the following compressive stress:

Normal-Set Epoxy 1,000 psi at 48 Hours

- (d) Compressive Yield Strength: This property is the compressive yield strength of the epoxy bonding agent at various ages. Comparison of this property between batches is an indication of the level of quality control achieved in manufacturing the material. The required compressive yield strength of the epoxy bonding agent shall be determined in accordance with ASTM C 881-99 with the following modifications:

- (1) The epoxy bonding agent shall be poured into the mold for forming specimens within 10 minutes after the beginning of mixing of the components.

- (2) The physical requirements are:

Normal-Set Epoxy 2,000 psi at 24 Hours and
7,000 psi at 48 Hours

- (e) Bond Strength: This property is the strength of the epoxy bonding agent as it bonds with concrete. This bond strength property shall be determined in accordance with and conform to ASTM C 881-99 which references ASTM C 882 with the following modifications:

- (1) The test cylinder of mortar shall have a compressive strength of at least 6,000 psi at seven days age.

- (2) The specimens shall be conditioned by soaking in water which is at the minimum temperature of the application temperature range for the formulation being tested. The temperature of the specimens shall be maintained at that temperature for the duration of the test. The required strength of ASTM C 881-99 shall be as modified as follows:

Normal-Set Epoxy 1,000 psi at 48 Hours

- (f) Heat Deflection of Epoxy Bonding Agent: This property is the temperature at which an arbitrary deflection occurs under arbitrary conditions in the cured epoxy bonding agent. It is a screening test to establish performance of the epoxy bonding agent throughout the temperature range at which a particular formulation may be applied. It shall be tested and satisfy the requirements in accordance with ASTM C 881-99.

III. CONSTRUCTION

General: An epoxy bonding agent meeting the requirements of this specification shall be applied to joining surfaces of all preconstructed composite units through which embedded post-tensioning ducts pass. The epoxy bonding agent shall be applied only when the substrate temperature of both surfaces to be joined is between 20 degrees F and 105 degrees F.

The formulation of epoxy bonding agent used shall have an application temperature range as previously defined in the Epoxy Material section which conforms to the substrate temperature of the surfaces to be joined. If the surfaces have different substrate temperatures, the formulation for the higher temperature shall be used, except in the case of substrate temperatures below 20 degrees F.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor shall plan his erection and post-tensioning operations such that for the particular formulation of epoxy bonding agent being used, the time elapsing between initial mixing of the components for the first batch of epoxy bonding agent and application of a minimum of 40 psi compression over the entire joint of preconstructed composite units shall not exceed 70 percent of the contact time. Prior to beginning erection, the Contractor shall submit to the Engineer for review, details covering how compliance with this time limit will be achieved during erection of segments.

The compressive force across a joint (contact pressure) may be accomplished through temporary post-tensioning or permanent post-tensioning. Regardless of other requirements specified elsewhere, a contact pressure of 40 psi shall be maintained at all points on the mating surfaces until the epoxy bonding agent hardens.

The specified contact pressure shall be continuously maintained across a joint.

Qualifications of Contractor's Personnel: The work of mixing, handling, and applying the epoxy bonding agent shall be under the direct supervision of a person who has experience in the use of this material. The Engineer may require the Contractor to arrange for a technical representative of the manufacturer to be at the site as an advisor at the beginning of this operation.

The Contractor shall ensure that all personnel who will be working with the epoxy bonding agent are thoroughly familiar with the safety precautions necessary when handling this material.

Cleaning of Surfaces To Be Joined: The surfaces to which the epoxy bonding agent are to be applied shall be free from oil, form release agent, laitance or any other material that would prevent the epoxy bonding agent from bonding to the concrete surface. These detrimental materials shall be removed by light sandblasting or high pressure water blasting with a minimum pressure of 5,000 psi and shall not destroy the surface shape or profile of the mating surfaces.

The surfaces shall have no free moisture on them at the time the epoxy bonding agent is applied. Free moisture will be considered to be present if a rag, after being wiped over the surface, becomes damp.

Mixing Epoxy Bonding Agent: Only epoxy bonding agent components from full containers opened immediately prior to being combined and for which the shelf life indicated on the containers has not expired shall be used during erection. Each container of a component shall be thoroughly mixed prior to combining of the components.

The two components of the epoxy bonding agent shall be combined and thoroughly mixed in a mechanical mixer in strict accordance with the manufacturer's recommendations.

Mixing of the epoxy bonding agent shall be scheduled so that the material in a batch is applied to the face of the joint within 20 minutes after the components are combined, unless suitably demonstrated to be workable.

The Engineer at his discretion may require a dry assembly of the mating segments to check the fit of the two surfaces before applying the epoxy.

Applying Epoxy Bonding Agent: The epoxy bonding agent shall be uniformly applied to a nominal thickness of 1/16-inch in accordance with the manufacturer's recommendations with a spatula or by appropriate hand tool(s). The material shall be applied to both faces to be joined. No material shall be placed within 1/2-inch of a post-tensioning duct.

No epoxy bonding agent from a batch shall be used for which the time since combining of components has exceeded 20 minutes.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

After the concrete preconstructed composite units have been joined and the specified contact pressure applied a discernable bead line of epoxy bonding agent must be apparent along the entire exposed edges of a joint. All excess bonding agent shall be cleaned from visible surfaces of the concrete segment in such a way as to not damage or stain the concrete surface. Excess epoxy squeezed from the joint shall be captured and not allowed to free-fall from the structure. Epoxy material shall not be smeared on external surfaces of the concrete. Excess epoxy material may be removed after hardening provided that the concrete surface is not damaged.

Should the epoxy fail to produce a discernable bead line or if the Engineer should find areas where the joint has not fully closed, the Contractor shall provide a repair method to the Engineer for approval. The Contractor shall take reasonable steps to identify the cause of the problem and propose a solution prior to continuing epoxy joining work.

Immediately after the preconstructed composite units are joined, a swab shall be passed through each empty post-tensioning duct to smooth out any epoxy bonding agent in the duct.

Artificial Heating: If the Contractor elects to erect segments in cold weather when the substrate temperature of the joint surfaces of concrete deck segments is below 20 degrees F, he may provide an artificial environment to increase the substrate temperature subject to the following restrictions:

- (a) The artificial environment shall be created by an enclosure surrounding the joint through which warm air is circulated.
- (b) The temperature of the concrete shall be raised to at least 30 degrees F to a depth of approximately 3 inches beneath the surface to be joined.
- (c) Localized heating shall be prevented and the temperature of the substrate shall not exceed 105 degrees F at any point on the surface of a joint.
- (d) The temperature of substrate surfaces shall be maintained between 30 degrees F and 105 degrees F for at least 2 hours after joining of the surfaces. This temperature range shall be adjusted depending on the applicable temperature range for the epoxy used, but cannot be below 30 degrees F.

The Contractor may propose, for review by the Engineer, an optional method of raising and maintaining the substrate temperature of the joint surfaces. Any optional method shall meet the restrictions set out above. The Engineer will base his approval of an optional method on it accomplishing an environment suitable for the epoxy bonding agent to perform satisfactorily.

Failure to Comply With Time Limits: If the time limit between mixing of the epoxy bonding agent and application of contact pressure to a joint is exceeded, the preconstructed composite units shall be moved apart and all epoxy bonding agent shall be removed from both faces of the joint. Solvent is not to be used to remove the epoxy bonding agent.

Record of Joining: The Contractor shall record and make available to the Engineer the following information:

- (a) General:
 - (1) Weather condition.
 - (2) Air temperature at the site on an hourly basis.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (b) For each joint identified as to location in the structure:
- (1) Lot number for the epoxy bonding agent components.
 - (2) Temperature of the concrete on the surface of each concrete segment when application of epoxy bonding agent was started.
 - (3) Time of mixing the first batch of epoxy bonding agent applied to the joint.
 - (4) Time of applying the specified contact pressure to the joint.
 - (5) Date of joining segments with epoxy.

IV. MEASUREMENT AND PAYMENT

Epoxy joining of preconstructed composite units will not be measured but the cost will be incidental to the unit price for "Class A5 Lightweight Concrete" item.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
CONCRETE SLOPE PROTECTION REPAIR

August 11, 2009

I. DESCRIPTION

This work shall consist of removing damaged existing precast concrete blocks on embankments at or near bridge abutments as shown on the plans or as specified by the Engineer. Damaged blocks removed shall be replaced by new blocks furnished by the Contractor.

II. MATERIALS

- (a) **Precast concrete blocks** shall conform to the requirements of Section 222.
- (b) **Mortar** shall be non-shrinking and shall conform to the applicable requirements of Section 218.
- (c) **Foundation course** shall be Grading B sand conforming to the requirements of Section 202 or approved local material similar in nature.
- (d) **Herbicide** shall conform to the requirements of Section 244.

III. PROCEDURES

Precast Concrete Block Slope Protection Repair: All damaged concrete blocks shall be removed along the joint to ensure all broken sections are removed. Soft sections of subgrade and unsuitable material shall be removed and replaced. The subgrade shall be compacted and shaped to a smooth, uniform surface.

The foundation course shall be spread on the subgrade to a depth of 2 inches and treated with an approved highly insoluble soil sterilent. Material shall be in a dry form and have a maximum solubility rate of 250 parts per million. Material shall be uniformly applied at the maximum rate recommended by the manufacturer.

Replacement blocks shall be bedded in the foundation course to match the existing blocks. Blocks shall be placed with continuous joints extending horizontally on the face of the slope and with broken (staggered) joints extending perpendicular thereto, up or down the slope. Blocks shall be rammed until the surface is firm and conforms to the finished slope. Joints shall be filled with mortar.

IV. MEASUREMENT AND PAYMENT

Concrete slope protection repair will be measured in square yards of surface area and will be paid for at the contract unit price per square yard. If limits are not shown on the plans, measurements will be made by the Engineer as appropriate. This price shall include repairing the subgrade, treatment of subgrade, furnishing and preparing the foundation course, furnishing and installing replacement blocks, and all necessary labor materials, equipment and incidentals to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Concrete block slope protection repair	Square yard

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
OVERHEAD TRANSMISSION LINES DOMINION VA POWER - CONSTRUCTION GUIDELINES
REFERENCE FOR PROJECT WITHIN AND/OR NEAR DOMINION VA POWER'S ELECTRIC
TRANSMISSION RIGHTS-OF-WAY

August 18, 2009

The following guidelines pertain to the overhead transmission lines that run parallel to the CSX tracks and over I-95 at the Lombardy Street Bridge. These transmission lines have been verified by Dominion VA Power to be 115kV. The minimum distance required by OSHA shall be maintained between electrical conductors and any part of the encroachment or equipment used in the installation or maintenance of encroachment.

OSHA REQUIREMENTS:

1910.269(k)(2)(i)

In areas not restricted to qualified persons only, materials or equipment may not be stored closer to energized lines or exposed energized parts of equipment than the following distances plus an amount providing for the maximum sag and side swing of all conductors and providing for the height and movement of material handling equipment:

1910.269(k)(2)(i)(A)

For lines and equipment energized at 50 kV or less, the distance is 10 feet.

1910.269(k)(2)(i)(B)

For lines and equipment energized at more than 50 kV, the distance is 10 feet plus 4 inches for every 10 kV over 50 kV

•Sag of conductors varies with changes in operating and ambient temperatures; therefore, required clearances will be based upon maximum sag. The minimum clearance of 12 feet is governed by the clearance required for the 115 kV lines. Plan and Profile sheets showing maximum sag of conductors can be provided by Dominion Virginia Power upon request.

•Contractor shall notify Stephanie Bagby - Transmission Engineer at telephone number (804) 771-6282 and the Area Construction Engineer to arrange a pre-construction meeting prior to any construction activities being conducted within the electric transmission right-of-way.

•Dominion Virginia Power, may, at its sole discretion, decide to have an inspector present while Contractor's work within the right-of-way is in progress. VDOT will pay for all actual inspection costs that Dominion Virginia Power incurs when construction work is done within Dominion Virginia Power's right-of-way.

•An on-site Dominion Virginia Power inspector will determine when additional shoring or protection is needed around any Dominion Virginia Power facilities. This will be done on a case by case basis based on factors that will be determined in the field. Dominion Virginia Power will not be responsible for providing the necessary additional shoring.

•Contractor may request to have the transmission line taken temporarily out of service for construction activities. However, Dominion Virginia Power reserves the right to deny any requested transmission line outage which, in the sole opinion of Dominion Virginia Power, would be detrimental to the service reliability of its transmission system. Outage requests for the utilization of the transmission right-of-way as a construction staging area must be submitted to Dominion Personnel at least three (3) months in advance.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

a. Transmission lines typically may be taken out of service, on a daily basis, during the months of March, April, October and November, provided that system conditions and loads are acceptable. However, Dominion Virginia Power reserves the right to re-energize the line with two (2) hours notice to the Contractor.

b. If the line outage required is greater than one (1) work day, Dominion Virginia Power reserves the right to choose between keeping the line out of service for the project duration or re-energizing the line each evening. There is a second option for outages required for multiple work days. Each day that the line is taken out of service, Dominion would install grounds and then remove the grounds when the day's work is complete. In the event that Dominion Virginia Power is unable to install and remove the grounds, an approved Contractor must be obtained to perform this work. A list of approved Contractors is available from Dominion Virginia Power upon request.

c. Once the line has been taken out of service, the Contractor may work under and/or adjacent to the line as necessary provided that no contact is made with the transmission line conductors or shield wires. Dominion Virginia Power may require that a Company operations inspector remain on site while the Contractor is working around the de-energized conductors. VDOT will pay the outage fee to Dominion Virginia Power up to a total of (25) instances. The contractor will be responsible for all outage fees (approximately \$8,000 per outage) beyond those (25) instances.

- Any truck, vehicle or equipment larger than the maximum vehicle dimensions allowed by the Virginia Department of Transportation on state roads without an over dimension permit shall be either shielded from the electric field of the transmission line(s) or other measures shall be put in place to limit the steady state current due to electrostatic effects of less than 5mA rms if truck, vehicle or equipment is short-circuited to ground.

Contractor shall be responsible for verifying the location of the Overhead Transmission Lines and adjusting his means and methods of conducting the PCU replacement work in a manner that does not interfere with the Overhead Transmission Lines. All costs associated with the replacement of the PCUs in the vicinity of the Lines shall be included in the bid price of other relevant items.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
**TEMPORARY CONSTRUCTION CROSSING and PROTECTION OF DAVIS-BACON
QUARTER SEWER LINE**

June 30, 2009

I. DESCRIPTION

The Contractor is advised that all work in the vicinity of the Davis-Bacon Quarter Sewer Line concrete box culvert shall be protected at all times. The culvert is approximately 12'wide x 12'deep and runs parallel and directly beneath the Dominion VA Power Transmission lines adjacent to the CSX railroad tracks under the I-95/Lombardy Bridge. The contractor shall take all necessary measures to protect the section of the sewer line in all locations which will be used to cross/setup equipment, set up temporary supports/scaffolding, and where materials will be stored. All sections of the sewer line that are not protected shall be delineated with temporary safety fence (in accordance with section 242 of the Specifications) along the perimeter of the outside edges of the sewer line. The required section of sewer line to be protected and duration of the protection shall be dependant on the Contractor's plan of operations.

II. MATERIALS

The materials, design, and methods will be at the discretion of the contractor. The contractor may elect to utilize timber mats, steel grates, fill material, or other configurations as he/she deems necessary.

III. PROCEDURES

Prior to performing any work adjacent to within 12ft. or over top of the sewer line, the Contractor shall submit to the Engineer, for review and approval, a protection plan designed and sealed by a Professional Engineer licensed to practice in the Commonwealth of Virginia. The plan shall include a plan view, necessary details of connections, materials list, and engineering calculations.

The protection mats shall be placed over the sewer line structure, such that the sewer line structure does not bear any of the load. No portion of the crossing/protection may bear directly onto the sewer line. Any damage to the sewer line caused by the Contractor's operations shall be immediately reported to the Engineer. Repairs due to damage shall be at the Contractor's expense. Costs of environmental impacts, penalties or fines imposed by federal, state, and/or local authorities due to damage shall be borne by the Contractor.

The Contractor shall secure the materials to construct the sewer line protection and delivery to the construction site. Temporary construction crossing materials shall become the property of the Contractor and shall be removed by the contractor once the protection is no longer required.

IV. MEASUREMENT AND PAYMENT

Temporary construction crossing will be paid for at the contract lump sum price. This price shall be full compensation for design, furnishing materials to the project site, maintaining protection, removal and disposal of materials when no longer required, and all labor, tools, equipment, materials and incidentals necessary to perform the installation, maintenance and removal of the protection. The first payment of 75% of contract lump sum price will be paid after installation as indicated in the Department-approved protection plan. The final 25% of the contract lump sum price will be made when no longer needed and all of the material has been removed from the site.

Payment will be made under:

Pay Item	Pay Unit
Temporary Construction Crossing	Lump Sum

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
TEMPORARY SUPPORT SYSTEM AT B-692

October 7, 2009

I. DESCRIPTION

This work shall consist of furnishing, installing, maintaining and removing the temporary support systems required at Piers 4, 5, 6, 7 and 8 on the Lombardy St./CSX Railroad Bridge in accordance with the plans, specifications and these special provisions.

II. MATERIALS

Structural steel and H-piles for this work shall conform to the requirements of ASTM A709 Grade 50. Concrete shall conform to the requirements of Section 217 for Class A3 concrete.

III. PROCEDURES

This work shall be scheduled so that a support system is complete and in place, to support adjacent spans at a required pier, to allow for the replacement of the pier cap as indicated in the plans. No span shall have both ends support by temporary supports at any one time.

Pre drilled holes for H-piles shall be drilled to elevations given in plans.

Before beginning any jacking operations, to transfer load from an existing pier cap to a temporary support, the Contractor's proposed jacking procedures and supporting calculations shall be submitted to the Department for review and approval. The plan shall be sealed by a professional engineer licensed to practice in the Commonwealth of Virginia.

The Contractor has the option to use the temporary support system shown in the plans or to develop an alternative design. The temporary support system is considered falsework, and modification are subject to the requirements of Section 105.10(c)(2) of the Specifications. All necessary detailed drawings and support calculations shall be submitted to the Department for review and approval.

Upon completion of the replacement of the required pier caps, the temporary support systems shall be removed and shall become the property of the Contractor.

IV. MEASUREMENT AND PAYMENT

The temporary support systems will be paid for at the contract lump sum price which price shall be full compensation for all materials, labor, tools, equipment and incidentals for the installation, maintenance, and removal of supports at all four locations shown in the plans.

Payment will be made under:

Pay Item	Pay Unit
Temporary Support System	Lump Sum

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
GUIDE SPECIAL PROVISION FOR
DRILLED SHAFTS

October 7, 2009

I. DESCRIPTION:

This work shall consist of all labor, materials, equipment and services necessary to perform all operations to complete the drilled shaft installation in accordance with the specifications, this special provision and with the details and dimensions shown on the plans. Drilled shafts are a reinforced concrete section, cast-in-place against insitu, undisturbed material. Drilled shafts are a straight shaft type and are vertical.

II. SITE INFORMATION

Engineering Geology Sheets are included in the Contract Documents for use by the Contractor. Data on subsurface conditions are not intended as representations or warranties of continuity of such conditions. The data are made available for the convenience of the Contractor, and it is expressly understood that the Department will not be responsible for interpretations or conclusions drawn there from by the Contractor.

The Contractor or prospective bidders may obtain, prior to bidding, right-of-entry and complete whatever investigations, research, tests, or analyses required for bid purposes.

A geotechnical report was prepared for this project. This report was prepared to establish design guidelines only and is not considered part of the Contract Documents or a warranty of subsurface conditions. The opinions and engineering analyses expressed in the report are those of the designers, and they represent their interpretation of subsurface conditions, and field and laboratory test data. Therefore, the information in the Geotechnical Report is not intended as a substitute for the Contractor's personal investigation, interpretation, and good judgment.

III. QUALIFICATIONS OF DRILLED SHAFT CONTRACTOR:

The Contractor performing the work described in this specification shall have experience consisting of successful installation of at least 10 drilled shaft projects installed within the past 5 years, 2 of which shall be similar or greater size and in similar geotechnical conditions. The Contractor shall provide documentation of his superintendent's qualifications, record experience, and prior project references demonstrating that he can handle unusual site conditions and equipment breakdowns. The drilled shaft work shall be performed under the supervision of the Contractor's superintendent, who shall have at least 5 years of experience installing drilled shafts within the last 8 years and shall be fully knowledgeable and experienced in construction of drilled shaft foundations of similar size and geotechnical conditions as those shown on the plans.

The mentioned documentation shall reference, for each project, the names and phone numbers of owner's representatives who can verify the Contractors' participation on those projects, detail the size and number of the shafts, methods used during installation, methods used for wall stabilization, local soil conditions, actual construction time, and contract time.

The Engineer may accept or reject the Contractor's Drilled Shaft Subcontractor based on his qualifications and previous field performance.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

IV. SUBMITTALS:

A. Installation Plan

No later than one month prior to constructing drilled shafts, the Contractor shall submit an installation plan for review by the Engineer. This plan shall provide information of the following:

- (a) A list of the 10 projects performed in the last 5 years by the Contractor performing the work specified as required experience in Section III. QUALIFICATIONS OF DRILLED SHAFT CONTRACTOR. The documentation shall reference, for each project the names and phone numbers of owner's representatives who can verify the Contractors' participation on those projects, detail the size and number of the shafts, methods used during installation, methods used for wall stabilization, local soil conditions, actual construction time, and contract time. Name and experience record of the drilled shaft superintendent who will be in charge of drilled shaft operations for this project. The Contractor shall provide documentation of his superintendent's qualifications, record experience, and prior project references demonstrating that he can handle unusual site conditions and equipment breakdowns. The mentioned documentation shall reference, for each project the names and phone numbers of owner's representatives who can verify the Contractors' participation on those projects, detail the size and number of the shafts, methods used during installation, methods used for wall stabilization, local soil conditions, actual construction time, and contract time.
- (b) List of proposed equipment to be used, including cranes, drills, augers, bailing buckets, final cleaning equipment, desanding equipment, slurry pumps, core sampling equipment, tremies or concrete pumps, etc.
- (c) Details of overall construction operation sequence and the sequence of shaft construction in bents or groups including the time for driving casing, sealing casing, excavation and/or drilling time, drilled shaft cleaning, rock coring, drilled shaft inspection and concrete placement.
- (d) Details of shaft excavation methods. Methods for monitoring verticality of the drilled shaft walls during excavation and details of proposed corrective measures to be implemented for shafts out of tolerance.
- (e) When the use of slurry is anticipated, details of the mix design and its suitability for the subsurface conditions at the construction site, mixing and storage methods, maintenance methods, and disposal procedures.
- (f) Details of methods to clean the excavated shaft.
- (g) Details of Steel Reinforcement Placement During Construction. Include methods to ensure cage centering and cover; cage integrity while lifted during placement (number of cranes, lift points, and spreader bars); number and location of bottom and side spacers; cage support; and tie downs during concrete placement.
- (h) Details of concrete placement, including proposed operational procedures for free fall, tremie or pumping methods.
- (i) Details of casing installation and removal methods.
- (j) Plan to Protect Existing Structures. The Contractor shall outline the steps he will take during drilled shaft installation to protect adjacent or nearby structures.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (k) Details of Environmental Control Procedures. Indicate plan to prevent loss of soil, slurry or concrete into waterways, project areas, or protected areas and to comply with all State and Federal environmental regulations.
- (l) Method to install and secure the Crosshole Sonic Logging (CSL) tubes to the reinforcing cage.
- (m) Concrete Mix Design. Include the details of the concrete mix design to be used. Mix design shall include a Slump Loss Graph. The Slump Loss Graph for a proposed drilled shaft mix design shall illustrate the slump reducing slowly and still exceeding 4 inches slump 4 hours after batching.
- (n) Concrete Placement Plan. The proposed Concrete Placement Plan shall ensure that sufficient concrete is at the job site or in transit to the job site so that the entire pour can be done without delay. Include location of the concrete plant, number of trucks, estimated delivery times, estimated time between trucks, and number of trucks at the site before placement begins. Indicate the use of tremie or concrete pump, dear lines, details of the seal to be used at the bottom end of the tremie or concrete pump line. Breakdowns of concrete plants, trucks, or traffic problems shall be considered under this Concrete Placement Plan. Include an estimate of the concrete placement and overpouring time per drilled shaft.
- (o) Methods of Disposal of Spoil Excavation, Waste Slurry, Waste Concrete, and Drilled Shaft Cutoffs. Sufficient details shall be presented to the Engineer to evaluate the adequacy and compliance of the Contractor's methods of disposal with the VDOT specifications, including all related environmental permits and local regulations.

The Engineer will evaluate the drilled shaft installation plan for conformance with the plans, specifications and special provisions. Within 14 days after receipt of the installation plan, the Engineer will notify the Contractor of any additional information required and/or changes necessary to meet the contract requirements. All procedural approvals given by the Engineer shall be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications.

Preconstruction Conference

A shaft preconstruction conference will be held with the Contractor and Sub-Contractor (if applicable) prior to the start of shaft construction to discuss construction and inspection procedures. This conference will be scheduled by the Engineer after the Contractor's submittals are approved by the Engineer.

V. FIELD DEMONSTRATION OF THE TRIAL SHAFT:

When required on the plans, after the Drilled Shaft Installation Plan has been approved, a trial (non-production) drilled shaft(s) will be constructed to the dimension(s) and at the location(s) indicated in the plans or as directed by the Engineer. The trial drilled shaft must be constructed in identical manner as that proposed for the production shafts, including the method of installation, CSL tube installation and testing, steel reinforcement, and concreting. The diameter and depth of the trial drilled shaft shall be the maximum diameter and maximum depth of any the production drilled shafts shown on the plans unless otherwise directed by the Engineer. During the construction of the trial drilled shaft, the Contractor must demonstrate the adequacy of his Drilled Shaft Installation Plan.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Construction of the trial drilled shaft(s) will be used to determine if the Contractor's methods, equipment, and proposed procedures are effective to produce a drilled shaft excavation and concreting that meet the requirements of the plans and specifications.

Failure by the Contractor to demonstrate to the Engineer the adequacy of methods and equipment shall be reason for the Engineer to require alterations in equipment and/or method by the Contractor to eliminate unsatisfactory results. Any additional trial holes required to demonstrate the adequacy of altered methods or construction equipment shall be at the Contractor's expense. Once approval has been given to construct production shafts, no changes will be permitted in the methods or equipment used to construct the satisfactory trial shaft without written approval of the Engineer.

The concreted trial shafts shall be cut off 2 feet below finished grade and left in place. The disturbed areas at the sites of the trial shaft holes shall be restored as nearly as practical to their original condition.

VI. MATERIALS:

A. Hydraulic Cement Concrete for Drilled Shafts

1. Hydraulic cement concrete shall conform to the requirements of Section 217 of the Road and Bridge specifications, except as noted herein.
2. Specifications for Concrete Mixture

(a) Requirements for Hydraulic Cement Concrete

Class of Concrete	Design Min. Laboratory Compressive Strength at 28 Days (f'c) (psi)	Design Max. Laboratory Permeability at 28 Days (Coulombs)	Aggregate Size No.	Min. Cementitious Content (lb./cu yd)	Max. Water /Cementitious <u>lb. water</u> /lb. cement	Consistency (in of slump)	Air Content (percent)
Drilled Shaft Concrete	5,000 or as specified on the plans	2500	8	635	0.40	See Section VI.A.2.(c)	4 ½ ± 1 ½

(b) Requirements for Low Permeability

1. Fly ash shall conform to the requirements of Section 241. Class F fly ash shall be between 20 percent and 25 percent by mass of the cementitious material. However, no more than 15 percent of the Portland cement of a standard mixture shall be replaced. Silica fume shall conform to the requirements of AASHTO M307 or ASTM C1240. Silica fume shall replace between 7 percent and 10 percent by mass of the cementitious material. Only silica fume at the rate of 3 percent to 7 percent may be added to all combinations to reduce the early permeability after the approval of the Engineer.

2. Quality Assurance for Low Permeability Concrete in Drilled Shafts

When required on the plans testing for permeability shall be conducted and submitted as part of the concrete mix design required in IV.A.(m) Installation Plan. At least two trial batches, using job materials, with permissible combination of cementitious materials shall be prepared, and test specimens shall be cast by the

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Contractor and tested by the Department for permeability and strength at least a month before the field application. The permeability samples shall be cylindrical specimens with a 4-inch diameter and at least 4-inches in length. They shall be moist-cured as the strength cylinders for acceptance except that the last 3 weeks of cure shall be at 100 degrees Fahrenheit \pm 10 degrees Fahrenheit. Cylinders shall be tested at 28 days in accordance with VTM 112. The test value shall be the result of the average values of tests on two specimens from each batch. Permeability values obtained from trial batches shall be 500 coulombs below the maximum values specified.

(c) Consistency of Concrete

Ensure that drilled shaft concrete has a slump between 7 inches and 9 inches when placement is to be under a drilling fluid and between 6 inches and 8 inches for all other placement techniques.

Ensure that drilled shaft concrete maintains a slump of 4 inches or more throughout the drilled shaft concrete elapsed time. Ensure that the slump loss is gradual as evidenced by slump loss tests described below. The concrete elapsed time is the sum of the mixing and transit time, the placement time and the time required for removal of any temporary casing that could cause the concrete to flow into the space previously occupied by the temporary casing.

Provide slump loss tests before drilled shaft concrete operations begin, demonstrating that the drilled shaft concrete maintains a slump of at least 4 inches throughout the concrete elapsed time. Perform slump loss testing of the drilled shaft mix using a laboratory acceptable to the Engineer.

(d) Slump Loss Test

Conduct the slump loss test as follows:

- 1) Batch the actual mix design at 8 inches (9 inches if wet placement) initial slump and at the highest concrete temperature expected on the job, but no less than 60°F.
- 2) Batch at least 4 cu. yd. in a mixer truck. Begin timing the test when the mixing water is introduced into the mix.
- 3) After initial mixing, measure and record the slump, ambient and, concrete temperature and percent air. Ensure all concrete properties are within specifications.
- 4) Mix the concrete intermittently at agitation speed for 30 seconds every 15 minutes.
- 5) Measure and record the slump, ambient and concrete temperatures, and percent air after every second 15 minute interval until the slump is 3 ½ inches.

Make certain the concrete maintains a minimum slump of 4 inches at least 4 hours after batching.

- (e) At least three concrete test cylinders shall be taken per load.

B. Reinforcing Steel

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Deformed reinforcing bars shall comply with the size, spacing, dimension, and details shown on the plans and shall conform to ASTM A 615, Grade 60, and all the pertinent requirements of Section 223 and 406 of the VDOT Road and Bridge Specifications.

C. Casing

Casing shall be steel, rigid, smooth, clean, watertight, and of ample strength to withstand both handling or driving stresses and to withstand pressure from both concrete and the surrounding earth materials. The outside diameter of casing shall not be less than the specified size of the drilled shaft. The thickness of steel casings shall not be less than (a) diameter less than 48 inches, minimum thickness $\frac{3}{8}$ inch; (b) diameter 48 to 78 inches, minimum thickness $\frac{1}{2}$ inch; (c) diameter greater than 78 inches minimum thickness $\frac{5}{8}$ inch. The dimensions are subjected to American Pipe Institute tolerances applicable to regular steel pipe. When approved by the Engineer, the Contractor may elect to provide a casing larger in diameter than shown in the plans. All casing diameters shown on the plans refer to O.D. (outside dimension).

Casing pipe shall conform to ASTM A 252, Grade 2, for temporary and permanent applications. All casing, except permanent casing, shall be removed from drilled shaft excavations. Splices for permanent casing shall be welded in accordance with Section 407.04 of the VDOT Road and Bridge Specifications with no interior splice plates, producing a true and straight casing. All welding shall be in accordance with ANSI/AWS D1.1.

D. Crosshole Sonic Logging Tubes

Drilled shafts shall be equipped with access tubes for Crosshole Sonic Logging (CSL) tests at the locations shown in the plans and according to Section XV, of these Specifications. Access tubes for CSL testing shall be 2 inches I.D. schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S. Pipes shall have a round, regular internal diameter, free of defects or obstructions; including any defect at the pipe joints, so to permit the free unobstructed passage of source and receiver probes. CSL probes should be 1.35 inches diameter or smaller and 6 to 10 inches long. Each tube or steel pipe shall be fitted with a watertight shoe onto the bottom and a removable cap at the top. Both, shoe and cap shall be watertight and free from corrosion, and the internal and external faces of the tubes clean to ensure passage of the probes and good bond with the concrete.

VII. CONSTRUCTION METHODS AND EQUIPMENT:

A. Protection of Existing Structures

All reasonable precautions shall be taken to prevent damage to existing structures and utilities as indicated in Sections 107.12 and 401.03 (g) of the VDOT Road and Bridge Specifications. These measures shall include but are not limited to vibration monitoring, or subsidence control during driving of casings, sheets, or drilling.

B. Construction Sequence

Excavation to bottom of footing elevation shall be completed before shaft construction begins unless otherwise noted in the contract documents or approved by the Engineer. Any disturbance to the footing area caused by shaft installation shall be repaired by the Contractor prior to the footing pour.

When drilled shafts are to be installed in conjunction with embankment placement, the Contractor shall construct drilled shafts after the placement of fill unless shown otherwise in the contract documents or approved by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Drilled shafts, constructed prior to the completion of the fill, shall not be capped until the fill has been placed as near to final grade as possible, leaving only the necessary work room for construction of the caps.

C. General Methods and Equipment

1.General

The method used for drilled shaft installation shall be suitable for the intended purpose and materials encountered. The dry method, wet method, temporary casing method, or permanent casing method can be used as necessary to produce a sound and durable foundation free of defects. When a particular installation method is required in the Contract Documents, only that method of construction shall be used. If no particular method is specified for use, the Contractor shall select and use one of the methods of construction cited above as determined by the site conditions and needed to properly accomplish the work. The permanent casing method shall be used only when required in the Contract Documents or authorized by the Engineer. The Contractor shall submit to the Engineer for approval his selected method of construction in the Drilled Shaft Installation Plan described in Section IV of these Specifications.

Where soil and groundwater conditions vary along the site, a single method of construction may be not appropriate for the entire job site, a combination of methods may be used. The Contractor may propose in his Drilled Shaft Installation Plan alternative methods of drilled shaft installation as appropriate, or recommendations in preparation for contingencies, or a contingency plan to change installation method when the new conditions are encountered.

2.Dry Construction Method

The dry construction method shall be used only at sites where the ground water level and soil and rock conditions are suitable to permit construction of the shaft in a relatively dry excavation, and where the sides and bottom of the shaft may be visually inspected by the Engineer prior to placing the concrete. The dry method consists of drilling the shaft excavation, removing accumulated water and loose material from the excavation, placing the reinforcing cage, and concreting the shaft in a relatively dry excavation.

The dry construction method shall only be approved by the Engineer when the trial shaft excavation demonstrates that: less 12 inches of water accumulates above the base over a one hour period when no pumping is permitted; the sides and bottom of the hole remain stable without detrimental caving, sloughing or swelling over a four-hour period immediately following completion of excavation; and any loose material and water can be satisfactorily removed prior to inspection and prior to concrete placement. The Contractor shall use the wet construction method or the casing construction method for shafts that do not meet the above requirements for the dry construction method.

3. Wet Construction Method

The wet construction method may be used at sites where a dry excavation cannot be maintained for placement of the shaft concrete. This method consists of using water or slurry (mineral or polymer) to maintain stability of the borehole perimeter while advancing the excavation to final depth, placing the reinforcing cage, and concreting the shaft. Where drilled shafts are located in open water areas, exterior casings shall be extended from above the water elevation into the ground to protect the shaft concrete from water action during placement and curing of the concrete. The exterior casing shall be installed in a manner that will produce a positive seal at

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

the bottom of the casing so that no piping of water or other materials occurs into or from the shaft excavation.

The wet construction method may be used in combination with the dry method and temporary or permanent casing methods. The wet method may involve desanding and cleaning the slurry (for mineral slurries); final cleaning of the excavation by means of a bailing bucket, air lift, submersible pump or other approved devices; and placing the shaft concrete with a tremie or concrete pump beginning at the shaft bottom. Temporary surface casings should be provided to aid shaft alignment and position, and to prevent sloughing of the top of the shaft excavation, unless the Contractor demonstrates to the satisfaction of the Engineer that the surface casing is not required. When using the wet method all drilled shaft operations shall be accomplished while maintaining at least 5 feet of positive head of fluid above the water table.

4. Temporary Casing Construction Method

The temporary casing method shall be used when the dry or wet construction methods are inadequate to prevent hole caving or excessive deformation of the hole. In this method the casing may be either placed in a predrilled hole or advanced through the ground by twisting, driving or vibration before being cleaned out.

When the casing is placed in a predrilled borehole and the temporary stability of the hole is needed, drilling slurry shall be used. The slurry that is trapped in the annular space behind the casing must be forced out of that space by the rising column of fluid concrete as the casing is being pulled. The slurry used to stabilize a borehole temporarily prior to the placement of casing must satisfy all of the criteria of drilling slurry for the wet method of construction.

5. Permanent Casing Construction Method

The permanent casing method shall be used only when required in the plans or approved by the Engineer, to construct drilled shafts through weak caving soils that do not contribute significantly to the drilled shaft shear capacity. In this method, before beginning the excavation, a permanent casing is installed to the projected depth by advancing it through the caving material by twisting, driving, or vibration. Unless specifically allowed by the plans, placement of permanent casing in an oversized hole or temporary casing outside the permanent casing beneath the ground surface will not be allowed. If full penetration of the permanent casing cannot be attained to the projected depth, excavate a selected depth inside the permanent casing, resume casing advancing, and repeat the process as necessary until the casing reaches the projected depth. Once the required elevation is reached, clean the excavation as indicated in XII of these specifications, lower the reinforcing cage, and concrete to completion.

D. Site Preparation

All costs associated with site preparation to include grading, excavating, fill, access, and other means to construct a level working surface will be included in the bid price of other materials.

VIII. EXCAVATION AND DRILLING EQUIPMENT:

The excavation and drilling equipment shall have adequate capacity, including power, torque and downthrust to excavate a hole of both the maximum diameter and to a depth of 20 percent beyond the depths shown on the plans or 15 feet whichever is greater.

The excavation and overreaming tools shall be of adequate design, size and strength to perform the work shown in the plans or described herein. When the material encountered cannot be drilled using conventional earth or rock augers and/or under-reaming tools, the Contractor shall provide special drilling equipment, including but not limited to: rock core barrels, rock tools, air

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

tools, and other equipment as necessary to construct the shaft excavation to the size and depth required. Blasting is not permitted to advance the excavation unless shown on the plans and specifications. Blasting for core removal is permitted when approved by the Engineer.

The Contractor shall stabilize all drilled shaft excavations with steel casing and/or fluid except, as approved by the Engineer, above the portions of the excavations in rock. Stabilize excavations at all times from the beginning of drilling through concrete placement. Provide casing or slurry in rock if unstable material is anticipated or encountered during drilling. When slurry is not used, do not leave a partially excavated shaft open overnight unless the excavation is cased to rock.

For the purposes of this special provision, "Rock" is defined as a continuous intact natural material in which the penetration rate with a rock auger is less than 2 inches per 5 minutes of drilling using a drill rig capable of applying at minimum of 35,000 pounds of down pressure (Crowd) while turning the auger for diameters equal to or less than 48 inches in diameter and at least 50,000 pounds of down pressure (Crowd) for augers greater than 48 inches in diameter. Rock augers shall be equipped with carbide teeth in good condition while performing this test. This definition excludes discontinuous loose natural materials such as boulders and man-made materials such as concrete, steel, timber, etc.

When slurry is used the Contractor shall adjust the excavation operations so that the maximum time the slurry is in contact with the sidewalls of the uncased portions of the drilled shaft excavation (from time of drilling to completing concrete placement) does not exceed 24 hours. The slurry shall be agitated in the drilled shaft excavations a minimum of every 4 hours. If the 24 hour time limit is exceeded, over-ream the drilled shaft excavation a minimum of 1 inch and a maximum of 3 inches, or as required by the Engineer, prior to performing other operations in the excavation. Over-ream with a grooving tool, overreaming bucket or other approved equipment at a minimum spacing of 12 inches. The Contractor bears all costs associated with both overreaming and additional shaft concrete placement at no additional cost to the Department. If concrete placement is not completed within three days of beginning drilling, enlarge the design drilled shaft diameter by a minimum of 6 inches, or as required by the Engineer, the entire length of the shaft at no additional cost to the Department. Enlarging the drilled shaft includes replacing the steel casing with steel casing the same size to which the drilled shaft is enlarged at no additional cost to the Department.

IX. EXCAVATIONS:

A. General

Shaft excavations shall be made at locations, shaft geometry and dimensions shown in the contract documents. The Contractor shall extend drilled shaft tip (base) elevations when the Engineer determines that the material encountered during excavation is unsuitable and/or differs from that anticipated in the design of the drilled shaft.

The Contractor shall maintain a construction method log during shaft excavation. The information recorded shall be as indicated in the "VDOT Excavation Form" provided by the Engineer. For each drilled shaft installed, record on the VDOT Excavation Form the location, dimensions, verticality, slurry test data, description of the materials encountered at all elevations, drilling time, elevation of the water table during excavation and seepage, description of any change in excavated material, elevation of top and bottom of the finished shaft, depth to the rock bearing stratum, condition of the bottom of the excavation or rock bearing surface, deviation from plan location, concrete data, a description of the tools and drill rigs used and any changes necessitated by changing ground conditions and other pertinent data to the drilled shaft operations. Submit a draft of this form for each completed drilled shaft within 24 hours of shaft completion. Report any unusual observation to the Engineer as soon as possible.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor shall provide areas for the disposal of unsuitable materials and excess materials removed from drilled shaft excavations and shall dispose them in accordance with applicable requirements of Section 106.04 of the VDOT Road and Bridge Specifications.

The Contractor shall not permit any worker to enter the drilled shaft excavation for any reason unless: a suitable casing has been installed, the water level has been lowered and stabilized below the level to be occupied, and an adequate safety equipment and procedures have been provided to the personnel entering the excavation which includes OSHA certification for confined space entry.

B. Obstructions

Surface and subsurface obstructions at drilled shaft locations shall be removed by the Contractor. Such obstructions may include man-made materials such as old concrete foundations and natural materials such as boulders. Special procedures and/or tools shall be employed by the Contractor after the hole cannot be advanced using conventional augers, drilling buckets and/or underreaming tools. Such special procedures/tools may include but are not limited to chisels, boulder breakers, core barrels, air tools, hand excavation, temporary casing, and increasing the hole diameter. Blasting shall not be permitted unless specifically approved by the Engineer.

C. Lost Tools

Drilling tools that are lost in the excavation shall not be considered obstructions and shall be promptly removed by the Contractor without compensation. All costs due to lost tool removal shall be borne by the Contractor including, but not limited to, costs associated with the repair of hole degradation due to removal operations or an excessive time that the hole remains open.

X. CASINGS

Casings shall be steel, smooth, clean, watertight, and of ample strength to withstand both handling and driving stresses and the pressure of both concrete and the surrounding earth materials. The outside diameter of casing shall not be less than the specified diameter of shaft, and the outside diameter of any excavation made below the casing shall not be less than the specified diameter of the shaft. No extra compensation will be allowed for concrete required to fill an oversized casing or oversized excavation. All casings, except permanent casings, shall be removed from shaft excavations. Any length of permanent casing installed below the shaft cutoff elevation, shall remain in place.

When the shaft extends above ground or through a body of water, the portion exposed above ground or through a body of water may be formed with removable casing except when the permanent casing is specified. Removable casing shall be stripped from the shaft in a manner that will not damage the concrete. Casings can be removed when the concrete has attained sufficient strength provided: curing of the concrete is continued for a 72-hour period; the shaft concrete is not exposed to salt water or moving water for 7 days; and the concrete reaches a compressive strength of at least 2500 psi, as determined from concrete cylinder breaks.

Temporary Casing

All subsurface casing shall be considered temporary unless specifically shown as permanent casing in the contract documents. The Contractor shall be required to remove temporary casing before completion of concreting the drilled shaft. Telescoping, predrilling with slurry, and/or overreaming beyond the outside diameter of the casing may be required to install casing.

If the Contractor elects to remove a casing and substitute a longer or larger-diameter casing through caving soils, the excavation shall be either stabilized with slurry or backfilled before the

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

new casing is installed. Other methods, as approved by the Engineer, may be used to control the stability of the excavation and protect the integrity of the foundation materials.

Before the casing is withdrawn, the level of fresh concrete in the casing shall be a minimum of 10 feet above either the hydrostatic water level in the formation or the level of drilling fluid in the annular space behind the casing, whichever is higher. As the casing is withdrawn, care shall be exercised to maintain an adequate level of concrete within the casing so that fluid trapped behind the casing is displaced upward and discharged at the ground surface without contaminating or displacing the shaft concrete.

Temporary casings which become bound or fouled during shaft construction and cannot be practically removed shall constitute a defect in the drilled shaft. The Contractor shall be responsible to improve defective shafts to the satisfaction of the Engineer. Such improvement may consist of, but is not limited to, removing the shaft concrete and extending the shaft deeper to compensate for loss of frictional capacity in the cased zone, providing straddle shafts to compensate for capacity loss, or providing a replacement shaft. All corrective measures including redesign of footings caused by defective shafts shall be done to the satisfaction of the Engineer by the Contractor without either compensation or an extension of the completion date of the project. In addition, no compensation will be paid for casing remaining in place.

B. Permanent Casing

Permanent casing shall be used when shown in the contract documents. The casing shall be continuous between top and bottom elevations prescribed in the plans. After installation is complete, the permanent casing shall be cut off at the prescribed elevation and the shaft completed by installing necessary reinforcing steel and concrete in the casing.

In cases where special temporary casings are shown on the plans or authorized in writing by the Engineer to be used in conjunction with permanent casing, the Contractor shall maintain both alignment of the temporary casing with the permanent casing and a positive, watertight seal between the two casings during excavation and concreting operations.

XI. SLURRY:

Mineral or polymer slurries shall be employed when slurry is used in the drilling process unless other drilling fluids are approved by the Engineer. Mineral slurry shall have both a mineral grain size that will remain in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. The percentage and specific gravity of the material used to make the mineral suspension shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement.

In locations with hard water or acidic groundwater, the slurry manufacturer shall measure the hardness, acidity, chloride and organic content of the mix water and groundwater and furnish for review and approval recommendations for modifications to the slurry that will ensure successful results in the conditions at the project site.

In locations or areas where saline or chemically contaminated ground water occurs, the use of attapulgite or sepiolite and/or additives instead of bentonite maybe needed. Furnish for review and approved recommendations for the type and modification to the proposed mineral slurry that will ensure successful results in the conditions at the project site.

During construction, the level of the slurry shall be maintained at a height sufficient to prevent caving of the hole. In the event of a sudden significant loss of slurry to the hole, the construction of that foundation shall be stopped until either a method to stop slurry loss or an alternate construction procedure has been approved by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The level of mineral slurry in the shaft excavation shall be maintained at a level not less than 5 feet above the highest expected piezometric pressure head along the depth of the shaft, and the level of polymer slurry shall be maintained at a level not less than 6 feet above the highest expected piezometric pressure head along the shaft. It is anticipated that the highest piezometric pressure head is the static water elevation or the ground water elevation, however, the Contractor is responsible for determining the highest piezometric pressure head. If at any time the slurry construction method fails, in the opinion of the Engineer, to produce the desired final results, then the Contractor shall both discontinue this method and propose an alternate method for approval by the Engineer.

A. Mineral Slurry

Mineral slurry shall be premixed thoroughly with clean fresh water and adequate time (as prescribed by the mineral manufacturer) allotted for hydration prior to introduction into the shaft excavation. Slurry tanks of adequate capacity will be required for slurry circulation, storage, and treatment. No excavated slurry pits will be allowed in lieu of slurry tanks without the written permission of the Engineer. Desanding equipment shall be provided by the Contractor as necessary to control slurry sand content to less than 4 percent by volume at any point in the borehole at the time the slurry is introduced, including situations in which temporary casing will be used. The Contractor shall take all steps necessary to prevent the slurry from “setting up” in the shaft. Such methods may include but are not limited to agitation, circulation and/or adjusting the properties of the slurry. Disposal of all slurry shall be done off site in suitable areas by the Contractor.

It is the responsibility of the Contractor to maintain a stable suspension at all times and keep the stability of the excavation. The Contractor shall adjust the slurry properties as necessary to bring the slurry to specifications.

Property at 70°F (°F)	Minimum Time of Slurry Introduction in the Drilled Shaft	Maximum Sand Content Before Concrete Placement in the Drilled Shaft	Method
Density in Fresh Water ^a (lb/ft ³)	69	75	density balance API-13B-1, Section 1
Density per quart	45	45	Hydrometer Cone Method API-13B-1, Section 22
	1	1	Universal pH meter or pH indicator paper strips
Content ^b (%)	Maximum	Maximum	API-13B-1

- (a) Density values shall be increased by two pounds per cubic foot (lb/ft³) in salt water.
- (b) At time of concreting, sand content at any point in the drilled shaft excavation shall not exceed 4% (by volume); test for sand content as determined by the American Petroleum Institute.
- (c) Minimum mixing time shall be 10 minutes.
- (d) Storage time to allow for hydration shall be minimum of 6 hours.

B. Polymer Slurry

If the Contractor proposes to use a polymer slurry, either natural or synthetic, it must be a product approved for use by the Department. Mixing of polymer slurry in the borehole will not be permitted. Slurry properties at the time of mixing and at the time of concreting must be in conformance with the written recommendations of the manufacturer. However, whatever product is used, the sand content at the base of the drilled shaft excavation shall not exceed 1 percent when measured by Method API 13B-1, Section 5, immediately prior to concreting.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor's slurry management plan shall include detailed provisions for controlling the quality of the slurry, including tests to be performed, the frequency of those tests, the test methods, and the maximum and/or minimum property requirements that must be met to ensure that the slurry meets its intended functions in the subsurface conditions at the construction site and with the construction methods that are to be used. The slurry management plan shall include a set of the slurry manufacturer's written recommendations.

Polymer slurry shall have the following properties:

Density at 70°F (lb/ft ³)	Time of Slurry Introduction in the Drilled Shaft	Time from Drilling and Before Concrete Placement in the Drilled Shaft	Method
Density in Fresh Water ^a	65	67	density balance API-13B-1, Section 1
Density per quart	maximum	maximum	Whitlock Cone Method API-13B-1, Section 2.2
	0	0	Universal pH meter or pH indicator paper strips
Content ^b (%)	maximum	maximum	API-13B-1

- (a) Density values shall be increased by two pounds per cubic foot (lb/ft³) in salt water.
- (b) At time of concreting, sand content at any point in the drilled shaft excavation shall not exceed 1% (by volume); test for sand content as determined by the American Petroleum Institute.
- (c) Minimum mixing time shall be 15 minutes.
- (d) Storage time to allow for hydration shall be minimum of 4 hours.

C. Water As Drill Fluid

If approved by the Engineer, the Contractor may use only water as a drilling fluid. All of the provisions in the table shown in this section for mineral slurries shall be met, except that the maximum density shall not exceed 70 pcf.

D. Slurry Testing

Slurry testing shall include the following tests, as a minimum: Density test (API 13B-1, Section 1), viscosity test (Marsh funnel and cup, API-13B-1, Section 2.2 or approved viscometer), pH test (pH meter, litmus paper), and sand content test (API sand content kit, API 13B-1, Section 5).

Tests should be performed when the slurry temperature is above 40 degrees Fahrenheit.

Tests to determine density, viscosity and pH value shall be performed during the shaft excavation to establish a consistent working pattern. A minimum of four sets of tests shall be made during the first 8 hours of slurry use. When the results show consistent behavior the testing frequency may be decreased to one set every four hours of slurry use.

The Contractor shall ensure that a heavily contaminated slurry suspension, which could impair the free flow of concrete, has not accumulated in the bottom of the shaft. Prior to placing concrete in any shaft excavation, the Contractor shall take slurry samples using a sampling tool approved by the Engineer. Slurry samples shall be extracted from the base of the shaft and at intervals not exceeding 10 feet up the slurry column in the shaft, until two consecutive samples produce acceptable values for density, viscosity, and pH.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

When any slurry samples are found to be unacceptable, the Contractor shall take whatever action is necessary to bring the slurry within specifications requirements. Concrete shall not be poured until the slurry in the hole is re-sampled and tests results produce acceptable values.

Reports of all tests required above signed by an authorized representative of the Contractor, shall be furnished to the Engineer on completion of each drilled shaft.

XII. EXCAVATION INSPECTION:

The Contractor shall provide equipment for checking the dimensions and alignment of each shaft excavation. The dimensions and alignment shall be determined by the Contractor under the direction of the Engineer. Final shaft depths shall be measured with a suitable weighted tape or other approved methods after final cleaning. Unless otherwise stated in the plans, a minimum of 50 per cent of the base of each shaft will have less than 1/2 inch of sediment at the time of placement of the concrete. The maximum depth of sediment or any debris at any place on the base of the shaft shall not exceed 1-1/2 inches. Shaft cleanliness will be determined by the Engineer, by visual inspection for dry shafts or other methods deemed appropriate by the Engineer for wet shafts.

For dry excavations, the maximum depth of water shall not exceed 3 inches prior to concrete pour.

For dry shafts, the sidewalls shall be visually free of cuttings that may have been smeared on the walls during the removal and insertion of drilling tools.

XIII. CONSTRUCTION TOLERANCES:

The following construction tolerances apply to drilled shafts unless otherwise stated in the contract documents:

- (a) The center of the drilled shaft shall be within 3 inches of plan position in the horizontal plane at the plan elevation for the top of the shaft.
- (b) The vertical alignment of a vertical shaft excavation shall not vary from the plan alignment by more than 1 1/2% of the total length of the shaft.
- (c) After all the concrete is placed, the top of the reinforcing steel cage shall be no more than 6 inches above and no more than 3 inches below plan position.
- (d) All casing diameters shown on the plans refer to O.D. (outside diameter) dimensions. The dimensions of casings are subject to American Pipe Institute tolerances applicable to regular steel pipe.
- (e) The top elevation of the shaft shall have a tolerance of plus 1 inch or minus 3 inches from the plan top-of-shaft elevation.
- (f) Excavation equipment and methods shall be designed so that the completed shaft excavation will have a planar bottom. The cutting edges of excavation equipment shall be normal to the vertical axis of the equipment within a tolerance of $\pm 3/8$ inch per foot of diameter.

Drilled shaft excavations and completed shafts not constructed within the required tolerances are unacceptable. The Contractor shall be responsible for correcting all unacceptable shaft excavations and completed shafts to the satisfaction of the Engineer. Materials and work necessary, including engineering analysis and redesign, to complete corrections for out-of-tolerance drilled shaft excavations shall be furnished without either cost to the Department or an extension of the completion date of the project.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

XIV. REINFORCING STEEL CAGE CONSTRUCTION AND PLACEMENT:

The reinforcing steel cage, consisting of longitudinal bars, ties, cage stiffener bars, spacers, centralizers, and other necessary appurtenances, shall be completely assembled and placed as a unit immediately after the shaft excavation is inspected and accepted, and prior to concrete placement. Internal stiffeners shall be removed as the cage is placed in the shaft so as not to interfere with the placement of concrete.

The reinforcing steel in the shaft shall be tied and supported so that the reinforcing steel will remain within allowable tolerances given in Section XIII of this specification. Plastic spacing devices shall be used at sufficient intervals [near the bottom and at intervals not exceeding 10 feet up the shaft] to ensure concentric spacing for the entire cage length. Use a minimum of one spacer per 30 inches of circumference of the casing with a minimum of three at each layer. The spacers shall be of adequate dimension to ensure a minimum 3 inch annular space between the outside of the reinforcing cage and the side of the excavated hole. Approved cylindrical feet (bottom supports) shall be provided to ensure that the bottom of the cage is maintained the proper distance above the base.

Hooks at the top of the reinforced steel cage shall not be bent outward if a temporary casing is to be used. Interior hooks must be designed to permit adequate clearance for the concrete tremie pipe (i.e. 10 inches minimum space). Hooks may be placed on dowels that may be rotated after concrete placement or casing removal and repositioned after the tremie is removed. The concrete must be fluid during dowel repositioning.

The elevation of the top of the steel cage shall be checked before and after the concrete is placed. If the upward displacement of the rebar cage exceeds 6 inches or if the downward displacement exceeds 3 inches, the drilled shaft will be considered defective. Corrections shall be made by the Contractor to the satisfaction of the Engineer. No additional shafts shall be constructed until the Contractor has modified his rebar cage support in a manner satisfactory to the Engineer.

If the bottom of the constructed shaft elevation is lower than the bottom of the shaft elevation in the plans, a minimum of one half of the longitudinal bars required in the upper portion of the shaft shall be extended the additional length by adding longitudinal reinforcing bars at the bottom of the cage. Tie or spiral bars shall be continued for the extra depth and the stiffener bars shall be extended to the final depth. All longitudinal and transverse bars must be lap spliced or spliced with mechanical splices. Welding to the reinforcing steel will not be permitted unless specifically shown in either the plans or special provisions.

When concrete placement does not follow immediately after cage placement, remove the steel from the excavation unless the Engineer directs otherwise. If the cage is removed, recheck excavation cleanliness in accordance with this special provision prior to reinstallation of the cage.

XV. INSTALLATION REQUIREMENTS FOR CSL INTEGRITY TESTS:

Crosshole Sonic Logging (CSL), a nondestructive testing (NDT) method, measures the time for an ultrasonic pulse to travel from a signal source in one access tube to a receiver in another access tube. Drilled shafts must be fitted with CSL test tubes to evaluate their integrity as indicated in the plans, Contract Documents, or as designated by the Engineer. Install the access tubes or pipes as nearly parallel and far as possible from the longitudinal bars. The number of tubes to be installed per each drilled shaft diameter is as indicated in the table below:

<u>Shaft Diameter</u>	<u>Number of CSL Tubes</u>	<u>Tube Spacing^a</u>
≥ 5 ft	4 minimum	90 degrees

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

0 to 7 ft	6 minimum	60 degrees
7 to 9 ft	8 minimum	45 degrees
Greater than 10 feet	10 minimum	36 degrees

(a) Spacing based on a central angle in degrees

The tubes shall be securely attached to the interior of the reinforcement cage with a minimum concrete cover of 3 inches, and they shall be wire-tied to the reinforcing cage every five feet to secure the tubes in position during placement of the reinforcing steel cage. In all cases the tubes shall be as near to vertical and parallel as possible. The Contractor shall install the tubes in the drilled shafts in a regular and symmetric pattern such that each tube is spaced a maximum distance possible from its adjacent tube and distributed around the drilled shaft perimeter as indicated by the central angle in the table above.

The tubes shall extend from the bottom of the drilled shaft to at least 3 feet above the top of the drilled shaft, or 2 feet above the ground surface for shafts with cut-offs below the ground surface. The tubes must be capped to prevent concrete or debris from entering during manipulation of the cage and concreting. Care must be taken during lifting and lowering the steel reinforcement so as not to damage the tubes. The CSL tubes shall be filled with clean water no later than 4 hours after concrete placement. Do not break the bond between the tube and the concrete by applying excessive torque, hammering, or other sort of stress while removing the caps or plugs from the pipes. For production shafts and upon completion of the CSL tests, remove all the water from the access tubes or drilled holes and fill them up with an approved grout. CSL testing procedures are found in Section XVII of these Specifications.

XVI. CONCRETE PLACEMENT:

A. General

Concrete placement shall be performed in accordance with the applicable portions of the general specifications on concrete materials in Section V.IA of this Special Provision and with the requirements herein.

Concrete shall be placed as soon as possible after reinforcing steel placement. Concrete placement shall be continuous from the bottom to the top elevation of the shaft. Concrete placement shall continue after the shaft excavation is filled until good quality concrete is evident at the top of shaft. Concrete shall be placed either by free fall or through a tremie or concrete pump. The free fall placement shall only be permitted in dry holes. Concrete placed by free fall shall fall directly to the base without contacting either the rebar cage or hole sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

The elapsed time from the beginning of concrete placement in the shaft to the completion of the placement shall not exceed 2-hours. Admixtures such as water reducers, plasticizers, and retarders shall not be used in the concrete mix unless permitted in the Contract Documents. All admixtures, when approved for use, shall be adjusted for the conditions encountered on the job. The Contractor may request a longer placement time provided he supplies a concrete mix that will maintain a slump of 4 inches or greater over the longer placement time as demonstrated by trial mix and slump loss tests.

Subject to performance satisfactory to the Engineer in the construction of the trial shafts, concrete to be placed in dry shafts less than 5 feet in diameter may be placed by allowing the concrete to free fall up to 60 feet into the excavation; for shafts at least 5 feet in diameter the free fall distance may be increased to 100 feet.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

During concrete placement the Contractor is required to plot the theoretical and actual concrete volume curves on the "DRILLED SHAFT CONCRETE VOLUMES FORM."

Within the first 16 hours after a drilled shaft has achieved its initial concrete set (as determined by the Engineer), do not drill adjacent shafts or allow any equipment wheel loads or excessive vibrations to occur at any point within a 20 foot radius of the drilled shaft unless the concrete has reached a strength of at least 1500 psi.

B. Tremies

Tremies may be used for concrete placement in either wet or dry holes. Tremies used to place concrete shall consist of a tube of sufficient length, weight, and diameter to discharge concrete at the shaft base elevation. The tremie shall not contain aluminum parts that will have contact with the concrete. The tremie inside diameter shall be at least 6 times the maximum size of aggregate used in the concrete mix but shall not be less than 10 inches. The inside and outside surfaces of the tremie shall be clean and smooth to permit both flow of concrete and unimpeded withdrawal during concreting. The wall thickness of the tremie shall be adequate to prevent crimping or sharp bends, which restrict concrete placement.

The tremie used for wet excavation concrete placement shall be watertight. Underwater or under-slurry placement shall not begin until the tremie is placed to the shaft base elevation, and the concrete shall be kept completely separated from the water or slurry prior to the time it is discharged. Valves, bottom plates or plugs may be used for this purpose only if concrete discharge can begin within one tremie diameter of the base of the drilled shaft. Plugs shall either be removed from the excavation or be of a material, approved by the Engineer, which will not cause a defect in the shaft if not removed. The discharge end of the tremie shall be constructed to permit the free radial flow of concrete during placement operations. The tremie discharge end shall be immersed at least 7 feet in concrete at all times after starting the flow of concrete. The flow of the concrete shall be continuous. The level of the concrete in the tremie shall be maintained above the level of slurry or water in the borehole at all times to prevent water or slurry intrusion into the shaft concrete.

If at any time during the concrete pour, the tremie line orifice is removed from the fluid concrete column and discharges concrete above the rising concrete level, the shaft shall be considered defective. In such case, the Contractor shall remove the reinforcing cage and concrete, complete any necessary sidewall removal directed by the Engineer and re-pour the shaft. All costs of replacement of defective shafts shall be the responsibility of the Contractor.

C. Pumped Concrete

Concrete pumps and lines may be used for concrete placement in either wet or dry excavations. All pump lines shall have a minimum 4 inch diameter and be constructed with watertight joints. Concrete placement shall not begin until the pump line discharge orifice is at the shaft base elevation.

For wet excavations, a plug or similar device shall be used to separate the concrete from the fluid in the hole until pumping begins. The plug shall either be removed from the excavation or be of a material, approved by the Engineer, that will not cause a defect in the shaft if not removed.

The discharge orifice shall remain at least 7 feet below the surface of the fluid concrete. When lifting the pump line during concreting, the Contractor shall temporarily reduce the line pressure until the orifice has been repositioned at a higher level in the excavation.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

If at any time during the concrete pour the pump line orifice is removed from the fluid concrete column and discharges concrete above the rising concrete level, the shaft shall be considered defective. In such case, the Contractor shall remove the reinforcing cage and concrete, complete any necessary sidewall removal directed by the Engineer, and re-pour the shaft. All costs of replacement of defective shafts shall be the responsibility of the Contractor.

D. Drop Chutes

Drop chutes may be used to direct placement of free-fall concrete in excavations where the maximum depth of water does not exceed 3 inches. Free fall placement is not permitted in wet excavations. Drop chutes shall consist of a smooth tube of either one piece construction or sections that can be added and removed. A drop chute can also be a hopper with a short tube to direct the flow of concrete. Concrete may be placed through either the hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. If concrete placement causes the shaft excavation to cave or slough, or if the concrete strikes the rebar cage or sidewall, the Contractor shall reduce the height of free fall and/or reduce the rate of concrete flow into the excavation. If caving or sloughing of the shaft walls occurs during free-fall placement of concrete, the shaft shall be considered defective. In such case, the Contractor shall remove the reinforcing cage and concrete, complete any necessary sidewall removal directed by the Engineer and re-pour the shaft. All costs of replacement of defective shafts shall be the responsibility of the Contractor. If concrete placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, the Contractor shall use either tremie or pumping techniques to accomplish the pour.

XVII. NONDESTRUCTIVE EVALUATION:

A. General

When called for in the contract documents, specific completed drilled shafts, the number and/or location of which are specified in the Contract Documents, shall be subjected to nondestructive tests to evaluate their structural integrity. The Contractor shall be responsible for performing and submitting reports of such tests to the Engineer in a timely manner. All testing shall be conducted after the concrete has cured for at least 48 hours. The Contractor shall employ a registered Professional Engineer registered in the Commonwealth of Virginia who has been qualified by the Department to perform, evaluate and report the tests. The report on the tests on any given shaft must be submitted to the Engineer within 3 working days of the performance of the tests on that shaft. The Engineer will evaluate and analyze the results and provide to the Contractor a response regarding the acceptability of the shaft that was tested within 3 working days of receipt of the test report.

The Contractor may continue to construct drilled shafts before the receipt of notice of acceptance of the tested shaft or shafts by the Engineer; however, if the Engineer finds the tested shaft(s) to be unacceptable, the Contractor shall be required to repair, at the Contractor's expense, the unacceptable shaft to the satisfaction of the Engineer and (a) prove to the satisfaction of the Engineer, at no expense to the Department, the acceptability of all shafts constructed since the unacceptable shaft was constructed and the acceptability of the procedure to be used in constructing future shafts, or (b) cease all drilled shaft construction until a new construction procedure acceptable to the Engineer has been proposed by the Contractor and accepted by the Engineer. In the latter case, those drilled shafts constructed after the unacceptable shaft shall be repaired to the satisfaction of the Engineer at the Contractor's expense. If any repair procedures or revisions to the Contractor's installation procedure are proposed by the Contractor, the Contractor shall submit a written plan to the Engineer to repair defects and revise construction procedures. If these plans involve changes to the structural design of the shafts or shaft caps, or to the geometry of the shafts, any redesign proposed in the Contractor's plan to the Engineer shall be performed at the Contractor's expense by a Professional Engineer registered in the Commonwealth of Virginia.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Engineer may require that additional shafts be tested. If the testing of the additional shaft(s) indicates the presence of a defect in any additional shaft, the testing cost for that shaft will be borne by the Contractor and the Contractor shall repair the shaft at the Contractor's expense, as above. Otherwise, the cost of the testing will be borne by the Department.

B. Crosshole Sonic Logging CSL Test

1. General

Crosshole Sonic Logging, CSL, is a nondestructive testing, NDT, method that measures the time for an ultrasonic pulse to travel from a signal source inside an access tube to a receiver inside another access tube and evaluates the integrity of drilled shafts. In uniform, good quality concrete, the travel time between these equidistant tubes will be relatively constant from the bottom to the top of the drilled shafts and corresponds to a reasonable concrete pulse velocity. In uniform, good quality concrete, the CSL test will also produce records with good signal amplitude and energy. Longer travel times and lower amplitude/energy signals indicate the presence of irregularities such as poor quality concrete, voids, honeycombs, or soil intrusions. The signal will be completely lost by the receiver and system recorder for more severe defects such as voids and soil intrusions.

The Contractor must install access tubes intended for Crosshole Sonic Logging CSL testing and perform the test(s) as indicated in the plans, and in Sections IV.B.(i), VI-D, and XV of this Special Provision. When the Contractor is required to perform CSL tests in the Contract Documents, he must only employ experienced personnel and engage the services of approved independent testing firm with previous experience in this sort of testing. The Contractor shall submit to the Engineer for his approval the list of personnel and testing firms he intends to use during the CSL testing program along with their competence and field experience to perform evaluate, and report the results of CSL tests. The Contractor shall perform the CSL tests in the number and locations specified in the Contract Documents or as requested by the Engineer, and he shall execute the test after at least 48 hours of concrete curing to allow for hardening of the concrete. The Engineer may specify a longer curing time when retarders are used in the mix design, or other factors that may result in a slower rate of concrete setting. All CSL testing must be completed within forty five calendar days of concrete placement.

Prior to beginning the CSL test, the Contractor shall assure that the test probes can pass through and down the tubes to the bottom of every installed tube. If a tube is obstructed, the Contractor, at his expense, must core a hole within the drilled shaft and near the obstructed tube to the depth indicated in the plans for that CLS tube, and the core shall be large enough to accommodate the probe through its full length. Core equipment, procedure, and location of the hole shall be approved by the Engineer prior to beginning coring. Logged results of the core drilling shall be submitted to the Engineer along with the cores. The CSL test can commence after the core hole is inspected and the probes can pass through.

The Contractor is responsible for submission of the CSL test report to the Engineer within 3 work days of its performance for a specific drilled shaft. The Engineer will evaluate and analyze the CSL test results within 3 working days of their receipt and provide the Contractor with a response regarding the acceptability of the drilled shaft tested.

2. Equipment for the Crosshole Sonic Logging, CSL, Test

The CSL test equipment consists of the following components:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a. A microprocessor-based CSL system or analyzer for display of individual CSL records, analog-digital conversion and recording of CSL data, analysis of receiver responses, and printing of CSL logs.
- b. Ultrasonic emitter and receiver probes for 2 inches I.D. pipe.
- c. An ultrasonic voltage pulse to excite the source with a synchronized triggering system to start the recording system.
- d. Winch and tripod and connecting cables.
- e. A depth measurement device to determine recorded depths.
- f. Appropriate filter/amplification and cable systems for CSL testing.

3. Logging Procedures for Crosshole Sonic Logging, CSL, Test

The test should proceed from the bottom to the top of the test tubes and in depth increments of about 3 inches to include the full depth of both tubes. Any slack shall be removed from the cables prior to pulling the probes providing accurate depth measurement records. Test a pair of perimeter and/or diagonal tubes, and include evaluation of the condition of the drilled shaft bottom. The source and receiver should be lifted simultaneously at a speed less than 1 ft per second, and a set of readings carefully taken at their corresponding depths. The CSL tests shall be carried out with the source and receiver probes in the same horizontal plane unless test results indicate potential anomalies/defects, in which case the questionable zone may be further evaluated with fan shape or angled tests (source and receiver are vertically offset inside the tubes). Equipment, procedure, and evaluation shall be adjusted to detect, locate, and assess the extent of any irregularity or void that appears in the path of the sonic pulse. Any anomalies/defects indicated by longer pulse arrival times and significantly lower amplitude/energy signals should be reported to the Engineer on site and any further tests should be carried out as necessary to evaluate the extent of such anomalies/defects.

Additional testing may be conducted in the event anomalies should be detected or suspected during the test. Information of the drilled shaft bottom and top elevations, length, along with construction dates shall be provided to the testing organization before or at the time of the CSL tests. Levels will be taken on top of each tube, and actual tube plumbness and length be recorded. CLS tests shall be conducted between pairs of tubes, and the determination of which pairs to be tested made by the independent testing agency.

4. Reporting Results of the Crosshole Sonic Logging, CSL, Test

Results of CSL test shall be presented in a report including:

- a. A brief explanation of how the test was performed, the CSL logs, the analyses, and the test results of each drilled shaft.
- b. Record the arrangement of the tubes and their dimensions per drilled shaft tested.
- c. Present a Plan View of the CSL test locations in relation to the bridge foundation.
- d. Arrival time of acoustic pulse versus depth in each pair of tubes for every drilled shaft tested.
- e. Pulse energy/amplitude versus depth in each pair of tubes for every drilled shaft tested.
- f. A CSL log shall be presented for each pair of tube tested, and when applies with any anomaly/defect zones properly discussed. Any zone with long arrival times and low power relative to other zones should be considered anomalous.

XVIII. ACCEPTANCE OF DRILLED SHAFTS:

A. Based on Specifications

Acceptance of drilled shafts shall be based on meeting the requirements as set forth in the Contract Documents. Drilled shafts will not be acceptable if:

1. Drilled shafts constructed disregarding any requirements of the Specifications or this Special Provision for Drilled Shaft.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2. Drilled shaft excavations constructed out of tolerance. The Contractor shall correct completed drilled shaft to acceptable tolerances before proceeding with new drilled shaft construction and submit correction for the Engineer's approval.
3. When applicable, slurry out of tolerance, especially late introduction into the drilled shaft and before concreting.
4. Cave-in of the drilled shaft walls due to improper use of casing or slurry; or failure to use weighting agents in the slurry in running groundwater.
5. Temporary casing that cannot be removed.
6. Horizontal separations or severe neck in the drilled shaft walls when pulling temporary casing with concrete adhering to it.
7. Failure to agitate slurry or to place concrete in a timely manner causing excessive build-up of mud cake on the wall of the excavation.
8. Horizontal sand lens in concrete produced by tremie or pump line pulled out of concrete when concreting under slurry or water.
9. Quarter-moon-shaped soil intrusion on the side of the drilled shaft created by interruption in flow of concrete being pumped or tremied into slurry-filled hole or use of telescoping casing where concrete from inner casing spills into the over break zone behind outer casing.
10. Soft or loose drilled shaft bottom caused by incomplete bottom cleaning, side sloughing, or sedimentation of cuttings from slurry column where base bearing is required.
11. Voids outside of cage when low slump concrete is introduced into the drilled shaft.
12. Honeycombing, washout of fines, or water channels in the concrete if concrete is placed directly into water.
13. Folded-in debris from insufficient cleaning of the drilled shaft excavation or excessive sand in the slurry.
14. Drilled shafts for which the mix design has been altered or extra water has been added without the approval of the Engineer.
15. Drilled shaft constructed in such a manner that the drilled shaft cannot be completed within the required tolerances. The Contractor shall submit correction methods for the Engineer's approval.

Final acceptance decision on whether repairs can or should be made or if the drilled shaft is rejected and must be replaced will be made by the Engineer as necessary applying criteria set forth herein and sound engineering judgment on a drilled shaft by drilled shaft basis.

B. Based on the Cross Hole Sonic Logging (CSL) Tests

Rejection of a drilled shaft based on the drilled shaft crosshole sonic logging testing shall be conclusive evidence that a defect exists in the drilled shaft that will result in inadequate or unsafe performance of the drilled shaft under service loads. The acceptance of each drilled shaft shall be the decision of the Engineer based on the results of the drilled shaft integrity testing report(s) and other information on the drilled shaft placement. If the CSL records are inconclusive, the Engineer may require coring or excavation of the drilled shaft to verify drilled shaft conditions. If a

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

defect is confirmed, the Contractor shall be responsible for all coring or excavation costs. If no defect is encountered, the Department will pay for all coring or excavation costs, including grouting of all core holes. Cores that cannot be advanced to the location of interest will not be paid for.

In the event testing discloses voids or discontinuities in the concrete which indicate that the drilled shaft is not structurally adequate, the drilled shaft shall be rejected, and construction of additional drilled shafts shall be suspended until the Contractor repairs, replaces or supplements the defective work, and the Engineer approves the remedial work. The Contractor shall suspend drilled shaft construction until the Engineer approves proposed changes to the methods of drilled shaft construction submitted in writing by the Contractor.

In the case that any drilled shaft is determined to be unacceptable, the Contractor shall submit a plan for remedial action to the Engineer for approval. Any modifications to the foundation drilled shafts and load transfer mechanisms caused by the remedial action will require calculations and working drawings prepared by and stamped by a Professional Engineer, hired by the Contractor and registered in the Commonwealth of Virginia, for all foundation elements affected. The Contractor shall provide all labor and materials required to design and repair or remediate drilled shafts at no additional cost to the Department and with no extension of the contract time.

The Contractor may continue to construct drilled shafts at his own risk before the receipt of notice of acceptance by the Engineer of the previously tested drilled shafts or drilled shafts constructed by a modified means and method of construction, however, if the Engineer finds the tested drilled shaft or drilled shafts to be unacceptable, the Contractor shall repair to the satisfaction of the Engineer, at the Contractor's sole expense, the unacceptable drilled shafts and (a) prove to the satisfaction of the Engineer, at no expense to the Department, the acceptability of all drilled shafts constructed since the unacceptable drilled shaft was built and the acceptability of the procedure to be used in construction of future drilled shafts, or (b) cease all drilled shaft construction until a new construction procedure has been proposed by the Contractor and accepted by the Engineer. In the latter case, drilled shafts built after the unacceptable drilled shaft shall be repaired at the Contractor's expense and to the satisfaction of the Engineer.

XIX. METHOD OF MEASUREMENT:

A. Drilled Shafts

Drilled shafts, complete in place, will be measured in linear feet for each diameter of shaft listed in the estimated quantities. The length will be determined as the difference between the top of the shaft elevation shown on the plans and the final bottom of the surface of the drilled shaft excavation elevation, as authorized, complete, and accepted by the Engineer.

B. Crosshole Sonic Logging (CSL)

CSL will be measured per each shaft tested.

C. Undefined Obstructions

Undefined obstructions shall be paid for under the requirements of VDOT Road and Bridge Specifications Section 109.05-Extra and Force Account Work and there will be no measurement under this item.

D. Trial Shaft

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The quantity to be paid shall be the authorized linear feet of trial shaft holes drilled to the diameter shown on the plans, completed and accepted. The linear feet of trial shaft holes shall be determined as the difference between the existing ground surface elevation at the center of the trial shaft hole prior to drilling and the authorized bottom elevation of the hole.

XX. BASIS OF PAYMENT:

A. Drilled Shafts

Drilled shafts (XX-inch diameter) will be paid for at the contract unit price per linear foot for drilled shaft of the diameter specified, complete-in-place, and accepted by the Engineer. Such payment will be considered to be full compensation for all costs involved with shaft excavation, using slurry when necessary, removal from the site and disposal of excavated material, the furnishing and placing of concrete, reinforcing steel and access tubes for Crosshole Sonic Logging, including all labor, materials, equipment, temporary and permanent casing, and incidentals necessary to complete the drilled shafts to the diameter and depths under the Contract Documents. Additional compensation will not be allowed for concrete required to fill oversized excavations and casings.

B. Crosshole Sonic Logging (CSL) TESTING

CSL testing will be paid for at the contract unit price for each shaft tested. Such payment shall be full compensation for all costs related to the mobilization, installation, instrumentation, performance and documentation of the CSL tests.

C. Undefined Obstructions

Undefined obstructions shall be paid for under the requirements of VDOT Road and Bridge Specifications Section 109.05-Extra and Force Account Work

D. Trial Shaft

Trial shaft of the specified diameter will be paid for at the contract unit price per linear foot for trial shaft. Such payment shall be full compensation for excavating the trial shaft hole through whatever materials are encountered to the bottom of shaft elevation or as authorized by the Engineer, temporary casing, slurry, plan furnishing and placing the reinforcing steel, installing crosshole sonic logging tubes, concreting the shaft, restoring the site as required and all other labor, materials and equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Drilled Shaft (36-inch diameter)	Linear Foot
Drilled Shaft (48-inch diameter)	Linear Foot
Drilled Shaft (66-inch diameter)	Linear Foot
Crosshole Sonic Logging (CSL) Test	Each

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
CASTING YARD

July 10, 2009

I. DESCRIPTION

This work shall consist of securing a site(s) for a casting yard(s) for pre-constructing composite superstructure units and precasting concrete filled steel grid deck panels, site plan, site preparation, erosion and sediment control, establishment of haul roads, establishment of all necessary facilities for preconstructing and precasting units as required by the plans, curing concrete and storage of completed units.

II. PROCEDURES

The Contractor shall secure the site(s) for this work which is adequate in size for storage of materials which include but are not limited to, reinforcing steel, aggregates, steel girders, structural steel, steel grid deck panels, cement and additives, post tensioning ducts and casting beds; for the manufacturing of the precast and pre-constructed units, curing completed units, and storing an adequate number of units to maintain continuous operations for the superstructure rehabilitation and replacement stage of this project.

Once the site(s) is secured, the Contractor shall provide the Engineer a site specific plan which shall provide in detail, the location of all facilities required for the manufacture, curing, and storage of the required units, the location of all haul roads within the site for delivering raw materials, moving completed units into storage, and roads leading off-site for the delivery of the completed units to each structure. A complete erosion & sediment control plan shall be included in the site plan. On approval of the site plan(s) by the Engineer, site work, preparation of the casting yard, curing, and storage areas may be carried out by the contractor.

All agreements shall be between the Contractor and the property owner. The Contractor shall submit a copy of all agreements to the Engineer. The Department will not be liable for any delays to the schedule or project completion due to casting yard operations, vandalism, theft, breakdowns, material shortage, third-party impacts, disputes between the Contractor and property owner, or Force Majeure ("acts of God"). The Department will also not be liable for any monetary compensation to the contractor or property owner due to the agreement(s) or any actions taken by either party.

If the Contractor elects to utilize the casting yard location for demolition of the existing bridge sections, it will be his responsibility to ensure that demolition is allowed at that site under all applicable Federal, State, and Local regulations as well as the property owner's restrictions. If a separate demolition site is necessary, it will be the sole responsibility of the Contractor to obtain that location at no cost to the Department.

Costs of environmental impacts, penalties or fines imposed by federal, state, and/or local authorities due to damage shall be borne by the Contractor.

The Department has identified a few possible locations for casting yard(s):

- **Richmond City Wastewater Treatment Plant (I-95 mile marker 73)**
Mr. Robert Steidel, Deputy Director of Public Utilities
804-646-8311
robert.steidel@richmondgov.com

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- **Old Azalea Mall Site (I-95 & Rte. 1 Brook Road *mile marker 81*)**
Dewberry Capital Atlanta, GA – Marissal Carrasquillo
404-888-8717

- **Vacant Field (Rte. 1 south of Rte. 161 Hilliard Road)**

II. MEASUREMENT AND PAYMENT

The casting yard(s) will be paid for at the contract lump sum price. This price shall include full compensation for securing the site(s), obtaining all necessary site permits, access road improvements, total site maintenance, all utility costs, erosion and sedimentation control costs, security fence installation/maintenance/removal, of all necessary elements for a casting yard, and removal of all facilities upon completion of all casting yard-related work. The site(s) shall be restored to conditions indicated in the agreement with the property owner.

Payment for the casting yard will be made as follows: The first payment of 50% of contract lump sum price will be paid on securing the site(s) and approval of the site specific plan. Thereafter, a payment of 2% of contract lump sum price will be paid each month up to a maximum of 90% of the contract lump sum price. The final 10% of the contract lump sum price will be made at the final completion of the project.

The lump sum price bis shall be full compensation for all casting yards secured by the Contractor.

Payment will be made under:

Pay Item	Pay Unit
Casting Yard(s)	Lump Sum

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
REMOVAL AND RECONSTRUCTION OF EXISTING MEDIAN BARRIER DROP INLET

August 19, 2009

I. DESCRIPTION

This work is for modifying the top portion of the median drop inlets identified on the plans as to be removed, to allow for the construction of the temporary crossover along I-95.

II. MATERIALS

Materials shall be in accordance with the Specifications and plan details.

III. PROCEDURES

Method of installation and maintenance shall be in accordance with the Work Area Protection Manuel, plan details and as directed by the Engineer.

Each inlet that is removed shall be reconstructed when the cross-over is no longer needed. The contractor shall remove the concrete barrier portion of the inlet, exposing the slot and the base. The openings shall be cover in accordance with the plans and paved.

The inlets shall be reconstructed by demolishing the temporary pavement, removing the temporary cover and installing a new top section of pre-cast concrete median barrier drop inlet in accordance with the manufacturer's recommendations and the plans.

The Contractor shall provide working drawings of the inlet reconstruction in accordance with section 105.10 of the Specifications.

IV. MEASUREMENT AND PAYMENT

Remove Exist. Median Drop Inlet will be paid for each. This price shall include all work required to remove existing inlets. Work may include, but not limited to, sawcutting of pavement and inlet structure, removing existing subgrade, removal/disposal of all existing pavement, and all necessary labor, materials, equipment and incidentals to complete the work.

Reconstruct Exist. Median Barrier Drop Inlet will be paid for each. This price shall include all work required to reconstruct the existing inlets. Work may include, but not limited to, full-depth sawcutting of pavement, removing temporary subgrade, cutting/removing/disposal of temporary concrete slab, mortar work, backfill, and all necessary labor materials, equipment and incidentals to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Remove Exist. Median Drop Inlet	Each
Reconstruct Existing Median Barrier Drop Inlet	Each

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
MECHANICALLY STABILIZED EARTH WALLS
(SEGMENTAL BLOCK FACING)

July 1, 2009

1.0 DESCRIPTION

This work shall consist of furnishing and constructing Mechanically Stabilized Earth (MSE) Walls with segmental concrete block facing in accordance with these specifications and in conformity with the lines, grades, dimensions, and design shown on the plans or established by the Engineer. This specification is intended to cover MSE wall systems utilizing segmental block facing as approved by VDOT Structure and Bridge Division.

2.0 SUBMITTALS

The Contractor shall submit working drawings, shop plans, and design calculations, signed and sealed by a Virginia Registered Professional Engineer, to the Engineer for review by the Department. The Contractor shall allow 30 days from the day the submittals are received by the Department for review and approval. Fabrication or any wall construction shall not begin prior to the approval of the design, working drawings and shop plans. Approval of the Contractor's working drawings and shop plans shall not relieve the Contractor of any of his responsibility under the contract for the successful completion of the work.

2.1 Working Drawings and Shop Plans

The working drawings and shop plans shall reflect all information needed to fabricate and erect the walls including:

- a. Elevations at the top of wall at all the horizontal and vertical break points and at interval not exceeding 50 feet along the wall;
- b. Elevations at the top of leveling pad step breaks;
- c. Elevation of the finished grade in front of the wall;
- d. The number, size, type, length, and details of the soil reinforcing elements in each design section;
- e. The locations and sizes of all pipes and utilities that will be penetrating the wall face or within the soil reinforced mass;
- f. Typical cross-section or cross-sections showing the elevation relationship between ground conditions and proposed grades;
- g. Details for construction of wall around obstructions (i.e. drainage facilities, utilities, overhead sign footing, piles, drilled shafts) within the reinforced backfill;
- h. Details pertaining to coping, parapets, railing, fencing as required by the contract plans;
- i. Shape, dimension, color, and designation of segmental blocks and alignment and connection devices.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2.2 Design Calculations

The proposed design shall satisfy the design parameters and requirements in the plans and in the special provisions. Complete design calculations shall include the most critical geometry and loading combination for each design section that exist during construction and at the end of construction.

2.3 Supporting Documents and Testing Reports

For segmental block or soil reinforcement systems that are not in VDOT approved list, the following design parameters and supporting documents and testing reports shall be submitted to the Engineer for review:

- a. Certifications of Ultimate Tensile Strength (T_{ULT}). Ultimate tensile strength shall be the minimum average roll values (MARV) and determined from wide width tensile test in accordance with ASTM D-6637.
- b. The values of Creep Reduction Factor (RF_{CR}). RF_{CR} shall be determined from creep tests performed in accordance with ASTM D-5262.
- c. The values of Installation Damage Reduction Factor (RF_{ID}). RF_{ID} shall be determined from field and laboratory test results and literature review, as described in ASTM D 5818 for MSE wall select backfill specified or for more severe soils.
- d. The values of Durability Reduction Factor (RF_D). RF_D shall be defined as the combined effects of chemical and biological degradation. Laboratory test results, extrapolation techniques, and comprehensive literature review shall document RF_D for all material components in accordance with FHWA NHI-00-044, "Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes".
- e. The values of Long-term Connection Strength Reduction Factors (CR_{cr}). CR_{cr} shall be determined in accordance with the long-term connection strength protocol as described in Appendix A of FHWA NHI-00-043 "Mechanically Stabilized Earth Walls Reinforced Soil Slopes".

3.0 MATERIALS

The Contractor shall make arrangements to purchase or manufacture the facing elements, soil reinforcement, connection devices, cap block adhesive, and all other necessary components. Material not conforming to this section of the specifications shall not be used without the written consent from the Engineer.

3.1 Segmental Concrete Blocks

Segmental concrete blocks shall be made of hydraulic cement concrete with a minimum 28-day compressive strength of 4000 psi. Maximum water absorption limit shall be 5%.

When concrete block freeze-thaw test is required on the plans, concrete blocks shall be tested in accordance with ASTM C1262 to demonstrate durability. The concrete block shall meet the requirements of ASTM C1372, except that acceptance regarding durability under this testing method shall be achieved if the weight loss of each of four of the five specimens at the conclusion of 150 cycles does not exceed 1% of its initial weight when tested in water. Blocks shall also meet the additional requirements of ASTM C 140.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3.1.1. Inspection, Sampling and Testing

The Contractor or his supplier shall furnish facilities and shall perform all necessary sampling and testing in an expeditious and satisfactory manner. Acceptance of the concrete block with respect to compressive strength will be determined on a lot basis. The maximum number of blocks in each lot shall be 5,000. The lot will be randomly sampled in accordance with ASTM C-140. Compressive strength tests shall be performed by the supplier and approved by the Engineer. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupon provisions of Section 5.2.4 of ASTM C-140. Blocks represented by three test coupons shall have an average compressive strength of 4000 psi and all individual coupons shall have compressive strength of 3500 psi.

3.1.2. Casting

Segmental concrete blocks shall be cast in steel mold and in a manner that will assure the production of uniform segmental concrete blocks. The concrete in each block shall be placed without interruption and shall be consolidated by the use of an approved method.

3.1.3. Finish and Appearance

Unless otherwise shown on the plans or directed by the Engineer, concrete surfacing for the front face of the block shall be natural gray fractured rock face finish. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction.

3.1.4. Tolerances - All block units shall be manufactured within the following tolerances:

- The length and width of each individual block shall be within $\pm 1/8$ inch of the specified dimension. Hollow units shall have a minimum wall thickness of 1-1/4 inches.
- The height of each individual block shall be within $\pm 1/16$ inch of the specified dimension.
- When a broken or fractured face finish is required, the dimension of the front face shall be within ± 1 inch of the theoretical dimension of the unit.

3.1.5. Rejection

Segmental concrete blocks will be subject to rejection because of failure to meet any of the requirements specified above. In addition, any of the following defects will be sufficient cause for rejection:

- Defects that indicate imperfect molding.
- Cracked greater than 0.02 inch in width and longer than 25% of the height of the block.
- Severely chipped or broken blocks.
- Defects indicating honeycombed or open texture concrete.
- Color variations on front face of block due to excess form oil or other reason.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3.1.6. Marking

The date of manufacture, production lot number, and type of block in accordance with the approved design drawings shall be clearly marked on each lot.

3.1.7. Handling, Storage and Shipping

Segmental concrete blocks shall be handled, stored and shipped in such manner as to eliminate the dangers of chipping, cracks, fractures and discoloration.

3.2 Geogrid Reinforcement

Geogrids shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. Structure of geogrid reinforcement shall be dimensionally stable and able to retain its geometry under manufacture, transport and installation. Geogrid design requirements shall be as shown in the plans and specified in the design drawings.

3.2.1 Delivery, Storage, and Handling

The Contractor shall check the geogrid reinforcement upon delivery to assure that the proper grade and type of material has been received. Rolled geogrid shall be stored in accordance with the manufacture's recommendations. During all periods of shipment and storage, geogrid reinforcement shall prevent wet cement, epoxy and like materials which may affix themselves, from coming in contact with the geogrids.

3.3 Steel Mesh Reinforcement

Inextensible metallic mesh design requirements shall be as shown in the plans and specified in the design drawings. Metallic mesh reinforcement shall be shop fabricated of cold drawn steel wire conforming to the requirements of ASTM A-82 and shall be welded into the finished mesh fabric in accordance with the requirements of ASTM A-185. Mill certification containing the yield strength of the mesh reinforcement shall be provided.

Galvanization shall be applied after the mesh is fabricated and conform to the requirements of ASTM A-123. Any damage to the galvanizing shall be repaired in accordance with the requirements of Section 233 of the Specifications.

3.4 Connection Devices

Connection devices, such as bars, pins, plates etc, shall consist of non-degrading polymer or galvanized steel and be made for the express use with the segmental concrete blocks supplied.

3.5 Select Backfill Material

Select backfill material used in the reinforced zone shall be reasonably free from organic material, shale or other poor durability particles and otherwise deleterious materials. The backfill shall conform to the following grading as determined by AASHTO T-27:

Sieve Size	Percent Passing
4 in. +	100
No. 40	0 - 60
No. 200	0 - 15

The maximum soil particle size for polymeric geogrid reinforcement shall be 3/4 inch unless full scale installation damage tests are conducted in accordance with ASTM D5818, or if epoxy coatings are used for steel reinforcements.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Plasticity Index (P.I.) of the backfill material as determined by AASHTO T-90 shall not exceed 6.

Backfill material shall exhibit an angle of internal friction of not less than 34 degrees, as determined by the standard Direct Shear Test, AASHTO T236, on the portion finer than the #10 sieve, using a sample of the material compacted to 95 percent of AASHTO T99, Methods C or D, with oversized correction as outlined in Note 7, at optimum moisture content. No testing is required for material where 80 percent of sizes are greater than 3/4 inch.

Backfill material shall have a magnesium sulfate soundness loss of less than 30 percent after four cycles.

Additionally, the backfill material shall conform to the following electrochemical requirements:

- For steel mesh reinforcement:

Requirements	AASHTO Test Methods
a) pH range between 5.0 and 10.0	T289
b) Resistivity greater than 3,000 ohm-cm	T288
c) Chlorides less than 100 ppm	T291
d) Sulfates less than 200 ppm	T290
e) Organic Content less than 1%	T267

If resistivity is greater or equal to 5000 ohm-cm, the chlorides and sulfates requirements may be waived.

- For geogrid reinforcement:

Requirement	AASHTO Test Methods
a) pH range between 4.5 and 9.0	T289

The Contractor shall perform analysis tests for each source of material and shall perform such additional tests to assure conformance whenever the character of the select backfill material changes.

The Contractor shall furnish the Engineer a Certificate of Compliance certifying the furnished select backfill materials comply with the aforementioned requirements. Test results performed by the Contractor necessary to assure contract compliance shall also be furnished the Engineer.

3.6 Block Unit Fill

Well graded crushed stone or crushed gravel placed in the segmental block voids (where required by wall manufacturer), between the blocks, and used as drainage aggregates behind the blocks shall meet the following gradation:

Sieve Size	Percent Passing
1 in.	100 -75
¾ in.	50 -75
No. 4	0 - 60
No. 40	0 - 50
No. 200	0 - 5

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3.7 Geotextile Filter Fabric

If required, separate the select backfill and block unit fill with a geotextile meeting the requirements for drainage fabric as specified in Section 246. The minimum lap shall be 12 inches.

3.8 Cast-In-Place Concrete

Concrete for leveling pads shall be Class A3 conforming to the requirements of Section 217 of the Specifications.

3.9 Cap Block Adhesive

Cap block shall be cast to or attached to the top segmental blocks in strict accordance with the manufacturer's requirements and the adhesive manufacturer's recommended procedures. Contractor shall provide a written 10 year warranty, that the integrity of the materials used to attach the cap blocks will preclude separation and displacement of the cap blocks for the warranty period.

4.0 CONSTRUCTION REQUIREMENTS

4.1 Wall Excavation

Wall excavation shall be unclassified in accordance with the requirements of Sections 506 and 401 of the Specifications and shall be performed in conformity to the limits and construction stages shown on the plans.

4.2 Foundation Preparation

The foundation for the structure shall be graded level for a width equal to or exceeding the length of reinforcement or as shown on the Plans. Prior to wall construction, the foundation shall be compacted in accordance with the embankment requirements of Section 303.04 (h) of the Specifications and graded to a relatively smooth and uniform surface. Any foundation soils found to be unsuitable shall be removed and replaced with select backfill as per Materials of these specifications.

At each wall foundation level, an unreinforced concrete leveling pad shall be provided as shown on the plans. Leveling pads shall be level within 1/8 inch per pad or per 100 feet, whichever is greater. The pad shall be cured a minimum of 24 hours before placement of segmental blocks.

4.3 Block Installation

First course of segmental blocks shall be placed on leveling pad and leveled side-by-side and front-to-rear with adjacent blocks. Prior to placing the next course of blocks, all voids in and around the blocks shall be filled with unit fill. Drainage aggregate and select backfill shall be placed and compacted as shown on the plans. All excess materials shall be swept from the top of the blocks prior to installing the soil reinforcement and/or the next course of blocks. Blocks shall be installed in a running bond pattern and the method of aligning blocks shall follow block manufacturer's recommendations.

Successive courses shall be placed in the sequence and alignment shown on the plans as backfill proceeds. Wall facing vertical tolerances and horizontal alignment tolerances shall not exceed 0.75 inch when measured with a 10 feet straight edge. The overall vertical tolerance of wall (plumbness from top to bottom) shall not exceed 0.5 inch per 10 feet of wall height.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

4.4 Soil Reinforcement Placement

Soil reinforcement shall be placed in accordance with the manufacturer's recommendations and these specifications. Soil reinforcement shall be placed within the layers of the compacted backfill material at the locations shown on the plans. Soil reinforcement shall be placed with the strongest direction of soil reinforcement perpendicular to the wall face, unless shown otherwise in the wall plan. Soil reinforcement shall be connected to the segmental block face in accordance with the block supplier's recommendations. The soil reinforcement shall then be laid flat and uniformly tensioned to remove any slack in the connection and soil reinforcement material.

4.5 Select Backfill Placement

The placement of the select backfill material shall closely follow the erection of each course of blocks. At each reinforcing element level, backfill shall be roughly leveled to an elevation approximately 1 inch above the level blocks before placing and attaching reinforcement to the blocks. Unless otherwise shown on the plans, reinforcement shall be placed normal to the face of the wall. The maximum lift thickness shall not exceed 8 inches loose and shall closely follow block installation. The Contractor shall decrease this lift thickness if necessary to obtain the specified density.

Backfill shall be compacted to 95% of the maximum density as determined by AASHTO T-99, Method C or D with oversize correction as outlined in Note 7. For backfills containing more than 80 percent material retained on the 3/4 inch sieve, a method of compaction consisting of at least four passes with a heavy roller shall be used. For applications where spread footings are used to support bridge or other structural loads, the top 5 feet below the footing elevation shall be compacted to 100 percent AASHTO T-99. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill material shall have a placement moisture content equal to the optimum moisture content. Moisture content may be up to 2 percentage points less than optimum moisture content.

At the end of each day's operations, the Contractor shall shape the last level of backfill as to permit runoff of rainwater away from the wall face. Backfill compaction shall be accomplished without disturbance or distortion of reinforcing elements and blocks. Compaction adjacent to the backside of the wall in a strip 3 feet wide shall be achieved using mechanical hand tampers.

4.6 Cast-In-Place Concrete

Concrete work for leveling pads and wall top coping shall be performed in accordance with the requirements of Section 404 of the Specifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

5.0 MEASUREMENT AND PAYMENT

The quantity of Mechanically Stabilized Earth Walls (Segmental Block Facing) to be paid for will be the plan quantity, in units of square feet of retaining structure, as shown on the contract drawings. Unless otherwise defined on the plans, payment shall be full compensation for all submittals, excavation; temporary shoring when not specified on the wall plans or in the proposal as a separate pay item; concrete leveling pads; concrete segmental blocks; soil reinforcement; masonry; reinforcing steel; select backfill material; block unit fill, backfilling; compaction; geotextile filter fabric; riprap to fill temporary excavation, including all work necessary outside the retainage area shown on the plans; disposal offsite or onsite, where permitted by the Engineer, of unsuitable or surplus material; and all materials, labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Retaining Structure	Square foot

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
MECHANICALLY STABILIZED EARTH WALLS
(CONCRETE PANEL FACING)

July 1, 2009

1.0 DESCRIPTION

This work shall consist of furnishing and constructing Mechanically Stabilized Earth (MSE) Walls in accordance with these specifications and in conformity with the lines, grades, dimensions, and design shown on the plans or established by the Engineer. This specification is intended to cover all steel strip or mesh stabilized wall systems utilizing discrete concrete face panels as approved by VDOT Structure and Bridge Division.

2.0 SUBMITTALS

The Contractor shall submit working drawings, shop plans, and design calculations, signed and sealed by a Virginia Registered Professional Engineer, to the Engineer for review by the Department. The Contractor shall allow 30 days from the day the submittals are received by the Department for review and approval. Fabrication or any wall construction shall not begin prior to the approval of the design, working drawings and shop plans. Approval of the Contractor's working drawings and shop plans shall not relieve the Contractor of any of his responsibility under the contract for the successful completion of the work.

2.1 Working Drawings and Shop Plans

The working drawings and shop plans shall reflect all information needed to fabricate and erect the walls including:

- a) Elevations at the top of wall at all the horizontal and vertical break points and at interval not exceeding 50 feet along the wall;
- b) Elevations at the top of leveling pad step breaks;
- c) Elevation of the finished grade in front of the wall;
- d) The number, size, type, length, and details of the soil reinforcing elements in each design section;
- e) The locations and sizes of all pipes and utilities that will be penetrating the wall face or within the soil reinforced mass;
- f) Typical cross-section or cross-sections showing the elevation relationship between ground conditions and proposed grades;
- g) Details for construction of wall around obstructions (i.e. drainage facilities, utilities, overhead sign footing, piles, drilled shafts) within the reinforced backfill;
- h) Details pertaining to coping, parapets, railing, as required by the contract plans;
- i) Shape, dimension, and designation of wall panel;
- j) Details of the architectural or finish treatment supplied.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2.2 Design Calculations

The proposed design shall satisfy the design parameters and requirements in the plans and in the special provisions. Complete design calculations shall include the most critical geometry and loading combination for each design section that exist during construction and at the end of construction.

3.0 MATERIALS

The Contractor shall make arrangements to purchase or manufacture the facing elements, reinforcing mesh or strips, connection devices, joint materials, and all other necessary, components. Material not conforming to this section of the specifications shall not be used without the written consent from the Engineer.

3.1 Reinforced Concrete Face Panels

Concrete for face panel units shall be Class A4 conforming to the requirements of Section 217 of the Specifications except that the maximum water/cement ratio shall be 0.47. Panel steel reinforcement shall meet the requirements of Section 223 of the Specifications.

Panel steel reinforcement, connection devices, and lifting devices shall be set in place to the dimensions and tolerances shown on the plans prior to casting.

3.1.1. Testing and Inspection

The Contractor or his supplier shall furnish facilities and shall perform all necessary sampling and testing in an expeditious and satisfactory manner. Panels will be considered acceptable for placement in the wall when control cylinder tests exceed 85% of 28 day design strength requirements.

3.1.2. Casting

Concrete panels shall be cast on a flat area; the front face of the form at the bottom and the back face at the upper part. Galvanized connection devices shall be set on the rear face. The concrete in each unit shall be placed without interruption and shall be consolidated by the use of an approved vibrator, supplemented by such hand-tamping as may be necessary to force the concrete into the corners of the forms and prevent the formation of stone pockets or cleavage planes. Clear form oil of the same manufacture shall be used throughout the casting operation.

3.1.3. Curing

Panel units shall be cured in accordance with the requirements of Section 404.03 (k) of the Specifications. Any panel concrete placement that does not reach specified design strength within 28 days will be rejected as determined by concrete control cylinders.

3.1.4. Removal of Forms

The forms shall remain in place for a minimum of 20 hours or when control cylinder tests indicate that the concrete has attained at least 20% of the 28-day design requirement in accordance with the requirements of Section 404.03 (j) of the Specifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3.1.5. Concrete Finish and Tolerances

Unless otherwise shown on the plans, concrete surface for the front face shall be a Class 1 finish conforming to the requirements of Section 404 of the Specifications or as detailed on the plans and a uniform surface finish on the rear face. Rear face of the panel shall be screeded to eliminate open pockets of aggregate and surface distortions in excess of 1/4 inch.

3.1.6. Tolerances - All panel units shall be manufactured within the following tolerances:

- Lateral position of connection devices within 1 inch.
- All other panel dimensions within 3/16 inch
- Squareness, as determined by the difference between the two diagonals, shall not exceed ½ inch.
- *Surface irregularities on smooth formed surfaces measured on a length of 5 feet shall not exceed 1/8 inch. Surface irregularities on textured-finish surfaces measured on a length of 5 feet shall not exceed 5/16 inch.*

3.1.7. Rejection

Panel units will be subject to rejection because of failure to meet any of the requirements specified above. In addition, any of the following defects will be sufficient cause for rejection:

- Defects that indicate imperfect molding.
- Defects such as chipped or broken concrete.
- Defects indicating honeycombed or open texture concrete.
- Color variations on the front face of panel due to excess form oil or other reason.

3.1.8. Marking

The date of manufacture, production lot number, and piece mark shall be clearly scribed on the rear face of each panel unit.

3.1.9. Handling, Storage and Shipping

All panel units shall be handled, stored and shipped in such manner as to eliminate the danger of chipping, cracks, fractures and excessive bending stresses. Panel units shall be removed from casting beds by an approved four-point pick up method. Panel units in storage shall be supported on firm blocking to protect the panel connection devices and the exposed exterior finish.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3.3 Soil Reinforcing and Connection Devices

3.2.1 Reinforcing Strips

Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either ASTM A-36 or ASTM A-572 Grade 65 or equivalent. Galvanization for reinforcing strips shall conform to the requirements of ASTM A-123 and the minimum coating thickness shall be 2 oz/sf (or 3.4 mils).

3.2.2 Reinforcing Mesh and Bar Mats

Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the requirements of ASTM A-82 and shall be welded into the finished mesh fabric in accordance with the requirements of ASTM A-185, except that, the minimum average shear stress of the weld shall be at least 35,750 psi. The reinforcing mesh manufacturer shall provide certification that the minimum average weld shear strength is adequate for the proposed design and provides a reasonable safety factor.

Galvanization shall be applied after the mesh is fabricated and conform to the requirements of ASTM A-123 and the minimum coating thickness shall be 2 oz/sf (or 3.4 mils).. Any damage to the galvanizing shall be repaired in accordance with the requirements of Section 233 of the Specifications.

3.2.3 Tie Strips/Lug

Tie strips/lug shall be shop fabricated of hot rolled steel conforming to the requirements of ASTM A-570, Grade 50 or equivalent. Galvanization shall conform to ASTM A-123 and the minimum coating thickness shall be 2 oz/sf (or 3.4 mils)..

3.2.4 Fasteners

Bolts and nuts shall conform to the requirements of ASTM A-325 or ASTM A-449 and shall be galvanized in accordance with ASTM A-153 and minimum coating thickness of 2 oz/sf (or 3.4 mils).

3.2.5 Connection Devices

Connection loop shall be fabricated of cold drawn steel wire conforming to the requirements of ASTM A-82 and welded in accordance with the requirements of ASTM A185. Connector bars shall be fabricated of cold drawn steel wire conforming to the requirements of ASTM A-82 and galvanized in accordance with ASTM A-123. All connection devices shall be galvanized in accordance with the requirements of ASTM A-123 or approved equal and minimum coating thickness shall be 2 oz/sf (or 3.4 mils).

3.3 Joint Materials

3.3.1. Joint Cover

If required, cover all joints between panels on the back side of the wall with a geotextile meeting the requirements for drainage fabric as specified in Section 245. Use adhesive approved by the manufacturer to attach the geotextile to the panel. The minimum width and lap shall be 12 inches.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3.3.2. Bearing Pads

Provide in horizontal joints between panels preformed EPDM rubber pads conforming to ASTM D-2000 for 4AA, 812 rubbers, neoprene elastometric pads having a Durometer Hardness of 55±5, or high density polyethylene pads with a minimum density of 59.06 lb/ft³ in accordance with ASTM 1505.

3.3.3 Joint Filler

If required, provide flexible foam strips as recommended by wall manufacturer for filler for vertical and inclined joints between panels, and in horizontal joints where pads are used, where indicated on the plans.

3.4 Select Backfill Material

Select backfill material used in the structure volume shall be reasonably free from organic material, shale or other poor durability particles and otherwise deleterious materials. The backfill shall conform to the following grading as determined by AASHTO T-27:

Sieve Size	Percent Passing
4"	100
No. 40	0 - 60
No. 200	0 - 15

The Plasticity Index (P.I.) of the backfill material as determined by AASHTO T-90 shall not exceed 6.

Backfill material shall exhibit an angle of internal friction of not less than 34 degrees, as determined by the standard Direct Shear Test, AASHTO T236, on the portion finer than the #10 sieve, using a sample of the material compacted to 95 percent of AASHTO T99, Methods C or D, with oversized correction as outlined in Note 7, at optimum moisture content. No testing is required for material where 80 percent of sizes are greater than 3/4 inch.

Backfill material shall have a magnesium sulfate soundness loss of less than 30 percent after four cycles.

Additionally, the backfill material shall conform to the following electrochemical requirements when steel soil reinforcement is used:

Requirements	AASHTO Test Methods
a) pH range between 5.0 and 10.0	T289
b) Resistivity greater than 3,000 ohm-cm	T288
c) Chlorides less than 100 ppm	T291
d) Sulfates less than 200 ppm	T290
e) Organic Content less than 1%	T267

If resistivity is greater or equal to 5000 ohm-cm, the chlorides and sulfates requirements may be waived.

The Contractor shall perform analysis tests for each source of material and shall perform such additional tests to assure conformance whenever the character of the select backfill material changes.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor shall furnish the Engineer a Certificate of Compliance certifying the furnished select backfill materials comply with the aforementioned requirements. Test results performed by the Contractor necessary to assure contract compliance shall also be furnished the Engineer.

3.5 Cast-In-Place Concrete

Concrete for leveling pads and wall top coping shall be Class A3 conforming to the requirements of Section 217 of the Specifications.

4.0 CONSTRUCTION REQUIREMENTS

4.1 Wall Excavation

Wall excavation shall be unclassified in accordance with the requirements of Sections 506 and 401 of the Specifications and shall be performed in conformity to the limits and construction stages shown on the plans.

4.2 Foundation Preparation

The foundation for the structure shall be graded level for a width equal to or exceeding the length of reinforcement or as shown on the Plans. Prior to wall construction, the foundation shall be compacted in accordance with the embankment requirements of Section 303.04 (h) of the Specifications and graded to a relatively smooth and uniform surface. Any foundation soils found to be unsuitable shall be removed and replaced with select backfill as per Materials of these specifications.

At each panel foundation level, an unreinforced concrete leveling pad shall be provided as shown on the plans. Leveling pads shall be level within 1/8 inch per pad or per 100 feet, whichever is greater. The pad shall be cured a minimum of 12 hours before placement of wall panels.

4.3 Wall Erection

Precast concrete panels shall be placed vertically with the aid of a crane or other suitable equipment. For erection, panels shall be handled by means of a lifting device set into the upper edge of the panels. Panels shall be placed in successive horizontal lifts in the sequence shown on the plans as backfill placement proceeds. As fill material is placed behind a panel, the panels shall be maintained in vertical position by means of temporary wooden wedges placed in the joint at the junction of the two adjacent panels on the external side of the wall. External bracing may also be required for the initial lift. Vertical tolerances (plumbness) and horizontal alignment tolerance shall not exceed 3/4 inch when measured along a 10-foot straight edge. The maximum allowable lateral offset at any panel joint shall be 3/4 inch. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed 1/2 inch per 10 feet of wall height.

4.4 Select Backfill Placement

The placement of the select backfill material shall closely follow the erection of each lift of panels. At each reinforcing element level, backfill shall be roughly leveled before placing and attaching reinforcement to the panel. Unless otherwise shown on the plans, reinforcement shall be placed normal to the face of the wall. The maximum lift thickness shall not exceed 8 inches loose and shall closely follow panel erection. The Contractor shall decrease this lift thickness if necessary to obtain the specified density.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Backfill shall be compacted to 95% of the maximum density as determined by AASHTO T-99, Method C or D with oversize correction as outlined in Note 7. For backfills containing more than 80 percent material retained on the 3/4 inch sieve, a method of compaction consisting of at least four passes with a heavy roller shall be used. For applications where spread footings are used to support bridge or other structural loads, the top 5 feet below the footing elevation shall be compacted to 100 percent AASHTO T-99. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill material shall have a placement moisture content equal to the optimum moisture content. Moisture content may be up to 2 percentage points less than optimum moisture content.

At the end of each day's operations, the Contractor shall shape the last level of backfill as to permit runoff of rainwater away from the wall face. Backfill compaction shall be accomplished without disturbance or distortion of reinforcing elements and panels. Compaction adjacent to the backside of the wall in a strip 3 feet wide shall be achieved using mechanical hand tampers. No compaction density tests are required within 3 feet from the back face of wall.

4.5 Cast-In-Place Concrete

Concrete work for leveling pads and wall top coping shall be performed in accordance with the requirements of Section 404 of the Specifications.

5.0 MEASUREMENT AND PAYMENT

The quantity of Mechanically Stabilized Earth (MSE) walls to be paid for will be the plan quantity, in units of square feet of retaining structure, as shown on the contract drawings. Unless otherwise defined on the plans, payment shall be full compensation for all submittals, excavation; temporary shoring when not specified on the wall plans or in the proposal as a separate pay item; concrete footing; leveling pads; face panels; copings and moment slabs; masonry; reinforcing steel; select backfill material; backfilling; compaction; joint materials; riprap to fill temporary excavation, including all work necessary outside the retainage area shown on the plans; disposal offsite or onsite, where permitted by the Engineer, of unsuitable or surplus material; and all materials, labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Retaining Structure	Square foot

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
GRINDING CONCRETE: IN-PLACE PCUs

March 11, 2010

I. DESCRIPTION

This work shall consist of diamond grinding the proposed Portland cement concrete surface of the precast composite units (PCUs), once they are set in place, in an effort to remove irregularities, riding surface - high spots, and grinding of the remaining riding surface in conformity with the plans or determined by the Engineer. The ground surface shall be free from gouges, grooves, oil film and other imperfections of workmanship, and shall have a textured surface suitable as a riding surface.

II. EQUIPMENT

Grinding shall be accomplished with a self propelled diamond grinding machine having a leveling sensor, a self-contained water system for control of dust and fines, and be of a type that has operated successfully on work comparable to that proposed under this contract. The equipment shall be capable of grinding the surface without causing spalls at joints and cracks or fracture of aggregates in the surface.

III. CONSTRUCTION METHODS

Grinding shall be performed in a longitudinal direction, and shall begin and end at lines normal to the pavement centerline in any ground section.

Pavement residue shall be collected and disposed of in accordance with Section 106.04 of the Specifications.

Unless otherwise permitted, all equipment and vehicles in use under traffic shall be equipped with and shall operate flashing or rotating amber warning lights.

Ground pavement surfaces will be tested by the Engineer or Inspector with a 10 foot straightedge. Areas showing deviations of more than 1/8" (inch) in 10 feet (longitudinal direction) and more than 1/4" (inch) in 10 feet (transverse direction) shall be reground, at no additional cost to the Department. Any damage to the concrete deck from the grinding operation will be corrected by the Contractor as per Section 412 of the Road & Bridge Specifications at no additional cost to the Department.

IV. BASIS OF PAYMENT

The cost of grinding PCUs to obtain specified tolerances will not be paid for by the Department, but shall be borne by the Contractor.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
TRAFFIC OPERATIONS

July 28, 2009

This work shall consist of all installation of Maintenance of Traffic (MOT) items as shown on the plans and required by the MUTCD and the *2005 Virginia Work Area Protection Manual* for the Superstructure rehabilitation and replacement phase of this project, including daily setup and removal of all signs, markings, lights, barricades and barriers for maintenance of traffic. The work shall include coordination with the Department's personnel, local jurisdictions, Virginia State Police, incident management assets, emergency services. Traffic operations shall be implemented and coordinated in accordance with the Traffic Management Plan (TMP).

PROCEDURES

The Contractor shall furnish personnel and facilities for the superstructure replacement phase of this project in accordance with the TMP and the *Work Zone Traffic Control Management* special provision and this *Traffic Operations* special provision. The Contractor shall:

1. **Work Plan** - Develop and provide a Work Plan for each phase of construction. The plan shall include procedures for installation of all traffic control devices, installation of signs, construction of median crossovers, and coordination with State Police, inspectors and incident management team. This work plan shall be submitted to the Engineer for review and approval prior to establishing any traffic control devices for work zone operations. Work plan shall be in accordance with maintenance of traffic plans, TMP and MUTCD.
2. **Equipment and Material Staging and Storage** – Coordinate transportation, staging locations, and schedules for Equipment and Material Staging and Storage.
3. **Coordinate with City forces** regarding installation of signs and traffic control devices on city streets and on RMA facilities with Mr. Tom Flynn, City Transportation Engineer and with Mr. Jim Kennedy of RMA.
4. **MOT Demonstration** - Once all traffic control devices, signs, barricades, moveable barriers, etc., are installed or are ready to be placed in position for lane closures, and at least two weeks prior to beginning the superstructure rehabilitation/replacement phase of the project, the Traffic Control Supervisor (TCS) shall plan, coordinate and schedule a maintenance of traffic demonstration which will include an explanation of the Work Plan (describing the set-up of traffic control for lane closures for the first phase and stage as shown on the plans) followed by an actual set-up and breakdown of all components. This demonstration will be "live" in that it shall include State Police, sub-contractors maintenance patrol, emergency services (Fire & Ambulance), and placement of the moveable barrier.

The Contractor shall walk through his plan of his setup for cranes and transport vehicles once traffic control is in place.

The TCS shall observe and time all operations to assure that nighttime schedules can be met.

In the event the maintenance of traffic Work Plan is not acceptable to the Engineer, the Contractor shall provide a detailed report to the Engineer outlining necessary adjustments in manpower, equipment and procedures. Upon approval, the Engineer may require additional demonstrations as he determines to be appropriate.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

5. **Transportation Management Plan (TMP)**-The TCS will be provided with copies of the TMP. The TMP contains requirements for incident management and communications. The TCS shall be prepared to coordinate the *Traffic Incident Management Strategies* and be thoroughly familiar with the *I-64 Repaving/I-95 Bridge Replacements Communications Plan* furnished by the Engineer. During the nighttime lane closures for the superstructure rehabilitation and replacement phase of the project, the TCS shall maintain close contact and coordination with the Virginia State Police assigned to this project and shall respond immediately to repair or replace traffic control devices and/or signs in the work zone, assist the State Police in traffic control when requested and request wrecker service to remove vehicles from the work zone when requested by State Police. In the event of an incident in the work zone or resulting from work zone queues the TCS shall coordinate with the Virginia State Police, the TAMS contractor (Transfield), and the Department's Richmond Transportation Operations Center (TOC).
6. **Police Patrols** - The Contractor is advised that the Department will use Police patrols in construction work zones to enhance the safety of both the public and construction personnel, during the life of this contract.
7. Establish locations for all signs and traffic control devices to assure adequacy of location for safety and for driver visibility.

MEASUREMENT AND PAYMENT

The coordination, work plan, communication, briefings, and other management duties described within this Special Provision shall be paid for as part of and in accordance with the Special Provision for *Work Zone Traffic Control Management*.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
WORK ZONE TRAFFIC CONTROL MANAGEMENT

June 19, 2009

I. GENERAL DESCRIPTION

This work shall consist of providing work zone traffic control management in strict compliance with the contract, plans, specifications, the Traffic Management Plan (TMP), the Virginia Work Area Protection Manual and the Manual on Uniform Traffic Control Devices (MUTCD), including supervision of personnel and the installation, inspection, and maintenance of all traffic control devices on the project.

II. REQUIREMENTS

The Contractor shall assign a traffic control supervisor (TCS) to provide work zone traffic control management for the project. If the Contractor assigns more than one TCS to provide work zone traffic control management, a weekly schedule identifying who will be in charge of providing work zone traffic control management on a daily basis shall be submitted to the VDOT Area Construction Engineer by the Contractor. Inclusion of the Special Provision Copied Note for **PERSONNEL REQUIREMENTS FOR WORK ZONE TRAFFIC CONTROL** stating individual training requirements for personnel involved in Work Zone Traffic Control will in no way invalidate the requirement for the services of a Traffic Control Supervisor for this project to perform the functions and duties stated herein. The Contractor shall ensure that the personnel meeting the individual training requirements and conditions for **WORK ZONE TRAFFIC CONTROL** and **WORK ZONE TRAFFIC CONTROL MANAGEMENT** are present on the project as stated in each of these Contract provisions.

The TCS shall have a set of traffic control plans, the TMP and a copy of the edition of the Virginia Work Area Protection Manual specified on the plan sheet or in the contract readily available at all times.

A. Certification

Prior to commencing work requiring work zone traffic control management, the Contractor shall submit to the Area Construction Engineer a valid copy of the Traffic Control Supervisor certificate (wallet size card) issued by the American Traffic Safety Services Association (ATSSA), or another similarly accredited agency or firm approved by the Department.

The Department will accept the certification by ATSSA or any approved agency or firm only if all of the following minimum requirements are met:

1. Successful completion of an Intermediate or Advanced work zone traffic control training course approved by the Department.
2. Passing a written examination given by the agency or firm on the approved work zone traffic control training course.
3. A minimum of two years full-time field experience in work zone traffic control. The experience may be verified by the Department at its discretion.

The TCS certification shall be renewed every four years by the TCS taking and passing a recertification test. The recertification test shall be taken through ATSSA or an agency or firm approved by the Department. Recertification shall be done in the fourth year prior to the expiration date.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

B. Duties

The TCS's main responsibility shall be work zone traffic control management. The TCS may have other assigned duties on the project as approved in writing by the Area Construction Engineer. The following is a listing of the TCS's primary duties:

1. The TCS(s) shall personally provide work zone traffic control management and supervision services at the project site in accordance with the TMP.
2. The TCS(s) shall coordinate the training of TMP Monitors, flagging and signing personnel.
3. The TCS(s) shall supervise the TMP Monitors, flagging and signing personnel.

C. Documentation - Traffic Control Diary

The TCS shall maintain a project work zone traffic control diary in a bound book. The Contractor shall provide a sufficient number of diaries for his or her use.

The TCS shall keep the work zone traffic control diary current on a daily basis, and shall sign each daily entry. Entries shall be made in ink in a format approved by the Area Construction Engineer, and there shall be no erasures or white-outs. Incorrect entries shall be struck out and then replaced with the correct entry. Photographs may be used to supplement the written text.

The work zone traffic control diary shall, at all times, be available for inspection by the VDOT Maintenance of Traffic Coordinator and a copy of the diary shall be submitted to the MOT Coordinator on a weekly basis.

The work zone traffic control diary(s) shall become the property of the Department at the completion of the project. Failure to submit the diary shall result in the withholding of final payment until the diary(s) is submitted.

D. Availability of TCS

Traffic control management shall be provided under the supervision and direction of the TCS on a 24-hour-per-day basis throughout the duration of the project.

The TCS shall be available on every working day—on call at all times—and available upon the Area Construction Engineer's request during normal working hours and during other than normal working hours in the case of emergency. The provisions for availability of the TCS shall also be met during times of partial or full project suspension. Contact telephone numbers for the TCS(s) shall be provided to Department project personnel, the Area Construction Engineer, the Residency Administrator, and the region Smart Traffic Center prior to the Contractor commencing work requiring work zone traffic control management.

E. Failure to Comply

The Area Construction Engineer may suspend all or part of the Contractor's operation(s) for failure to comply with the approved "Traffic Control Plan" or failure to correct unsafe traffic conditions within 24 hours for critical items and 72 hours for non-critical items after such notification is given to the Contractor in writing.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

In the event that the Contractor does not take appropriate action to bring the deficient work zone traffic control into compliance with the approved traffic control plan or fails to correct the unsafe traffic conditions, the Department may proceed with the corrective action using its own forces, equipment, and material to maintain the project and such costs, plus 25 percent for supervisory and administrative personnel, will be deducted from the money owed to the Contractor for the project.

The Contractor shall not be relieved of the responsibility to provide work zone traffic control safety to the traveling public when a project is under full or partial suspension. When a project is under suspension due to the Contractor's failure to comply with this section, or when the contract is under liquidated damages, the Contractor shall continue to provide work zone traffic control management and no additional measurement or payment will be made.

If suspensions or partial suspensions are requested by the Contractor, the additional work zone traffic control management costs will be at the Contractor's expense.

III. MEASUREMENT AND PAYMENT

Work Zone Traffic Control Management will be paid for at the contract lump sum price. This price shall be full compensation for furnishing 24 hour services as specified, including preparing and furnishing Work Zone Traffic Control diaries.

When work zone traffic control management is paid for by the lump sum, monthly partial payments for work zone traffic control management will be made on a pro rata basis for the estimate period being vouchered for payment.

In the event the contract time is authorized to be extended in accordance with the provisions of Section 108.04 of the Specifications, the provisions of Section 104.02 of the Specifications will not apply. The payment for this item will be compensated on a daily basis by dividing the original lump sum bid amount by the number of calendar days in the original contract time and the resultant daily dollar value assigned to this item.

Payment will be made under:

Pay Item	Pay Unit
Work Zone Traffic Control Management	Lump Sum

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
OPEN JOINTS ON BRIDGE SIGN

March 12, 2010

I. DESCRIPTION

These specifications cover the material requirements for providing a special design construction sign.

II. MATERIALS

Materials shall be in accordance with the Specifications, plan details and Mobility Management Division Memorandum MM-328, "Open Joints on Bridge Sign."

III. PROCEDURES

Method of installation and maintenance shall be in accordance with the Work Area Protection Manual, plan details and as directed by the Engineer.

IV. MEASUREMENT AND PAYMENT

Open Joints on Bridge Sign will be measured and paid for in accordance with Section 512.04 of the Specifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
PCU TRANSPORT PLAN

July 14, 2009

I. DESCRIPTION

This work shall consist of transporting the pre-constructed composite superstructure units and all other superstructure elements from the casting yard site to the construction site, including any staging areas en route.

II. PROCEDURES

The Contractor shall provide to the Engineer a transport plan for each structure. The plan shall depict:

- A list of PCUs and location in the structure.
- The dimensions and weight of each unit during transport.
- Dates/Times that each PCU will be transported from the casting yard, staged, and delivered to the site.
- Description of the vehicle(s) to be used for transporting of PCUs.
- A map indicating the route from the casting yard to the staging area to the structure location. Map shall highlight all bridges and their respective load ratings that will be traveled over/under, all overhead lines, sign structures or other possible obstructions, and any significant landmarks along the route that could potentially be affected.
- Copy of the DMV permit.

Contractor shall ensure that the transport plan is executed in accordance with the contract Traffic Management Plan (TMP) and does not produce any conflicts. Any deviation from the contract TMP will require the submission of a new/modified TMP for review by the Engineer. The new TMP shall be signed and sealed by a Professional Engineer licensed to practice in the Commonwealth of Virginia.

II. MEASUREMENT AND PAYMENT

The transport plan(s) is incidental to the PCUs and shall be included in the cost of other related items.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
CPM PROGRESS SCHEDULE

December 31, 2009

SECTION 108.03 – PROGRESS SCHEDULE of the Specifications is deleted and replaced by this provision.

For definitions of scheduling terms not defined herein and for guidelines on preparing and maintaining the Progress Schedule, refer to the *VDOT Post-Award Scheduling Guide*.

I. GENERAL REQUIREMENTS

The Contractor shall plan the Work and shall prepare and submit a Progress Schedule, in accordance with this provision, for the Engineer's review and acceptance. The Progress Schedule shall represent the Contractor's proposed plan to accomplish the Work in accordance with the requirements of the Contract. The Contractor shall maintain the Progress Schedule monthly to ensure that it continues to represent the current status of the project and the Contractor's current work plan to complete the project. The Progress Schedule shall be used by all involved parties, as the basis for planning all work required to complete the project. It shall also be used by the Department to monitor the project and to assess progress of the Work.

The Progress Schedule shall depict the sequence in which the Contractor proposes to perform the Work and the dates on which the Contractor contemplates starting and completing all schedule activities required to complete the project. The Progress Schedule shall also show when all work to be performed by the Department and other involved parties must be completed. The Progress Schedule shall reflect a practicable work plan and logical progress of the Work in accordance with standard construction practices and as specified in the Contract Documents. It shall also reflect the proposed phasing and sequencing as indicated in the Contract Documents or as approved by the Engineer. When preparing the schedule, the Contractor shall consider all known or specified constraints or restrictions such as: holidays, seasonal, normal weather, traffic or local events that may impact traffic, utility, railroad, right-of-way, environmental, permits, or other limitations to the Work.

The Contractor shall designate a Project Scheduler for the project and shall submit his/her qualifications for the Engineer's written approval prior to submission of any Progress Schedule. The Project Scheduler must have at least three (3) years of verifiable experience in successfully preparing and maintaining resource-loaded critical path method (CPM) schedules on large scale projects of similar type and complexity. The Contractor shall provide current contacts for verification of the Project Scheduler's qualifications and experience. The Project Scheduler shall be primarily responsible for the development and maintenance of the Contractor's Progress Schedule and shall represent the Contractor in all scheduling meetings and discussions or issues concerning the Progress Schedule. The Contractor shall submit, for the Engineer's approval, a written notification and qualifications of a replacement Project Scheduler prior to replacing the Project Scheduler.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

At least seven (7) calendar days prior to beginning the Work, the Contractor shall attend a Scheduling Conference with the Engineer to discuss key issues necessary for the development of the Baseline Progress Schedule and the Contractor's overall plan to complete the project. Such key issues may involve project specific requirements relative to the Contract plans and specifications and any known constraints or foreseeable issues that may impact the schedule. Such project specific requirements shall include, but are not limited to: scheduling, phasing, sequencing, milestone(s), work to be performed by the Department or other involved parties; or any known or likely constructability issues relative to the Contract plans and specifications. Other key issues shall include as applicable: key submittals, permits, construction access, right of way, environmental, utility, traffic or local events that may impact traffic, or other limitations to the Work. During the Scheduling Conference, the Contractor shall discuss his/her overall plan of operations concerning the Maintenance of Traffic (MOT)/Sequence of Construction or any proposed deviations from the phasing, staging, or sequence of construction as indicated on the Contract plans or as approved by the Engineer. The Contractor shall also discuss his/her overall plan of operations, including, but are not limited to where the Work will begin and how it will progress; the proposed working calendar(s), work to be accomplished each construction season, resource utilization plan, and proposed means and methods for major operations. The Contractor shall also provide his/her Preliminary Progress Schedule, which shall depict in sufficient details his/her planned or contemplated operations for the first one-hundred and twenty (120) calendar days of Work. The Scheduling Conference may be held in conjunction with the Pre-Construction Conference or at a separate meeting as mutually agreed to by the Contractor and the Engineer.

II. OVERVIEW OF THE VARIOUS REQUIRED PROGRESS SCHEDULE SUBMISSIONS

A. Preliminary Progress Schedule – At the Scheduling Conference, or as approved by the Engineer, the Contractor shall submit to the Engineer for review and acceptance a Preliminary Progress Schedule. At the Contractor's discretion, a complete detailed Baseline Progress Schedule for the entire project may be submitted in lieu of the Preliminary Progress Schedule. The Preliminary Progress Schedule submission shall consist of the following:

1. Preliminary Progress Schedule: The Preliminary Progress Schedule shall depict, at a detailed level, the Contractor's proposed start/finish dates for all activities scheduled for the first one-hundred and twenty (120) calendar days of work. It shall also include, as applicable, any milestones or work to be performed by sub-contractors, the Department, or third parties during the first one-hundred and twenty (120) calendar days of work. The Preliminary Progress Schedule shall also depict at a summary level the proposed overall plan to complete the remainder of the project. The summary level activities shall depict, as applicable, the overall sequence and approximate timing to complete each phase, stage, and/or feature of Work. The Preliminary Progress Schedule shall depict the anticipated project critical path. The Preliminary Progress Schedule shall be prepared in accordance with Section IV (A), with the exception of cost-loading.
2. Preliminary Progress Schedule Narrative: The Preliminary Progress Schedule Narrative shall describe the Contractor's detailed work plan for the first one-hundred and twenty (120) calendar days of work. It shall also describe in general terms the overall work plan to complete the remainder of the Work. The Preliminary Progress Schedule Narrative shall describe the Contractor's proposed sequence of construction, resource utilization plan, working calendar(s), methodology, scheduling assumptions, and considerations for applicable project constraints as reflected in the Preliminary Project Schedule. The Preliminary Progress Schedule Narrative shall be prepared in accordance with Section IV (B).

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Until the Baseline Progress Schedule is accepted by the Engineer, the Contractor shall submit an update of the Preliminary Progress Schedule monthly, within five (5) working days after the current data date or as approved by the Engineer. For the purposes of this provision the data date is defined as the current status date of the Progress Schedule. The updated Preliminary Progress Schedule shall show the actual progress of work completed to date and the current detailed schedule for accomplishing the work planned for the following one-hundred and twenty (120) calendar days of Work, as of the data date. It shall also show the summary level activities required to complete the entire project.

B. Baseline Progress Schedule – Within sixty (60) calendar days after the Notice to Proceed (NTP) date or as approved by the Engineer, the Contractor shall submit in its entirety, his/her Baseline Progress Schedule, to the Engineer for review and acceptance. The Baseline Progress Schedule submittal shall consist of the following:

1. Baseline Progress Schedule: The Baseline Progress Schedule shall represent the Contractor's initial detailed plan to accomplish the entire scope of Work in accordance with the Contract. The Baseline Progress Schedule shall depict in a time-scaled network logic diagram, the sequence in which the Contractor proposes to perform the work, the project critical path, and the dates on which the Contractor contemplates starting and completing the individual schedule activities required to complete the project. The Baseline Progress Schedule shall also depict the current status of the project and the Contractor's current plan to complete the remaining work, as of the Baseline Progress Schedule submittal date. The Baseline Progress Schedule shall be prepared in accordance with Section IV (A).
2. Baseline Progress Schedule Narrative: The Baseline Progress Schedule Narrative shall describe the Contractor's overall work plan to complete the entire project as reflected in the Baseline Progress Schedule. The narrative shall describe the Contractor's proposed sequence of construction, resource utilization plan, working calendar(s), methodology, scheduling assumptions, and considerations made to accommodate potential disruptions in progress of the Work due to normal weather and other applicable known and foreseeable project constraints. The Baseline Progress Schedule Narrative shall be prepared in accordance with Section IV (B).
3. Baseline Progress Earnings Schedule: The Baseline Progress Earnings Schedule shall indicate the Contractor's anticipated cumulative progress each month as of the Contractor's progress estimate date as defined in Section 109.08(a) of the Specifications. The anticipated cumulative progress shall be expressed as "Percent Complete" based on the anticipated total earnings to date relative to the Total Contract Value. The Baseline Progress Earnings Schedule shall be based on the Baseline Progress Schedule and shall be prepared on the VDOT Form C-13CPM in accordance with Section IV (C).

Upon acceptance by the Engineer, the Baseline Progress Schedule shall replace the Preliminary Progress Schedule. The accepted Baseline Progress Schedule shall henceforth become the project Schedule of Record (SOR). The SOR shall be defined as the currently accepted Baseline or a subsequent revision in the form of a Revised Progress Schedule, against which all subsequent Progress Schedule Updates and progress will be compared. The SOR shall be used by the Engineer to assess the Contractor's schedule based performance on the project.

C. Progress Schedule Update – The Contractor shall on a monthly basis submit for the Engineer's review and acceptance the Contractor's Progress Schedule Update within five (5) working days after the Contractor's progress estimate date or as approved by the Engineer. The Progress Schedule Update shall consist of the following:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

1. Progress Schedule Update: The Progress Schedule Update shall depict the actual status of the completed or on-going activities and the Contractor's current plan to complete the remaining work as of the data date. The Progress Schedule Update shall be prepared in accordance with Section IV (A).
2. Progress Schedule Update Narrative: The Progress Schedule Update Narrative shall describe the work performed since the previous update and the Contractor's current plan for accomplishing the remaining work. It shall describe the current status of the project and any deviations from scheduled performance relative to the SOR. It shall also describe any progress deficiencies/schedule slippages or any time-related issues encountered; as well as any actions taken or proposed to avoid or mitigate the effects of the progress deficiencies/schedule slippages or time-related issues. The Progress Schedule Update Narrative shall be prepared in accordance with Section IV (B).
3. Progress Earnings Schedule Update: The Progress Earnings Schedule Update shall depict the current status of the project by percent complete based on the actual total earnings to date relative to the total Contract value. The Progress Earnings Schedule Update shall show the actual monthly and cumulative cost to date, as reflected on the Contractor's payment estimate; any variance in percent complete relative to the SOR; and the projected earnings for the remaining payment periods. The Progress Earnings Schedule Update shall be prepared on the VDOT Form C-13CPM in accordance with Section IV (C).

Upon acceptance by the Engineer, the Progress Schedule Update shall replace any previous Progress Schedule Updates as the current update of the SOR; however, it shall not replace the SOR. The currently accepted Progress Schedule Update shall henceforth become the contemporaneous schedule with which to report the current status of the project, plan the remaining Work, and evaluate the effects of any time-related changes or impacts on the remaining Work.

D. Revised Progress Schedule – When the Contractor proposes a significantly different approach to his/her work plan than is currently shown in the SOR or when required by Engineer, the Contractor shall submit to the Engineer for review and acceptance a Revised Progress Schedule. The Revised Progress Schedule shall be submitted in lieu of a subsequent Progress Schedule Update or as specified in the Engineer's written request. The Engineer will require a Revised Progress Schedule when the current Progress Schedule Update or work plan differs or deviates significantly from the current SOR. Differs or deviates significantly will be construed to mean deviations from the SOR for major changes in the on-going or proposed work plan or changes in the Work that alters the project critical path, Contract interim milestone(s), or Contract time limit. A Revised Progress Schedule will be required when:

1. The Engineer approves a Schedule Impact Analysis (SIA) for authorized changes in the Work that will impact the schedule, as defined in Section III of this provision. Such changes may include additions or deletions to the Work or other changes that are directed or authorized in writing by the Engineer, in accordance with the applicable portions of Sections 104 and 109 of the Specifications.
2. The Engineer approves a SIA for unanticipated changes in the Work or conditions that will impact or has impacted the schedule, as defined in Section III of this provision. Unanticipated changes involve changes to the Work that are deemed by the Engineer to be beyond control and without the fault of the Contractor, which may include unknown or unforeseeable differing site conditions, new or unanticipated requirements, or impacts caused by third party entities, such as railroads, utility companies, permitting agencies, environmental, etc.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

3. The Contractor proposes to revise his/her overall sequence or work plan or the Engineer determines that the Contractor's current work plan differs or deviates significantly from the SOR. Such major deviations may include but are not limited to changes in the Contractor's proposed phasing, general sequence, or means and methods. The Contractor may revise his/her Progress Schedule at any time, at his/her discretion; however, the Engineer will only consider accepting a Revised Progress Schedule for major changes that deviates significantly from the SOR.
4. The Engineer determines that progress of the Work is trending towards unsatisfactory, in accordance with Section VIII (C), and in the opinion of the Engineer, it is apparent that the progress deficiency will not result in a critical delay and a Revised Progress Schedule rather than a Recovery Plan is required to correct the progress deficiency. In such cases, the Engineer will request a meeting with the Contractor to discuss progress of the Work relative to the SOR and to determine the appropriate corrective action required.

The Revised Progress Schedule submission shall be prepared and submitted in the form of a Baseline Progress Schedule as described in Section II (B). However, it shall reflect the current status of the project as of the submittal date, approved changes in the Work and any impacts resulting from the change(s), and the proposed plan for completing the remaining work. The Revised Progress Schedule will be reviewed by the Engineer for acceptance in accordance with Section VII. Upon acceptance by the Engineer, the Revised Progress Schedule shall henceforth replace the accepted Baseline Progress Schedule or any previously accepted Revised Progress Schedule as the SOR for the remainder of the project.

- E. Final As-Built Progress Schedule** – Within thirty (30) calendar days after final acceptance, the Contractor shall submit to the Engineer his/her Final As-built Progress Schedule. The Final As-built Progress Schedule shall show the actual start and finish dates for each activity in the schedule. The Contractor shall certify in writing that the Final As-built Progress Schedule accurately reflects the actual start and finish dates for all activities contained in the Progress Schedule. The Final As-built Progress Schedule shall be submitted in the form of a monthly Progress Schedule Update and shall represent the last Progress Schedule Update submission.

III. SCHEDULE IMPACT ANALYSIS (SIA) FOR PROPOSED AND UNANTICIPATED CHANGES

- A. Proposed Changes and Schedule Impacts** – When changes in the Work are proposed or authorized by either the Engineer; or when progress of the Work will be or has been impacted by other unanticipated changes in the Work or condition, the Contractor shall submit a Schedule Impact Analysis (SIA) for the Engineer's review and approval, in accordance with the following:
1. Impacts Due to Directed or Authorized Changes: When the Engineer issues a written order or authorizes a change in the Work in writing, in accordance with the applicable portions of Sections 104.02 and 109.05 of the Specifications, the Contractor shall submit in writing within seven (7) calendar days of the Engineer's written direction or as required by the Engineer, a request for a time extension, if the Contractor believes that additional time is required to perform the Work. The Contractor shall submit along with his/her request a prospective Schedule Impact Analysis (SIA) and all supporting data to substantiate the request for a time extension in accordance with the provision of this Section.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2. Impacts Due to Unanticipated Changes: When the Contractor discovers or encounters a previously unknown or unanticipated condition, error or omission in the Contract plans and specifications, a differing site condition in accordance with Section 104.03, or when an event occurs, that he believes will impact progress of the Work or cause a delay in the completion of the Work, the Contractor shall promptly notify the Engineer in writing, within two (2) working days of such discovery, encounter, or event. The Contractor shall then gather all available pertinent information and data necessary to determine how such error or omission, condition, or event will impact progress of the Work or cause a delay in the completion of the Work. The Contractor and the Department shall promptly meet to evaluate the scope and potential impact of such error or omission, condition, or event to allow the Engineer to make a timely decision on how to proceed, as well as to determine how the effects of such impact can be avoided or mitigated. In addition, the Contractor shall submit in writing within seven (7) calendar days after the meeting and prior to proceeding with the Work affected by such condition or event, a request for a time extension and a prospective SIA and all supporting data to substantiate the request for a time extension, unless directed otherwise by the Engineer. The Contractor's notice as defined herein, a subsequent meeting with the Engineer, or submittal of a request for time extension shall not constitute a notice of intent to file a claim as required by Section 105.19. If the Contractor is directed by the Engineer to proceed with the Work prior to approving a request for a time extension or if the Contractor disagrees with the Engineer's directions or requirements, then the Contractor must give the Department a notice of intent to file a claim, prior to proceeding with the Work, in accordance with Section 105.19.
3. Unresolved Impacts: When the Contractor believes he is entitled to a time extension for an unresolved impact to the Work that is attributable to authorized changes in the Work including, but not limited to changes authorized by either Force Account Work or Unilateral Work Order, for which the scope of the critical path delay could not be determined or mutually agreed to at the time the change was authorized or the delaying event or changed condition was encountered, as established by the Engineer; or when the Contractor believes he is entitled to a time extension for an on-going delay that is attributable to a cause beyond the control and without fault of the Contractor or those for whom the Contractor is responsible, the Contractor shall submit for the Engineer's review and approval, a request for a time extension and a retrospective SIA and all supporting data to substantiate the request for a time extension. The SIA shall be submitted within fourteen (14) calendar days after the cessation date of the delaying event or completion of the changed Work or Work directly impacted by such authorized change or condition, or as directed or approved by the Engineer. Submittal of such a request for a time extension shall not constitute a notice of intent to file a claim as required by Section 105.19. If the Contractor disagrees with the Engineer's directions or requirements, then the Contractor must give the Department a notice of intent to file a claim, prior to proceeding with the work impacted by such authorized change, in accordance with Section 105.19.

B. Schedule Impact Analysis (SIA) – The SIA submission shall include a SIA schedule and a written SIA statement; as well as supporting data and such information necessary for the Department to make an adequate and timely evaluation of any request received from the Contractor for a time extension. The SIA submission shall consist of the following:

1. A SIA schedule which shall depict the schedule impact of the added work, changed work or condition, or impacting event based on the Contemporaneous Period Analysis (CPA) method. For purposes of this provision, the CPA method is defined herein, as a comparative schedule analysis technique that is based on comparing the impacted Progress Schedule Update to the most recently accepted Progress Schedule Update, which is performed at the time a change in the Work is authorized or a change in condition or an impacting event is encountered, to determine the status of the currently accepted Progress Schedule Update before and after the impact. The SIA schedule shall:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a) Be based on the currently accepted Progress Schedule Update, submitted prior to the earlier of the date the delaying event or changed condition was encountered or the change in the Work was authorized. If the most recently submitted Progress Schedule Update is unacceptable, then the Engineer will evaluate the request based on the previously accepted Progress Schedule Update. In which case, the Contractor shall update the previously accepted Progress Schedule Update to show the actual progress of Work to date as of the earlier of the date the delaying event or changed condition was encountered or the change in the Work was authorized.
 - b) Include a fragmentary network (fragnet) of activities representing the added work, changed work or condition, or impacting event. The fragnet activities shall be logically linked to the affected activities to show the direct impact on the Work.
 - c) Show the current status of the Work by showing the actual status of the completed and on-going activities as of the submittal date.
 - d) Depict the schedule impact by showing a comparison between the impacted Progress Schedule Update and the most recently accepted Progress Schedule Update with a data date closest to and prior to the earlier of the date the impacting event or change in condition was encountered or the change in the Work was authorized.
 - e) Depict the overall impact on the project critical path, Contract interim milestone(s), other significant dates, and the Contract fixed completion date, as applicable.
2. A written SIA statement to:
- a) Describe the type, cause, and scope of the added work, changed work or condition, or impacting event.
 - b) Provide sequence and timing of events and/or actions by all involved parties relating to the impact.
 - c) Describe the particular operations affected as well as identify by Activity ID and Activity Name the activities that are or will be directly impacted.
 - d) Describe the impact on the critical path, total float, Contract interim milestone(s), other significant dates, or the Contract fixed completion date, as applicable.
 - e) Include a comparative analysis report relative to the currently accepted Progress Schedule Update to identify all changes made to the impacted Progress Schedule.
 - f) Identify any actions taken or needed to avoid or mitigate the delay or the effects of the delay.

Upon approval by the Engineer, the Contractor shall incorporate the SIA into the Progress Schedule. If appropriate, the approved SIA shall be used to substantiate any request for a time extension or time related damages or compensations, in accordance with the applicable portions of Sections 104, 108.04, and 109.05 of the Specifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

IV. DETAILED REQUIREMENTS FOR PROGRESS SCHEDULE SUBMISSIONS

A. Progress Schedule – The Progress Schedule shall conform to the following requirements:

1. Software Compatibility Requirements: The Contractor shall prepare and maintain the Progress Schedule using scheduling software that is capable of meeting all requirements of this provision. The Contractor's scheduling software shall be wholly compatible with the Department's scheduling software system and shall have the capability to import and export project data in the Primavera proprietary exchange format (XER). The Department's scheduling software system is the latest version of Primavera's Project Management software (currently P6 version 6.2). Compatible shall mean that the Contractor-provided electronic file versions of the schedule can be imported into the Department's scheduling software system with no modifications, preparation or adjustments. At the Contractor's request, secured access via the internet may be granted to allow the Contractor to develop and maintain his/her Progress Schedule in the Department's scheduling software system. The Progress Schedule shall be submitted in accordance with Section V.
2. Software Settings: If Primavera (P6) or equivalent scheduling software with similar features is used to prepare the Progress Schedule, the Contractor shall define the project attributes and schedule calculation options in accordance with the following software settings:
 - a) When creating the Progress Schedule, define Project ID as the Contract ID number.
 - b) When creating the Progress Schedule, define the project "Must Finish By" date to equal the Contract Fixed Completion date.
 - c) When creating the Progress Schedule, define the baseline for Earned Value calculations as the "Project Baseline".
 - d) When calculating the Progress Schedule, use "Retained Logic" when scheduling progressed activities. Software features such as "Progress Override" that severs ties between predecessor and successor activities for out-of-sequence progress shall not be used when calculating the schedule. Out-of-sequence logic for on-going and remaining activities shall be corrected on a monthly basis to reflect the current sequence of work.
 - e) When creating and calculating the Progress Schedule, define the critical activities as "Longest Path".
 - f) When calculating the Progress Schedule, define schedule calculation option to compute total float as "Finish Float = Late Finish – Early Finish".
 - g) When calculating the Progress Schedule, define calendar for scheduling relationship lags as "Predecessor Activity Calendar".
 - h) When preparing a schedule report with summarized dates and durations, the global default calendar shall be set to a global calendar that is based on an 8-hour work-day and a 7-day workweek, without non-work days or holidays.
3. Work Breakdown Structure (WBS): The Contractor shall define a project WBS to allow for a hierarchical organization and summarization of the Progress Schedule. As applicable, the WBS shall allow for multiple levels of summarization of the Progress Schedule based on the project scope of Work. The WBS shall allow for a hierarchical organization of the Progress Schedule in accordance with the phasing/sequence of construction and traffic control plans, as specified in the Contract, or as directed by the Engineer. The Contractor shall apply the WBS to breakdown the Work into easily definable and measurable work packages.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

4. Activity Codes: The Contractor shall define activity codes to facilitate review, analysis, and use of the Progress Schedule. The Contractor shall define and assign as applicable, activity codes to allow for filtering, grouping, and sorting of activities by Responsibility (party responsible for performing the work), Phase (phase in which the activity occurs), Feature of Work (major component of Work), Area (segment of the project in which the activity occurs), Location (specific location of the work), Work Type (type of operation), Crew (crew type and number of crews), and Contract Modification (approved or pending Work Order/Force Account). All activity codes shall be defined at the project level as project-specific codes. Use of global activity codes shall not be allowed and shall be grounds for rejecting the Progress Schedule submission.

5. Calendars: The Contractor shall define and assign, as applicable, an appropriate calendar to each activity to indicate when the activity can be performed. All calendars shall be defined at the project level as project-specific calendars. Project-specific calendars shall be exclusive to the project and shall bear a unique calendar name prefixed by the Contract ID number (e.g. C00012345B01_5-Day Workweek w/Holidays). Use of global calendars shall not be allowed and shall be grounds for rejecting the Progress Schedule submission. The project-specific calendars shall be defined as follows:
 - a) Define a standard working calendar for activities that will be performed during the Contractor's normal working schedule. The Contractor's standard working calendar shall indicate the standard working days per week and non-work days including, but are not limited to week-ends and holidays.
 - b) Define a 7-day project-specific calendar without holidays or other non-work days, as applicable, for activities that are not constrained by week-ends, holidays, weather or other non-work day restrictions or for activities that may be assigned 7-day calendar when the Contract specifies calendar day durations. Such activities may include Department review, procurement, and delivery activities; or curing, piling load test, or settlement or surcharge period activities, etc.
 - c) Define special project-specific calendars, as applicable, for weather sensitive activities or activities that are constrained by temperature, seasonal, or environmental restrictions that do not permit work during specific periods of the year or conditions. Such calendars may be based on the Contractor's standard working calendar, but modified to include the additional non-work periods.
 - d) Define other working calendars, as applicable, to indicate the standard working days per week and non-work days for sub-contractors, utilities, or other involved parties, if different from the Contractor's standard working calendar.

6. Level of Detail: The Contractor shall develop the Progress Schedule to an appropriate level of detail that allows for the formation of a reasonable critical path. The Work shall be sub-divided into easily definable and measurable tasks to allow for progress of on-going activities to be easily determined. The Work shall be sub-divided to such a level that the activity durations for on-site work (excluding fabrication and delivery of materials) are twenty (20) workdays or less, unless longer durations are approved by the Engineer. The Progress Schedule shall show as applicable, key milestones for significant project events, discrete work activities to indicate the type of operation and location of work, and other time-based tasks required for completion of the project. The Progress Schedule shall show as applicable:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a) Contract milestone activities including Bid Letting, Contract Award/Execution, Contract NTP, Contract Fixed Completion (finish milestone activity to indicate the completion of the project); and Contract interim milestone(s), as applicable, such as substantial completion, incentive/disincentive, etc.
- b) Other key milestones required for coordination of the Work and for monitoring progress of the project, such as: start and finish of a phase, stage, or feature of work, major traffic switches, major closures, delivery of major equipment or material, start/finish dates for work to be performed by the Department or other third parties, substantial completion, pre-final acceptance inspection, final acceptance, etc.
- c) Administrative activities such as preparation, review and approval of permits, shop drawing, or working drawing submittals.
- d) Procurement activities such as procurement, fabrication, and delivery of long lead materials such as sign structures, signs, lighting facilities, traffic signals, precast items, structural members, specialty items, etc.
- e) Construction start-up activities such as mobilization, staging area setup, construction survey, construction access, installation of erosion control systems, etc.
- f) Maintenance of Traffic (MOT) activities such as installation of temporary signs, traffic control setup, installation of detour and traffic switches.
- g) Roadway construction activities such as clearing and grubbing, install drainage structures, regular excavation, borrow excavation, embankment, grading, place subbase, place aggregate base, place asphalt concrete, place Portland cement concrete pavement, etc.
- h) Activities for incidental roadway construction work such as underdrains, curb and gutter, median barriers, guardrail and steel median barriers, sidewalk, retaining walls; sound barrier walls, etc.
- i) Activities for traffic control items such as sign structures, lighting structures, signal structures, traffic signals, traffic signs and delineators, pavement markings and markers, roadway lighting, etc.
- j) Activities for roadside development work such as seeding, sodding, landscaping, etc.
- k) Bridges and structures construction activities such as Drive Piles Pier 1, FRP Pier 1 Foundation, FRP Pier 1 Stem, Erect Girders Span A, FRP Abut A Wall, etc.
- l) Other applicable activities that are required for completion of the project such as:
 - i) Installation and removal of temporary systems or structures such as causeways, shoring, sheet piling, cofferdams, etc.;
 - ii) Utility notification and relocation;
 - iii) Pile load test;
 - iv) Sampling and testing periods;
 - v) Settlement or surcharge periods;
 - vi) Curing periods;
 - vii) Acceptance testing;
 - viii) Punch list and clean-up;
 - ix) Traffic control tear-down;
 - x) Demobilization and move-out.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor's failure to include any element of the Work in the Progress Schedule shall not relieve the Contractor from completing all work required in accordance with the Contract.

7. Activity Attributes: If Primavera (P6) or equivalent scheduling software with similar features is used to prepare the Progress Schedule, the Contractor shall define the following attributes for each activity in the Progress Schedule in accordance with the following:
 - a) Activity ID assignments shall be in increments of at least 10.
 - b) Activity Name shall be unique and recognizable and shall identify the type of operation and location of the work.
 - c) Activity Type shall be defined as "Task Dependent" when the duration of the activity is not dependent on the calendar of an assigned resource.
 - d) Activity Type shall be defined as "Start Milestone" or "Finish Milestone" for milestone activities.
 - e) Activity Type shall be defined as "Level of Effort" for activities whose durations are dependent on the start/finish dates of their predecessors and successors.
 - f) Activity Duration Type shall be defined as "Fixed Duration & Units".
 - g) Activity Percent Complete Type shall be defined as "Physical" if the remaining duration of the activity is dependent on the amount of time required to complete the remaining work rather than the activity progress percent complete. If the Activity Percent Complete Type is defined as "Physical", the Contractor shall update the remaining duration for each progressed activity to reflect the amount of time required to complete the remaining work as of the data date.
 - h) Activity Percent Complete Type shall be defined as "Duration" if the remaining duration of the activity is directly related to or dependent on the activity progress percent complete.
8. Activity Duration: Activity duration shall be reasonable to allow for an accurate determination of progress of ongoing activities between update periods. Activity durations shall be assigned as follows:
 - a) Activity durations shall be defined in number of workdays required to complete the work. Activity duration for activities that are assigned a 7-day calendar shall be defined in calendar days.
 - b) Activity durations for on-site work activities shall not exceed twenty (20) workdays or thirty (30) calendar days, unless approved by the Engineer. Activity durations in excess of twenty (20) workdays or thirty (30) calendar days will be allowed for the summary level activities in the Preliminary Progress Schedule; or for procurement activities such as submittal preparation, review, procurement, fabrication, and delivery of long lead materials; or for other non-procurement activities such as settlement or surcharge periods, concrete curing, etc.
 - c) Department activities for submittal review and/or approval shall have durations of thirty (30) calendar days, except as otherwise defined herein or elsewhere by specific Contract language.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- d) Activity durations for on-site work activities shall not include any intermittent period of inactivity of more than ten (10) working days. In such cases the activity shall be split to show discrete period(s) of work, unless approved by the Engineer.
9. Network Logic: The Progress Schedule shall show the order and inter-dependence of the activities and the sequence in which the Contractor proposes to accomplish the Work. The Contractor shall apply the Critical Path Method (CPM) of network calculation to generate the Progress Schedule. The project critical path shall be based on the longest network path through the project. The Progress Schedule network logic shall be developed in accordance with the following:
- a) The network logic shall be based on the Precedence Diagram Method (PDM).
 - b) Each activity except the first activity (Bid Letting) and last activity (Contract Fixed Completion) shall be logically constrained by a minimum of one predecessor and one successor activity.
 - c) Start-to-finish (SF) relationships shall not be used.
 - d) Start-to-start (SS) or finish-to-finish (FF) relationships with negative lags or positive lags in excess of ten (10) workdays shall not be used.
 - e) The network logic shall allow for the formation of a discrete network path for each Contract interim milestone.
10. Schedule Constraints: The Contractor's use of schedule constraints with the exception of the specific requirements listed below is discouraged and will be approved on a case-by-case basis by the Engineer. The use of schedule constraints such as "Start On" or "Finish On" for the purpose of manipulating float and the use of schedule constraints that violate network logic such as "Mandatory Start" or "Mandatory Finish" will not be allowed.
- a) The first activity (Bid Letting) will represent the start of the project and shall be constrained with a "Start On or After" (Early Start) date equal to the Bid Letting date.
 - b) All Contract interim completion milestone activities shall be constrained with a "Finish On or Before" (Late Finish) date equal to the Contract specified date. For Contracts that include an incentive/disincentive provision to finish earlier or no later than a Contract specified "must finish by" interim milestone date, the incentive/disincentive interim milestone activity shall be constrained with a "Finish On or Before" date equal to the later of either the Contractor's proposed early completion interim milestone date, if earlier than the Contract specified "must finish by" interim milestone date, or the Contract specified early completion interim milestone date for the maximum early completion incentive allowed in the Contract.
 - c) The last activity in the Progress Schedule (Complete Project) shall represent the completion of the project and shall be constrained with a "Finish On or Before" (Late Finish) date equal to the Contract Fixed Completion date.
 - d) When a schedule constraint is used, other than the schedule constraints specified herein, the Contractor shall define a notebook topic for schedule constraints and shall indicate in the activity notebook, the reason for using such constraint.
11. Data Date: The data date is defined herein, as the current status date of the Progress Schedule. All Progress Schedule submissions shall be calculated using an appropriate data date to indicate the status of the project at the time the Progress Schedule is submitted.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a) For the Preliminary, Baseline, or subsequent Revised Progress Schedule submission, the data date shall be the submittal date.
 - b) For the monthly Progress Schedule Update submissions the data date shall be the Contractor's monthly progress estimate date as defined in Section 109.08(a) of the Specifications.
12. Total Float: Total float is defined herein, as the number of workdays that an activity or a network of activities can be delayed without extending the completion date of either a related Contract interim milestone or the Contract, beyond the date specified in the Contract, as applicable. Except as specified herein, total float shall be calculated, as applicable, relative to a related Contract interim milestone date or the Contract fixed completion date specified in the Contract or a subsequent Work Order.

For Contracts that include a disincentive only provision for finishing later than a Contract specified "must finish by" interim milestone date, total float shall be calculated relative to the Contract specified "must finish by" date. For Contracts that include an early completion incentive/disincentive provision to finish earlier or no later than a Contract specified "must finish by" interim milestone date, total float shall be calculated relative to the later of either the Contractor's proposed early completion date or the Contract specified early completion date for the maximum early completion incentive allowed in the Contract. In which case, the Contractor shall declare in writing, at the time of submitting his/her Baseline Progress Schedule or as specified in the incentive/disincentive provision, his/her intended early completion date(s) for the applicable Contract interim milestone or Contract fixed completion, as reflected on the Baseline Progress Schedule.

With the exception of A+B based Contracts, any float available in the Progress Schedule, at any time, shall be considered project float and is not for the exclusive use or benefit of either the Department or the Contractor. It shall be understood by the Contractor and the Department that float is a shared commodity and either party has the right to full use of any available float. Until such time that all available float is depleted, the project float shall be used in the best interest of the project and in a manner that best serves the timely completion of the Work by either a specified Contract interim milestone or the Contract fixed completion date, as applicable.

For A+B based Contracts for which the Contractor bids the Contract time and/or Contract interim milestone(s), any float on a critical activity or activities on the critical path shall belong to the Contractor and any float on non-critical activities or activities not on the critical path shall belong to the project and shall be considered available for use by either the Department or the Contractor for the benefit of the project.

The Contractor shall not modify the Progress Schedule at any time for the purpose of manipulating float. Negative float conditions will not be allowed in the Preliminary, Baseline, or Revised Progress Schedule. Any request for a Contract time extension will be evaluated, in accordance with Section 108.04, based on available project float.

13. Resource Loading: The Contractor shall resource load each activity in the Progress Schedule that represents onsite work for which manpower, materials, and/or equipment will be utilized, unless otherwise exempted or approved in writing by the Engineer. The Progress Schedule shall be reasonably resource loaded to allow for an accurate determination of the manpower, materials, and/or equipment required to complete the activity. The Progress Schedule shall be resource loaded in accordance with the following:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- a) Contract-specific “Manpower” (labor) resource shall be defined and assigned to the applicable activities for each crew or individual craft labor classification required for prosecution of the work. If a labor resource is defined by crew, the Contractor shall list in the resource notes, by trade and number, each labor classification that make up the crew. If multiple shifts are necessary to perform certain activities, the Contractor shall designate the labor resources required for each shift. Each assigned labor resource shall uniquely identify the crew or individual craft labor by trade and number; as well as show the total work hours planned. The Resource ID shall uniquely identify the resource and shall be prefixed by the Contract ID number (e.g. C00012345B01.Crew1).
 - b) Contract-specific “Equipment” (non-labor) resources shall be defined and assigned to the applicable activities for each machinery or equipment needed to perform the work. Each assigned equipment resource shall uniquely identify the equipment by type, size, and number of pieces; as well as show the total work hours planned. The Resource ID shall uniquely identify the resource and must be prefixed by the Contract ID (e.g. C00012345B01.Crane1).
 - c) Contract-specific “Supplies” (material) resources shall be defined and assigned to the applicable activities for each material needed to perform the work. Each assigned material resource shall uniquely identify the type of material and unit of measure; as well as show the quantity planned. The Resource ID shall uniquely identify the resource and must be prefixed by the Contract ID (e.g. C00012345B01.Form1).
 - d) When defining a resource, the Contractor shall specify whether the resource is a labor, non-labor, or material resource.
 - e) The Contractor shall specify a maximum units/time for each resource to indicate the maximum amount of work that the resource can perform in a single work day on assigned activities. For labor and non-labor resources the maximum units/time shall be defined as hours/day (e.g. 8 hours/day). For material resources the maximum units/time shall be defined as quantity/day (e.g., 300 tons/day, 500 cy/day, etc.).
 - f) For activities whose duration are dependent on the calendar of an assigned resource (resource dependent activities), the Contractor shall define and assign a project-specific resource calendar for the resource to indicate availability of the resource.
14. Cost Loading: The Contractor shall cost load each activity in the Progress Schedule for which the Contractor expects to receive payment to allow for monitoring progress of the Work based on earnings. The Progress Schedule shall be reasonably cost loaded to allow for an accurate determination of progress of the Work based on earnings. The Progress Schedule shall be cost loaded in accordance with the following:
- a) Contract-specific material resources shall be defined and assigned to the applicable activities for each Contract line item as shown on the Contract Schedule of Items. The Resource ID shall be unique and shall be based on the associated Contract Line Item Number (CLIN) and prefixed by the Contract ID (e.g., C00012345B01.0010).
 - b) Quantities and costs shall be assigned to applicable activities to allow for an accurate determination of progress of the activity based on amount of work completed.
 - c) Activities shall be cost-loaded to allow for summarization of the budgeted quantity and budgeted costs by Resource ID. The aggregate sum of the budgeted quantity and budgeted costs for all activities to which the resource is assigned shall equal the total Contract amount for the associated CLIN as shown in the Contract Schedule of Items.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- d) The aggregate sum of the budgeted costs for all cost-loaded activities shall equal the Total Contract Value. Total Contract Value will be considered to mean the current Contract amount including the original Contract amount and any authorized adjustments for changes in the Work in accordance with, but are not limited to, the provisions of Sections 109.04 and 109.05 of the Specifications.
 - e) Anticipated payments for Material on Hand in accordance with Section 109.09 of the Specifications or for other adjustments such as asphalt, fuel, retainage, incentives, disincentives, etc., will not be considered in the Progress Schedule, unless specifically directed otherwise by the Engineer.
15. Progress Schedule Update: The Progress Schedule Update shall be based on the most recently accepted Progress Schedule and shall be prepared in accordance with the following:
- a) All activities that are completed prior to the current data date shall show actual start and finish dates. All on-going activities shall show the actual start date and remaining duration to indicate the amount of time required to complete the remaining work as of the current data date.
 - b) Activity percent complete for on-going activities shall be based on amount of work completed as of the current data date relative to the total amount of work planned. The actual cost of on-going activities shall equal the earned value cost, which shall be based on the activity percent complete.
 - c) Activity relationships for the remaining activities shall be modified as necessary to correct out-of-sequence progress for on-going and remaining activities to reflect the Contractor's current plan for completing the remaining work.
 - d) The Progress Schedule shall be calculated using the current data date.
- B. Progress Schedule Narrative** – As specified in Section II of this provision, a Baseline Progress Schedule Narrative shall be submitted with the Baseline Progress Schedule submission and a Progress Schedule Update Narrative shall be submitted with the Progress Schedule Update submission. The Progress Schedule Narrative shall be prepared in accordance with the following:
1. Baseline Progress Schedule Narrative: The Baseline Progress Schedule Narrative shall include the following written information:
- a) The Contractor's overall plan describing:
 - i) The proposed overall sequence of construction, including where the work will begin and how the work will progress;
 - ii) The general procedures for completing each feature of Work or major operation;
 - iii) The resource usage plan in terms of the proposed number and types of crews and major equipment; as well as a description of how the crews will be utilized throughout the project;
 - iv) Anticipated daily production rates for each major operation.
 - b) A description of the project critical path.
 - c) A description of any near critical float path(s) (secondary float paths with total float value within twenty (20) days of the critical path total float).

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- d) A listing of the major milestone dates, including as applicable, Contract interim milestone(s), major traffic switches, start/finish milestones for each phase or stage of work, or related work to be performed by the Department or other third parties.
 - e) A log identifying the schedule constraints used and explanation of the reasons why and the purpose for using each constraint.
 - f) A description of the proposed working calendar(s) to indicate the Calendar ID, number of work days per week, number of shifts per day, and number of hours per day as well as the anticipated number of non-working days per month for each calendar with considerations, as applicable, for holidays, normal weather conditions; as well as for seasonal or other known or specified constraints and restrictions (i.e. traffic, local events, environmental, permits, utility, etc.).
 - g) A log of the applicable DBE participation activities in the Progress Schedule for which the Contractor intends to claim credit for attaining the DBE goal required in the Contract. The list shall indicate the proposed start/finish dates and durations of the DBE participation activities.
 - h) A description of any known problems or anticipated issues that may impact the schedule; and any actions taken, proposed, or needed to correct the problems.
2. Progress Schedule Update Narrative: The Progress Schedule Update Narrative shall include the following written information:
- a) A description of the current status of the project in terms of the current actual percent complete by total earnings relative to the SOR planned percent complete; as well as the scheduled completion dates of the interim milestone(s) and project completion.
 - b) A description of any deviations from scheduled performance in terms of the scheduled completion dates of the interim milestone(s) and project completion since the previous schedule submission, including a statement explaining why any of the schedule milestone date(s) is forecast to occur after the specified date(s).
 - c) A description of the work performed since the previous Progress Schedule submission and any deviations from the work scheduled.
 - d) A description of any changes in the Contractor's work plan in terms of sequence of construction, shifts, manpower, equipment, or materials.
 - e) A description of any deviations in project critical path since the previous Progress Schedule submission.
 - f) A listing of adverse weather dates and number of days lost this period due to adverse weather or conditions resulting from adverse weather. List the activities affected and any impacts to the critical path.
 - g) A description of problems encountered or anticipated since the previous Progress Schedule submission, including an explanation of any corrective actions taken or required to be taken.
 - h) A description of work planned for the next update period and actions to be taken by the Department or other involved parties.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

C. Progress Earnings Schedule – The Progress Earnings Schedule shall be based on the cost-loaded Progress Schedule and shall consist of the following:

1. Activity Cost-loading Report (ACR): An Activity Cost-loading Report (ACR) to show a listing of the budgeted costs for each cost-loaded activity, an aggregate sum of the budgeted costs for each resource, and an overall summary of the budgeted costs for the project. The ACR shall be grouped by Resource ID and sorted by Activity ID and shall show for each activity the Activity ID, Activity Name, Price/Unit, Budgeted Unit (Quantity), Budgeted Cost, Actual Cost, Remaining Cost, and At Completion Cost.
2. Progress Earnings Schedule S-Curve: The Progress Earnings Schedule S-Curve shall depict the Contractor's monthly planned cumulative progress based on percentage of cumulative earnings to date relative to the total Contract value, as of the Contractor's progress estimate date. The Progress Earnings Schedule S-Curve shall be updated monthly to show the current actual monthly and cumulative earnings to date; as well as the projected monthly and cumulative remaining earnings for the remaining payment periods. The Progress Earnings Schedule S-Curve shall be submitted in an electronic format on the VDOT Form C-13CPM and shall be prepared based on the Progress Schedule and as follows:
 - a) The Progress Earnings Schedule S-Curve shall show a plot of the baseline, actual and projected percent complete progress curves.
 - b) The planned cumulative percent complete shall be based on the time-distributed monthly and cumulative budgeted costs (earnings) data generated from the Baseline Progress Schedule or a subsequent Revised Progress Schedule.
 - c) The actual percent complete for each payment period shall be based on the actual monthly and cumulative earnings (total earnings to date) for work completed to date as reflected on the Contractor's current progress payment estimate.
 - d) The projected cumulative percent complete for each remaining payment period shall be based on the projected time-distributed monthly and cumulative costs data generated from the current Progress Schedule Update for the remaining work.

V. REPORTING AND SUBMITTAL REQUIREMENTS FOR PROGRESS SCHEDULE SUBMISSIONS

Unless otherwise directed by the Engineer, the Contractor shall submit for each Progress Schedule submission the following submittal items. Each electronic file submittal shall have a unique file name prefixed by the Contract ID to identify the Contract, submission type and order of submission, and date of submittal (e.g. C00012345B01_B1_11-30-09.xer, C00012345B01_U1_12-31-09.xer, etc.). The Progress Schedule submittals shall include:

1. A transmittal letter to the Engineer, identifying the date of submittal and which Progress Schedule is being submitted for review.
2. Two (2) sets of data compact disks (CD) containing the electronic working file of the Progress Schedule in an "XER" file format. Each CD shall be labeled to indicate the Contract ID, type of submission, filename, and submittal date.
3. Two (2) sets of paper copies of the following schedule reports:
 - a) Schedule calculation log.
 - b) A legible time-scaled bar-chart plot of the Progress Schedule to show for each activity: the Activity ID, Activity Name, Original Duration, Remaining Duration, Start and Finish

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

dates, Activity Percent Complete, and Total Float. The bar-chart plot shall identify the project critical path (longest path).

- c) A legible network logic diagram plot of the Progress Schedule depicting the order, interdependence of activities, and sequence in which the work will be accomplished.
 - d) A tabular Predecessor/Successor report sorted in ascending order by Activity ID to show the following:
 - i) Activity ID;
 - ii) Activity Name;
 - iii) Original Duration;
 - iv) Remaining Duration;
 - v) Early Start;
 - vi) Early Finish;
 - vii) Late Start;
 - viii) Late Finish;
 - ix) Total Float;
 - x) Critical (Yes or No);
 - xi) Predecessors: Activity ID, Activity Name, Early Start, Early Finish, Relationship Type, Lag, Driving (Yes or No), Constraint, and Constraint Date;
 - xii) Successors: Activity ID, Activity Name, Early Start, Early Finish, Relationship Type, Lag, Driving (Yes or No), Constraint, and Constraint Date.
4. Electronic file copies by email of the following:
- a) A working file of the Progress Schedule in an "XER" file format.
 - b) Electronic "PDF" copy of the Progress Schedule Narrative.
 - c) Electronic "PDF" copy of the Progress Earnings Activity Cost-loading Report (ACR).
 - d) Electronic "PDF" copy of the Progress Earnings Schedule S-Curve.
 - e) A working file of the Progress Earnings Schedule (VDOT Form C-13CPM).

VI. FAILURE TO SUBMIT PROGRESS SCHEDULES

The Engineer will take necessary actions in accordance with the following for failure on the part of the Contractor to submit the required Progress Schedules:

- 1. Work shall not commence until after seven (7) calendar days from the date the Contractor submits his/her complete Preliminary Progress Schedule, unless otherwise approved in writing by the Engineer.
- 2. If the Contractor fails to submit his/her complete Baseline Progress Schedule within sixty (60) calendar days after the NTP date or as approved by the Engineer, the Engineer will delay approval for payment of the Contractor's monthly progress estimate until such time as the Contractor has satisfied the submittal requirements.
- 3. If the Progress Schedule submission is deemed unacceptable by the Engineer; and the Contractor fails to submit an acceptable Progress Schedule within fourteen (14) calendar days after the Engineer's request, the Engineer will delay approval for payment of the Contractor's monthly progress estimate until such time as the Contractor has satisfied the submittal requirements.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

4. If the Contractor fails to provide a Progress Schedule Update or if a Revised Progress Schedule is required as specified herein and the Contractor fails to provide such a Progress Schedule, the Engineer will delay approval for payment of the Contractor's monthly progress estimate until such time as the Contractor has satisfied the submittal requirements.
5. If the Contractor fails to provide an acceptable Final As-built Progress Schedule as specified, the Engineer will delay approval for payment of the Contractor's final progress estimate until such time as the Contractor has satisfied the submittal requirements.

Please note: Delays resulting from the Contractor's failure to provide the Progress Schedule in accordance with the requirements set forth herein will not be considered just cause for extension of the Contract time limit or for additional compensation.

VII. REVIEW AND ACCEPTANCE

The Engineer will review all Progress Schedule submissions within fourteen (14) calendar days of receipt of the Contractor's complete submittal. The Engineer's review for acceptance will not commence until all required submittal items and schedule information as defined herein are provided. Acceptance by the Engineer will be based on completeness and conformance with the requirements of the Contract.

If the Contractor's Progress Schedule submission is deemed to be acceptable, the Engineer will respond with a written notice of acceptance. The Engineer's response may include comments or concerns on the schedule or a request for clarification. When the Engineer's response include any comments, concerns, or request for clarification, the Contractor shall respond accordingly within seven (7) calendar days of receipt of the Engineer's response.

If the Contractor's Progress Schedule submission is deemed to be unacceptable, the Engineer will issue a written notification of non-conformance or incompleteness with a request for resubmission. The Engineer's response will include comments describing the deficiencies prompting the Engineer's decision. At the Engineer's discretion, the Contractor may be required to attend a schedule review meeting to discuss the issues or to facilitate review and acceptance of the Progress Schedule submission.

When the Progress Schedule submission is deemed to be unacceptable, the Contractor shall revise and re-submit the Progress Schedule submission accordingly, within seven (7) calendar days of receipt of the Engineer's response. Failure on the part of the Contractor to respond may adversely affect the Engineer's ability to completely evaluate the Contractor's schedule for acceptance.

Review and acceptance by the Engineer will not constitute a waiver of any Contract requirements and will in no way assign responsibilities of the work plan, scheduling assumptions, and validity of the schedule to the Department. Failure of the Contractor to include in the Progress Schedule any element of work required by the Contract for timely completion of the project will not excuse the Contractor from completing the Work within the Contract specified interim milestone(s) or the Contract time limit, as applicable.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIII.MONITORING THE WORK AND ASSESSING PROGRESS

- A. Three Week Look-Ahead (TWLA) Schedule Report** – At least seven (7) calendar days prior to beginning the Work, the Contractor shall submit three (3) copies of his/her initial detailed TWLA schedule report to the Engineer for any activities planned during the first three weeks. Every week thereafter, on a day agreed to by the Contractor and the Engineer, the Contractor shall attend a weekly schedule meeting to discuss the Contractor’s current detailed work plan for the following three-week period. The Contractor shall furnish, at the weekly schedule meeting, his TWLA schedule report and shall be prepared to discuss his current detailed work plan for the following three weeks. The TWLA schedule report may be prepared using the currently accepted Progress Schedule Update or in an electronic format approved by the Engineer. The Contractor shall notify the Engineer at least two (2) working days in advance of any changes in the Contractor’s planned operations or critical stage work requiring Department oversight or inspection. The TWLA schedule report shall show the following:
- a) Activity ID, Activity Name, Responsibility Code, Start Date, Finish Date, Original Duration, Remaining Duration, Activity Percent Complete, and Activity Status.
 - b) A one-week look-back schedule to show the actual start and/or finish date(s) for any activity that was started or completed during the previous week. If the TWLA schedule report was prepared using the Progress Schedule, the one-week look-back actual start/finish dates may be shown in a hand-written format.
 - c) A detailed schedule of activities for work in progress and any work planned during the following three-week period. Identify the type of operation, location of the work, proposed shift (if different from the standard working hours), and the planned start and/or finish dates for each operation.
 - d) Any work to be performed by the Department or other third parties.
 - e) Any critical stage(s) of work requiring VDOT oversight or inspection.
- B. Monitoring The Work** – The Engineer will monitor the Work regularly to identify any deviations from the Contractor’s scheduled performance relative to the SOR. The Contractor shall attend a monthly progress schedule meeting with the Engineer on a day agreed to by the Contractor and the Engineer, to discuss the Contractor’s progress and planned operations for the following sixty (60) calendar days. The Contractor shall furnish and shall be prepared to discuss his/her detailed 60-day look-ahead schedule at the progress meeting. The 60-day look-ahead schedule shall be based on the Contractor’s current monthly Progress Schedule Update.
- C. Progress Evaluation** – Progress will be evaluated by the Engineer at the time of the monthly progress estimate relative to the SOR. The Contractor’s actual progress will be considered unsatisfactory if any of the following conditions occurs:
- 1. The actual total earnings to date percentage for work completed, based on the Contractor’s progress payment estimate, falls behind the SOR planned cumulative late dates earnings percentage, or is more than ten (10) percentage points behind the SOR planned cumulative early dates earnings percentage, whichever occurs first.
 - 2. The calculated completion date of a Contract interim milestone is later than the specified completion date by more than twenty-one (21) calendar days.
 - 3. The calculated project completion date is later than the Contract fixed completion date by more than forty-five (45) calendar days.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- D. Progress Deficiency and Schedule Slippage** – When the Contractor’s actual progress is trending toward unsatisfactory status, the Engineer will request a meeting with the Contractor to specifically and substantially discuss reversing this trend and any actions taken or needed to be taken by the Contractor to recover satisfactory progress.

When the Contractor’s actual progress is deemed unsatisfactory as defined by any of the conditions listed under **Progress Evaluation** of this provision, the Engineer will issue a written notice of unsatisfactory performance to advise the Contractor that five (5) percent retainage of the monthly progress estimate is being withheld and will continue to be withheld as described in Section 109.08(c), for each month the Contractor’s actual progress is determined to be unsatisfactory. When the Contractor fails to respond with good faith efforts as described herein to restore satisfactory progress, the Engineer will issue a notice to indicate that he may recommend the Contractor be temporarily disqualified from bidding on Contracts with the Department as described in Section 102.08 of the Specifications, if progress remains unsatisfactory at the time of preparation of the next monthly progress estimate following the Engineer’s notice. Prior to recommendation for removal from the list of pre-qualified bidders, the Engineer will allow the Contractor fourteen (14) calendar days from the date of the unsatisfactory performance notice to respond. Such “good faith” efforts shall be provided in sufficient detail to allow the Engineer to fully evaluate the Contractor’s plans for recovery. As an example of good faith efforts, the Contractor may submit to the Engineer, a proposed recovery plan in the form of a Progress Schedule Update and a written statement to describe the Contractor’s proposed actions and timeframe to correct the progress deficiency or schedule slippage. The Contractor may also submit to the Engineer a written explanation and supporting documentation to establish that such delinquency was attributable to conditions beyond his/her control. Any schedule adjustments resulting from a recovery plan will be reviewed in accordance with Section VII, but the modified Progress Schedule Update shall not replace the current SOR.

When the Engineer determines the Contractor’s progress is again satisfactory the five (5) percent retainage previously withheld will be released to the Contractor in accordance with the provisions of Section 109.08 (c) of the Specifications.

If the Contractor is temporarily disqualified from bidding on Contracts with the Department, the Contractor will not be reinstated until either the Engineer deems that his/her progress has improved to the extent that the Work can be completed within the Contract time limit or the project has received final acceptance in accordance with the provisions of Section 108.09.

IX. MEASUREMENT AND PAYMENT

Required Progress Schedule submissions will be measured and paid for in accordance with the following:

- A. Basis of Payment** – Progress payments will be made in accordance with the following:

1. Progress payments for the Baseline Progress Schedule pay item will be made as follows:
 - a) A twenty-five (25) percent of the Contract bid item lump sum amount will be made upon acceptance of the Preliminary Progress Schedule submission.
 - b) A seventy-five (75) percent of the Contract bid item lump sum amount will be made upon acceptance of the Baseline Progress Schedule submission. When a Baseline Progress Schedule is provided in lieu of a Preliminary Progress Schedule, a payment of one hundred (100) percent of the Contract bid item lump sum amount will be made upon acceptance of the Baseline Progress Schedule submission.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- 2. Progress payments for the Progress Schedule Update pay item will be made as follows:
 - a) Progress payments of one each (1 EA) at the Contract bid item unit price will be made upon acceptance of the Progress Schedule Update submission.
 - b) A Revised Progress Schedule may be required in lieu of and paid for as a Progress Schedule Update, as determined by the Engineer. When a Revised Progress Schedule is required by the Engineer, in addition to a Progress Schedule Update, progress payments of one each (1 EA) at the Contract bid item unit price will be made under the pay item for Progress Schedule Updates upon acceptance of the Revised Progress Schedule submission.
 - c) Progress payments of one each (1 EA) at the Contract unit price will be made upon acceptance of the Final As-built Schedule submission.
 - 3. No separate measurement and payment will be made for attendance of the Scheduling Conference, progress meetings or other schedule related meetings. All costs associated with attendance of the scheduling meetings will be considered incidental.
 - 4. No separate measurement and payment will be made for providing a SIA. All costs associated with the preparation and submittal of the SIA will be considered incidental.
- B. Payment Items** – Payments for all associated costs to attend schedule meetings, prepare, update, revise, and/or furnish the Progress Schedule will be made under the following pay items:

Payment will be made under:

Pay Item	Pay Unit
Baseline Progress Schedule	Lump Sum
Progress Schedule Update	Each

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
FORMAL PARTNERING

July 16, 2009

I. DECLARATION AND DESCRIPTION

The Virginia Department of Transportation (VDOT) is firmly committed to the formation of a partnering relationship with the Contractor, all subcontractors, suppliers, FHWA representatives; where appropriate, other federal agencies, local government officials, utilities representatives, law enforcement and public safety officials, consultants, and other stakeholders to effectively and efficiently manage and complete each construction or maintenance contract to the mutual and individual benefits and goals of all parties. Partnering is an approach to fulfilling this commitment where all parties to the contract, as well as individuals and entities associated with or otherwise affected by the contract, willingly agree to dedicate themselves by working together as a team to fulfill and complete the construction or maintenance contract in cost effective ways while preserving the highest standards of safety and quality called for by the contract documents combined with the goals of on time/on budget completion. The approach must still allow for the fact that the members of the team share many common interests yet have differing authorities, interests, and objectives that must be accommodated for the project to be viewed as successful by all parties. It is recognized by VDOT that partnering is a relationship in which:

- Trust and open communications are encouraged and expected by all participants
- All parties move quickly to address and resolve issues at the lowest possible level by approaching problems from the perspectives and needs of all involved
- All parties have identified common goals and at the same time respect each other's individual goals and values
- Partners create an atmosphere conducive to cooperation and teamwork in finding better solutions to potential problems and issues at hand

II. PARTNERING STRUCTURE

It is the business intent of the Department that partnering will be required on all projects, either in the formal sense or informally where the spirit and principles of partnering are practiced from onsite field personnel to executive level owners and employees. The VDOT Field Guide to Partnering available on the VDOT website <http://www.virginiadot.org/business/resources/partnerfinalallowres.pdf> will be the standard reference guide utilized to structure and guide both types of partnering efforts. This guide will be systematically evaluated to incorporate better practices as our partnering efforts evolve. Of particular note is the need for effective and responsive communication between parties to the partnering relationship as emphasized by the Special Provision "Project Communication and Decision Making" found elsewhere in this contract. Targets for timely responses by the Department and the Contractor will be established through the partnering mechanism.

Partnering efforts shall be promoted by a professional facilitator trained in partnering principles. Partnering, and more specifically the Partnering Charter, will not change the legal relationship of the parties to the Contract nor relieve either party from any of the terms of the Contract.

III. PROCEDURES

The following specific procedures for partnering shall apply to this project. Participants shall consult the VDOT Field Guide for Partnering for assistance in developing specific guidelines to implement partnering.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Pre-Partnering Meeting

The Contractor's Project Manager or designee and the VDOT District Administrator or designee shall mutually schedule a Pre-Partnering meeting prior to the Partnering Workshop as soon as possible after the Department's award of the contract. During the Pre-Partnering meeting these individuals or their representatives shall develop objectives for the workshop, select a facilitator, decide on those individuals and entities associated with or affected by the Construction contract that should be invited to participate and extend appropriate notice in sufficient time to arrange attendance and meaningful participation. The selection of the facilitator must be mutually acceptable to both the Department and the Contractor.

Partnering Workshop

Generally, the Partnering Workshop will be scheduled after the pre-construction conference. Formal partnering efforts require that the Contractor employ a facilitator trained in the recognized principles of partnering to conduct the first preconstruction partnering workshop, known as the Formal Partnering Kick-Off Workshop. The facilitator will lead all parties through the Partnering Workshop agenda and the VDOT Field Guide to Partnering during the kick-off workshop. The extent of the partnering workshop and agenda will be predicated on project complexity, size, number of potential stakeholders, potential outstanding issues, and local needs, etc. The Formal Partnering Kick-Off Workshop will establish the specific frequency and general schedule for further Partnering meetings.

Partnering Meetings during Project Construction

During construction, partnering meetings will be scheduled quarterly. These meetings are anticipated to be ½ day sessions (4 hr). Each year, one of these meetings will be an all-day event (8 hr) in which a team-building style activity will take place. The specifics of the event will be agreed upon by the VDOT and Contractor's Project Managers. The Contractor and VDOT will require the attendance of their key decision makers, including subcontractors and suppliers. Both the Contractor and VDOT shall also encourage the attendance of affected utilities, concerned businesses, local government and civic leaders or officials, residents, and consultants, which may vary at different times during the life of the Contract. The Department and the Contractor are to agree upon partnering invitees in advance of each meeting. Follow-up partnering workshops may be held throughout the duration of the project as deemed necessary by the Contractor and the Engineer.

IV. MEASUREMENT AND PAYMENT

Formal Partnering (Kick-Off Workshop) will be measured per day and will be paid for at the contract unit price per day which price shall include providing the partnering facilities, professional facilitation, and other miscellaneous costs including copying fees and refreshments. Subsequent periodic partnering meetings are not considered a pay item, unless the Contractor and the Engineer mutually agree in advance it is appropriate to hold additional formally facilitated workshop(s), in which case the method of measurement and basis of payment will be the same as for the Formal Partnering (Kick-Off Workshop). The maximum daily value for this pay item shall not exceed \$15,000 unless otherwise specified.

Payment will be made under:

Pay Item	Pay Unit
Formal Partnering	Day

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
LIMITATION OF OPERATIONS

Project 7095-964-115
March 25, 2010

LIMITATION OF OPERATIONS

Lane Closures, Shoulder Closures, and Detours will not be permitted for the following events / holidays:

- New Years Day to include the day preceding and day following
- Easter Sunday to include the preceding Friday, Saturday, and following Monday
- Memorial Day to include the preceding Friday, Saturday, Sunday, and following Tuesday
- Independence Day to include the day preceding and day following
- Labor Day to include the preceding Friday, Saturday, Sunday, and following Tuesday
- Thanksgiving Day to include the preceding Wednesday and following Friday, Saturday, Sunday, and Monday
- Christmas Day to include the day preceding and day following
- Richmond International Raceway NASCAR/Indy Events to include Thursday, Friday, Saturday, Sunday, and Monday
- Governor's Inauguration Event to include the day preceding and day following

GENERAL CONDITIONS

The Contractor is hereby advised that construction activities on this project requiring temporary single-lane closures and/or multi-vehicle hauling operations on I-95 will not be permitted Monday through Friday from 6:00 a.m. to 8:30 a.m. and from 3:00 p.m. to 6:00 p.m. Temporary multi-lane closures will be restricted to nighttime operations between the hours of 8:00 p.m. and 6:00 a.m. weeknights, beginning 8:00 p.m. on Sunday evening and ending 6:00 a.m. Friday, except as otherwise permitted herein. The Contractor will be permitted to install a temporary two lane closure beginning at 8:00 p.m.

In addition to weekday nighttime lane or shoulder closures, weekend (Saturday and Sunday) nighttime closures may be allowed when approved in writing by the Engineer. Such request for approval will required a minimum 72-hour advance notice. Request for approval shall be submitted promptly after a pre-activity meeting has been held as described elsewhere in these special provisions.

Lane Closures shall be removed at the request of the Engineer or other jurisdictional authority (authorities) when required to expedite emergency operations.

When temporary lane or shoulder closures are in effect, active prosecution of work shall begin within one (1) hour after the lane or shoulder is closed. Any delay greater than one (1) hour with no work in progress will require the Contractor to remove the lane or shoulder closure. No additional request for a lane or shoulder closure will be authorized by the Engineer until the Contractor discusses with the Engineer the reason for failure to begin active prosecution of the work as required within the timeframe herein, and furnishes details to the Engineer to prevent such a reoccurrence.

Due to the impact of the complete ramp closures and subsequent detours on the traveling public, active prosecution of the work in these areas shall begin immediately once the closure time starts. The Contractor shall actively prosecute work until the ramp is returned to normal traffic flow.

All lane use times displayed in this document are subject to revision by the Engineer should field conditions warrant modifications to posted times referenced herein. The Contractor will be

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

responsible for all MOT activities required by temporary lane and shoulder closures and complete closure restrictions referenced above in accordance with the Special Provision for Section 512 Maintenance of Traffic included with this Contract.

During allowed CD Road and Ramp closures, the Contractor will have access to all areas within these work zones for the purposes of patching, placing pavement overlay, and prescribed concrete grinding operations. It is expected that some of the pavement patching operations be accomplished under prior lane and/or shoulder closure operations so that the complete closure will be reserved for maximizing pavement overlay operations and other associated non-paving activities that can be best performed while these areas are not under traffic. Subsequent shoulder work and guardrail activities may also be performed under shoulder closures, as to minimize the impact to the traveling public. The Contractor shall plan his operations during these periods of complete closure to continuously prosecute the work in this area by the use of continuous work shifts, multiple crews, extended work hours, backup or redundant equipment or similar efficient and effective methods to maximize paving operations and minimize time of impact to the public.

The Contractor will submit a plan and schedule of work to the Engineer detailing all activities associated with the complete closure periods prior to any work in this area being performed. This plan shall be in accordance with the current VWAPM and the current edition of the MUTCD, and the Traffic Management Plan with sufficient detail including but not limited to anticipated or planned dates for complete closure, crew types and size, equipment (both primary and backup), narrative of the work plan describing plan of operations for the closure period. This plan shall be submitted for the Engineer's review for a minimum of two (2) weeks. Once the plan is reviewed and accepted by the Engineer, the Contractor shall notify the Engineer a minimum of 21 days prior to the start date of any complete closure; Contractor will confirm the date of the complete closure 7 days prior to the actual date.

The Contractor shall advise the Engineer of planned temporary lane and/or shoulder closures a minimum of 24 hours in advance of closures. The Contractor shall schedule the sequence of construction for this contract so that traffic shall not be disrupted by lane or shoulder closures during the time periods described herein.

The Contractor shall provide the Engineer a minimum 48-hour notification of any (non-weather situation) cancellation of nighttime lane closures. This shall be 2 working days and by 2 PM. This will be required in order to get notice out to the media and traveling public. Failure to provide the notification within the 48-hour window will result in a penalty of \$5,000.00 to offset the administrative costs and reimbursement of the State Troopers. Weather-related cancellations shall be made no later than 4-6 hours prior to planned closure.

NIGHT WORK

In areas where work is to be performed during the hours of dusk or darkness, the Contractor shall furnish, place and maintain lighting facilities capable of providing light of sufficient intensity (five foot-candles minimum) to facilitate good workmanship and proper inspection at all times. The lights shall be arranged so as not to interfere with or impede traffic approaching the work site(s) from either direction or produce undue glare to property owners.

Lighting of work site(s) may be accomplished by the use of any combination of portable floodlights or standard equipment lights, etc. that will provide the proper illumination. Lighting integral to or attached to working mobile equipment such as rollers, pavers or the like shall not be considered sufficient for the purpose of this specification.

The Contractor shall continually review traffic control devices to ensure their proper installation and working order, including monitoring of lights used during low visibility and nighttime operations.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

DISINCENTIVES

In the event the Contractor fails to restore all lanes of traffic impacted by the Contractor's operations by the end of the permitted closure periods defined herein the Department will assess a disincentive in accordance with the following tables for each time minute increment or portion thereof that the Contractor fails to restore traffic on. If disincentives are assessed by the Engineer, they shall be deducted from the next monthly progress estimate. The Engineer is the sole authority in determining when disincentives will be assessed.

For the purposes of this contract, restoration of traffic shall mean the opening of all travel lanes to traffic including the completion of all construction work, the removal or relocation of all work zone traffic control devices and signs to their approved site as determined by the Engineer, and removal of all workers, materials and equipment from the roadway.

If the Contractor incurs the assessment of these disincentives for failure to restore traffic lanes, the Contractor will not be allowed further lane closures until the reasons for the assessment are evaluated and the Contractor can provide assurances to the Engineer that the causes have been corrected. *No monetary disincentive is applied from 6AM to 7AM, however if the contractor fails to restore all lanes of traffic by 6AM, the Engineer reserves the right to disallow further lane closures until the contractor meets with the District Construction Engineer and supplies adequate documentation/reasons as well as a corrective plan to ensure that the causes have been corrected. No consideration will be given to schedule impacts in this event.

The Engineer reserves the right to monitor traffic conditions impacted by the work and to make additional restrictions as may be necessary; i.e., terminate a lane closure early. Additional restrictions for other holidays or special local events may be necessary. The Engineer will endeavor to identify these well in advance so that the Contractor may adjust his operations accordingly.

If an approved shoulder closure is required to protect from hazards, no restrictions or disincentive will apply.

These disincentives are imposed, not as a penalty, but in order to minimize the impact of lane closures and construction operations on roadway users. The disincentive amount is based on daily road user costs, which are defined as representing the average daily cost of interference and inconvenience to the road user.

The Contractor waives any defense as to the validity of any disincentives stated in the Contract, the Contract Documents, or these Specifications and assessed by the Department against the Contractor on the grounds that such disincentives are void as penalties or are not reasonably related to actual damages.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Disincentive Table:

<u>Failure to Restore All Traffic Lanes By</u>	<u>Amount</u>	<u>Cumulative Amount</u>
6:00 a.m.	\$0	\$0*
6:15	\$0	\$0*
6:30	\$0	\$0*
6:45	\$0	\$0*
7:00 a.m.	\$2,000	\$2,000
7:15	\$2,000	\$4,000
7:30	\$2,000	\$6,000
7:45	\$2,000	\$8,000
8:00 a.m.	\$5,000	\$13,000
8:15	\$5,000	\$18,000
8:30	\$5,000	\$23,000
8:45	\$5,000	\$28,000
9:00 a.m.	\$3,000	\$31,000
9:15	\$3,000	\$34,000
9:30	\$3,000	\$37,000
9:45	\$3,000	\$40,000
10:00 a.m.	\$1,000	\$41,000
10:15	\$1,000	\$42,000
10:30	\$1,000	\$43,000
10:45	\$1,000	\$44,000
11:00 a.m.	\$100	\$44,100
11:15	\$100	\$44,200
11:30	\$100	\$44,300
11:45	\$100	\$44,400
12:00 Noon	\$0	\$44,400
12:15	\$0	\$44,400
12:30	\$0	\$44,400
12:45	\$0	\$44,400
1:00 p.m.	\$0	\$44,400
1:15	\$0	\$44,400
1:30	\$0	\$44,400
1:45	\$0	\$44,400
2:00 p.m.	\$100	\$44,500
2:15	\$100	\$44,600
2:30	\$100	\$44,700
2:45	\$100	\$44,800
3:00 p.m.	\$1,000	\$45,800
3:15	\$1,000	\$46,800
3:30	\$1,000	\$47,800
3:45	\$1,000	\$48,800
4:00 p.m.	\$5,000	\$53,800
4:15	\$5,000	\$58,800
4:30	\$5,000	\$63,800
4:45	\$5,000	\$68,800
5:00 p.m.	\$9,500	\$78,300
5:15	\$9,500	\$87,800
5:30	\$9,500	\$97,300
5:45	\$9,500	\$106,800
6:00 p.m.	\$20,000	\$126,800
6:15	\$20,000	\$146,800
6:30	\$20,000	\$166,800
6:45	\$20,000	\$186,800

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

<u>Failure to Restore All Traffic Lanes By</u>	<u>Amount</u>	<u>Cumulative Amount</u>
7:00 p.m.	\$1,500	\$188,300
7:15	\$1,500	\$189,800
7:30	\$1,500	\$191,300
7:45	\$1,500	\$192,800
8:00 p.m.	\$0	\$192,800

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
“NO EXCUSES” INCENTIVE/ DISINCENTIVE

March 29, 2010

The Department will pay the Contractor a “no excuses” incentive in the amount of \$3,000,000 if the work under the Contract is completed on or before June 27, 2014. For the purposes of this provision, completion shall be defined as all work on the I-95 mainline completed with full restoration of traffic lanes and no additional lane closures on the I-95 mainline will be required for the remainder of the Contract for any reason. Further, in the event that the Contractor does not satisfactorily complete the work on or before October 24, 2014, the Department will assess a disincentive in the amount of \$25,000 a day for each calendar day including Sundays and holidays that the work is not completed and accepted beyond October 24, 2014. This disincentive will be assessed in addition to any liquidated damages the Department may determine are applicable in accordance with the requirements of Section 108.06 of the Specifications.

The Engineer will be the sole approving authority in determining completion. The “no excuses” incentive completion date will not be adjusted for any reason, cause or circumstances whatsoever, unless directed by the Engineer as per section 108.04 of the 2007 Road & Bridge Specifications. In which case, the Engineer will be the sole approving authority in determining if the “no excuses” incentive completion date will be adjusted. In the event that the Engineer approves adjustments to the completion dates, a work order will be generated to clearly identify the date changes and the application of incentive/disincentive with regard to the new date(s).

The parties anticipate that delays may be caused by or arise from any number of events during the course of this Contract including, but not limited to: work performed, work deleted, work orders, supplemental agreements, force accounts, delays, disruptions, differing site conditions, utility conflicts, design changes or defects, time extension, extra work, overruns, nearby or adjacent projects, right of way issues, permitting issues, actions of suppliers, subcontractors or other contractors, actions of third parties and actions of CSXT and their agents, shop drawing approval, process delays, expansion of the physical limits of the project, weather, weekends, holidays, suspension of contract time, extended or absorbed home office or job site overhead, lump sum maintenance of traffic adjustments lost profits, prime mark-up impacts, conditions, circumstances, or potential damages on or pertaining to or as arising out of the Contract, or other events, forces, or factors sometimes experienced in highway and bridge construction work. Further, all costs or impacts incurred by the Contractor (not previously identified and covered by work order, overrun, or Force Account) shall be the sole responsibility of the Contractor if the Contractor chooses to accept the *no excuse* incentive.

The Contractor shall, in order to receive the “no excuses” incentive:

1. Complete all work on I-95 mainline and obtain Department concurrence in writing of such.
2. Notify the Department in writing no later than 30 days of completion of all work on the I-95 mainline that the Contractor elects to be paid the “no excuses” incentive, for which he is eligible to be paid, based on achieving the actual completion date. The Contractor will be required to sign a form supplied by the Department which shall include a statement by the Contractor that all work on the I-95 mainline under the contract has been completed as defined in this special provision and shall include a full and complete release and acknowledgement of satisfaction by the Contractor of any and all claims, causes, actions, issues, demands, disputed, and matters of controversy of any nature or kind whatsoever for all work performed from commencement of the contract until the Department’s concurrence of completion of all work on the I-95 mainline. This release and acknowledgement of satisfaction shall be all-inclusive and absolute, except any routine Department final estimating quantity adjustments.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Should the Contractor fail to complete the I-95 mainline work in the Contract as shown elsewhere in this provision or should the Contractor, having done so, fail to request the “no excuse” incentive for any reason, including but not limited to the Contractor choosing not to fully release and acknowledge satisfaction as set forth herein, the Contractor shall have no rights to any incentive payment whatsoever under this article.

If the Contractor elects to exercise the “no excuses” incentive payment provision, should this provision conflict with any other provision in the Contract; the Contract shall be interpreted in accordance with the provisions herein.

These disincentives are imposed, not as a penalty, but in order to minimize the impact of lane closures and construction operations on roadway users. The disincentive amount is based on daily road user costs, which are defined as representing the average daily cost of interference and inconvenience to the road user.

The Contractor waives any defense as to the validity of any disincentives stated in the Contract, the Contract Documents, or these Specifications and assessed by the Department against the Contractor on the grounds that such disincentives are void as penalties or are not reasonably related to actual damages.



U.S. Army Corps
Of Engineers
Norfolk District

**CERTIFICATE OF COMPLIANCE
WITH
ARMY CORPS OF ENGINEERS PERMIT**

Permit Number: 09-4007-15 (Corps # 2009-00100)

VDOT Project Number: 7095-964-115, B601, B602, B603, B693, B694

Name of Permittee: Virginia Department of Transportation

Date of Issuance: January 12, 2009

Permit Type: Nationwide Permit #3

Within 30 days of completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

Alice Allen-Grimes
c/o Regulatory Branch
Norfolk District Corps of Engineers
803 Front Street
Norfolk, Va. 23510-1096

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation has been completed in accordance with the permit conditions.

Signature of Permittee

Date

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
NATIONWIDE PERMIT 3 - MAINTENANCE

TO DISCHARGE DREDGE OR FILL MATERIAL IN WATERS OF THE UNITED STATES PURSUANT
TO SECTION 404 OF CLEAN WATER ACT
CONDITIONS AND LIMITATIONS ISSUED TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION

Date: March 11, 2009
Project: 7095-964-115, B601, B602, B603, B692,
B693, B694, B695, B696, B697, B698, B699,
BRDGS, C502, P101, R202
Permit#: 09-4007-15

Permitted activity: to replace the superstructure and rehabilitate the substructure of the north and southbound bridges (structure #2002) of I-95 over Upham Brook in Henrico County, VA. This project also entails placing temporary scaffolding in Upham Brook. When possible, the scaffolding will be suspended from the bridge. No cofferdams or causeways will be placed in the stream. This project results in no excavation, no permanent fill and 4.0 cubic yards of temporary fill below OHW. There are no wetland impacts associated with this project.

Applicable Crossing(s): Bridge over Upham Brook

The following conditions apply to this project only:

1. Precautions will be taken to prevent any material from entering the waterway during construction. (Crossing Name: Bridge over Upham Brook)
2. In-stream activities will be conducted during low-flow conditions, using non-erodible cofferdams to isolate the construction area, blocking no more than 50% of the stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas, and implementing strict erosion and sediment control measures throughout the project period as described in the Virginia Erosion and Sediment Control Handbook, 1992, Virginia Department of Conservation and Recreation. (Crossing Name: Bridge over Upham Brook)
3. Erosion and sediment control measures will be strictly implemented and adhered to during the lifespan of the project, including the project-specific erosion and sediment control plan. (Crossing Name: Bridge over Upham Brook)

The following conditions are applicable to this project *unless otherwise noted above in the conditions applicable to this project only:*

1. This project will be constructed in accordance with the contract documents and is subject to the provisions cited in the above regulations.
2. A permit may be either modified, suspended, or revoked by the permitting agency upon violation of any of the terms or conditions of the permit, or if the permitting agency determines such actions will otherwise be in the public interest.
3. The Contractor shall be responsible for designing and supplying to VDOT's District Environmental Manager all sketches and notes necessary to acquire any permit modification required for changes in the proposed construction methods. The District Environmental Manager will obtain the necessary permit modifications.
4. VDOT and its Contractor shall permit representatives of state and federal environmental regulatory agencies to make periodic inspections at any time in order to insure that the activity being performed under authority of the permit(s) is in accordance with the terms and conditions prescribed herein.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

5. All work shall be done in such a manner as to minimize sedimentation/siltation of state waters in accordance with Virginia Erosion and Sedimentation Regulations (VR 625-02-00). Appropriate erosion and sedimentation controls and practices shall be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark, must be permanently stabilized at the earliest practicable date, in accordance with the requirements of Section 107.16 (a).
6. All dredged or excavated materials must be deposited and retained in an upland area.
7. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary work structures, work and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of the construction site.
8. Temporary fills must consist of materials and be placed in a manner that will not be eroded by expected high flows.
9. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
10. If unknown historic or archeological remains are discovered during construction, the Contractor shall immediately notify VDOT's District Environmental Manager.
11. No activity may cause more than minimal adverse effects on navigation. Any safety lights and signals prescribed by the U.S. Coast Guard must be installed and maintained.
12. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody including those species that normally migrate through the area unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
13. No discharge of dredged or fill material may consist of unsuitable material, and material must be free of toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
14. No discharge of dredged or fill material may occur in the proximity of a public water supply intake except where the discharge is for adjacent bank stabilization.
15. Heavy equipment working in wetlands or mudflats must be placed on mats or other approved structures to minimize soil disturbance.
16. To the maximum extent practicable, the pre-construction course, condition, capacity and location of open waters must be maintained for each activity, unless the alteration benefits the aquatic environment. The activity must be constructed to withstand expected high flows and must not restrict or impede the passage of normal or high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).
17. If the discharge creates an impoundment of water, adverse effects on the aquatic system caused by accelerated water passage and/or the restriction of its flow must be minimized to the maximum extent practicable.
18. Pipes and culverts placed in streams will be countersunk at both the inlet and outlet ends. Pipes that are 24 inches or less in diameter shall be countersunk 3 inches below the natural stream bottom and pipes that are greater than 24 inches in diameter shall be countersunk 6 inches below the natural stream bottom. All single pipes or culverts with bottoms shall be depressed (countersunk) below the natural streambed at both the inlet and outlet of the structure. In sets of multiple pipes or culverts with bottoms at least one pipe or culvert shall be depressed (countersunk) at both the inlet and outlet to convey low flows.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

19. If bedrock is encountered during pipe or culvert placement that prevents the required countersinking, the Contractor must stop work until VDOT's District Environmental Manager acquires any necessary permit modifications.
20. Blasting of stream bottoms through the use of explosives is not acceptable as a means of providing for countersinking of pipes on bedrock.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
VIRGINIA MARINE RESOURCES COMMISSION'S
VIRGINIA GENERAL PERMIT (VGP)
FOR PROJECTS UNDERTAKEN IN, ON, OR OVER STATE-OWNED SUBAQUEOUS LANDS
(WATERWAYS AND TIDAL WETLANDS) WITHIN THE COMMONWEALTH
CONDITIONS AND LIMITATIONS ISSUED TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION

Permit #: 09-4007-15
Project: 7095-964-115, B601, B602, B603, B692,
B693, B694, B695, B696, B697, B698, B699,
BRDGS, C502, P101, R202
Date: March 11, 2009

Permitted Activity: to replace the superstructure and rehabilitate the substructure of the north and southbound bridges (structure #2002) of I-95 over Upham Brook in Henrico County, VA. This project also entails placing temporary scaffolding in Upham Brook. When possible, the scaffolding will be suspended from the bridge. No cofferdams or causeways will be placed in the stream. This project results in no excavation, no permanent fill and 4.0 cubic yards of temporary fill below OHW. There are no wetland impacts associated with this project.

Applicable Crossing(s): Bridge over Upham Brook

The following conditions apply to this project only:

1. Precautions will be taken to prevent any material from entering the waterway during construction. (Crossing Name: Bridge over Upham Brook)
2. In-stream activities will be conducted during low-flow conditions, using non-erodible cofferdams to isolate the construction area, blocking no more than 50% of the stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas, and implementing strict erosion and sediment control measures throughout the project period as described in the Virginia Erosion and Sediment Control Handbook, 1992, Virginia Department of Conservation and Recreation. (Crossing Name: Bridge over Upham Brook)
3. Erosion and sediment control measures will be strictly implemented and adhered to during the lifespan of the project, including the project-specific erosion and sediment control plan. (Crossing Name: Bridge over Upham Brook)

The following conditions are applicable to this project *unless otherwise noted above in the conditions applicable to this project only:*

1. Any proposed deviation to work authorized in Upham Brook must be formally re-coordinated and approved by the Virginia Marine Resources Commission (VMRC) prior to undertaking the work. The Contractor shall be responsible for designing and supplying all sketches and notes necessary to acquire any permit modification required for changes in the proposed construction methods. VDOT's District Environmental Manager will be responsible for filing any necessary permit modifications.
2. This permit may be revoked at any time by the VMRC upon failure of the contractor to comply with any of the terms and conditions of this permit or at the will of the General Assembly of Virginia.
3. The duly authorized agents to the commission shall have the right to enter upon the premises at reasonable times for the purpose of inspecting the work being done pursuant to this permit.
4. The Contractor shall immediately notify VDOT's District Environmental Manager if unknown historic or archeological remains are discovered during construction.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

5. The sale of material removed from state-owned bottoms is specifically prohibited without the approval of the VMRC.
6. The Contractor shall comply with the water quality standards as established by the Virginia Department of Environmental Quality and all other applicable laws, ordinances, rules, and regulations affecting the conduct of the project. The granting of this permit shall not relieve the contractor of the responsibility of obtaining any and all other permits or required authorizations for this project.
7. This permit shall not affect or interfere with the right vouchsafed to the people of Virginia concerning fishing, fowling and the catching of and taking of oysters and other shellfish in and from the bottom of areas and waters not included within the terms of this permit.
8. This permit shall to the extent practicable minimize the adverse effects of the project upon adjacent properties, tidal wetlands, and upon the natural resources of the Commonwealth.
9. This permit is subject to any lease of oyster planting ground in effect on the date of this permit. Nothing in this permit shall be construed as allowing the contractor to encroach on any lease without the consent of the leaseholder. The contractor shall be liable for any damages to such lease.
10. The issuance of this permit does not confer upon the Contractor any interest or title to beds of the waters.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
ESCROW OF BID PREPARATION DOCUMENTS

March 19, 2008

SECTION 103 AWARD AND EXECUTION OF CONTRACTS of the Specifications is amended to include the following:

DESCRIPTION - The purpose of this special provision is to preserve the Contractor's bid preparation documents for use by the Department in the evaluation of any notice of intent to file a claim, written claim, or litigation which alleges alterations from bidding conditions that may originate from or arise out of the Contract or its performance.

The apparent low bidder shall submit to the Department, within 7 calendar days after notification from the Contract Engineer, a legible copy of all bid documentation used to prepare the bid for this Contract. At the time of notification, the Contract Engineer will designate the time and place for submitting the bid preparation documentation. The documentation will be placed in escrow with a banking institution or other bonded document storage facility approved by the Department and preserved by that facility as specified elsewhere in this special provision.

DESCRIPTION OF BID PREPARATION DOCUMENTS - The Contractor shall submit all documents used in the preparation of the bid, including, but not limited to: all writings, computer printouts, charts, schedules and all other data compilations which contain or reflect information, data and calculations, Contractor equipment rates, Contractor overhead rates, labor rates, efficiency or productivity factors, arithmetic extensions, quotations and correspondence from subcontractors and material suppliers, to the extent that such rates, correspondence and quotations were used by the Contractor in formulating and determining the amount of the bid used by the Contractor in bidding for this project. This term also includes any manuals, which are standard to the industry, used by the Contractor in determining the bid for this project and may be included in the bid documentation by reference and shall include the name and date of the publication and publisher. The term does not include bid documents provided by the Department for use by the Contractor in bidding on this project.

The subcontractors and material suppliers may, in conjunction with the prime Contractor, submit their documentation within the aforementioned timeframe. The subcontractors' and material suppliers' bid preparation documents may each be kept separate from the prime Contractors' documentation by means of a separate sealed container in order to protect their confidentiality.

CERTIFICATION - The document container shall be accompanied by an index listing all documents in the container, including author, date, nature and subject matter, and a certification, signed by the Contractor.

Subcontractors and material suppliers who have submitted separate, sealed documentation shall have an index and certification signed by the subcontractor or material supplier.

The certification shall state that the material in the escrow documents container contains all the bid preparation documents used in the preparation of the bid, and that all documentation is complete and legible.

SUBMITTAL OF BID PREPARATION DOCUMENTS - Upon receipt of bid preparation documentation, the Department will immediately review the documents for completeness. Where concerns exist as to the completeness of the Contractor's submittal, the Department may request additional information from the Contractor to determine how the bid was prepared.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Once the Contractor has submitted all requested information the Contract Engineer and the low bidder's representative will then meet at a mutually agreeable time to verify the completeness and legibility of the bid preparation documents, after which the documents will be resealed jointly by the Contract Engineer and the low bidder's representative. Subcontractors and material suppliers who have submitted separate, sealed documentation may accompany the bidder and be present to verify completeness and legibility of their bid proposal documents. The documents will be kept under lock and key under the Contract Engineer's direct control for safe keeping while in the Department's possession during the verification process.

After verification, the low bid will be recommended to the Commonwealth Transportation Board for award.

After execution and award of the Contract, the Contractor, accompanied by the Contract Engineer or his representative, shall place the sealed container, containing the bid preparation documents, in the custody of an approved escrow agent or approved banking institution, which will be paid for by the Contractor.

FAILURE OR REFUSAL TO PROVIDE BID DOCUMENTATION - Failure or refusal to provide complete bid preparation documents and the certification required by this Special Provision shall result in the proposal being declared non-responsive and the proposal will not be considered.

This remedy is not exclusive and the Department may take such actions as are available under the law.

USE AND RELEASE OF DOCUMENTS - Notification of the Contractor's intent to file claim, or the filing of a claim or initiation of litigation by the Contractor, which allege alterations from bidding conditions, will be sufficient grounds for the Department to obtain the release and custody of the bid documentation and to review, copy, inspect or otherwise use such documents in any intent to file claim analysis, claim hearing or legal action.

In the absence of such action, and after the expiration of the 60 days for filing a claim as specified in §33.1-386 A of the Code of Virginia, the Contractor may submit a written statement that there are no claims and request the return of the escrow documents. The Department will then notify the escrow agent to release the sealed container to the Contractor, appropriate subcontractors, and appropriate material suppliers.

In the event the documents have been opened and used, the Attorney General will determine when the documents will be released to the custody of the Contractor. This will be determined after all litigation and appeals granted under the state statutes have been exhausted.

In accordance with the Contractor's certification that the sealed container placed in escrow contains all of the materials relied upon in preparing the bid, the Contractor agrees to waive the right to use any bid preparation documents or other purported bid information other than those placed in escrow, in claims, litigation or disputes originating from or arising out of the Contract or the performance of the Contract.

PROTECTION AND OWNERSHIP OR DOCUMENTS - The bid preparation documents and certifications are, and will remain the property of the Contractor. The parties acknowledge that this information is considered to be confidential and proprietary, and constitute trade secrets of the Contractor. The Contractor shall designate such materials as trade secrets and /or proprietary information as provided in Code of Virginia §2.2-4342F. In the event the Department takes custody of such documents in accordance with the terms of this special provision, the Department agrees (1) that it will not disclose or transmit such information to anyone other than VDOT officials who are involved in the review or litigation of any contract dispute, notice of intent to file claim or claim, any consultants retained by the Department, attorneys utilized by the Department, or the Court hearing any aspect of the case; (2) at the conclusion of any claim or litigation, return all such documents to the Contractor. The Department will provide written notification to the Contractor prior to invoking the use and release procedures of this special provision and opening any of the escrowed documents.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

It is the intent of this special provision that the escrowed bid preparation documents and certification is considered exempt from disclosure to the maximum extent allowed by Code of Virginia §2.2-4342F or other applicable statute. In the event a request for such documents is made pursuant to the Freedom of Information Act, the Contractor shall be notified in writing prior to any determination by the Department concerning their release. In the event of disclosure to any Court pursuant to this special provision, the Department will not object to the issuance of a protective order by the Court to limit public disclosure of such information.

ESCROW INSTRUCTIONS - The Department will provide escrow instructions and appropriate forms to the banking institution or other bonded document storage facility consistent with this Specification.

COST OF ESCROW - The Contractor will bear the costs of the bonded warehouse; however, there will be no separate payment for compilation of the data, escrow container, cost of verification, or storage of bid documents, but the cost thereof shall be included in other appropriate items.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
MAGNESIUM PHOSPHATE Mg NH(4) PO(4) CONCRETE WORK

March 10, 2010

I. DESCRIPTION

This work shall include furnishing, mixing, and placing magnesium phosphate concrete for longitudinal closure pours between preconstructed composite units, filling anchorage blockouts, transverse closure pours at span continuity joints, and transverse pours at the tops of abutment backwalls all in accordance with the plans, the specifications, and these Special Provisions.

As noted hereinafter, certain ingredients in magnesium phosphate concrete require special handling and protective measures. The Contractor shall conduct all operations in strict accordance with the procedures recommended by the manufacturer of the magnesium phosphate concrete systems and their components.

II. MATERIALS

The magnesium phosphate systems for this project shall all be the product of one manufacturer who shall develop sufficient systems to provide for all applications described in these Special Provisions and shown on the plans. The Contractor shall submit the name of the manufacturer and adequate technical data to describe the several systems, their properties, and limitations. The Contractor shall also furnish sufficient material of each system for testing by the Department. The Engineer's approval of each system will require satisfactory conformity with the test values specified herein and agreement with the technical data submitted. In the event any magnesium phosphate system(s) presented for testing does (do) not meet the Specifications, all expenses required to test new or modified material(s) shall be borne by the Contractor.

The Department approved magnesium phosphate systems shall be prepackaged into components, including packaging of aggregates, for shipment and mixing at the job site. Packages shall identified for the specific application (i.e., closure pours, anchorage blockouts, etc.).

Magnesium Phosphate Mortars: The mortars shall be a two-component system consisting of a max of 1/2 gal of water per bag of mortar product (8.3% by weight) and a dry prepackaged magnesium phosphate cement and fine aggregate not to exceed 1/16 inch in diameter. Proportioning and mixing shall be in accordance with the manufacturer's recommendation. Only the retarded version shall be used.

Aggregate for Magnesium Phosphate Concrete: The prepackaged coarse aggregate added to the magnesium phosphate mortar mix in the field shall be clean, hard, dry, and nonporous uncrushed washed gravel added at 30 to 60 % by weight of mortar. Aggregate shall be conform to Section 203, and the following gradations:

(a) For blockouts and continuity detail (ASTM C33 No. 8 stone):

U.S. Sieve Sizes	Percent Passing (By Weight)
1/2-inch	100
3/8-inch	85 – 100
# 4	10 – 30
# 8	0 – 10
# 10	0

(b) At longitudinal closure pours and tops of abutment backwalls (ASTM C33 No. 57 stone):

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

U.S. Sieve Sizes	Percent Passing (By Weight)
1 ½-inch	100
1-inch	95 – 100
1/2-inch	25 – 60
# 4	0 – 10
# 8	0 – 5
# 10	0

The magnesium phosphate mortar and concrete mixtures shall conform to the following physical properties and applicable test methods:

Test	Methods	Specifications
Compressive Strength @ 2 hr.	ASTM C109 air cured	4,000 psi
Compressive Strength @ 28 days	ASTM C109 air cured	6,000 psi
Shrinkage, Linear	ASTM C157	Maximum of 0.02 per cent

The ambient and/or substrate temperature range during application shall be from 45 degrees F to 100 degrees F, and setting time is critical to the construction operations. The mortar and concrete mixtures shall be tested for compressive strength at 2 hours after casting at the lowest temperature proposed for the work. The molds shall be at the lowest temperature proposed and the samples shall be stored at that temperature for 2 hours, at which time they shall be tested without delay. The average strength of a minimum of three cubes tested shall exceed 4,000 psi. This test shall be repeated by the manufacturer for each production run prior to shipment and the results certified to the Engineer. This test will also be performed periodically by the Engineer on material stored at the site, particularly on materials stored over an extended period or subjected to adverse temperatures or moisture conditions.

The working time and pot life of the mixed mortars and concretes shall be adequate to permit placement, compacting and finishing by the methods to be utilized by the Contractor for the several applications on the Project and the workability of the mixtures shall be consistent throughout the ambient and substrate temperatures when these materials will be used.

III. CONSTRUCTION

The Contractor shall provide all field testing instruments and equipment necessary to prepare the required specimens and perform the tests in conformity with these Special Provisions.

The magnesium phosphate concrete placement conditions shall be as recommended by the manufacturer. Minimum and maximum temperatures, as specified by the manufacturer, must be strictly adhered to throughout the placement and curing period.

The Contractor shall have the magnesium phosphate concrete manufacturer's applications engineer present on the site when magnesium phosphate concrete work begins so he may assist the Contractor and the Engineer in connection with these operations. He shall remain on the site until the Engineer is satisfied that the Contractor is familiar with the use of the magnesium phosphate mixtures as demonstrated by consistently satisfactory usage and placement. He shall be made available at such other times as necessary to provide advice regarding changed conditions or problems. All costs of having the application, the Engineer on site shall be included in the unit price for magnesium phosphate mortar and concrete.

Magnesium phosphate mortar and concrete furnished for placement shall be periodically tested at the job site for conformance with the physical properties demonstrated for acceptance of the system. During each pour, the contractor will prepare at least (three) 4-in cubes for compressive breaks to

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

verify the quality of the magnesium phosphate mixtures and to give an indication of strength for other operations. The Department will oversee the contractor preparing the samples. Opening to Traffic: During each pour at least three (3) 4-in cubes shall be prepared for compressive breaks to verify the quality of the magnesium phosphate mixtures and to give an indication of strength for other operations. Cubes are to be field-cured in the same conditions as the application. The average of the break tests shall exceed 4,000 psi at 2 hour with storage at the ambient temperature of the structure where the pour was made. Acceptance: Three (3) 4-in cubes shall be cast by the Department every 100cy for acceptance. These cubes shall be cured in a controlled environment and tested at 28 days.

During anchorage blockout and transverse closure pours, if the magnesium phosphate mortar or concrete fails to meet the required strength at 2 hours, the Contractor shall, before opening to traffic, provide adequate supplemental support. If the deck panel breaks during the temporarily supported period due to inadequate support, it shall be replaced at the Contractor's expense.

If the material furnished meets all the requirements of the Contract as to preparation, placing, and physical properties but does not perform adequately, then the Contractor shall replace the panel as directed by the Engineer at the expense of the Department.

No further work shall be performed until the problem is identified and the defect in procedure or material is corrected.

Magnesium Phosphate Concrete (PC) Structural Pours: Formwork, where required, shall be steel treated with a release agent such as oil, or forms of plastic laminate or polyethylene which do not require release agents. The forms must be tight enough to hold the magnesium phosphate concrete material but shall be adequately vented where necessary to prevent entrapment of air.

- (a) Surface Preparation: The surface preparation of concrete and steel prior before placement of magnesium phosphate concrete, is extremely critical to ensure good adhesion to these substrates. All grease, dirt, paint, and laitance shall be removed by suitable means proposed by the magnesium phosphate manufacturer and approved by the Engineer. All surfaces must be clean, sound, and saturated surface dry (damp but no standing water).
- (b) Mixing Magnesium Phosphate Concrete: The magnesium phosphate concrete shall be mixed in accordance with the manufacturer's instructions to obtain a homogeneous mix which will not separate when poured onto a plane surface. The method of mixing shall be coordinated with batch size, ambient and substrate conditions, working time (and/or pot life), handling methods and placement techniques to obtain a proper continuous pour for the task at hand.
- (c) Placement and Finishing: Ambient and/or substrate temperatures shall be between 45 degrees F to 100 degrees F at the time of placement. Any standing water shall be removed from the prepared surfaces prior to placement of magnesium phosphate concrete. As the magnesium phosphate concrete is placed, it shall be compacted using a finger vibrator or stringer vibrator. Care shall be exercised to obtain sufficient compaction to completely fill the forms eliminating any voids or honeycomb, while not causing segregation of the mix.

Magnesium phosphate concrete pours for longitudinal closures between preconstructed composite unit and transverse pouts at the top of abutment backwalls shall be placed in accordance with the manufacturer's recommendations to negate shrinkage effects.

Leveling may be accomplished using a magnesium or aluminum screed being certain to maintain a surplus of material in front of the screed at all times. The screeding action shall be such as to produce a macrot textured surface equivalent in skid resistance to a stiff broomed finish on Portland cement concrete pavement.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (d) Caution: The magnesium phosphate manufacturer shall submit for approval and distribution material safety data sheets and a safety program for the materials and procedures to be used for the magnesium phosphate concrete and mortar applications for this project.

IV. MEASUREMENT AND PAYMENT

Magnesium Phosphate concrete and mortar will be measured in cubic yards within the neat lines as shown on the plans and will be paid for at the contract unit price per cubic yard. This price will include cleaning, preparation, furnishing, forming, mixing, testing, pouring, finishing and all incidental materials, labor and equipment to complete in conformity with the plans, the Specifications, these Special Provisions and as directed by the Engineer.

Payment will be made under:

Pay Item	Pay Unit
Magnesium Phosphate Concrete	Cubic Yard

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
EPOXY INJECTION PRESSURE CRACK SEALING

February 5, 2010

I. DESCRIPTION

This work shall consist of repairing cracks in concrete with an epoxy resin compound at locations shown on the plans or designated by the Engineer.

II. MATERIALS

Epoxy resin compounds shall conform to the requirements of Section 243 of the Specifications, except that Type EP-4 LV used to fill and seal rigid cracks shall have a viscosity of 5 poises or less at 75° F.

III. CONSTRUCTION PROCEDURES

The Contractor shall subject cracks to several blows with a five-pound hammer. At locations where a hollow sound is detected with the hammer, the Contractor shall remove loose, spalled or otherwise deteriorated unsound concrete. The crack shall then be blown clean with oil free compressed air and injection ports installed along the crack at 18" on center. The crack shall be surface sealed with Epoxy, Type EP-6 and allowed to fully cure according to manufacturer's directions prior to pressure sealing. After surface curing the crack the Contractor shall internally pressure seal the crack with Epoxy, Type EP-4 LV Modified using slow, steady pressure from an injection gun capable of producing a fluid pressure of at least 100 psi.

Injection of EP-4 LV Modified epoxy shall begin at the lowest injection port and shall be pumped until the epoxy reaches the next higher port. This process shall be repeated until the full length of the crack is pressure sealed. After the entire crack has been pressure sealed, injection port fittings shall be removed and the resulting holes filled with Epoxy, Type EP-6.

IV. MEASUREMENT AND PAYMENT

Pressure sealing cracks will be measured in linear feet of crack repaired and paid for at the contract unit price per linear foot, which price shall be full compensation for removing and disposing of unsound concrete, cleaning cracks, installing injection ports, furnishing and installing epoxies to seal cracks, and for all materials, labor, tools, equipment and incidentals necessary to fully complete the work.

Payment will be made under:

Pay Item	Pay Unit
Pressure Sealing Cracks (Abutments / Piers)	Linear Foot

NOTICE OF AUTHORIZATION

COMMONWEALTH OF VIRGINIA
Virginia Department of Transportation

Date: 03/11/2009
Permit #: 09-4007-15
Project: 7095-964-115, B601, B602, B603, B692,
B693, B694, B695, B696, B697, B698,
B699, BRDGS, C502, P101, R202

Permittee: Keith M Rider
Address: P.O. Box 219
Sandston, VA 23150

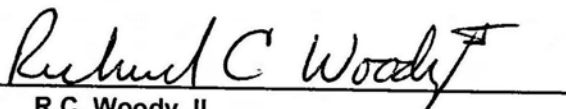
The permitted activity is to replace the superstructure and rehabilitate the substructure of the north and southbound bridges (structure #2002) of I-95 over Upham Brook in Henrico County, VA. This project also entails placing temporary scaffolding in Upham Brook. When possible, the scaffolding will be suspended from the bridge. No cofferdams or causeways will be placed in the stream. This project results in no excavation, no permanent fill and 4.0 cubic yards of temporary fill below OHW. There are no wetland impacts associated with this project.

The permitted activity has been authorized by the following permit(s):

Permit	Authorized	Expires
VMRC: VGP-1	03/05/2009	03/05/2012
COE Section 404 Permit: Nationwide Permit 3	01/12/2009	03/18/2012
DEQ Virginia Water Protection Permit:	N/A	N/A
TVA:	N/A	N/A

The following conditions apply to this project only:

- Erosion and sediment control measures will be strictly implemented and adhered to during the lifespan of the project, including the project-specific erosion and sediment control plan.
- In-stream activities will be conducted during low-flow conditions, using non-erodible cofferdams to isolate the construction area, blocking no more than 50% of the stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas, and implementing strict erosion and sediment control measures throughout the project period as described in the Virginia Erosion and Sediment Control Handbook, 1992, Virginia Department of Conservation and Recreation.
- Precautions will be taken to prevent any material from entering the waterway during construction.



R.C. Woody, II
Natural Resources Program Manager

THIS NOTICE MUST BE CONSPICUOUSLY DISPLAYED AT THE SITE OF WORK
AES Form 03-4 (10/2003)

GENERAL PERMIT
DEPARTMENT OF THE ARMY
NORFOLK DISTRICT - CORPS OF ENGINEERS
VIRGINIA MARINE RESOURCES COMMISSION

Permit #: 09-4007-15
Project: 7095-964-115, B601, B602, B603, B692, B693, B694, B695, B696, B697, B698, B699, BRDGS, C502, P101, R202
Effective Date: 03/05/2009
Expiration Date: 03/05/2012

Request for authorization was made at the 01/13/2009 Interagency Coordination Meeting.

- Perform work in or affecting navigable waters of the United States pursuant to Section 10 of the River and Harbor Act of March 3, 1899;
- Discharge dredge or fill material into waters of the United States pursuant to Section 404 of the Clean Water Act; and/or
- Encroach in, on, or over State-owned subaqueous bottoms pursuant to Chapter 12, Subtitle III, of Title 28.2 of the Code of Virginia.

Applicant: Virginia Department of Transportation
P.O. Box 219
Sandston, VA 23150

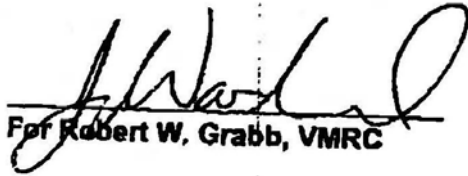
is hereby authorized under the provision of the VMRC General Permit dated July 6, 1999 and the Department of the Army, Corps of Engineers - Nationwide Permit 3

to replace the superstructure and rehabilitate the substructure of the north and southbound bridges (structure #2002) of I-95 over Upham Brook in Henrico County, VA. This project also entails placing temporary scaffolding in Upham Brook. When possible, the scaffolding will be suspended from the bridge. No cofferdams or causeways will be placed in the stream. This project results in no excavation, no permanent fill and 4.0 cubic yards of temporary fill below OHW. There are no wetland impacts associated with this project.

- Erosion and sediment control measures will be strictly implemented and adhered to during the lifespan of the project, including the project-specific erosion and sediment control plan.
- In-stream activities will be conducted during low-flow conditions, using non-erodible cofferdams to isolate the construction area, blocking no more than 50% of the stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas, and implementing strict erosion and sediment control measures throughout the project period as described in the Virginia Erosion and Sediment Control Handbook, 1992, Virginia Department of Conservation and Recreation.
- Precautions will be taken to prevent any material from entering the waterway during construction.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

This project will be constructed in accordance with the attached plans and sketches and is subject to the provisions cited in the above regulations.


For Robert W. Grabb, VMRC

03/05/2009
Date

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
VIRGINIA MARINE RESOURCES COMMISSION'S

VIRGINIA GENERAL PERMIT (VGP)

FOR PROJECTS UNDERTAKEN IN, ON, OR OVER STATE-OWNED SUBAQUEOUS LANDS
(WATERWAYS AND TIDAL WETLANDS) WITHIN THE COMMONWEALTH
CONDITIONS AND LIMITATIONS ISSUED TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION

Permit #: 09-4007-15
Project: 7095-964-115, B601,
B602, B603, B692,
B693, B694, B695,
B696, B697, B698,
B699, BRDGS, C502,
P101, R202
Date: 03/11/2009

Permitted Activity: to replace the superstructure and rehabilitate the substructure of the north and southbound bridges (structure #2002) of I-95 over Upham Brook in Henrico County, VA. This project also entails placing temporary scaffolding in Upham Brook. When possible, the scaffolding will be suspended from the bridge. No cofferdams or causeways will be placed in the stream. This project results in no excavation, no permanent fill and 4.0 cubic yards of temporary fill below OHW. There are no wetland impacts associated with this project.

Applicable Crossing(s): Bridge over Upham Brook

The following conditions apply to this project only:

1. Erosion and sediment control measures will be strictly implemented and adhered to during the lifespan of the project, including the project-specific erosion and sediment control plan. (Crossing Name: Bridge over Upham Brook)
2. In-stream activities will be conducted during low-flow conditions, using non-erodible cofferdams to isolate the construction area, blocking no more than 50% of the stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas, and implementing strict erosion and sediment control measures throughout the project period as described in the Virginia Erosion and Sediment Control Handbook, 1992, Virginia Department of Conservation and Recreation. (Crossing Name: Bridge over Upham Brook)
3. Precautions will be taken to prevent any material from entering the waterway during construction. (Crossing Name: Bridge over Upham Brook)

The following conditions are applicable to this project *unless otherwise noted above in the conditions applicable to this project only:*

1. Any proposed deviation to work authorized in and must be formally re-coordinated and approved by the Virginia Marine Resources Commission (VMRC) prior to undertaking the work. The contractor shall be responsible for designing and supplying all sketches and notes necessary to acquire any permit modification required for changes in the proposed construction methods. VDOT's District Environmental Manager will be responsible for filing any necessary permit modifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

2. This permit may be revoked at any time by the VMRC upon failure of the contractor to comply with any of the terms and conditions of this permit or at the will of the General Assembly of Virginia.
3. The duly authorized agents to the commission shall have the right to enter upon the premises at reasonable times for the purpose of inspecting the work being done pursuant to this permit.
4. The Contractor shall immediately notify VDOT's District Environmental Manager if unknown historic or archeological remains are discovered during construction.
5. The sale of material removed from state-owned bottoms is specifically prohibited without the approval of the VMRC.
6. The contractor shall comply with the water quality standards as established by the Virginia Department of Environmental Quality and all other applicable laws, ordinances, rules, and regulations affecting the conduct of the project. The granting of this permit shall not relieve the contractor of the responsibility of obtaining any and all other permits or required authorizations for this project.
7. This permit shall not affect or interfere with the right vouchsafed to the people of Virginia concerning fishing, fowling and the catching of and taking of oysters and other shellfish in and from the bottom of areas and waters not included within the terms of this permit.
8. This permit shall to the extent practicable minimize the adverse effects of the project upon adjacent properties, tidal wetlands, and upon the natural resources of the Commonwealth.
9. This permit is subject to any lease of oyster planting ground in effect on the date of this permit. Nothing in this permit shall be construed as allowing the contractor to encroach on any lease without the consent of the leaseholder. The contractor shall be liable for any damages to such lease.
10. The issuance of this permit does not confer upon the contractor any interest or title to beds of the waters.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR

NATIONWIDE PERMIT 3 - MAINTENANCE

TO DISCHARGE DREDGE OR FILL MATERIAL IN WATERS OF THE UNITED STATES PURSUANT TO
SECTION 404 OF CLEAN WATER ACT
CONDITIONS AND LIMITATIONS ISSUED TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION

Date: 03/11/2009
Project: 7095-964-115, B601,
B602, B603, B692,
B693, B694, B695,
B696, B697, B698,
B699, BRDGS, C502,
P101, R202
Permit #: 09-4007-15

Permitted Activity: to replace the superstructure and rehabilitate the substructure of the north and southbound bridges (structure #2002) of I-95 over Upham Brook in Henrico County, VA. This project also entails placing temporary scaffolding in Upham Brook. When possible, the scaffolding will be suspended from the bridge. No cofferdams or causeways will be placed in the stream. This project results in no excavation, no permanent fill and 4.0 cubic yards of temporary fill below OHW. There are no wetland impacts associated with this project.

Applicable Crossing(s): Bridge over Upham Brook

The following conditions apply to this project only:

1. Erosion and sediment control measures will be strictly implemented and adhered to during the lifespan of the project, including the project-specific erosion and sediment control plan. (Crossing Name: Bridge over Upham Brook)
2. In-stream activities will be conducted during low-flow conditions, using non-erodible cofferdams to isolate the construction area, blocking no more than 50% of the stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas, and implementing strict erosion and sediment control measures throughout the project period as described in the Virginia Erosion and Sediment Control Handbook, 1992, Virginia Department of Conservation and Recreation. (Crossing Name: Bridge over Upham Brook)
3. Precautions will be taken to prevent any material from entering the waterway during construction. (Crossing Name: Bridge over Upham Brook)

The following conditions are applicable to this project *unless otherwise noted above in the conditions applicable to this project only:*

1. This project will be constructed in accordance with the contract documents and is subject to the provisions cited in the above regulations.
2. A permit may be either modified, suspended, or revoked by the permitting agency upon violation of any of the terms or conditions of the permit, or if the permitting agency determines such actions will otherwise be in the public interest.

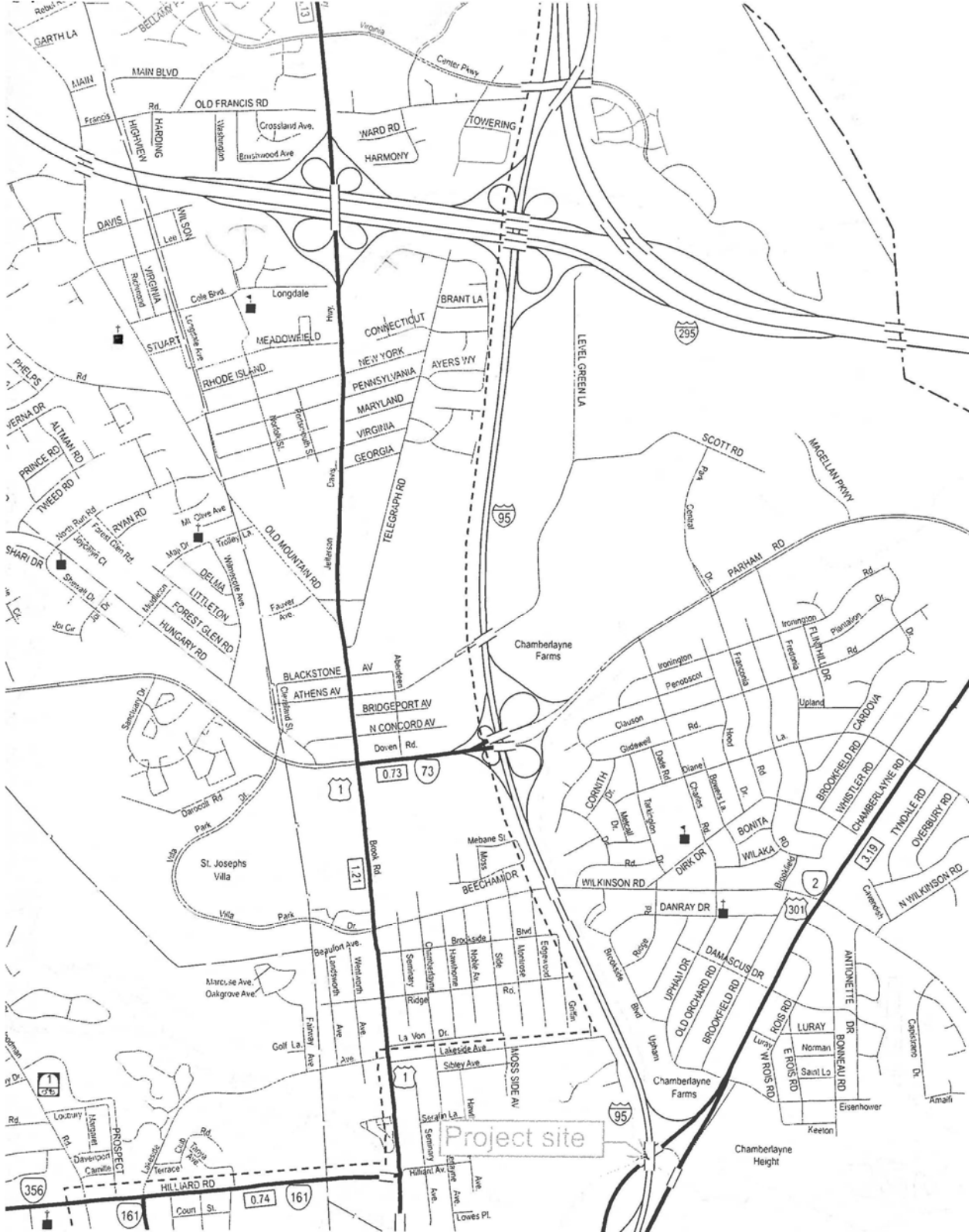
ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

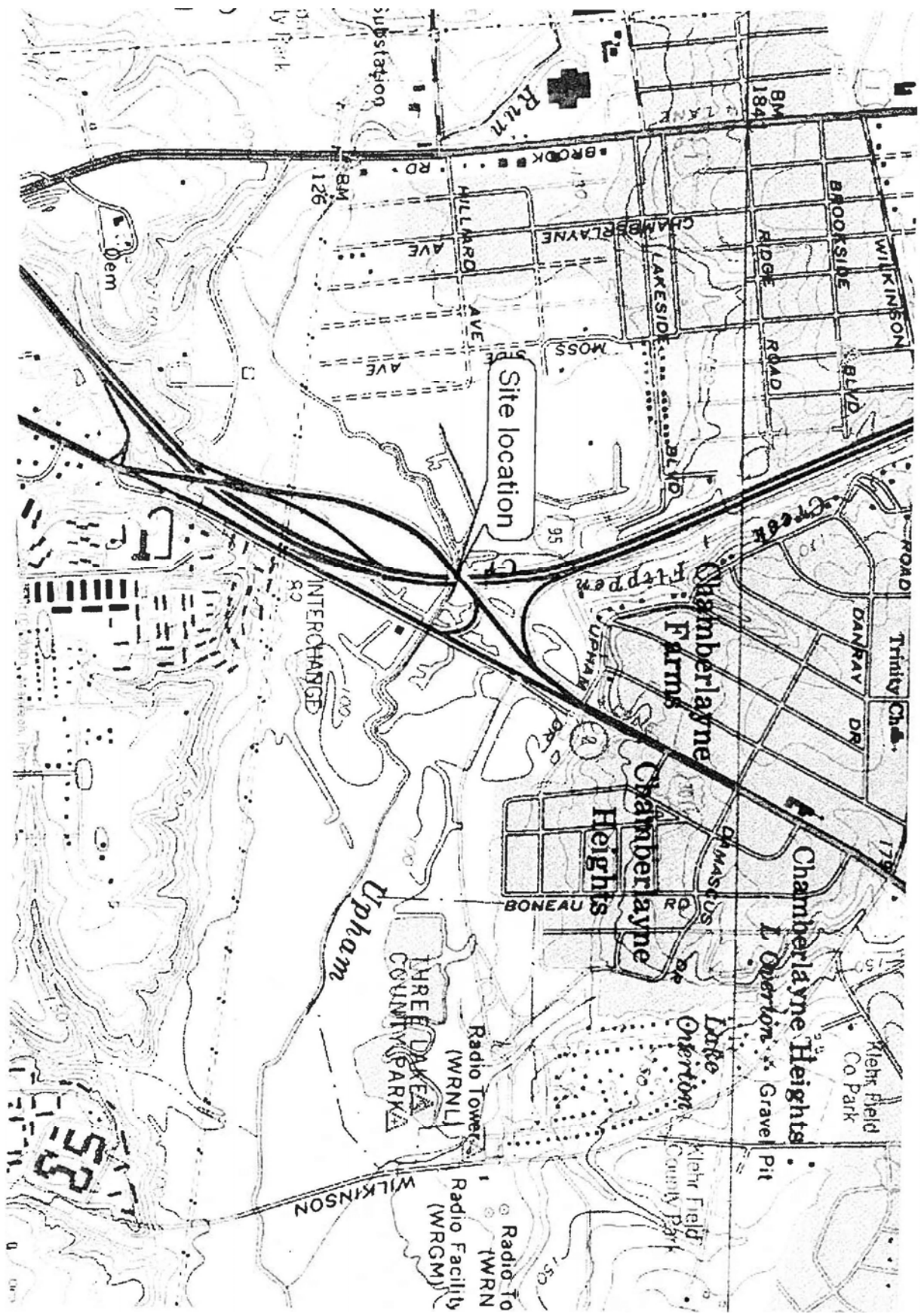
3. The Contractor shall be responsible for designing and supplying to VDOT's District Environmental Manager all sketches and notes necessary to acquire any permit modification required for changes in the proposed construction methods. The District Environmental Manager will obtain the necessary permit modifications.
4. VDOT and its Contractor shall permit representatives of state and federal environmental regulatory agencies to make periodic inspections at any time in order to insure that the activity being performed under authority of the permit(s) is in accordance with the terms and conditions prescribed herein.
5. All work shall be done in such a manner as to minimize sedimentation/siltation of state waters in accordance with Virginia Erosion and Sedimentation Regulations (VR 625-02-00). Appropriate erosion and sedimentation controls and practices shall be used and maintained in effective operating conditions until all disturbed areas have been stabilized, in accordance with the requirements of Section 107.14 (a).
6. All dredged or excavated materials must be deposited and retained in an upland area.
7. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary work structures, work and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of the construction site.
8. Temporary fills must consist of materials and be placed in a manner that will not be eroded by expected high flows.
9. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
10. If unknown historic or archeological remains are discovered during construction, the Contractor shall immediately notify VDOT's District Environmental Manager.
11. No activity may cause more than minimal adverse effects on navigation. Any safety lights and signals prescribed by the U.S. Coast Guard must be installed and maintained.
12. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody including those species that normally migrate through the area unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
13. No discharge of dredged or fill material may consist of unsuitable material, and material must be free of toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
14. No discharge of dredged or fill material may occur in the proximity of a public water supply intake except where the discharge is for adjacent bank stabilization.
15. Heavy equipment working in wetlands or mudflats must be placed on mats or other approved structures to minimize soil disturbance.
16. To the maximum extent practicable, the pre-construction course, condition, capacity and location of open waters must be maintained for each activity, unless the alteration benefits the aquatic environment. The activity must be constructed to withstand expected high flows and must not restrict or impede the passage of normal or high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).
17. If the discharge creates an impoundment of water, adverse effects on the aquatic system caused by accelerated water passage and/or the restriction of its flow must be minimized to the maximum extent practicable.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

18. Pipes and culverts placed in streams will be countersunk at both the inlet and outlet ends. Pipes that are 24 inches or less in diameter shall be countersunk 3 inches below the natural stream bottom and pipes that are greater than 24 inches in diameter shall be countersunk 6 inches below the natural stream bottom. All single pipes or culverts with bottoms shall be depressed (countersunk) below the natural streambed at both the inlet and outlet of the structure. In sets of multiple pipes or culverts with bottoms at least one pipe or culvert shall be depressed (countersunk) at both the inlet and outlet to convey low flows.
19. If bedrock is encountered during pipe or culvert placement that prevents the required countersinking, the Contractor must stop work until VDOT's District Environmental Manager acquires any necessary permit modifications.
20. Blasting of stream bottoms through the use of explosives is not acceptable as a means of providing for countersinking of pipes on bedrock.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02



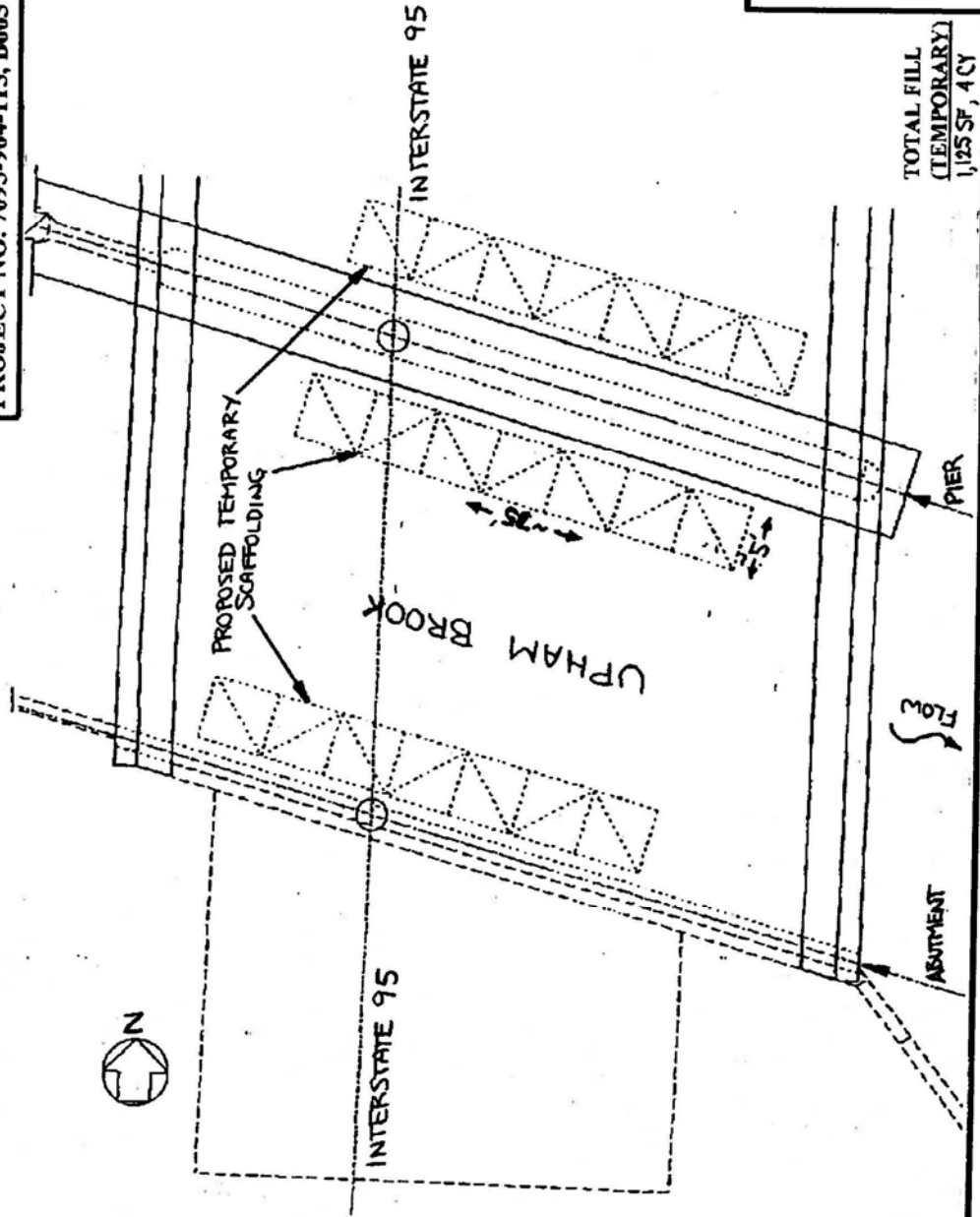


VDOT

BRIDGE OVER UPHAM BROOK
SUPERSTRUCTURE REPLACEMENT &
SUBSTRUCTURE REPAIRS

INTERSTATE 95 - HENRICO CO.

PROJECT NO. 7095-964-115, B603 - UPC 18944



NOT TO SCALE
SHEET 1 OF 2

TOTAL FILL
(TEMPORARY)
1,125 SF, 4 CY

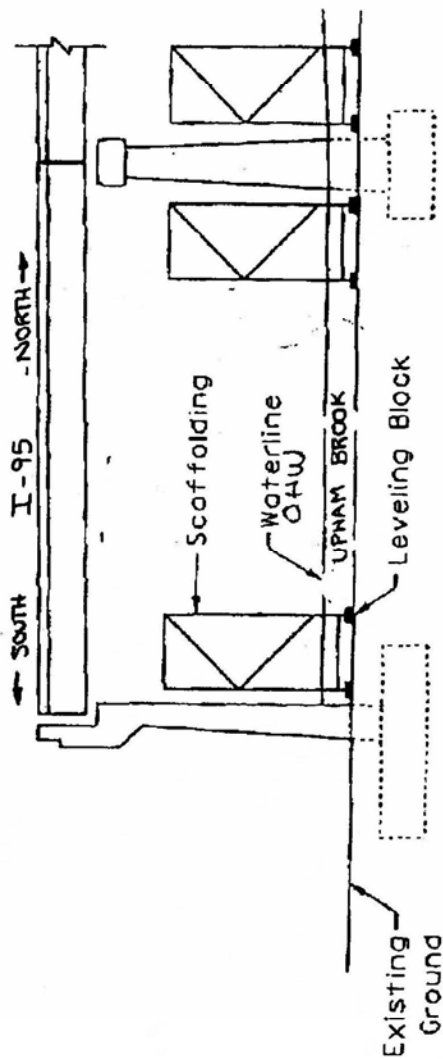
12/15/2008

VDOT

**BRIDGE OVER UPHAM BROOK
SUPERSTRUCTURE REPLACEMENT &
SUBSTRUCTURE REPAIRS**

INTERSTATE 95 - HENRICO CO.

PROJECT NO. 7095-964-115, B603 - UPC 18944



NOT TO SCALE
SHEET 2 OF 2

12/15/2008

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
CSXT RAILWAY WORK REQUIREMENTS

January 5, 2010

I. GENERAL

The following information governs construction and demolition work to be performed for this project that shall be prosecuted on, over or adjacent to the facilities owned by CSXT. It shall be the Contractor's responsibility when prosecuting work in these areas to plan and execute the work in accordance with the information set forth herein as well as the rest of the Contract documents. The prosecution of all such work within the limitations identified herein or on the plans shall require the prior review and approval of the Engineer and the Construction Monitoring Representative (CMR) on behalf of CSXT. All communication and correspondence with CSXT and the CMR shall reference the location as City of Richmond, VA and milepost as SRN-2.91 and DOT# 623520F.

II. CSXT CONSTRUCTION REQUIREMENTS

1. All construction related correspondence will be directed to AECOM, acting as the Construction Monitoring Representative (CMR) on behalf of CSXT, with the following contact and address:

Brian V. Harrison
Manager – Construction Services
AECOM
260 S. Broad Street, Suite 1500
Philadelphia, PA 19102
(215) 966-4846

Upon receipt of notification, the CMR will direct the Contractor to the local CSXT construction contact for the project.

2. The Contractor shall submit to the Engineer the following construction procedures. The Contractor shall obtain written acceptance from CSXT or their representative before proceeding with construction.
 - a. Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed during the project. This submission will include a walkthrough at which time CSXT personnel will be present. Work will not be permitted to commence until the Contractor has provided CSXT with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of CSXT property that has the potential of affecting CSXT train operations must be submitted and approved by CSXT prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between VDOT, Contractor, CSXT and the CMR. The narrative shall address project level coordination and day to day, specific work operations including, but not limited to, crane and equipment operations, access road installation and removal, demolition plans, erection plans and temporary works. A Professional Engineer in the Commonwealth of Virginia must sign and seal the Means and Methods submission.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- b. Demolition Shield – Submittals must include a plan showing the details of the shield, a written installation and removal procedure and design calculations verifying the capacity of the shield. The shield shall be a bottom of superstructure level shield designed for a minimum load of fifty (50) pounds per square foot plus the weight of the equipment, debris and any other load to be carried. A registered Professional Engineer in the Commonwealth of Virginia must seal all demolition shield plans, calculations and procedures. Timber matting will not be permitted on the CSXT main line tracks.
- c. Demolition Plans – Submittals must include detailed plans and procedures for all demolition activities. The submittals must indicate the overall sequence of work as well as the sequence of work within each span showing the number of shields in place at any one time. The submission shall indicate the location and capacity of any proposed cranes, the estimated lifting loads and the connection devices (i.e. slings, shackles, etc.) All lifting equipment and connection devices shall have capacity for 150% of the actual lifting load. The factor of safety provided by the manufacturer in the lifting capacity charts shall not be considered in the 150% factor of safety. A registered Professional Engineer in the Commonwealth of Virginia must seal all demolition plans, calculations and procedures.
- d. Erection Plans – Submittals must include detailed plans and procedures for all erection activities. The submission shall indicate the location and capacity of any proposed cranes, the estimated lifting loads and the connection devices (i.e. slings, shackles, etc.) All lifting equipment and connection devices shall have capacity for 150% of the actual lifting load. The factor of safety provided by the manufacturer in the lifting capacity charts shall not be considered in the 150% factor of safety. A registered Professional Engineer in the Commonwealth of Virginia must seal all erection plans, calculations and procedures.
- e. Sheeting and Shoring Plans – When sheeting and shoring is necessary, submittals shall be required for any sheeting and shoring to be constructed which may impact CSXT right of way and track. The submission shall include details, methods, and locations shown on the plans and he shall submit three (3) sets of detailed drawings and one (1) set of calculations in accordance with CSXT Design & Construction Standard Specifications. A registered Professional Engineer in the Commonwealth of Virginia must seal all sheeting and shoring plans submitted by the Contractor.
- f. Track Monitoring – When sheeting and shoring is necessary, the Contractor may be required to submit a detailed track monitoring program to detect both horizontal and vertical movement of the CSXT track and roadbed for CSXT approval prior to performing any sheeting, shoring or excavations near CSXT track.
- g. Ballast Protection – The proposed ballast protection system shall use filter fabric and indicate the anchorage system. The ballast protection system is to extend 25' beyond the proposed limit of work and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.
- h. Construction Schedule – Submit a detailed construction schedule for the duration of the project clearly indicating the time periods while working on and around CSXT right-of-way. As the work progresses, this schedule shall be updated and resubmitted as necessary, but no less than monthly, to reflect changes in work sequence, duration and method, etc.
- i. Erosion Control – The Contractor must ensure that proper erosion control is implemented on and adjacent to CSXT right-of-way during construction. The Contractor must prevent silt and debris accumulation in the railroad roadbed, ditches and other railroad facilities. The Contractor may be required to submit a detailed erosion control plan for review and acceptance by CSXT or the CMR prior to performing any work.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- j. Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site.
- k. Access Road & Site Preparation – Contractor shall have access to the areas north of the tracks via School Street (which is east of the bridge). Contractor will be permitted to fill in the northern most track (which is out of service). All fill used shall be the same ballast stone that is currently being used. Contractor will also be permitted to fill in depressions between the tracks and the crashwalls to create a level working surface for equipment. No temporary or permanent drainage pipe shall be used on CSX property at any time. Stone used to fill in the track shall be removed after completion of construction so that the old tracks are exposed to the original condition for future removal by CSX. Contractor will be permitted to clear and grub all necessary vegetation within the temporary easement. **CROSSING OF ACTIVE TRACKS WILL NOT BE PERMITTED.**
- l. Insurance – Submit all necessary insurance information in accordance with the current CSXT Insurance Requirements for approval. The complete original policies, 2 copies, and all correspondence relating to policy shall be submitted to:

Donna W. Melton
Manager – Insurance
CSX Transportation, Inc.
500 Water Street - C907
Jacksonville, FL 32202
Phone: 904-359-1247
Fax: 904-245-2833

with a copy to the CMR. The insurance policies will be required to be in place and approved prior to any work commencing on or that could potentially impact CSXT right-of-way.

- 3. Up to thirty (30) days will be required to review all construction submissions. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved.
- 4. The Contractor shall have a pre-construction meeting with CSXT's Roadmaster, Mr. Kevin Critzer, and the CMR in attendance to discuss potential On-Track Safety issues during project construction activities.
- 5. The Contractor must not use CSXT right-of-way for storage of materials or equipment during construction. The CSXT right-of-way must remain clear at all times. If the Contractor has no other means of storage of materials, CSXT may allow the Contractor to apply for a Lease Agreement between CSXT and the Contractor. The application is found online at www.csx.com.
- 6. Equipment may not be positioned to block the railroad access road, track area or any part of the CSXT right-of-way without prior CSXT approval. Any grading or construction machinery that is parked near the track unattended shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save CSXT, as far as State Law will allow, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

7. The Contractor will be required to abide by the provisions of the VDOT/Railroad Construction Agreement. Periodically, throughout the project duration, the Contractor will be required to meet, discuss and, if necessary, take immediate action at the discretion of CSXT personnel and/or the CMR to comply with provisions of that agreement and these specifications.
8. This project will require extensive use of CSXT Flagmen to protect train operations from project activity in the area of the tracks. While CSXT cannot guarantee the availability of flagmen at all requested times, every accommodation will be extended to the Contractor when forces are available. Flagging requests should be made to CSXT Roadmaster, Mr. Kevin Critzer, at telephone (804) 226-7443 at least thirty (30) days in advance. Termination or cancellation of a flagman requires ten (10) days notice to avoid incurring costs.
9. No work shall be undertaken on, over or adjacent to the facilities owned by CSXT until the flagman (or flagmen) is present at the job site. Under the terms of the agreement between the VDOT and CSXT, the Railroad has sole authority to determine the need for flagging required to protect its operations. The requirements of such services will be whenever the Contractor's personnel or equipment are or are likely to be, working on the Railway's right-of-way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track to such extent, that in the Railroad's opinion, the movement of trains must be controlled by flagging. The Contractor's work requiring railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman's presence in excess of 40 hours per week, and is additionally subject to the holidays, standard days off, or other work day restrictions of the Railroad. Please note: Actual track time available on any given day may vary. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and cannot be called for, or requested on an on-call basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. If, after the flagman is assigned to the project site, a Railroad emergency arises that requires the flagman's presence elsewhere, then the Contractor shall delay work on Railway right-of-way until such time as the flagman is again available.
10. All crane and equipment operations that could potentially impact CSXT right-of-way must be coordinated with the CSXT Flagman.
11. The Contractor or the Agency shall be responsible to have painted on the structure the DOT Number 623 520 F assigned to the I-95 grade separation over CSXT. This DOT # 623 520 F shall be affixed at a location on either side of the CSXT tracks or property and in a manner such that it can be readily discerned and visible from track level.
12. Contractor must be accompanied by a CSXT Flagman or representative while accessing the CSXT access road and its right of way.

III. MEASUREMENT AND PAYMENT

The costs of all work required by this special provision, including but not limited to, insurance, compliance with CSXT safety requirements, planning, scheduling, correspondence, coordination, erection plans, shoring plans, and demolition plans, designed by a professional engineer, shall be included in the cost of other appropriate bid items. No separate measurement or payment will be made for the work involved or the costs of complying with the CSXT Construction Requirements contained herein unless specifically listed as pay items in other contract documents.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
CSX TRANSPORTATION, INC. PREPARED RAILROAD BALLAST

December 16, 2009

(1) SCOPE:

These specifications cover the requirement for grading and other significant physical properties of mineral aggregates for prepared ballast.

(2) TYPES OF BALLAST:

Quarried Granite and Dolomite Limestone, produced in a crushing-screening plant designed to satisfy the specifications listed herein.

(3) GENERAL REQUIREMENTS:

The type and sizes of prepared ballast shall be designated by the Railroad in conformance to approved standards.

(4) HANDLING:

Processed ballast shall be handled at the producing plant in such a manner that it is kept free from segregation. It shall be loaded only into cars which are clean and free from rubbish or any substance which would foul or damage the ballast. The producer should not make repeated passes of equipment over the same levels in stock piled ballast.

Ballast shall be washed prior to loading in railcars.

(5) INSPECTION:

The Railroad reserves the right to reject any car of ballast arriving at the site for unloading that does not conform to the specification as determined by methods of test.

If material loaded does not conform to these specifications, the Railroad must notify the supplier to stop loading until the fault has been corrected and to dispose of all defective material without cost to the Railroad.

(6) TESTING:

(A) Determinations of deleterious substances resistance to abrasion and soundness shall be made at a testing laboratory selected by the Railroad, but visual inspections and gradation test shall be made at the place of production prior to shipment as often as considered necessary.

(B) Samples of the finished product for all tests shall be representative and of sufficient weight for testing.

(7) QUALITY REQUIREMENTS:

(A) Deleterious substances shall not be present in prepared ballast in excess of the following amounts:

Material finer than No. 200 sieve = 1% Soft and Friable pieces = 2% Clay lumps = 0.5%

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(B) The percentage of wear of prepared ballast tested in the Los Angeles Machine shall not be greater than:

Granite = 32% Dolomite = 28% Except as otherwise specified by Railroad

(C) Granite ballast is predominately considered CSX Standard, dependent upon economic evaluation. The following guidelines should be followed in determining the type of ballast application for each territorial location:

Granite ballast should be used on lines having tonnage in excess of 25 MGT annually.

Dolomite Limestone ballast with maximum 24% loss (L.A. abrasion) can be used on lines having 10 MGT to 25 MGT annually based on economic evaluation.

Dolomite Limestone ballast with maximum 28% loss (L.A. abrasion) can be used on lines having less than 10 MGT annually, based on economic evaluation.

Dolomite = MgCo³ More Than 36% -Approved Dolomite Limestone = MgCo³ 28-36% -Approved Limestone = MgCo³ Less Than 28% -Not Approved Slag Ballast -Not Approved

It is the Division's responsibility to evaluate annual tonnage application when ordering weekly ballast requirements (based on the above guidelines). The Chief Engineer's office will determine the best solution to be administered.

(D) The soundness of prepared ballast for use in regions where freezing temperatures are expected shall be such that when tested in the sodium soundness test, the weighted average loss shall not be in excess of 7% after 5 cycles.

- (8) GRADING REQUIREMENTS:
- (9) PREPARED RAILROAD BALLAST FOR CSX SHALL CONFORM TO THE FOLLOWING GRADING REQUIREMENTS:
- (10) METHODS OF TEST:

The grading of prepared ballast shall be determined by test with laboratory sieves having square openings and conforming with current ASTM Specifications, Designation E-11.

SCREEN SIZE	MAIN LINE AREA #4A	WALKWAY		BASE	
		AREA 5	AREA 57	GA BASE	CRUSHER RUN
2-1/2"	100%				
2"	90 - 100%				
1-1/2"	60 - 90%	100%	100%	100%	100%
1"	10 - 30%	90 - 100%	95 - 100%		
3/4"	0 - 10%	40 - 75%		60 - 100%	
1/2"		15 - 35%	25 - 60%		
3/8"	0 - 1%	0 - 15%			
NO. 4		0 - 5%	0 - 10%		
NO. 8			0 - 5%		
NO. 10				30 - 55%	15 - 45%
NO. 60				8 - 35%	
NO. 200				5 - 20%	5 - 12%

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The supplier shall certify the ballast delivered to the Railroad is typical of that upon which specified tests have been made. Samples shall be secured in accordance with the current ASTM methods of sampling. Designation D-75.

Sieve analysis shall be made in accordance with current ASTM method of test. Designation C-136. Material finer than the No. 200 sieve shall be determined in accordance with the current ASTM of test. Designation C-117.

The percentage of soft particles shall be determined in accordance with the ASTM method of test. Designation C235.

The percentage of clay lumps shall be determined in accordance with the current ASTM method of test. Designation C-142. The resistance to abrasion shall be determined in accordance with the current ASTM method of test. Designation C131, or C-535, using the standard grading most nearly representative of the size of ballast specified. Soundness test shall be made in accordance with the current ASTM method of test. Designation C-88.

The weight per cubic foot shall be determined in accordance with the current ASTM method of test. Designation C29.

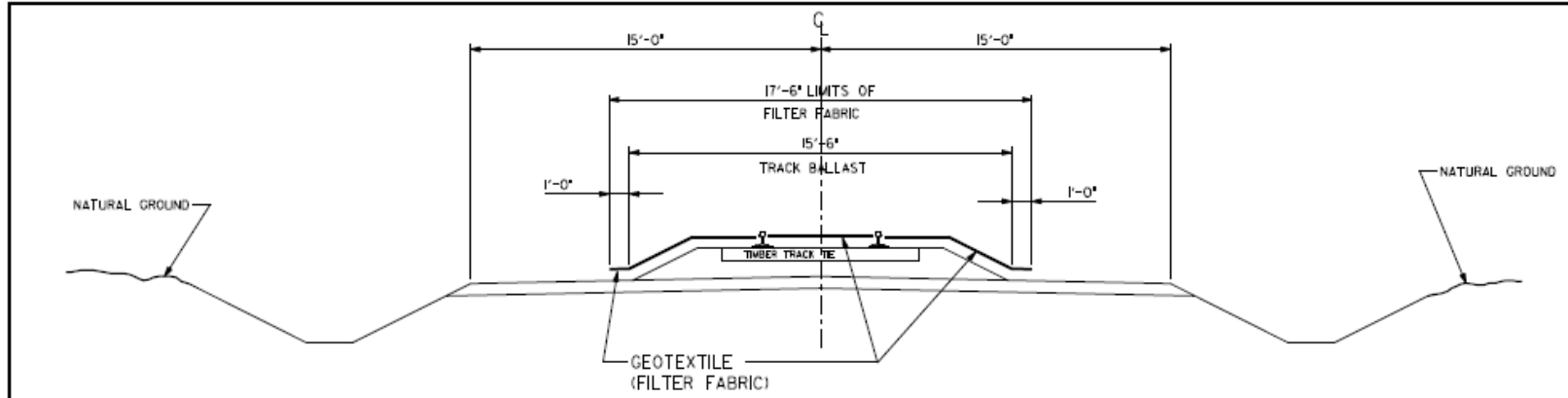
B. These specifications will be used for the purchase of all Ballast installed on CSXT.

Prepared by: D. G. Schott

Reviewed: _____ signed _____
 Director – Standards &
 Tessting

Approved: _____ signed _____ AVP - Equipment and Track Systems Engineering
Office of the Assistant Vice President - Equipment and Track Systems Engineering Jacksonville, Florida
MWI 401-01, December 16, 1996

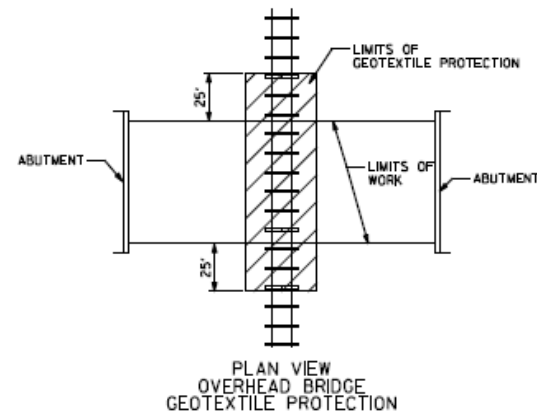
ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02



GEOTEXTILE ROADBED PROTECTION DETAIL (TYPICAL)

NOTES:

1. ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE RAILROAD AUTHORIZED CONSTRUCTION MONITORING REPRESENTATIVE (CMR)
2. NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.
3. LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE CMR (SEE PLAN VIEW).
4. FILTER FABRIC SHALL BE NAILED TO TIMBER TRACK TIES WITH "GRIP CAP" TYPE ROOFING NAIL AND PLASTIC DISC FASTENERS OR EQUIVALENT ON 24 INCH CENTER TO CENTER SPACING. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE CMR.
5. INSTALLATION SHALL BE ADJUSTED ACCORDINGLY FOR MULTIPLE TRACKS.
6. GEOTEXTILE SHALL BE CLEANED AND MAINTAINED AS DIRECTED BY THE CMR.



DMJM HARRIS
 280 S. Broad Street, Suite 1500 ■ Philadelphia, Pennsylvania 19102
 TEL: 215-735-0832 ■ FAX: 215-735-0883

GEOTEXTILE ROADBED PROTECTION DETAIL

DATE: 5/2004 REV: 04/20/2004

CSX TRANSPORTATION

CONSTRUCTION SUBMISSION CRITERIA

TABLE OF CONTENTS

	Page Number
INTRODUCTION	1
SECTION I: Definitions	1
SECTION II: Demolition Procedure	2
SECTION III: Erection Procedure	5
SECTION IV: Excavation and Shoring	7
SECTION V: Track Monitoring	10

CONSTRUCTION SUBMISSION CRITERIA

INTRODUCTION

The information in this document is intended to improve communication and clarify the CSXT criteria related to construction submissions that may involve CSXT property. All work must be performed in a manner as to not adversely impact existing CSXT operations. Please note that there are other standards associated with construction that must be adhered to including but not limited to the CSXT Special Provisions, CSXT Insurance Requirements as well as governing local, county, state and federal requirements. This document and other CSXT standards are subject to change without notice, and future revisions will be available at the CSXT website www.csx.com.

I. DEFINITIONS

- Agency* – The project sponsor.
- AREMA* – American Railway Engineering and Maintenance Association – the North American railroad industry standards group.
- Construction Submission* – The Agency or its representative shall submit six (6) sets of plans, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.
- Controlled Demolition* – Removal of the existing structure or subcomponents in a manner that prevents any portions from falling onto CSXT employees, equipment or property. The proposed procedures shall be detailed in the means and methods submission for CSXT review and acceptance.
- Contractor* – The Agency’s or CSXT’s representative retained to perform the project work.
- Engineer* – CSXT Engineering Representative or a GEC authorized to act on the behalf of CSXT.
- GEC* – General Engineering Consultant who has been authorized to act on the behalf of CSXT.
- Professional Engineer* – An engineer who is licensed in State or Commonwealth (if required by the Agency) in which the project is to occur. The drawings and calculations shall be prepared by the Professional Engineer and shall bear his seal and signature.
- Submission Review Period* - **a minimum of 30 days in advance of start of work.** Up to 30 days will be required for the initial review response. Up to an additional 30 days may be required to review any/all subsequent submissions or resubmission.

CONSTRUCTION SUBMISSION CRITERIA

Theoretical Railroad Live Load Influence Zone – A 1½ Horizontal to 1 Vertical theoretical slope line starting 1'-6" below top of rail elevation and 12'-0" from the centerline of the nearest track.

II. DEMOLITION PROCEDURE:

The Agency or its contractor shall submit as defined above, a detailed procedure for demolition of the structure over Railroad Tracks.

- A. The Agency or its Contractor shall submit the detailed procedure for demolition of existing structures over or adjacent to CSXT's tracks or right-of-way. This procedure shall include a plan showing the locations of cranes, horizontally and vertically, operating radii, with loading or disposal locations shown, with all dimensions referenced from the center line of the near track, including beam placement on ground or truck loading staging plan. The plan shall also include the location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions should be shown. No crane or equipment may be set on the CSXT rails or track structure and no material may be dropped on CSXT property.
- B. Also included with this submittal the following information:
 1. Computations showing weight of picks must be submitted. Computations shall be made from field verified plans of the existing structure beams being removed and those plans or sections thereof shall also be included in the submittal; the weight shall include the weight of concrete or other materials including lifting rigging.
 2. If the sponsor can prove to CSXT that plans do not exist and weights must be calculated from field measurements, the field measurements are to be made under the supervision of the Professional Engineer submitting the procedure and shall include sketches and estimated weight calculations with the procedure. If possible, field measurements shall be taken with a CSXT representative present.
 3. Crane rating sheets showing cranes to be adequate for 150% of the actual weight of the pick. A complete set of crane charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted. Safety factors that may have

CONSTRUCTION SUBMISSION CRITERIA

been “built in” to the crane charts are not to be considered when determining the 150% Factor of Safety.

4. A data sheet shall be prepared listing the type, size and arrangements of slings, shackles, or other connecting equipment. Include copies of a catalog or information sheets for specialized equipment. All specific components proposed for use shall be clearly identified and highlighted in the submitted documents. The safe working load capacity of the connecting equipment shall be 150% above the calculated weight of the pick.
5. A complete written procedure is to be included that describes the sequence of events, indicating the order of lifts and any repositioning or rehitching of the crane or cranes.
6. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., torch/saw cutting various portions of the superstructure or substructure, dismantling splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.
7. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor’s means and methods submission.
8. Design and supporting calculations prepared by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review. A guardrail will be required to be installed in a track where a temporary bent is located within twelve (12) feet from the centerline of that track. The guardrail will be installed by CSXT forces at the expense of the Agency or its contractor.
9. Existing, obsolete, bridge piers shall be removed to a minimum of 3’-0” below the finished grade, final ditch line invert, or as directed by the Engineer.
10. A minimum quantity of 25 Tons of CSXT approved track ballast may be required to be furnished and stockpiled on site by the Contractor, or as directed by the Engineer.

CONSTRUCTION SUBMISSION CRITERIA

11. CSXT's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab.

NOTE: On-track or ground level debris shields such as crane mats are prohibited for use by CSXT.

- C. Overhead Demolition Debris Shield - Shall be installed prior to the demolition of the bridge deck or other relevant portions of the superstructure.
 1. The demolition debris shield shall be erected from the underside of the bridge over the track area to catch all falling debris.
 2. The Contractor shall include the demolition debris shield installation/removal means and methods as part of the proposed Controlled Demolition procedure submission.
 3. The demolition debris shield shall provide 23'-0" minimum vertical clearance or maintain the existing vertical clearance if the existing clearance is less than 23'-0" as approved by CSXT. Horizontal clearance to the centerline of the track should not be reduced unless approved by the Engineer.
 4. The vertical clearance ATR (above top of rail) is measured from the top of rail to the lowest point on the overhead shielding system measured within a distance of 6'-0" out from each side of the track centerline.
 5. The demolition debris shield design and supporting calculations all signed/sealed by a Professional Engineer, shall be submitted for review and acceptance.
 6. The demolition debris shield shall have a **minimum** design load of 50 pounds per square foot **plus** the weight of the equipment, debris, personnel, and other loads to be carried.
 7. The Contractor shall include the proposed bridge deck removal procedure in its demolition means and methods and shall verify that the size and quantity of the demolition debris generated by the procedure does not exceed the shield design loads.
 8. The contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Engineer.
- D. Vertical Demolition Debris Shield – This type of shield may be required for substructure removals in close proximity to CSXT track and other facilities, as determined by the Engineer.

CONSTRUCTION SUBMISSION CRITERIA

1. Prior to commencing the demolition activity, the Contractor shall install a ballast protection system consisting of geotextile to keep the railroad ballast from becoming fouled with construction or demolition debris and fines. The geotextile ballast protection system shall be installed and maintained by the Contractor for the project duration in accordance with the attached plan, or with additional measures as directed by the Engineer.
 2. The Agency, or its Contractor, shall submit detailed plans, with detailed calculations, prepared and submitted by a Professional Engineer of the protection shield and ballast protection systems for approval prior to the start of demolition.
 3. Blasting will not be permitted to demolish a structure over or within CSXT's right-of-way.
- E. The Controlled Demolition procedure must be approved by the **Engineer** prior to undertaking work on the project.
- F. The Contractor shall provide timely communication to the Engineer when scheduling the demolition related work so that the Engineer may be present during the entire demolition procedure.
- G. At any time during demolition activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances which may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

III. ERECTION PROCEDURE:

The Agency or its Contractor shall submit a detailed procedure for performing erection on/about CSXT property, as defined above.

- A. The Agency or its Contractor shall submit six (6) copies of the detailed procedure for erection of the proposed structures over or adjacent to CSXT's tracks or right-of-way. This procedure shall include a plan showing the locations of cranes, horizontally and vertically, operating radii, with staging locations shown, including beam placement on ground or truck unloading staging plan. Plan should also include the location of all tracks, other railroad facilities; wires, poles, adjacent structures, or

CONSTRUCTION SUBMISSION CRITERIA

buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions should be shown. No crane or equipment may be set on the CSXT rails or track structure.

- B. Also included with this submittal the following information:
1. As-Built Bridge Seat Elevations - All as-built bridge seats and top of rail elevations shall be furnished to the Engineer for review and verification at least 30 days in advance of construction or erection, to ensure that minimum vertical clearances as approved in the plans will be achieved.
 2. Computations showing weight of picks must be submitted. Computations shall be made from plans of the structure beams being erected and those plans or sections thereof shall also be included in the submittal; the weight shall include the weight of concrete or other materials including lifting rigging.
 3. Crane rating sheets showing cranes to be adequate for 150% of the actual weight of the pick. A complete set of crane charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted. Safety factors that may have been "built in" to the crane charts are not to be considered when determining the 150% Factor of Safety.
 4. A data sheet shall be prepared listing the type, size and arrangements of slings, shackles, or other connecting equipment. Include copies of a catalog or information sheets for specialized equipment. All specific components proposed for use shall be clearly identified and highlighted in the submitted documents. The safe working load capacity of the connecting equipment shall be 150% above the calculated weight of the pick.
 5. A complete written procedure is to be included that describes the sequence of events, indicating the order of lifts and any repositioning or rehitching of the crane or cranes.
 6. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical sub tasks (i.e., performing aerial splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.

CONSTRUCTION SUBMISSION CRITERIA

7. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
 8. Design and supporting calculations prepared by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review. A guardrail will be required to be installed in a track where a temporary bent is located within twelve (12) feet from the centerline of that track.
- C. The proposed Erection procedure must be approved by the Engineer prior to undertaking work on the project.
- D. The Contractor shall provide timely communication to the Engineer when scheduling the erection related work so that the Engineer may be present during the entire erection procedure.
- E. At any time during construction activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances which may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

IV. EXCAVATION AND SHORING:

The Agency or its contractor shall submit as defined above, a detailed procedure for the installing sheeting/shoring adjacent to Railroad Tracks.

- A. Shoring protection shall be provided when excavating adjacent to an active track or railroad facility or as determined by CSXT. Shoring will be provided in accordance with *AREMA Manual for Railway Engineering* Chapter 8, part 28; except as noted below.
- B. Shoring may not be required if all of the following conditions are satisfied:
 1. Excavation does not encroach upon a 1½ horizontal: 1 vertical theoretical slope line starting 1'-6" below top of rail and at 12'-0" minimum from centerline of the track (live load influence zone).
 2. Track is on level ground or in a cut section and on stable soil.

CONSTRUCTION SUBMISSION CRITERIA

3. Excavation does not adversely impact the stability of a CSXT facility (i.e. signal bungalow, drainage facility, undergrade bridge, building, etc.).
 4. Shoring is not required by any governing construction code.
- C. When the track is on an embankment, excavating the toe of the embankment without shoring may affect the stability of the embankment. Therefore, excavation of the embankment toe without shoring will not be permitted.
- D. Trench Boxes are prohibited for use on CSXT within the Theoretical Railroad Live Load Influence Zone.
- E. The required protection is the cofferdam type that completely encloses the excavation. Where dictated by conditions, partial cofferdams with open sides away from the track may be used. Cofferdams shall be constructed using steel sheet piling, or when approved by the Engineer, steel soldier piles with timber lagging. Wales and struts shall be provided and designed as needed. The following shall be considered when designing cofferdams:
1. Shoring shall be designed to resist a vertical live load surcharge of 1,880 lbs. per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, 8'-6" wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in *AREMA Manual for Railway Engineering*, Chapter 8, Part 20.
 2. Allowable stresses in materials shall be in accordance with *AREMA Manual for Railway Engineering*, Chapter 7, 8, and 15.
 3. A construction procedure for temporary shoring shall be shown on the drawing.
 4. All shoring systems on or adjacent to CSXT right-of-way shall be equipped with railings or other approved fall protection.
 5. A minimum horizontal clearance of 10'-0" from centerline of the track to face of nearest point of shoring shall be maintained provided a 12'-0" roadbed is maintained with a temporary walkway and handrail system.

CONSTRUCTION SUBMISSION CRITERIA

F. The contractor shall submit the following drawings and calculations (all shall be signed/sealed by a Professional Engineer) for CSXT's review and approval.

1. Six (6) sets of detailed drawings of the shoring systems showing sizes of all structural members, details of connections, and distances from centerline of track to face of shoring. Drawing shall show a section showing height of shoring and track elevation in relation to bottom of excavation.
2. Six (6) sets of calculations of the shoring design.

The drawings and calculations shall be prepared by a Licensed Professional Engineer in the State (if required by the Agency) where the shoring is to be constructed and shall bear his seal and signature. Shoring plans shall be approved by CSXT's construction engineering and inspection representative.

3. For sheeting and shoring within 18'-0" of the centerline of the track, the live load influence zone, and in slopes, the contractor shall use interlocked steel sheeting (sheet pile).
4. Sheet pile installed in slopes or within 18'-0" of the centerline of track shall not be removed.
5. Sheet piles shall be cut off a minimum of 3'-0" below the finished grade, ditch line invert, or as directed by the **Engineer**. The ground shall be backfilled and compacted immediately after sheet pile is cut off.
6. A procedure for cutting off the sheet pile and restoring the embankment shall be submitted to the Engineer for review and acceptance.

G. Blasting is not permitted on or adjacent to CSXT right-of-way without prior written approval from the **Engineer**. Mechanical and Chemical means of rock removal must be explored before blasting is considered. If written permission for the use of explosives is granted, the Agency or Contractor must comply with all of the following:

1. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Agency or Contractor.

CONSTRUCTION SUBMISSION CRITERIA

2. Electronic detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
3. No blasting shall be done without the presence of an authorized representative of CSXT. Advance notice to the Engineer as required by the CSXT Special Provisions is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require.
4. Agency or Contractor must have at the project site adequate equipment, labor and materials, and allow sufficient time, to clean up debris resulting from the blasting and correct any misalignment of tracks or other damage to CSXT property resulting from the blasting. Any corrective measures required must be performed as directed by the Engineer at the Agency's or Contractor's expense without any delay to trains. If Agency's or Contractor's actions result in the delay of any trains including passenger trains, the Agency or Contractor shall bear the entire cost thereof.
5. The Agency or Contractor may not store explosives on CSXT property.
6. At any time during blasting activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances which may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

V. TRACK MONITORING

The Agency or its Contractor shall submit for CSXT review and approval, a detailed track monitoring program to detect both horizontal and vertical movement of the CSXT track and roadbed, a minimum of 30 days in advance of start of work.

- A. For the installation of temporary or permanent shoring systems, including but not limited to soldier piles and lagging, and interlocked steel sheeting on or adjacent to CSXT's right-of-way, the contractor may be required to

CONSTRUCTION SUBMISSION CRITERIA

submit a detailed track monitoring program for CSXT's approval prior to performing any work near CSXT's right-of-way.

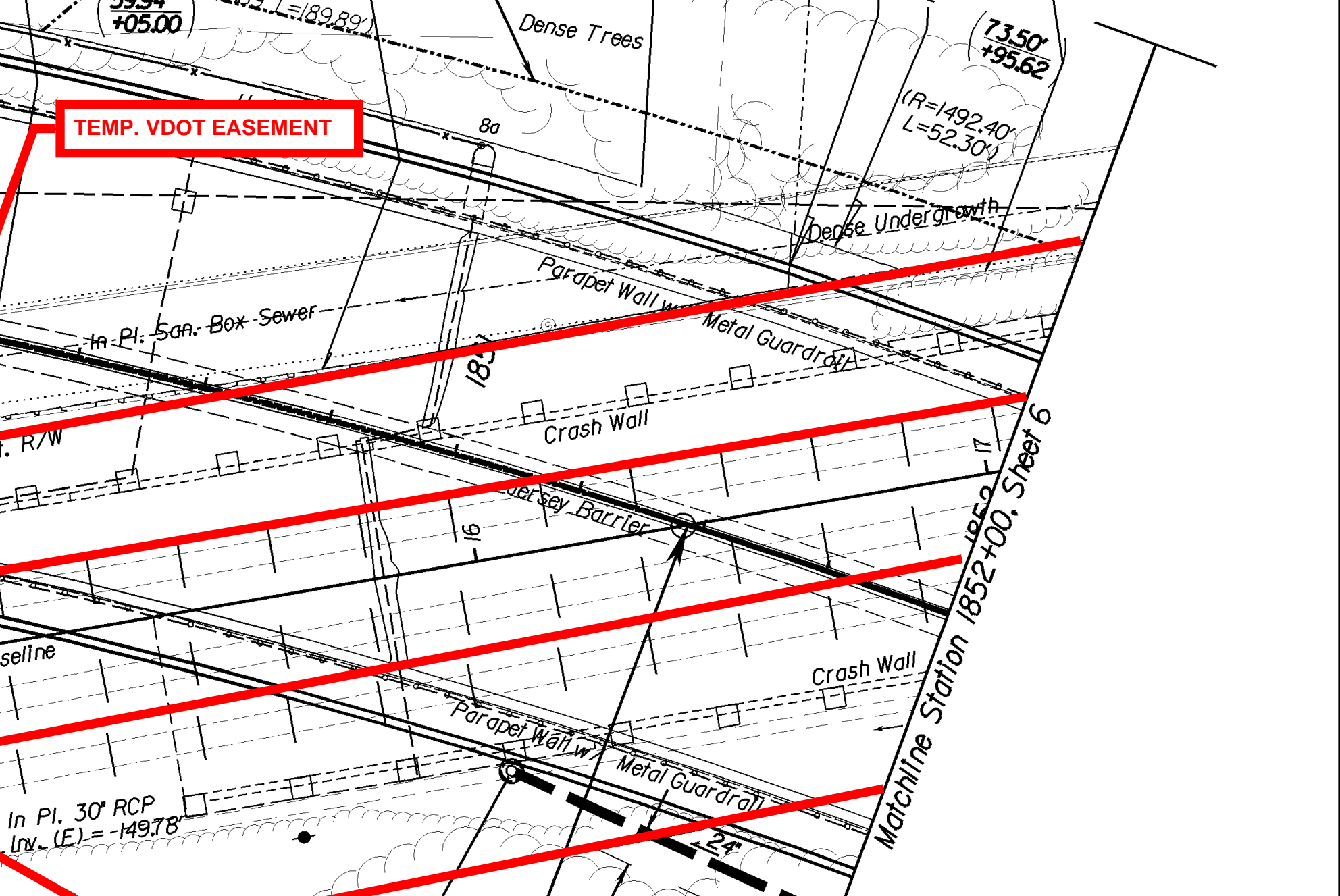
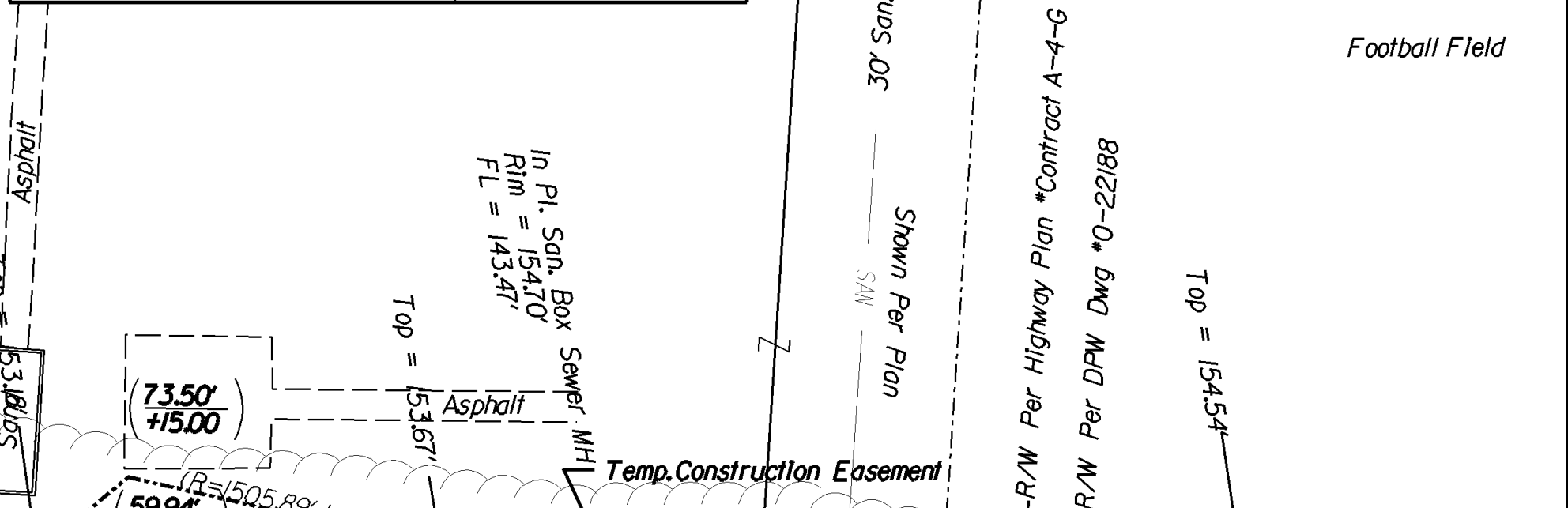
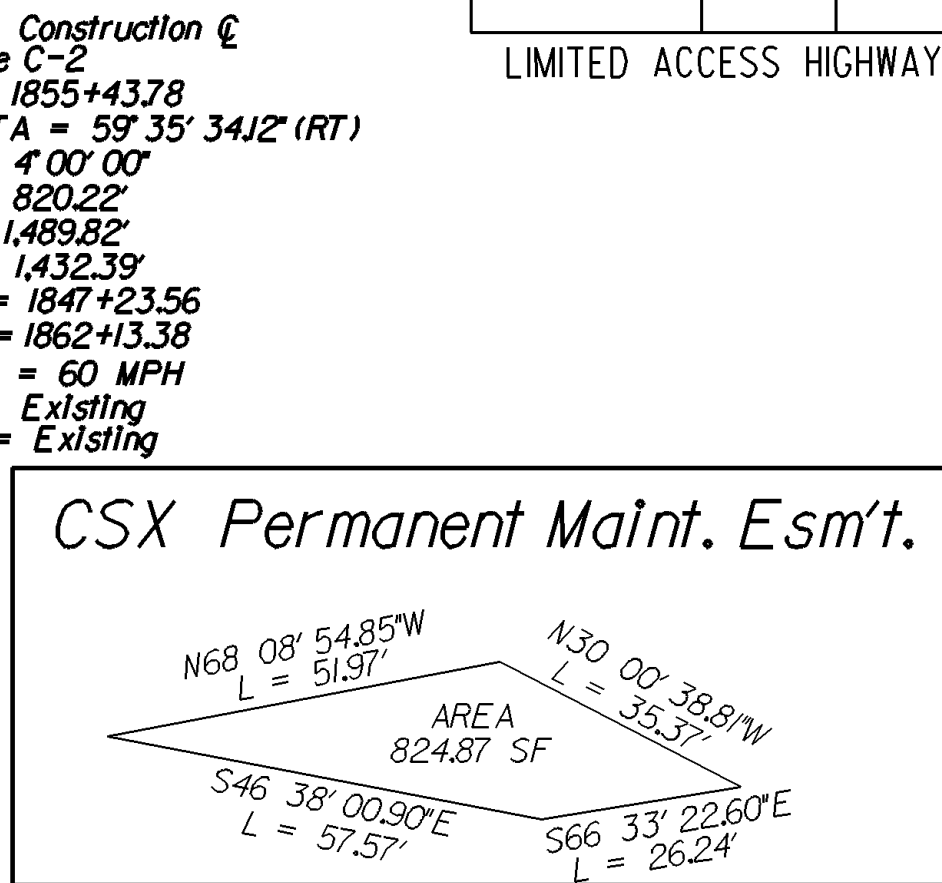
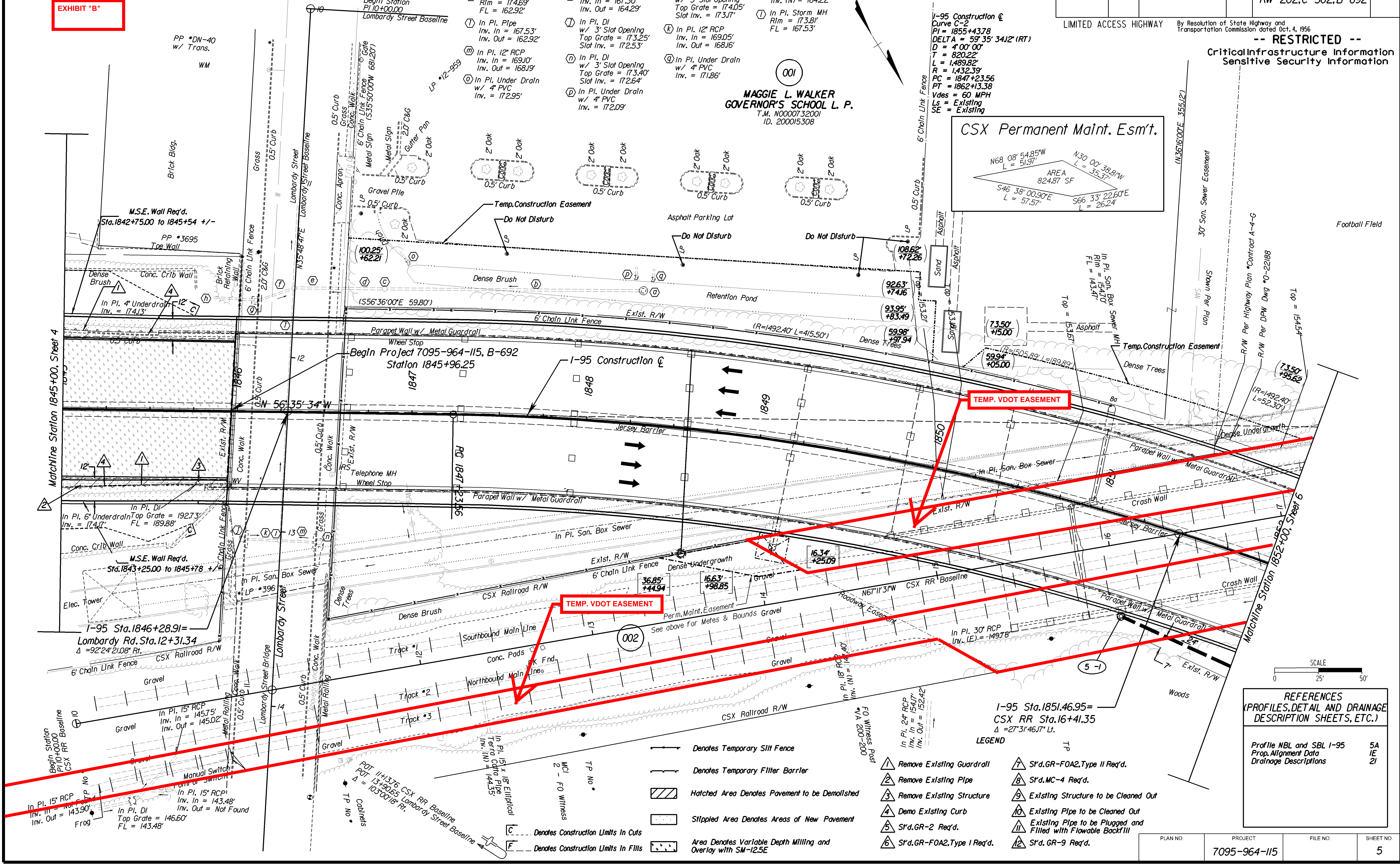
- B. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. CSXT reserves to the right to modify the survey locations and monitoring frequency as necessary during the project.
- C. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Engineer for analysis.
- D. If any movement has occurred as determined by the Engineer, CSXT will be immediately notified. CSXT, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSXT or performed by CSXT including the monitoring of corrective action of the contractor will be at project expense.

PROJECT MANAGER: Steve McNeely
 SURVEYED BY: NXL Construction Services
 DESIGN SUPERVISED BY: Brian Smith
 DESIGNED BY: URS Corp.

ORDER NO.: D28
 CONTRACT ID. NO.: C00018944C02

REVISED	STATE	FEDERAL AID	ROUTE	STATE	PROJECT	SHEET NO
	VA.		95		7095-964-115, PE-101, RW-202, C-502, B-692	5

LIMITED ACCESS HIGHWAY By Resolution of State Highway and Transportation Commission dated Oct. 4, 1996
-- RESTRICTED --
 Critical Infrastructure Information
 Sensitive Security Information



REFERENCES
 (PROFILES, DETAIL AND DRAINAGE DESCRIPTION SHEETS, ETC.)

Profile NBL and SBL I-95	5A
Prop. Alignment Data	1E
Drainage Descriptions	2I

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	7095-964-115		5

\$T/MS/STAMP#

PROJECT MANAGER: Steve McNeely
 SURVEYED BY: NXL Construction Services
 DESIGN SUPERVISED BY: Brian Smith
 DESIGNED BY: URS Corp.

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

REVISED	STATE	FEDERAL AID PROJECT	ROUTE	STATE PROJECT	SHEET NO
	VA.		95	7095-964-115, PE-101, RW-202, C-502, B-692	6

LIMITED ACCESS HIGHWAY By Resolution of State Highway and Transportation Commission dated Oct. 4, 1956

-- RESTRICTED --

Critical Infrastructure Information
 Sensitive Security Information

- (A) In Pl. DI w/ 1-20' Slot Opening & 1-Grate 1.65' x 2.50' Top Grate(NBL) = 176.76' Bottom Inv. = 174.38' FL = 174.56'
- (B) In Pl. 15' RCP Inv. In = 174.56' Inv. Out = 173.88'
- (C) In Pl. DI w/ 2-6' Slot Openings & 2-Grates 1.65' x 2.50' Top Grate(NBL) = 176.68' Top Grate(SBL) = 176.31' Bottom Inv. = 173.63' FL = 173.93'
- (D) In Pl. 15' RCP Inv. In = 174.47' Inv. Out = 173.68'
- (E) In Pl. DI w/ 1-12' Slot Opening & 1-Grate 1.65' x 2.50' Top Grate(NBL) = 176.87' Bottom Inv. = 174.37' FL = 174.47'
- (F) In Pl. 15' RCP Inv. In = 173.93' Inv. Out = 166.49'
- (G) In Pl. 8" RCP Inv. In = Inaccessible (Unable to locate) Inv. Out = 168.82'
- (H) In Pl. 15" CMP Inv.(E) = 176.49' Inv.(W) = Cannot Locate Pipe Is buried Top of Pipe = 156.74'

I-95 Construction C
 Curve C-2
 PI = 1855+43.78
 DELTA = 59° 35' 34.12" (RT)
 D = 4' 00" 00"
 T = 820.22'
 L = 1,489.82'
 R = 1,432.39'
 PC = 1847+23.56
 PT = 1862+13.38
 Pdes = 60 MPH
 Ls = Existing
 SE = Existing

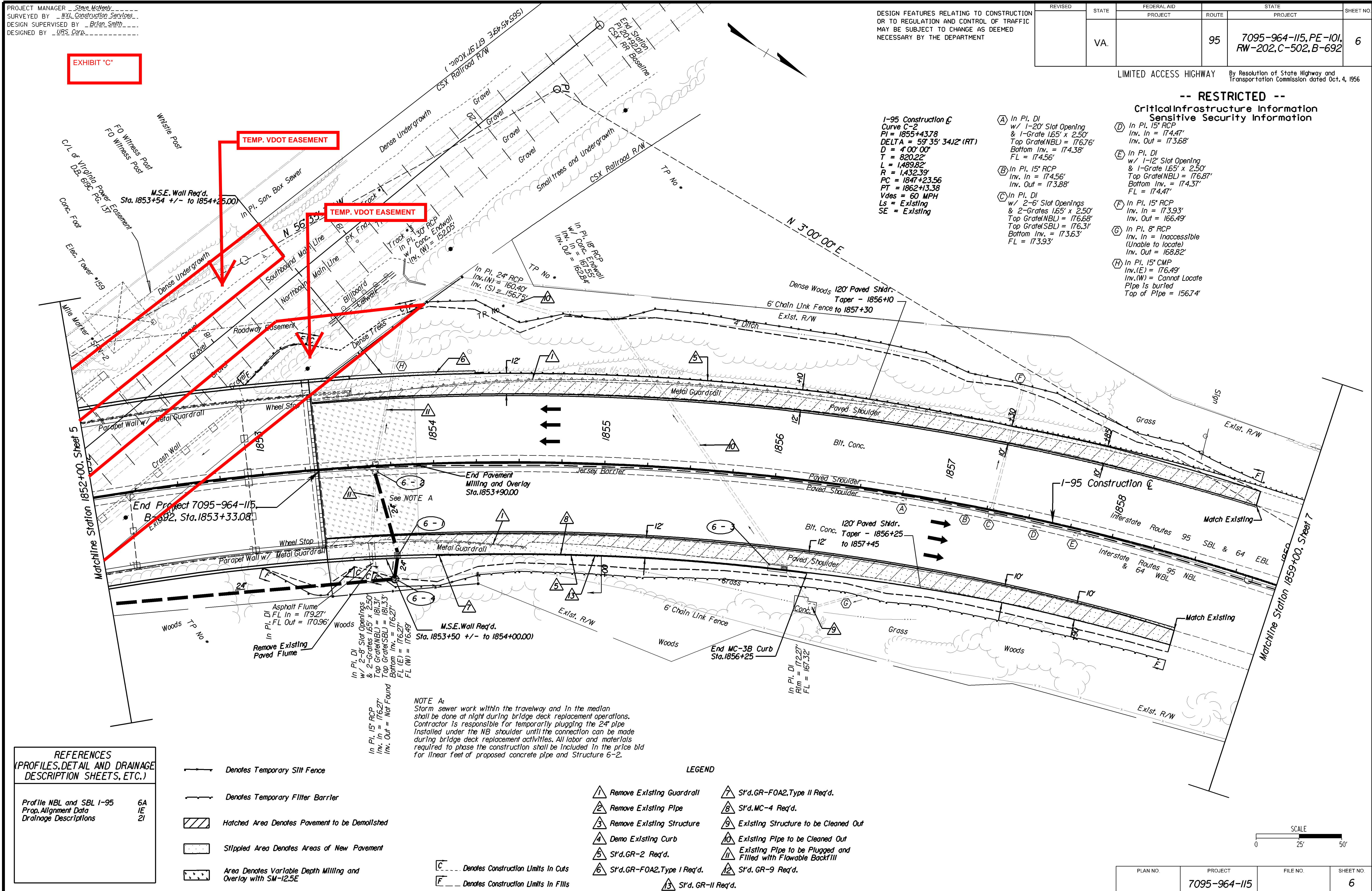


EXHIBIT "C"

TEMP. VDOT EASEMENT

TEMP. VDOT EASEMENT

REFERENCES
 (PROFILES, DETAIL AND DRAINAGE DESCRIPTION SHEETS, ETC.)

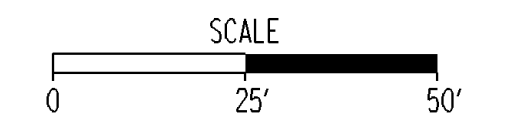
Profile NBL and SBL I-95	6A
Prop. Alignment Data	1E
Drainage Descriptions	2I

- Denotes Temporary Silt Fence
- Denotes Temporary Filter Barrier
- ▨ Hatched Area Denotes Pavement to be Demolished
- ▨ Stippled Area Denotes Areas of New Pavement
- ▨ Area Denotes Variable Depth Milling and Overlay with SM-12.5E

NOTE A:
 Storm sewer work within the travelway and in the median shall be done at night during bridge deck replacement operations. Contractor is responsible for temporarily plugging the 24" pipe installed under the NB shoulder until the connection can be made during bridge deck replacement activities. All labor and materials required to phase the construction shall be included in the price bid for linear feet of proposed concrete pipe and Structure 6-2.

LEGEND

- ⚠ Remove Existing Guardrail
- ⚠ Remove Existing Pipe
- ⚠ Remove Existing Structure
- ⚠ Demo Existing Curb
- ⚠ S'd.GR-2 Req'd.
- ⚠ S'd.GR-FOA2, Type I Req'd.
- ⚠ S'd.GR-FOA2, Type II Req'd.
- ⚠ S'd.MC-4 Req'd.
- ⚠ Existing Structure to be Cleaned Out
- ⚠ Existing Pipe to be Cleaned Out
- ⚠ Existing Pipe to be Plugged and Filled with Flowable Backfill
- ⚠ S'd.GR-9 Req'd.
- ⚠ S'd.GR-11 Req'd.



PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	7095-964-115		6

Route 95
Project 7095-964-115,B692
Overhead Bridge Replacement
Over CSXT Inc. Right of Way and Track
Milepost SRN-2.91, DOT 623-520F
Florence Division, Bellwood Sub
City of Richmond, VA

Route 95
Project 7095-964-115,B692
Overhead Bridge Replacement
Over CSXT Inc. Right of Way and Track
Milepost SRN-2.91, DOT 623-520F
Florence Division, Bellwood Sub
City of Richmond, VA

THIS AGREEMENT, made and executed in duplicate as of the
9th day of DECEMBER 2009, between the
COMMONWEALTH OF VIRGINIA, acting by and through the Chief Engineer of the
Department of Transportation, hereinafter called "State", and CSX TRANSPORTATION,
INC., a Virginia corporation, hereinafter called "Railway".

WITNESSETH THAT:

WHEREAS, State proposes to replace and widen the existing bridge and
approach roadways that carry Route I-95 (DOT 623-520F) in the City of Richmond,
Virginia, over Railway's main line right of way and tracks located at approximate Railway
Milepost SRN-2.91; and

WHEREAS, Title I, United States Code "Transportation Equity Act for the 21st
Century" including amendments and revisions thereof has become effective in providing
part of the funds for the construction of the Project such as contemplated herein; and

WHEREAS, it is desired by the parties hereto to carry out and accomplish the
demolition and removal of the existing Route I-95 (DOT 623-520F) bridge deck and pier
modifications at approximate Railway Milepost SRN-2.91, and the construction of a new
bridge deck, superstructure and pier modifications to carry Route I-95 (DOT 623-520F)
over and across Railway's main line right of way and track at approximate Railway
Milepost SRN-2.91, the approaches thereto, the work appurtenant thereto and to
determine and agree upon the manner of performing said work; the portion of it to be
done by each of the parties hereto; the proportion of costs and expenses to be paid by
each of said parties; and the mode and time of reimbursing Railway for the portion of

work to be performed by it, all upon the terms, covenants and provisions hereinafter set forth.

NOW, THEREFORE, for and in consideration of the mutual covenants hereinafter stipulated to be kept and performed, it is agreed between the parties hereto as follows:

- § 1. The plans and specifications for this Project are identified as follows:
- A. Commonwealth of Virginia, Department of Transportation plans for Route I-95 overpass replacement said Project 7095-964-115,B692 and the current road and bridge specifications and special provisions of the Department of Transportation.
 - B. Before this Agreement shall be in force and effect, the foregoing plans shall meet the approval in writing by the parties hereto and upon such approval shall become a part of this Agreement by reference.
- § 2. The work to be done under this Agreement consists of the demolition, removal and disposal of the existing Route I-95 (DOT #623-520F) bridge deck, over Railway's right of way and track at approximate Railway Milepost SRN-2.91, the construction of a new highway bridge deck, superstructure and pier modifications to carry Route I-95 (DOT 623-520F) over and across Railway's right of way and tracks at approximate Railway Milepost SRN-2.91, the approaches thereto, the work appurtenant thereto, the acquisition of rights of way therefore and the adjustments to Railway's facilities required thereby. The work herein described is hereinafter referred to as the "Project" and the costs and expenses in connection with said work are hereinafter referred to as "Project Expense." all as shown on said plans, the work appurtenant thereto, the acquisition of rights of way therefore and the adjustments to Railway's facilities required thereby. The work herein described is hereinafter referred to as the "Project" and the costs and

expenses in connection with said work are hereinafter referred to as "Project Expense."

§ 3. Responsibility for the several necessary items of work shall be as follows:

A. State shall perform or cause to be performed at Project Expense the following work:

- (1) Dismantle, remove and dispose of the existing bridge deck on the highway overpass of Route I-95 (DOT 623-520F) as it crosses Railway right of way and track at approximate Railway Milepost SRN-2.91, as shown on the plans described in § 1 hereof, all salvageable material from the removal of said deck and superstructure shall become the property of the State or State's contractor.
- (2) Construction and placement of new bridge deck, necessary superstructure and pier modifications for the new bridge carrying Route I-95 (DOT 623-520F) over and across the Railways main line right of way and tracks at approximate Railway Milepost SRN-2.91, as shown on the plans described in § 1.
- (3) Temporary falsework, sheeting, shoring and cribbing necessary for the replacement for said Route I-95 (DOT 623-520F) bridge and for the maintenance of Railway's traffic during construction at approximate Railway Milepost SRN-2.91.
- (4) Grading, drainage, pavement and materials to construct access roadways for construction access for said work, removal of same upon completion of said work and for restoring disturbed areas to the preconstruction conditions or to the satisfaction of Railway's

officials and designated representative for said Route I-95 (DOT 623-520F) bridge at approximate Railway Milepost SRN-2.91.

- (5) The necessary precautions to prevent slope erosion beneath the bridge and to minimize silt fouling Railway's roadbed and ditches.

B. Railway shall perform or cause to be performed at Project Expense the following work:

- (1) Temporary or permanent changes in Railway's communication and signal lines and facilities, as may be appropriate.
- (2) Furnish such flagman and watchman service as may be necessary in connection with work performed by Railway's forces and the State or State's agents or contractors.
- (3) Furnish such engineering and plans as may be necessary in connection with work to be performed by Railway's forces.
- (4) Furnish an estimate for the aforementioned work, said estimate in the amount of \$ 275,965.00 shall meet the approval of State and upon such approval shall become a part of this Agreement, attached hereto.

C. Public utilities including water, power, telephone, light, gas or sewer lines or any other utilities conflicting with the construction of this Project shall be removed, replaced, or relocated at no expense to Railway.

§ 4. Any work necessary in connection with the Project, which is not specifically provided for in § 3, or its subsections, shall be done at Project Expense by one of the parties hereto as may be mutually agreed upon by said parties. All work shall be done in accordance with the plans and specifications referred to in § 1 hereof, together with such other plans and specifications that may be agreed upon by the said parties to carry out the work fully in accordance with the intent of this

Agreement and in accordance with good engineering practices. If the parties are unable to agree, the issue or issues will be resolved in accordance with the applicable laws of the United States and the Commonwealth of Virginia.

§ 5. The following temporary construction clearances will be permitted by Railway.

Horizontal – 15.0 feet measured at right angles from the centerline of the nearest track.

Vertical – 23.0 feet measured above the top of the highest rail of Railway's track.

Should temporary clearances less than those specified herein be required during construction, the State and its contractor shall notify Railway's designated representative, a minimum of 72 hours in advance of same, providing him with details for the work which will require such reduced clearances, and State and its contractors shall abide by his instructions for performance of such work. It is understood and agreed that nothing herein contained shall be construed as granting to State or its contractor authority for clearances contrary to any applicable law or regulation.

§ 6. State shall have general charge of engineering on the Project, however Railway shall provide, at Project Expense, such engineering services as may be necessary in connection with the work to be performed by Railway. Railway may also provide, at Project Expense, an inspector to protect its interest in the work to be done on Railway's property and/or facilities by State's forces or contractor.

§ 7. The State shall have charge of the acquisition of all property or property rights required for the Project, whether purchased, appropriated or otherwise, and the cost shall be charged to Project Expense. If any additional rights of way are required outside of Railway's property, State shall acquire same at Project Expense.

- A. Railway, without prejudice to any of their existing rights, insofar as they have the right to do so and subject to provisions of § 9 hereof, hereby grants to State for a period of twelve (12) months from the date of this Agreement:
- (1) A temporary nonexclusive right of entry through, on, over, and upon those parcels of Railway as shown on State's plans for the construction of the highway facilities and appurtenances.
 - (2) Necessary temporary nonexclusive rights of ingress to and egress from land upon which the aforesaid right of entry is granted, on adjoining lands of Railway, excluding, however, grade crossings, provided such right of ingress and egress shall be exercised along such routes and upon such terms as may be defined and imposed by the Railway's designated representative.
 - (3) Temporary construction easements as are designated on State's right of way plats for the purpose of the aforesaid described construction.
- B. The grants hereinabove set forth are subject to and subordinate to:
- (1) Railway approval of State's project construction plans and State's right of way plats prior to State's entry and possession.
 - (2) The safe and continued operations of Railway.
 - (3) The continued and faithful performance by State and its contractors of all terms, covenants and provisions herein contained.
- C. Railway, insofar as they have the legal right to do so and as their title permits, shall convey or cause to be conveyed to State, by separate deed, permanent easements for highway purposes to certain parcels of

land, and grant nonexclusive easements over other parcels of land for the aforesaid project, either wholly or partly on Railway's property, as shown on State's project plans and State's right of way plats; said permanent easements and/or nonexclusive easement parcels to be identified hereto by prior mutual agreement between the parties and distinguished as permanent easements and nonexclusive easement parcels on State's right of way plats. State shall furnish to and for Railway review and approval, descriptions of said parcels. The price to be paid by State to Railway for said parcels, representing the fair market value thereof, plus damages, if any, to the residue, less any special benefits accruing to Railway, plus the fair market value of said temporary construction easements granted in § 7.A herein, shall be as mutually agreed upon prior to expiration of the aforesaid twelve (12) month period. If agreement as to price is reached, an additional period of ninety (90) days shall be allowed for settlement. However, if no agreement as to price is reached with the aforesaid twelve (12) month period, state, within ninety (90) days after expiration of said term, shall institute eminent domain proceedings as authorized by law, for determination of the value of same. The rights of occupation granted in § 7.B of this Agreement shall continue through institution of such eminent domain proceeding to settlement. The provisions of the agreement shall survive the institution of such eminent domain proceedings. The date of execution of this Agreement shall be construed as establishing the date of valuation. Taxes and assessments will also be adjusted as of the date of take. Interest at statutory rate shall also accrue on final award over and above the amount of the certificate on record.

- D. Such easement hereby granted is limited to the use for highway purposes of space required for said bridge and for piers, foundations and other parts of the bridge, together with the use of reasonable additional space for construction and for access to the highway facilities for maintenance purposes; it being understood that the easement shall not restrict the Railway from utilizing the airspace under said bridge for railroad operations and for wire lines or other facilities which will not encroach on the reasonable requirements for maintaining the highway facilities. All other rights are reserved unto the Railway.
- E. State, in its maintenance of the highway facilities, agrees to obtain written permission from the Railway before undertaking any work which may interfere with or be a real or potential hazard to passage of trains or other railroad operations and agrees to bear all expense for flagman or watchman services which the Railway may deem necessary because of its operations.
- F. Railway agrees to notify the State prior to undertaking the use of airspace over the easement and prior to starting the construction of any fixed installation, other than its customary signal and communication facilities, within 8 feet of the underside of said bridge or within 15 feet of said easement, it being understood that such use will afford reasonable protection and safety to the highway facilities and highway traffic, and will not unreasonably interfere with maintenance of the highway facilities. Legal title and ownership in any structure included in this Project erected by State on this easement is in State.
- G. (1) With respect to those parcels identified and distinguished in said deed as Nonexclusive Easement parcels (surface or grade

crossing easements), Railway shall EXCEPT and RESERVE unto itself, its successors, assigns and licenses, all rights (including but not limited to those which it now deems, or from time to time may deem, desirable or necessary for its operations or the operations of its successors, assigns and licensees as they now are or may lawfully be engaged in from time to time) to construct, reconstruct, relocate, operate, use, maintain, repair, renew and remove such of its rail facilities as now are, or such additional facilities as Railway or its successors, assigns, and licensees may deem desirable or necessary to be located in, upon, over, under or across the premises aforesaid, so long as such reserved rights do not interfere with Grantee's use of the premises for the purpose(s) expressed herein.

(2) Said deed shall further provide that said highway structures on Railway property shall be maintained, repaired, renewed, reconstructed and/or removed in accordance with the provisions contained in this Agreement, and the plans for said Project, which Agreement and plans are to be on file in the respective offices of the parties hereto, and which shall survive the delivery of said deed.

H. All rights herein granted by Railway to State shall not be construed in any way whatsoever as being for the benefit of State or State's contractor or any others not a party to this Agreement.

§ 8. State shall require its contractor:

A. To use all reasonable care and diligence in the performance of the work and cooperate fully with Railway's officials and designated representative

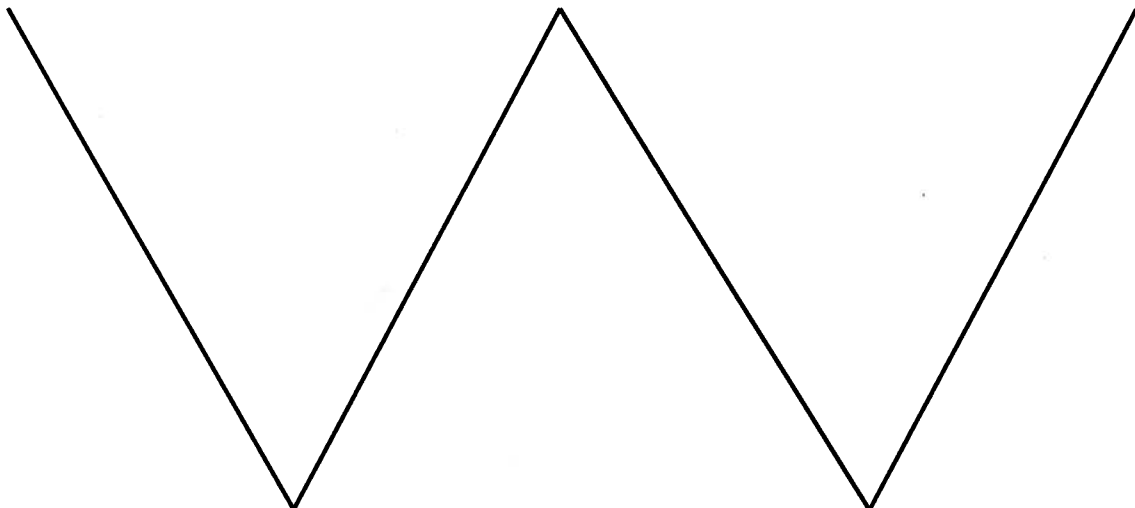
in order to avoid accidents, damage or delay to or interference with trains on Railway's tracks.

- B. To consult with Railway's designated representative before beginning any work on Railway's right of way and abide by his instructions insofar as the safety of Railway operations is concerned.
- C. Not to perform any work over or within, or to place or permit the placing of any machinery, equipment, material or other debris within 15.0 feet from the centerline of Railway's track, without obtaining prior authority therefor from Railway's designated representative.
- D. Before commencing work on Railway's property, submit to State for obtaining approval of Railway, his design and method for performing any work on Railway's right of way, including plans and specifications for shoring and sheeting for excavations adjacent to the tracks. State to review said submittals and if found in substantial conformance with provisions of his contract with the State, shall forward same to Railway for review and approval. It is understood and agreed to by the parties hereto that approval of said designs and methods by Railway shall not in any way relieve the State or its contractor of any obligations, responsibilities and liabilities imposed upon them by the provisions of this Agreement.
- E. To notify Railway's designated representative in writing of the need for flagman or watchman services as determined by the Railway, such notice shall be received by the appropriate Railway official a minimum of 30 days in advance of this need.
- F. To notify Railway's designated representative in writing when, such flagman or watchman services shall be terminated subject to Railway's concurrence.

- G. To reimburse Railway for actual loss and expense incurred or suffered by Railway by reason of any substandard clearances erected on this Project by the contractor.
- H. To reimburse Railway for actual loss and expense incurred or suffered by Railway in the event Railway must detour trains by reason of contractor blocking Railway's tracks.
- § 9. State shall require its contractor, before commencing work of constructing said Project within Railway's right of way, to furnish evidence acceptable to Railway that the contractor has obtained the insurance policies set forth on Exhibit A attached hereto, in addition to worker's compensation coverage as required by the Statutes of Virginia, automobile liability insurance, and Contractor's Public Liability and Property Damage Insurance generally required of its contractor by State on such projects with limits of liability as set forth in the Contractor Proposal.
- § 10. After completion of the work, said Route I-95 (DOT 623-520F) over Railway's right of way and track at approximate Railway Milepost SRN-2.91, including highway drainage and appurtenances, shall be maintained by the State as a part of the State's System of Interstate Highways.
- § 11. In accordance with the Federal-Aid Policy Guide, Section 646.210, and revisions and supplements thereto, this project is not deemed to be of any benefit to Railway and therefore no participation shall be required of Railway to Project Expense. It is understood that the construction of the Project, as herein contemplated, is to be financed from funds provided by the Federal Government and State and expended under State and Federal regulations. All plans, specifications, estimates of costs, awards of contract, acceptance of work and procedures in general are subject at all times to Federal and State laws, rules

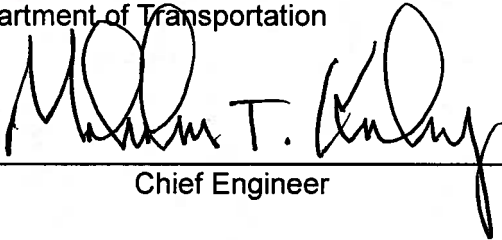
and regulations, orders and approvals applicable to State projects of the character herein contemplated. All plans, specifications, estimates of costs, awards of contract, acceptance of work and procedures in general are subject at all times to State laws, rules and regulations, orders and approvals applicable to State projects of the character herein contemplated. Railway shall render its bills to State for actual costs and expenses incurred by it on account of the Project in accordance with State's standard accounting procedures (i.e., Federal Aid Policy Guide, Part 140, Subpart I, of the Federal Highway Administration and revisions and supplements thereto). Any items paid Railway throughout the progress of the Project by State and not found to be in accordance with said regulations by State in their final audit shall be promptly refunded State by Railway upon submission of the items so disapproved. The State shall not be liable for payment of any bill received more than 12 months after all work on the Project is completed and the Project has been accepted by the Railway and State, unless the Railway has requested an extension of the billing period in writing.

§ 12. This Agreement when properly executed shall be binding upon the parties hereto and their respective successors and assigns.



IN TESTIMONY WHEREOF, the parties hereto have caused this Agreement to be executed in duplicate, all as of the day, month and year herein above first written.


COMMONWEALTH OF VIRGINIA
Department of Transportation

By 
Chief Engineer

WITNESS:



CSX TRANSPORTATION, INC.

By 
Dale W. Ophardt
Title: Assistant Vice President - Engineering

WITNESS:



INSURANCE REQUIREMENTS

I. Insurance Policies:

Company and Contractor, if and to the extent that either is performing work on or about CSXT's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than \$5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSXT as an additional named insured.
2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than \$1,000,000, which insurance must contain a waiver of subrogation against CSXT and its affiliates.
3. Commercial automobile liability insurance with limits of not less than \$500,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSXT as an additional named insured.
4. Railroad protective liability insurance with limits of not less than \$5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of \$10,000,000, which insurance shall satisfy the following additional requirements:
 - a. The insurer must be financially stable and rated B+ or better in Best's Insurance Reports.
 - b. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
 - c. CSX Transportation must be named as the named insured on the Railroad Protective Insurance Policy.
 - d. Name and Address of Contractor and Company must be shown on the Declarations page.
 - e. Description of operations must appear on the Declarations page and must match the Project description, including project or contract identification numbers.
 - f. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.
 - g. Authorized endorsements may include:
 - (i). Broad Form Nuclear Exclusion - IL 00 21
 - (ii) 30-day Advance Notice of Non-renewal or cancellation
 - (iii) Required State Cancellation Endorsement
 - (iv) Quick Reference or Index - CL/IL 240

h. Authorized endorsements may not include:

- (i) A Pollution Exclusion Endorsement except CG 28 31
- (ii) A Punitive or Exemplary Damages Exclusion
- (iii) A "Common Policy Conditions" Endorsement
- (iv) Any endorsement that is not named in Section 4 (f) or (g) above.
- (v) Policies that contain any type of deductible

5. Such additional or different insurance as CSXT may require.

II. Additional Terms

1. Contractor must submit its original insurance policies and two copies and all notices and correspondence regarding the insurance policies to:

Donna W. Melton
Manager—Insurance
CSX Transportation, Inc.
500 Water Street - C907
Jacksonville, FL 32202
Phone: 904-359-1247
Fax: 904-245-2833

2. Neither Company nor Contractor may begin work on the Project until it has received CSXT's written approval of the required insurance policies.

**CSX TRANSPORTATION, INC.
 FORCE ACCOUNT ESTIMATE**

ACCT. CODE : 709 - VA0326

ESTIMATE SUBJECT TO REVISION AFTER: 4/6/2010 DOT NO.: 623 520 F
 CITY: Richmond COUNTY: ___ STATE: VA
 DESCRIPTION: Proposed deck widening, replacement and superstructure rehabilitation of I-95 over CSXT
 DIVISION: Florence SUB-DIV: Bellwood MILE POST: SRN-2.91
 AGENCY PROJECT NUMBER: 7095-964-115,B692

PRELIMINARY ENGINEERING:

200 Labor (Non Contract)		\$	1,350
200 Additive	38.91%	\$	525
230 Expenses		\$	235
212 Contracted & Administrative Engineering Services		\$	15,000
Subtotal		\$	17,110

CONSTRUCTION ENGINEERING/INSPECTION:

200 Labor (Non Contract)		\$	1,890
200 Additive	38.91%	\$	735
230 Expenses		\$	329
212 Contracted & Administrative Engineering Services		\$	45,800
Subtotal		\$	48,754

FLAGGING SERVICE: (Contract Labor)

070 Labor (Conductor-Flagman)		\$	-
050 Labor (Foreman/Inspector)		\$	70,560
070 Additive13	3.71% (Transportation Department)	\$	-
050 Additive12	9.08% (Engineering Department)	\$	91,079
230 Per Diem	(Engineering Department)	\$	15,750
230 Expenses		\$	-
Subtotal		\$	177,389

SIGNAL & COMMUNICATIONS WORK:

\$ -

TRACK WORK:

\$ -

ACCOUNTING & BILLING:

040 Labor		\$	3,100
040 Additive14	5.92%	\$	4,524
Subtotal		\$	7,624

PROJECT SUBTOTAL

\$ 250,877

900 <u>CONTINGENCIES:</u>	10.00%	\$	25,088
----------------------------------	--------	----	--------

GRAND TOTAL ***** \$ **275,965**

DIVISION OF COST:

Agency	100.00%	\$	275,965
Railroad		\$	-
TOTAL *****		\$	275,965

This estimate has been prepared based on site conditions, anticipated work duration periods, material prices, labor rates, manpower and resource availability, and other factors known as of the date prepared. The actual cost for CSXT work may differ based upon the agency's requirements, their contractor's work procedures, and/or other conditions that become apparent once construction commences or during the progress of the work

Office of Assistant Chief Engineer Public Projects--Jacksonville, Florida

Estimated prepared by: AECOM

DATE: 10/8/2009

REVISED:

Form Revised 05-29-2009 -LLS

Project Summary Sheet

ACCT. CODE : 709 - VA0326
 Pub EB - VA EB3 (VA)

ESTIMATE SUBJECT TO REVISION AFTER: 4/6/10 **DOT NO.:** 623 520 F
CITY: Richmond **COUNTY:** ___ **STATE:** VA
DESCRIPTION: Proposed deck widening, replacement and superstructure rehabilitation of I-95 over CSXT
DIVISION: Florence **SUB-DIV:** Bellwood **MILEPOST:** SRN-2.91
DRAWING NO.: ___ **DRAWING DATE:** ___
AGENCY PROJECT NUMBER: 7095-964-115,B692

Amount		
Task	Task Desc	Total
40	Labor General Office	\$7,624
50	Labor Roadway	\$161,639
60	Labor Signal	
65	Labor Signal1	
70	Labor Transportation	
200	Labor NonContract	\$4,501
210	Invoice Material Material - Field & Consu	
211	Invoice Freight	
212	Invoice Contract Eng	\$60,800
215	Invoice Misc	
216	Invoice Utilities	
220	Material New Material - Shop	
228	Scrap Credit	
230	ExpenseRpts	\$16,314
241	Invoice Rental	
900	Other	
900	Contingencies	\$25,088
	Material New	
Grand Total		\$275,965

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SECTION 217.06 (TABLE II-17) CLASSIFICATION OF CONCRETE MIXTURES (REQUIREMENTS FOR HYDRAULIC CEMENT CONCRETE) of the Specifications is amended to add the following:

Self-consolidating concrete (SCC) shall meet the requirements of regular A4 concrete except that the slump requirement shall be waived. Instead the slump flow (ASTM C 1611) shall be measured, which is the diameter of the concrete spread. The slump flow shall be 25 ± 3 in. and there shall be no visible segregation in the spread. The slump flow shall be compared to slump flow with the J-Ring (ASTM C 1621) and the difference shall be 2 inches or less. Combined aggregate grading and viscosity modifying admixture (VMA) can be used.

Contractor shall perform all tests under the supervision of the Engineer, or a Department representative. The following ASTM Standard Test Methods shall be adhered to:

- **C 1611** Test Method for Slump Flow of Self-Consolidating Concrete.
- **C 1621** Test Method for Passing Ability of Self-Consolidating Concrete by J-Ring.

A VSI value of 0 or 1 will be acceptable; a value of 2 or 3 shall be rejected. The Engineer shall be the sole authority in this determination.

Contractor shall demonstrate by documents indicating successful experience or by successful trial batching that satisfactory SCC can be produced that meets the specification requirements. A concrete technologist (such as the admixture supplier) experienced in the production of SCC; representing the contractor or the producer shall be present during placement. Concrete shall stay plastic and within the slump flow specified during the placement. Concrete placement will be conducted in a way where air is not encapsulated and segregation is not occurring.

05-12-10 (SPCN)

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
PRICE ADJUSTMENT FOR STEEL

Project No. 7095-964-115
May 19, 2010

The Department will adjust monthly progress payments up or down as appropriate for cost changes in steel used on specific items of work identified in the contract in accordance with this provision. Provided within this Special Provision is a master listing of standard bid items the Department has determined are eligible for steel price adjustment.

Included with the bidding proposal is an automatically generated *project-specific* listing of *standard* bid items the Department has identified as eligible for steel price adjustment. Only items on this listing will be eligible for steel price adjustment. Generally, *non-standard* pay items will not be eligible for steel price adjustment unless such steel items are project-specific modifications of items normally eligible, are clearly and specifically identified by a separate and distinct steel pay item and the quantities present on the project constitute major items of the work, in which case such items may be addressed by project specific provisions and their related pay items designated in the bid proposal as being eligible. The listing of items eligible for steel price adjustment for a particular project will be shown on Form C-21C "Bid Items Eligible for Steel Price Adjustment" and included with the bidding documents. The Bidder may choose to have steel price adjustment applied to any, all or none of the eligible items shown on Form C-21C. The Bidder's selection of items for steel price adjustment or non selection (non participation) may not be changed once he has submitted Form C-21C to the Department

In order to confirm eligibility for steel price adjustment under this provision, within 15 calendar days after the date of the Contract Award letter, the Contractor shall submit to the State Contract Engineer on Form C-21C those pay items he chooses to have steel price adjustment applied on. Items the Contractor chooses for steel price adjustment must be designated by writing the word "Yes" in the column titled "Option" by each bid item chosen for adjustment. The Contractor's designations on Form C-21C must be written in ink or typed, and signed by the Contractor to be considered complete. Items not properly designated, or designated with "No" or left blank on the Contractor's C-21C "Bid Items Eligible for Steel Price Adjustment" form will automatically not be considered for adjustment. If the Contractor fails to return his Form C-21C within the timeframe specified, no steel items will be eligible for steel price adjustment on the designated project.

Please note: Inventoried materials from the listing of eligible items are specifically excluded for consideration. Additionally, items from the listing of eligible items for which the Contractor has requested payment as Material on Hand in accordance with the provisions of Section 109.09 are specifically excluded for consideration past the delivery date to the fabricator. This provision also does not allow for price adjustment for embedded steel where the steel item is a component of the finished bid item and there is no separate or distinct payment for the steel item or for steel used for pre-tensioned or post-tensioned precast components where furnishing steel is included in the unit price of the finished bid item.

Also note: For the purposes of this contract steel used in the prestressed tendons, even though summarized separately with a distinct pay item **will not be eligible** for price adjustment as this typically is an embedded steel component of a finished bid item.

The requirements of this provision shall apply only to material cost changes that occur between the date of the receipt of bids by the Department and the date the material is shipped to the fabricator. In addition to the requirements listed above, to be eligible for this price adjustment, the Contractor, subcontractor and/or supplier is required to place his purchase order for the steel items in his contract he has designated for price adjustment within 30 calendar days after the date of execution of this contract with the Department so as to better ensure reduced cost for steel used in such items. The timeliness of his response is also to insure the receipt of such items in a timely manner that shall not adversely affect his progress schedule or contract completion date. Further, in order for steel items to be eligible for adjustment, once shipped to the fabricator, the items shall be specifically stored, labeled, or tagged, recognizable by color marking, and identifiable by project for inspection and audit verification.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Within 14 days after the date of contract execution, the Contractor shall submit to the appropriate District Construction Engineer material price quotes, bid papers, or other similar type of documentation satisfactory to the Department for the bid items listed in the Contract for which it is requesting a steel price adjustment. This documentation shall support the completion of the form establishing the average price per pound for the eligible steel bid item. The Contractor must use the format as shown with this provision; no other format for presenting this information will be permitted. The Contractor shall certify that all items of documentation are original and were used in the computation of the amount bid for the represented eligible pay items for the month bids were opened. This documentation shall support the base line material price ("Base Price") of the steel item only. No adjustment will be made for changes in other components of the contract unit bid price, including, but not limited to, fabrication, shipping, storage, handling, and erection.

Failure to submit specifically required information such as purchase order, price data, bill of lading, material information or other requested information as noted herein will result in the Contractor not being eligible for price adjustment of steel items.

Price adjustment of each qualifying item under consideration will be subject to the following condition:

There is an increase or decrease in the cost of eligible steel materials in excess of 10 percent up to a maximum of 60 percent from the Base Price when compared with the latest published price index ("Price Index") in effect at the time material is shipped to the fabricator.

The Price Index the Department is using is based on The U.S. Department of Labor, Bureau of Labor Statistics, Producers Price Index (PPI) which measures the average price change over time of the specific steel eligible item from the perspective of the seller of goods. The specific Producers Price Index (PPI) to be used to adjust the price for the eligible VDOT steel items is shown in the table below. **Please note:** The Producers Price Index (PPI) is subject to revision 4 months after original publication, therefore, price adjustments and payments will not be made until the index numbers are finalized.

The table attached to the end of this provision indicates the Producers Price Index (PPI) steel category index items and the corresponding I.D. numbers to which VDOT items will be compared.

The price adjustment will be determined by computing the percentage of change in index value beyond 10 percent above or below the index on the bid date to the index value on the date the steel material is shipped to the fabricator (Please see included sample examples). Weights and date of shipment must be documented by a bill of lading provided to the Department. The final price adjustment dollar value will be determined by multiplying this percent increase or decrease in the index (after 10%) by the represented quantity of steel shipped, by the Base Price per pound subject to the limitations herein.

Price increase/decrease will be computed as follows:

$$A = B \times P \times Q$$

- Where;
- A = Steel price adjustment in lump sum dollars
 - B = Average weighted price of steel submitted with bid on project in \$ per pound
 - P = Adjusted percentage change in PPI average from shipping date to bid date minus 10% (0.10) threshold
 - Q = Total quantity of steel in pounds shipped to fabricator for specific project

Delays to the work caused by steel shortages may be justification for a contract time extension but will not constitute grounds for claims for standby equipment, extended office overhead, or other costs associated with such delays.

The need for application of the adjustments herein to extra work will be determined by the Engineer on an individual basis and, if appropriate, will be specified on the Work Order.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

This price adjustment is capped at 60 percent. This means the maximum "P" value for increase or decrease that can be used in the above equation is 50% (60%-10% threshold).

Calculations for price adjustment shall be shown separate from the monthly progress estimate and will not be included in the total cost of work for determination of progress or for extension of contract time.

Any apparent attempt to unbalance bids in favor of items subject to price adjustment may result in rejection of the bid proposal.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

20-Jan-05

Sample Form to be turned in for Steel Price Adjustment Provision
 (All prices to be supported by project-specific quotes)

BID DATE

28-Apr-04

Bid Item 61720 High Strength Structural Steel

Supplier	Description of material	Unit price f.o.b supplier \$/lbs	Quantity In lbs.	Price Extension	Date of Quote
XYZ mill	Structural beams Various sizes (see quote)	\$0.28	1,200,000	\$336,000.00	21-Apr-04
ABC distributing	Various channel & angle shapes (see quote)	\$0.32	35,000	\$11,200.00	20-Apr-04

Total 1,235,000 \$347,200.00

Average weighted price = \$0.2816

Note: All prices are to include any surcharges on materials quoted as if they are shipped in the month the bid is submitted. Vendors must include this surcharge along with their base price on their quotes.

v

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

20-Jan-05

Sample Calculation of a Price Adjustment (increase)

Project bid on April 28, 2004.

Project has 450,000 lb. of structural steel.

Orders placed in timely manner and according to contract.

Contractor's *f.o.b. supplier price for the structural steel in bid is \$0.2816 per pound.

*free on board

Adjusted** BLS Producers Price Index (PPI) most recently published average at time of bid is 139.6.

** final change
after 4 months

All steel shipped to fabricator in same month, October 2004.

Adjusted BLS Producers Price Index (PPI) most recently published average for month of October is 161.1

Adjustment formula is as follows:

$$A = B \times P \times Q$$

- Where;
- A = Steel price adjustment in lump sum dollars
 - B = Average weighted price of steel submitted with bid on project in \$ per pound
 - P = Adjusted percentage change in PPI average from shipping date to bid date minus 10% (0.10) threshold
 - Q = Total quantity of steel shipped to fabricator in October 2004 for this project in pounds

$$B = \$0.2816$$

$$P = (161.1 - 139.6) / 139.6 - 0.10 = 0.054$$

$$Q = 450,000 \text{ lb.}$$

$$A = 0.2816 \times 0.054 \times 450,000$$

$$A = \$6,842.88 \text{ pay adjustment to Contractor}$$

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

MASTER LISTING
STANDARD BID ITEMS ELIGIBLE FOR STEEL PRICE ADJUSTMENT

Sept. 24, 2008
 Dec. 4, 2008
 January 14, 2009
 March 18, 2009
May 11, 2010

rev # 1 added 4 corrosion resistant re-bar items.
 rev # 2 deleted item 68138 straighten structural steel
 rev # 3 identified BLS WPU used in \$ adjustment
 added items 61813,68109 & 68110
added item 61703, deleted item 65204(obsolete)

BLS Series I. D.

ITEM NUMBER	ITEM DESCRIPTION	UNITS	Number WPU used in \$ adjust.
00519	SHEET PILE, STEEL	SF	avg. 1017 & 101
00540	REINF. STEEL	LB	101704
00542	EPOXY COATED REINF. STEEL	LB	101704
00560	STRUCTURAL STEEL JB-1	LB	avg. 1017 & 101
11030	REINF. STEEL BRIDGE APPR. SLAB	LB	101704
11181	PATCH.HYDR.CEM.CONC. PAVE.	SY	101704
13290	GUARDRAIL GR-8 (NCHRP 350 TL-3)	LF	avg. 1017 & 101
13292	GUARDRAIL GR-8A (NCHRP 350 TL-3)	LF	avg. 1017 & 101
13294	GUARDRAIL GR-8B (NCHRP 350 TL-3)	LF	avg. 1017 & 101
13310	GUARDRAIL TERMINAL GR-6 (NCHRP 350)	LF	avg. 1017 & 101
13320	GUARDRAIL GR-2	LF	avg. 1017 & 101
13323	GUARDRAIL GR-2A	LF	avg. 1017 & 101
13331	RAD. GUARDRAIL GR-2	LF	avg. 1017 & 101
13333	RAD. GUARDRAIL GR-2A	LF	avg. 1017 & 101
13335	GUARDRAIL GR-3	LF	avg. 1017 & 101
13341	GUARDRAIL TER. GR-6(WEATHERING STEEL	LF	avg. 1017 & 101
13351	GUARDRAIL GR-8	LF	avg. 1017 & 101
13352	GUARDRAIL GR-8A	LF	avg. 1017 & 101
13353	GUARDRAIL GR-8B	LF	avg. 1017 & 101
13355	GUARDRAIL GR-10	LF	avg. 1017 & 101
13421	MEDIAN BARRIER MB-3	LF	avg. 1017 & 101
13450	MEDIAN BARRIER MB-5	LF	avg. 1017 & 101
13451	MEDIAN BARRIER MB-5A	LF	avg. 1017 & 101
13452	MEDIAN BARRIER MB-5B	LF	avg. 1017 & 101
13545	REINF. STEEL	LB	101704
14502	REINFORCING STEEL	LB	101704
15290	PATCH.CEM.CONC.PAVE.TY.CRCP-A	SY	101704
15302	PATCH.CEM.CONC.PAVE. TY. II	SY	101704
15305	PATCH.CEM.CONC.PAVE.TY. IV-A	SY	101704
17323	GUARDRAIL BEAM *	LF	avg. 1017 & 101
17325	RADIAL GUARDRAIL BEAM *	LF	avg. 1017 & 101
17327	RUB RAIL	LF	avg. 1017 & 101
17353	CABLE GR-3	LF	avg. 1017 & 101
17521	GUARDRAIL BEAM (WEATHERING STEEL)	LF	avg. 1017 & 101
17523	RADIAL GUARDRAIL BEAM (WEATHERING STEEL)	LF	avg. 1017 & 101
17525	RUB RAIL (WEATHERING STEEL)	LF	avg. 1017 & 101
22501	FENCE FE-W1	LF	avg. 1017 & 101
22643	FENCE FE-CL	LF	avg. 1017 & 101
22645	FENCE FE-CL VINYL COATED	LF	avg. 1017 & 101
23043	WATER GATE FE-4 TY.III	LF	avg. 1017 & 101
23501	FENCE FE-W1 (FABRIC ONLY)	LF	avg. 1017 & 101
45522	4" STEEL ENCASE. PIPE	LF	101706
45532	6" STEEL ENCASE. PIPE	LF	101706
45562	16" STEEL ENCASE. PIPE	LF	101706

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

45572	18" STEEL ENCASE. PIPE	LF	101706
45582	24" STEEL ENCASE. PIPE	LF	101706
45584	24" JACKED STEEL ENCASMENT PIPE	LF	101706
45592	30" STEEL ENCASE. PIPE	LF	101706
50402	SIGN POST STEEL 3"	LF	101706
50404	SIGN POST STEEL 4"	LF	101706
50406	SIGN POST STEEL 6"	LF	101706
50410	SIGN POST STEEL 10"	LF	101706
50412	SIGN POST STEEL 12"	LF	101706
50414	SIGN POST STEEL 14"	LF	101706
50416	SIGN POST STEEL 16"	LF	101706
50418	SIGN POST STEEL 18"	LF	101706
51317	SIG. POLE MP-1 20' ONE ARM 30'	EA	101706
51319	SIG. POLE MP-1 20' ONE ARM 32'	EA	101706
51325	SIG. POLE MP-1 20' ONE ARM 38'	EA	101706
51327	SIG. POLE MP-1 20' ONE ARM 40'	EA	101706
51329	SIG. POLE MP-1 20' ONE ARM 42'	EA	101706
51331	SIG. POLE MP-1 20' ONE ARM 44'	EA	101706
51337	SIG. POLE MP-1 20' ONE ARM 50'	EA	101706
51339	SIG. POLE MP-1 20' ONE ARM 52'	EA	101706
51341	SIG. POLE MP-1 20' ONE ARM 54'	EA	101706
51344	SIG. POLE MP-1 20' ONE ARM 56'	EA	101706
51346	SIG. POLE MP-1 20' ONE ARM 58'	EA	101706
51347	SIG. POLE MP-1 20' ONE ARM 60'	EA	101706
51348	SIG. POLE MP-1 20' ONE ARM 62'	EA	101706
51368	SIG. POLE MP-1 20' TWO ARMS 36' & 42'	EA	101706
51400	SIG. POLE MP-1 CO. LU. ONE ARM 38	EA	101706
51402	SIG. POLE MP-1 CO. LU. ONE ARM 40	EA	101706
51408	SIG. POLE MP-1 CO. LU. ONE ARM 46	EA	101706
51412	SIG. POLE MP-1 CO. LU. ONE ARM 50	EA	101706
51414	SIG. POLE MP-1 CO. LU. ONE ARM 52	EA	101706
51416	SIG. POLE MP-1 CO. LU. ONE ARM 54	EA	101706
51418	SIG. POLE MP-1 CO. LU. ONE ARM 56	EA	101706
51420	SIG. POLE MP-1 CO. LU. ONE ARM 58	EA	101706
51422	SIG. POLE MP-1 CO. LU. ONE ARM 60	EA	101706
55162	LIGHTING POLE LP-1 30'-4'	EA	101706
55163	LIGHTING POLE LP-1 30'-6'	EA	101706
55166	LIGHTING POLE LP-1 30'-12'	EA	101706
55169	LIGHTING POLE LP-1 35'-6'	EA	101706
55171	LIGHTING POLE LP-1 35'-10'	EA	101706
55176	LIGHTING POLE LP-1 40'-8'	EA	101706
55185	LIGHTING POLE LP-2 TYPE A	EA	101706
55186	LIGHTING POLE LP-2 TYPE B	EA	101706
55187	LIGHTING POLE LP-2 TYPE C	EA	101706
55188	LIGHTING POLE LP-2 TYPE D	EA	101706
55189	LIGHTING POLE LP-2 TYPE E	EA	101706
55190	LIGHTING POLE LP-2 TYPE F	EA	101706
55192	LIGHTING POLE LP-2 TYPE H	EA	101706
60452	REINF. STEEL BRIDGE APPR. SLAB	LB	101704
61700	REINF. STEEL	LB	101704
	CORROSIVE RESISTANT REINFORCING STEEL		
61703	SOLID STAINLESS	LB	101704
61704	CORROSION RESISTANT REINF. STEEL	LB	101704

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

61705	EPOXY COATED REINF. STEEL	LB	101704
61750	STRUCT.STEEL HIGH STRG.PLT.GIRDERS	LB	avg. 1017 & 101
61811	STR.STEEL PLATE GIRDER ASTM A709 GRADE50	LB	avg. 1017 & 101
61812	STR.STEEL PLATE GIRDER ASTM A709 GRADE50	LB	avg. 1017 & 101
61813	STR.STEEL PLATE GIRDER ASTM A709 GRADEHPS50W	LB	avg. 1017 & 101
61814	STR.STEEL PLATE GIRDER ASTM A709 GRADEHPS70W	LB	avg. 1017 & 101
61820	STR.STEEL ROLLED BEAM ASTM A709 GRADE 36	LB	avg. 1017 & 101
61821	STR.STEEL ROLLED BEAM ASTM A709 GRADE50	LB	avg. 1017 & 101
61822	STR.STEEL ROLLED BEAM ASTM A709 GRADE50W	LB	avg. 1017 & 101
61990	STEEL GRID FLOOR	SF	avg. 1017 & 101
64110	STEEL PILES 10"	LF	avg. 1017 & 101
64112	STEEL PILES 12"	LF	avg. 1017 & 101
64114	STEEL PILES 14"	LF	avg. 1017 & 101
64768	DRIVING TEST FOR 12" STEEL PILE	LF	avg. 1017 & 101
64778	DRIVING TEST FOR 14" STEEL PILE	LF	avg. 1017 & 101
65200	REINF. STEEL	LB	101704
65204	CORROSION RESISTANT REINF. STEEL	LB	101704
65205	EPOXY COATED REINF. STEEL	LB	101704
67086	PED. FENCE 6'	LF	avg. 1017 & 101
67088	PED. FENCE 8'	LF	avg. 1017 & 101
67089	PED. FENCE 10'	LF	avg. 1017 & 101
68100	REINF. STEEL	LB	101704
68105	EPOXY COATED REINF. STEEL	LB	101704
68107	STR.STEEL PLATE GIRDER ASTM A709 GRADE50	LB	avg. 1017 & 101
68108	STR. STEEL PLATE GIRDER ASTM A709 GR50W	LB	avg. 1017 & 101
68109	STR. STEEL PLATE GIRDER ASTM A709 GR.HPS50W	LB	avg. 1017 & 101
68110	STR. STEEL PLATE GIRDER ASTM A709 GR.HPS70W	LB	avg. 1017 & 101
68112	STR.STEEL ROLLED BEAM ASTM A709 GR.36	LB	avg. 1017 & 101
68113	STR.STEEL ROLLED BEAM ASTM A709 GR.50	LB	avg. 1017 & 101
68114	STR.STEEL ROLLED BEAM ASTM A709 GR. 50W	LB	avg. 1017 & 101
68115	STRUCT. STEEL	LB	avg. 1017 & 101
68270	REINF. STEEL BRIDGE APPR. SLAB	LB	101704
69060	SHEET PILES, STEEL	SF	avg. 1017 & 101
69100	REINF. STEEL	LB	101704
69104	CORROSION RESISTANT REINF. STEEL	LB	101704
69105	EPOXY COATED REINF. STEEL	LB	101704
69110	STEEL PILES 10"	LF	avg. 1017 & 101
69112	STEEL PILE 12"	LF	avg. 1017 & 101
69113	DRIVING TEST FOR 12" STEEL PILE	LF	avg. 1017 & 101

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
CATHODIC PROTECTION OF REINFORCED CONCRETE STRUCTURES

April 12, 2010

I. Description

This item relates to the installation of Sacrificial Cathodic Protection (SCP) of pier caps, columns, and abutments of structures in this contract. The Sacrificial CP system shall be applied within 8 to 12 weeks of the completion of ECE treatment. The purpose of SCP is to maintain the passivity of steel embedded in concrete and protect the structure from corrosion related damage. This special provision governs materials, equipment and application of an Aluminum-Zinc-Indium (Al-Zn-In) anode coating on the surface of concrete using a thermal spray process. The purpose of the anode coating is to control corrosion of the steel embedded in concrete by Sacrificial (also Galvanic) Cathodic Protection (CP).

The CP system shall consist of a sprayed Al-Zn-In anode coating and anode connector plates. The connector plates, when installed properly, facilitate establishing a connection between the anode coating and the reinforcing steel. A maximum of one substructure (piers or abutments) per bridge will be designated for future monitoring to document the effectiveness of SCP. This substructure shall be instrumented with two embedded silver/silver chloride reference electrodes. To facilitate testing of the anode current and polarization decay, the anode system shall be electrically isolated from the reinforcing steel except through a cable at the isolated anode connector plate. The instrumented test sites shall include permanently embedded reference electrodes, isolated anode connector plates, junction boxes, test boxes, wiring and conduit.

The CP system furnished shall include all materials identified in this special provision. The Contractor, prior to starting the work, shall demonstrate that they are capable of spraying the sacrificial alloy. The thermal spray operator shall have adequate technical training and two years of field experience, to safely and proficiently apply the anode coating on concrete structures. The metalizing contractor must have successfully performed at least one similar project involving cathodic protection of reinforced concrete using thermally sprayed anodes in the last two years.

The Contractor shall also employ the services of a Cathodic Protection (CP) Specialist for quality assurance and testing. The CP Specialist shall be a registered Professional Engineer (registered in Virginia) or a National Association of Corrosion Engineers (NACE) certified Cathodic Protection Specialist. The CP Specialist (either the Professional Engineer registered in Virginia or the NACE certified Cathodic Protection specialist) shall have at least 8 years experience in in corrosion control investigation and evaluation, corrosion control system design and installation, inspection and energizing of Cathodic Protection systems/ECE for steel reinforced concrete structures exposed to atmosphere

The Contractor shall submit the qualifications of the CP specialist and Corrosion Technician (within thirty days after notice to proceed) for Engineer's review and approval.

The latest versions of the following standards shall be observed:

ASTM D1002	Strength Properties of Adhesives in Shear by Tension Loading
ASTM D4285	Standard Test Method for Indicating Oil or Water in Compressed Air
ASTM D4541	Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testing

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

ASTM D4263	Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
ICRI No. 03732	Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays
SSPC CS 23.00	Guide for Thermal Spray Metallic Coating Systems
SSPC Guide 6	Guide for Containing Debris Generated During Paint Removal Process
ASTM B8	Specification, Concentric-Lay Stranded Copper Conductors, Hard, Medium Hard or Soft
ASTM D 1248	Specification, Polyethylene Plastic Molding and Extrusion Materials

The Contractor shall submit a detailed work plan including a QC/QA plan and a description of proposed materials and equipment to be used on this project prior to starting any CP related work. The submittals shall provide relevant constituents and properties of each material and the specification to which each complies. As a minimum, the Contractor shall supply the following:

(a) Materials for Surface Preparation

Abrasive Materials: The abrasive material shall be clean and dry non-metallic grit with no mineral constituents, which tend to break down and remain on the surface in visible quantities. The abrasive size shall be selected from 20-40 mesh and shall be hard and angular in shape. Abrasives that have been previously used to remove oil and/or grease shall not be allowed. The blast material shall be packaged at a plant and stored in a clean, dry condition at all times. The blast material left in the blasting pot overnight shall not be used and must be discarded. A copy of the material safety data sheet shall be submitted to the Engineer for approval prior to starting any sand blasting operations. The Contractor shall not use any blast material that has been previously used.

Equipment: The abrasive blasting equipment shall be a conventional, air pressure-type blaster. A minimum pressure of 80 psi (552 KPa) shall be maintained at the blast nozzle.

Vacuum-Assisted Abrasive Blasting Equipment: Equipment shall be designed to deliver steel shot, grit or other similar recyclable blasting abrasives and provide a closed system containment during blasting. The vacuum system shall be capable of recovering the abrasive, removing particles from the surfaces being treated and returning it to a dust separator which shall be an integrated part of the machine.

Containment: Class 4A as designated by the Structural Steel Painting Council (SSPC) in Guide 6, when the non-vacuum assisted abrasive blasting method is used.

Compressed Air: Compressed air used for abrasive blasting shall be clean, oil-free and dry per ASTM D 4285. Air line filters and moisture separators shall be installed upstream from the blasting equipment. These shall be inspected daily by the Contractor for cleanliness and correct operation. Any indication of equipment malfunction shall be corrected immediately.

Work Platform: The Contractor shall provide a platform that provides safe access for workers, supervisors, and Department, to all areas of work.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(b) Application Equipment

The coating shall be applied using electric-arc spray equipment. The arc spray equipment shall consist of a spray gun, wire feed unit, power supply and air compressor. To readily spray the coiled anode wire, a straightening device may be necessary. The Contractor shall be responsible for making any necessary modifications and adjustments to the thermal spray equipment so that the alloy wire can be sprayed to achieve the desired property and adhesion.

(c) Anode Wire

The galvanic anode wire shall meet the following specifications:

Nominal Chemical Composition:	Al-20Zn-0.2In
Max. Cu Content:	100 PPM
Wire Diameter:	1/8 in. (3.2 mm)
Density:	0.12 lb/in ³ (3.24 g/cm ³)
Open circuit potential in simulated concrete pore solution (pH = 12-13):	> -1.6 V (CSE)

(d) Anode Connector Plate

The anode connector plate shall consist of a perforated 16-gage aluminum alloy sheet, galvanized steel stud, nut and washers. The anode connector plates shall be 4.0-in. (102 mm) by 4.0-in. (102 mm) and 1/16 in. (1.6 mm) thick. The perforated hole size in the plate shall be 0.1875-in. (4.8 mm) diameter. Center to center spacing of the perforated holes shall be ¼ in. (6.4 mm), and the open area shall be 51%. The connector plate shall have four (4) holes for attachment to the concrete surface and one hole in the center of the plate for attachment of the steel stud or screw. The size of these holes shall be ¼-in. (6.4 mm) in diameter. Suitable plastic fasteners (similar to Fastex Part No. 354-260300-00-0078 or equal) shall be used for attaching the anode plate to the concrete surface. The anode connector plate shall be sand blasted on both sides to remove any surface film and to provide a profile for bonding. The anode wire and anode connector plates shall be kept clean, dry and free from oxides at all times.

(e) Epoxy for Backfilling

The epoxy used for backfilling shall be two part 100% solids epoxy (Sikadur 23, Lo Mod Gel or equivalent). The Contractor shall follow the manufacturer's instructions for mixing and installing the epoxy material

(f) Materials for Instrumented Test Sites

Reference Electrodes: The reference electrodes shall be silver-silver chloride (Ag-AgCl) that are designed for permanent installation in concrete structures. The reference electrode wire shall be two wire shielded #14 AWG with green THHN insulation. The reference electrode ground wire shall be #14 AWG with HMWPE insulation. The lead wire to reference electrode connection shall be completely sealed to prevent moisture penetration. The reference electrodes shall have lead wires of sufficient length so that it can be terminated in the test box without any splicing.

Test Boxes: Test boxes that house the current measuring shunt, anode disconnect switch and test wire terminations shall be PVC type JCII. Test boxes shall have lockable hinged covers, phenolic panel and suitable identification labels. All junction boxes shall comply with the requirements of NEMA Type 4X. A 1/4-in. diameter weep hole shall be provided at the lowest point in the test box. The test boxes shall be 6 inch (152 mm) wide by 6 inch (152 mm) high by 4 inch (102 mm) wide.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Junction Boxes: The junction boxes for housing the anode connector plates shall be 6 inch (152 mm) wide by 6 inch (152 mm) high by 4 inch (102 mm) wide. The anchors shall be durable plastic.

Wiring: The wires to the anode and the rebar shall be #12 AWG HMWPE red and black, respectively.

Conduit and Fittings: Conduits and fittings shall be Schedule 40 PVC. The conduit shall be sized in accordance with the latest revision of the National Electrical Code (NEC) for wire fill.

II. Installation

The Contractor shall field verify all dimensions. The Contractor shall coordinate installation of the system components with all other construction operations. The Contractor shall collect and safely dispose of all project wastes in accordance with the local, state and federal regulations. The Contractor shall provide effective enclosures of work sites to trap and collect wastes including scrap metal, demolition debris, concrete and concrete dust, blasting materials and aluminum-zinc-indium dust. The effectiveness of such enclosures shall be approved by the Engineer. Installation shall be as follows:

a) Electrical Continuity

No electrical continuity checks are required since electrical continuity was established prior to ECE treatment.

b) Installation of Anode Connector Plates (for non-monitoring sites)

The anode connector plates facilitate a direct electrical connection between the sacrificial anode and the reinforcing steel. There shall be at least two (2) anode connector plates per zone. For each anode connector plate, a threaded galvanized rod (stud) shall be attached to the reinforcing steel to facilitate attachment of the anode connector plate, as shown on the detail drawing. The following procedure shall be used:

- i. Using a concrete cover meter, locate the reinforcing steel at the location where the shorted-system anode connector plated is to be installed.
- ii. Drill a 1-in. (25 mm) diameter hole into the concrete to expose the reinforcing steel.
- iii. Attach a 1/4-in. (6.4 mm) diameter galvanized, threaded rod (stud) to the exposed steel, using the tapping method. The threaded rod must extend to the outer concrete surface to facilitate attachment of the anode connector plate. Secure the rod in the hole by backfilling with an epoxy adhesive. Take care not to drip epoxy on the surrounding concrete surface. Make sure that the epoxy is flush with the surface but does not overlap onto the concrete. The threaded rod must extend a minimum of 1 inch (25 mm) beyond the outer concrete surface to facilitate attachment of the anode connector plate.
- iv. Place duct tape over the exposed threaded rod and proceed with the abrasive blasting followed by metalizing. Apply only two passes of anode spray at the anode plate connector area, the second pass at 90 degrees to the first. Do not over apply Al-Zn-In coating in the anode connection plate area.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- v. After two passes of anode spray, remove the duct tape from the threaded rod and install the anode connector plate. Secure the anode connector plate to the threaded rod with a galvanized steel washer and nut. Drill four ¼-in. (6.4 mm) diameter holes into the concrete through the holes in each corner of the anode connector plate. Install the four plastic fasteners in the holes over the anode connector plate. After the connector plate is installed and tightened, cut off any excess length of the threaded rod to prevent future damage to the anode connector plate.
- vi. Clean the concrete surface and proceed with additional passes of anode spray over the connector plate (to achieve specified anode thickness) and then proceed towards the surrounding concrete. Ensure good contact between the coating and connector plate by measuring the resistance and voltage drop between surrounding coating and steel stud.
- vii. At areas away from the anode connector plate, spray all passes one after another (at 90 degrees of each other) until the desired thickness is achieved.

c) Installation of Anode Connector Plates (at monitoring or instrumented test sites):

The anode connector plates shall provide a direct electrical connection between the sacrificial anode and the reinforcing steel except for instrumented substructures. There shall be at least two (2) anode connector plates per zone.

- i. Using a concrete cover meter, locate the reinforcing steel at the location where the anode connector plate is to be installed. Mark the spot on the concrete.
- ii. Drill a ¾-in. (19 mm) diameter by 1-1/4-in. (32 mm) deep hole into the concrete away from the spot marked in Step "i." above, making sure that no steel is exposed. Provide adequate clearance for installation of the connector plate. Cover the hole with a duct tape.
- iii. Apply only two passes of anode spray at the anode plate connector area, the second pass at 90 degrees to the first. Do not over apply Al-Zn-In coating in the anode connection plate area. Remove the duct tape. Insert a plastic anchor into the drilled hole, as shown on the detail drawing for non-monitoring sites.
- iv. Place the anode connector plate on the surface of the concrete at the designated location over the plastic anchor and secure plate with the galvanized steel screw (ring terminal with wire attached) and washer. Drill four (4) ¼-in. (6.4 mm) diameter holes at the corners of the anode connector plate and install the plastic fasteners as shown on the drawing.
- v. Clean the concrete surface and proceed with additional passes of anode spray over the connector plate (to achieve specified anode thickness) and then proceed towards the surrounding concrete. Ensure good contact between the coating and connector plate by measuring the resistance and voltage drop between surrounding coating and steel stud.
- vi. At areas away from the anode connector plate, spray all passes one after another (at 90 degrees of each other) until the desired thickness is achieved.

d) Reference Electrodes (for instrumented test sites):

The reference electrodes shall be installed during the concrete repair stage. The Engineer shall mark the exact location of the reference electrodes in the field based on the half-cell potential data obtained after ECE treatment but before spraying Al-Zn-In anode. A maximum of one pier cap per bridge will be designated as a monitoring site.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- i. Two permanently embedded reference electrodes shall be installed in each instrumented substructure. All reference electrodes shall be installed as detailed in the design drawings.
 - ii. Storage: Store reference electrodes at room temperature (i.e. between 10°C (50°F) and 35°C (95°F)). Avoid excessive heat and sunlight. Keep cap secured and tight until use.
 - iii. Installation Procedures: Reference electrodes shall be installed in areas of sound concrete having high active half cell potential readings or as approved by the Engineer. Prior to excavating, the Engineer shall locate the stirrups and prestressing strands in the area of the excavation using Ground Penetrating Radar (GPR). Contractor shall cut a slot, about 2-in. (51 mm) wide by 6-1/2-in.(165 mm) long between the reinforcing steel hoop bars for placement of the reference electrode. The Contractor shall not expose any reinforcement (rebars or strands) in the reference electrode excavation. The depth of the slot shall be such that the reference electrode is situated at the same depth as the rebar/prestressing steel. Reference electrode excavations shall be visibly free of dirt, grease and other foreign material prior to placing the backfill material.
 - iv. The reference electrode shall be placed in the excavation and the lead wire routed through a slot on the concrete surface into the junction box. Any excess cable shall be cut once it has been properly routed to the junction box. An identification tag shall be affixed to the end of the cable indicating the reference electrode location and number.
 - v. The reference electrode excavation shall be patched with approved Portland Cement grout or concrete with 591 ohm-in (15,000 ohm-cm) resistivity or less. Just prior to backfilling, the plastic cap on the reference electrode shall be removed and discarded. The reference electrode shall be fully encapsulated with cementitious backfill material. The backfill material shall completely fill the excavation, and no voids shall be permitted.
- e) Ground Wire Connections (for instrumented test sites):**
- i. Wiring: The rebar wire shall be #12 AWG with black HMWPE insulation.
 - ii. Connections: The connection of each ground wire to the reinforcing steel shall be made using pin brazing or tack welding, in accordance with manufacturers' instructions. The connection of any exposed copper stranded wires in the excavated area shall be completely coated with a 100 percent solid epoxy.
 - iii. Patching: After installing the reference electrodes and ground wires, the excavated areas shall be filled with an approved air-entrained Portland cement concrete patching material. Each ground wire shall then be routed through a PVC conduit to a nearby PVC junction box.
- f) Concrete Cover Survey (for instrumented test sites):**
- Prior to the Al-Zn-In alloy anode installation, all concrete surfaces where the anode is to be installed shall be surveyed with a rebar locator to ensure that reinforcing steel or other metallic components are not exposed. The Contractor shall mark all areas where the embedded metals are within ¼-in (6.4 mm) from the concrete surface. If these areas are less than 6 inch (152 mm) by 6 inch (152 mm), the Contractor is permitted to mask these areas with a thin coat of nonconductive epoxy. If these areas are larger than 6 inch (152 mm) by 6 inch (152 mm), the Contractor shall mark these locations and notify the Engineer immediately. Dry sand shall be broadcast over the epoxy when it is wet.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

g) Junction Boxes and Test Boxes (for instrumented test sites):

Junction boxes and test boxes shall be installed at a convenient location for further testing.

- i. Anode wire connection: Securely attach a #12 AWG with red HMWPE insulation between the anode connector plate and the galvanized steel washer and nut – making sure that the nut is firmly tightened. Enclose the anode wire connection in a PVC junction box.
- ii. Rebar ground wire connection: Securely attach a #12 AWG with black HMWPE insulation to the rebar and route this wire to the test box through the PVC conduit. Provide a connection between the anode and the rebar ground wires through a precision 0.1 ohm fixed resistor inside the test box.
- iii. Fastening: The junction boxes and the conduit shall be secured on the concrete surface using durable plastic fasteners.
- iv. Sealing: All wire terminations shall be housed in junction/test boxes which shall be encapsulated to prevent any moisture intrusion and to provide electrical insulation from other nearby connections or wires. A weep hole shall be provided in the base of each junction box.
- v. Caulking: The perimeter of the junction boxes and test boxes shall be caulked with GE all outdoor weather caulk material. The caulking shall achieve water tightness to shelter the anode plate connector, wires, shunts, and other metals housed inside.
- vi. Identification: All Cathodic Protection wires shall be identified in the junction boxes using durable identification tags. Each wire shall be clearly marked as to its function and shall be identified correctly.

h) Wiring and Conduit (for instrumented test sites)

- i. Wiring: Route all lead wires from the embedded reference electrodes and their grounds, without splices, through the PVC conduits to the junction/test boxes.
- ii. Conduit: All wiring shall be installed in PVC conduits.
- iii. Connections: All conduit joints, fittings, couplings and adapters shall be jointed by means of solvent cement or as recommended by the conduit manufacturer.
- iv. Bending: Any conduit sections to be bent must be heated evenly over the entire length of the curve. Only electrical heaters designed specifically for the size and purpose of bending non-metallic conduit shall be used. Conduit bending shall be performed according to the conduit manufacturer's recommendations. For "blind" bends or for compound turns in a conduit run, the heated conduit may be solvent cemented in place while still flexible. The use of torches or other flame-type devices shall not be permitted. PVC conduit sections that were exposed to excessive heating, as evident by brown discoloration, shall be discarded.

i) Preparation of the Concrete Surface

Work performed under this section consists of cleaning the concrete surface and providing an anchor profile by abrasive blasting, so that an adequate bond between the concrete and thermally sprayed anode can be obtained. As a minimum, the Class 4A containment, as described in SSPC Guide 6, is required. The main purpose of the concrete surface preparation is to remove dust, grit, chalk marks, paints, curing compounds, and other substances which might inhibit bonding of the anode to the concrete. Abrasive blasting shall not commence before concrete repairs are completed and patch materials are allowed to cure properly. Abrasive blasting shall not take place on surfaces that are wet or damp.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

j) Application of Al-Zn-In Anode Coating

Anode connector plates shall be installed according to this special provision. The Contractor shall furnish all necessary labor, materials and equipment and install the sprayed sacrificial Al-Zn-In anode system in accordance with the following procedure.

- a. Concrete repair material shall cure for a minimum 14 day period or until full strength is achieved before abrasive blasting and metalizing. The enclosure temperature and surfaces to be sprayed shall be at a minimum of 9°F (5°C) above dew point temperature.
- b. Surfaces shall be thoroughly clean (vacuumed or blown clean with dry compressed air) within 15 minutes of the start of the thermal spray application. Any oil, grease, soil, water or other foreign matter that may have deposited on the surface after surface preparation has been completed shall be removed before the spray application. Additional cleaning, including light sand blasting, may be necessary if there has been a significant amount of rainwater runoff after the first sand blasting operation. Coating application shall only be performed when the concrete surface is clean and dry. Tests shall be performed prior to metalizing to determine the presence of moisture in the concrete. The test methods shall use ASTM D 4263-88 or a surface moisture meter for concrete, such as the Tramax Concrete Encounter Meter. If significant moisture is present, which adversely affects bonding of the aluminum alloy coating, a portable propane powered weed burner may be used to achieve adequate low concrete moisture levels. When using the weed burner, keep the burner moving slowly at an even pace, heating the concrete surface to a maximum temperature of 302°F (150° C). The Contractor shall inform the Engineer once the concrete surface is ready for metalizing. The Contractor is responsible for the proper placement and maintaining the integrity of the anode after the Engineer inspects and approves the prepared concrete surface.
- c. For monitoring sites, all metallic components or appurtenances such as drainpipes, conduit or bearing steel plates shall be isolated from the anode and temporarily covered with suitable masking materials, which shall extend, from the objects, by at least one-half inch on the concrete surfaces.
- d. The installation areas shall be enclosed during spraying for dust containment. The enclosure shall consist of tarps, panels, or other methods to prevent dust from escaping the immediate area such that it would constitute a health hazard. Personnel conducting spraying operations within the enclosure shall be provided with a hood with external air supply for respiration in accordance with OSHA 19-10-134.
- e. The concrete surface shall not be sprayed when the surface temperature is less than 5°C (41°F), unless the concrete surface is preheated with a torch prior to the thermal spray application.
- f. Short Circuit Detection (for instrumented test sites): The spray application of the sacrificial anode shall begin by metalizing the area(s) in which the anode connector plates are installed. To detect electrical short circuits between the anode and the reinforcing steel, connect a DC voltmeter between the threaded rod and a rebar wire. Begin by spraying the anode over the connector plate and then proceed toward the surrounding concrete. To facilitate short circuit detection, monitor the potential on the voltmeter for any sudden drop (i.e., at or close to 0 millivolt). A sudden drop in potential is indicative of a short circuit. When a short circuit is detected, all installation work shall stop until the short is identified and eliminated.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- g. During application, the thermal spray nozzle shall be maintained at a travel speed and a distance from the work surface such that the anode deposit efficiency and bond strength are maximized. Travel speed shall be approximately 16 inch per second (406 mm per second). The distance from the nozzle to the surface should be approximately 6 inches (152 mm).
- h. The spray application of the sacrificial anode shall begin by metalizing the concrete area where the anode connector plates are to be installed. Spray two passes of the anode coating, install the connector plate, fasten the anode connector plate to the concrete, clean the concrete surface, spray additional passes over the connector plate (to achieve specified anode thickness), and proceed toward the surrounding concrete surface.
- i. The metalizing shall extend one foot beyond the line where the old and new concrete surfaces meet. Surfaces not intended to be metalized which are adjacent to, or in close proximity to the surface to be metalized, shall be protected during metalizing. The masked surfaces shall form straight horizontal and vertical lines.
- j. The coating should be applied in multiple passes and should overlap on each pass in a crosshatch pattern before the first layer of material cools down. Uniform gun movement should be used to ensure a consistent thickness. Metalized areas shall have uniform appearance, free of visible coating defects such as: cracking, burning, blistering, uncoated areas, and other similar defects that will affect the functioning of the coating. Sufficient anode material shall be sprayed to achieve an average thickness of 12 mils (300 microns). This should correspond to a deposition rate of 0.2 pounds per square foot (0.98 kg/m²) of sprayed area. Typically, each pass results in 3 to 4 mil (75 to 100 microns) (1 mil = 1/1000 inch) thick anode coating. A total of 4 passes should correspond to a thickness of 12 mils. The Contractor shall achieve a final anode thickness of 12 to 16 mils (300 to 400 microns). The thickness of the anode coating shall not exceed 16 mils (400 microns). Excessive coating thickness leads to poor adhesion and subsequently poor corrosion protection. Material usage logs shall be used to document installation of the proper anode quantity. For confirmation of the material usage, the thickness of the coating shall be measured at a minimum of five (5) locations per 100 square feet (9.3 m²) using a reverse eddy current thickness gage, such as the DeFelsko PosiTector 6000. The test instrument shall be calibrated for the Al-Zn-In alloy being tested. The average of five (5) thicknesses shall be a minimum of 12 mils (300 microns). Areas of low thickness shall be repaired as follows (at no additional cost to the Department):
 - i. Clean the existing anode by lightly blasting the areas without exposing large aggregates.
 - ii. Re-apply the sacrificial anode coating using the procedures outlined in this specification.
 - iii. Inspect the sprayed anode for proper thickness and adhesion to the existing coating.
- k. Compressed air used for spraying shall be clean, oil-free and dry, per ASTM D 4285. Air line filters and moisture separators shall be installed upstream from the spraying equipment. These shall be inspected daily for cleanliness and correct operation. Any indication of malfunction in the equipment, indicated by oil or water in the filter or traps, shall be corrected immediately.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- i. The anode coating shall not contain any lumps, blisters, coarse texture, or loosely adhering particles, nor shall it contain any cracks, pinholes, or chips which expose the concrete substrate. It shall have a uniformly homogeneous appearance. Unacceptable areas shall be repaired by the Contractor at no additional cost to the Department. Repair work shall be conducted as follows:
 - i. Remove all degraded anode coating by scraping, strip blasting or both. During this process, light blasting shall be applied to the areas without exposing large aggregates.
 - ii. Re-apply the sacrificial anode coating.
 - iii. Inspect the sprayed anode for proper thickness, as described above.

k) Testing Adhesion Strength

Adhesion strength between the anode coating and concrete substrate shall be measured with a DeFelsko PosiTest AT-C Pull-Off Adhesion Tester, or equal. The Contractor shall use the test equipment and the procedures provided by the manufacturer for calibrating the pull off tester. The dolly size shall be 2 inch (51 mm) diameter. Adhesion strength tests shall be performed between 24 hours and 72 hours after metalizing. The dollies shall be removed after the pull off test. At locations where the dollies are removed, the area shall be cleaned of epoxy and the sacrificial coating reapplied. A minimum of three adhesion tests shall be performed per 1,000 square feet (93 square meters) of concrete surface. The average of the three tests shall be used for that location. The target adhesion strength of the sacrificial anode coating shall be greater than 75 psi (518 KPa). The target adhesion strength value shall be verified prior to the start of the spraying operation. The Contractor shall prepare, clean and spray three horizontal and vertical 2 feet by 2 feet (610 mm by 610 mm) test areas in accordance with this special provision. The Contractor shall perform work in the test areas in the presence of the Engineer.. The Engineer shall perform at least three adhesion tests per test area. The target adhesion value may be adjusted based on the values obtained at the test areas.

If, during the production process, the average adhesion strength is less than 75 psi but two out of three values are above 75 psi the anode coating is considered to have good bonding with the substrate. However, if two out of three values are below 75 psi, three additional tests shall be performed in the same area and values compared to 75 psi. If the test fails again, the Contractor shall remove all of the anode coating from this section of the substructure and reapply it. Sandblasting of defective areas may be required as directed by the Engineer. Cold overlaps during re-application may be necessary. However, cold overlaps shall not blister, burn or otherwise damage the anode layer underneath. If the damage occurs to the bottom layer of metalizing during re-application, the entire element shall be sandblasted and re-metalized at no additional cost to the Department.. The Contractor shall remove the anode coating from areas where the adhesion strength is less than 75 psi, and re-apply the anode coating in accordance with these specifications.

l) Graffiti Resistant Sealcoat

It is necessary to seal the concrete surfaces after the ECE treatment to prevent additional chloride intrusions. The Contractor shall apply this sealer only after the Engineer approves and accepts the sprayed anode. The following graffiti resistant sealer is in VDOT's approved list:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Prmakote – This is a non-sacrificial sealer. It is water based and breathable. It is manufactured by Visual Pollution Technologies, Inc. (480) 657-9183. Once the sprayed anode surface is accepted by the Engineer, the Contractor shall overcoat the metalized surface with this sealer. The Contractor shall provide a catalog cut sheet and the MSDS for this sealer along with other submittals prior to commencing any CP work.

m) System Commissioning (for instrumented test sites)

At each instrumented test site, the Engineer shall measure and record the AC resistance and DC voltage between the anode and steel, the DC millivolt drop across each shunt, the AC resistance between each reference electrode and the steel and the native potential of the steel using the embedded reference electrodes. Conduct minimum 4-hour depolarization tests using the embedded reference electrodes. The Engineer shall conduct these tests, and the results of the testing shall become a part of the system commissioning report.

IV. Measurement and payment

This work shall be paid for on a lump sum per structure basis of Al-Zn-In coating applied to the concrete surface. Payment for this work will be at the unit rate price for "Sacrificial Cathodic Protection," and shall include any and all patent and royalty costs, all materials, continuity bonding of discontinuous steel, scaffolding, anode connector plates, monitoring (instrumented) test site(s), surface preparation, enclosures, equipment, tools, testing and labor incidental for the completion of this item.

Payment will be made under:

Pay Item	Pay Unit
Sacrificial Cathodic Protection (Structure no.)	Lump Sum per Structure

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
ELECTROCHEMICAL CHLORIDE EXTRACTION

April 12, 2010

I. Description

This item relates to the Electrochemical Chloride Extraction (ECE) treatment of pier caps, columns, and abutments of structures in this Contract. The purpose of the ECE treatment is to extract chlorides from the concrete and protect the structure from corrosion related damage. ECE is a treatment process that takes about 60 days per zone. It is a non-destructive treatment that does not alter the final appearance of the structure. ECE stops corrosion by migrating chlorides away from the embedded reinforcement and by increasing the alkalinity of the concrete around the embedded reinforcement.

The proposed ECE treatment shall be performed per this special provision. This special provision presents specifications for the installation and operation of Electrochemical Chloride Extraction (ECE) systems for vertical, overhead, and chloride contaminated concrete surfaces. This special provision details the requirements for preparing, testing (prior to ECE), supplying, installing, energizing, testing (after ECE), and preparing a report for ECE treatments. Any alternative or equivalent materials, equipment, or methods proposed for use on this project shall be approved by the Engineer before being used on the project.

This is a patented process. It is the Contractor's responsibility to work within the agreement with the patent holder. All associated costs incurred when using this process/product including licensing and/or royalty fees shall be included in the bid price for this item.

II. Materials

Materials and equipments shall be designed, manufactured, and tested in accordance with applicable requirements from latest editions of the following codes and standards:

- National Electrical Manufacturers' Association (NEMA)
- American Society for Testing and Materials (ASTM)
- National Electric Code (NEC)
- American National Standards Institute (ANSI)

The materials and equipment to be used in this project will be subject to a corrosive atmosphere, to an ambient temperature of -22 °F (-30°C) to 122 °F (50°C), and to very high relative humidity.

a) Anode System Materials

Anode material shall be #4 gage welded wire steel mesh.

b) Epoxy for Coating Welded Connections, Exposed metal, and Exposed Copper wire

The epoxy material shall be a non-conductive 100 percent solid, moisture, and chemical resistant two-part epoxy. The epoxy shall initially cure in 20 minutes at 70 °F (21°C) and cure to an ultimate compressive strength of 9000 psi (62 Mpa) in 24 hours at 70 °F (21°C).

c) Junction Boxes

The junction boxes shall be installed on the structure to facilitate testing of all anode and structure negative connections. The junction boxes shall be weatherable plastic or fiberglass, with a nonmetallic cover. The junction boxes shall also have minimum dimensions of 8" (203 mm) high by 8" (203 mm) wide by 4" (102 mm) deep. The junction boxes shall be secured to the concrete surface using at least four plastic mechanical fasteners. There shall be at least one junction box per individual zone.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

d) Electrical Conduit and Related Hardware

The conduits for cables and wires used in the ECE treatment shall be polyvinyl chloride (PVC). The fittings (i.e. couplers, reducers, etc.) and attachment hardware (i.e. clamps, fasteners, etc.) shall be 100% plastic. Each length of the conduit shall bear the UL label. PVC conduits shall conform to NEMA standard publications No. TC2. Conduit fittings shall meet NEMA TC3. Solvent cement for attaching fittings to the conduit shall be supplied or recommended by the conduit manufacturer. The conduits and fittings shall not be affected by exposure to sunlight and the pH of the ECE environment.

e) Electrical Outlet

The Contractor shall provide all necessary outlets for ECE treatment including rectifiers, motor for the timed irrigation system, lighting, and other outlets related to ECE work. The Contractor shall also provide one 110V, 20A electrical outlet (at every substructure slated for ECE) to the Engineer, when required, for use before and during ECE treatment.

f) Wires and Cables

The wires used for system negative connections shall be black #6 AWG THHN. The anode wires for anode subzones shall be red #10 AWG THHN. If there are no anode subzones within a zone, the anode wire from the junction box to that zone shall be #6 AWG THHN. The wires from the junction boxes to the rectifier circuit shall be black #4/4 SO for both system negatives and the anode.

g) Licenses & Permits

The Contractor is responsible to obtain all necessary licenses and/or permits to drop a power pole at the site. Each zone of the ECE rectifier shall be limited to a max. of 40V.

h) Electrolyte for the ECE Treatment

The electrolyte for the ECE treatment shall be potable water. The Contractor is responsible to obtain all necessary licenses and/or permits to tap into the City fire hydrants. The Contractor shall install all necessary fittings (acceptable to the City water department) to tap into the fire hydrant. The Contractor shall take all necessary precautions to prevent the electrolyte from freezing.

III. Procedures

Submittals

The Contractor shall submit for approval three sets of design drawings and catalog cuts of all the materials to be used on this project. Prior to installation, the Contractor shall survey the concrete surface and submit the survey report with his statement of suitability of the surface for ECE installation.

Removal of Delaminated Concrete

The Contractor shall identify and mark on the concrete surface all of the delaminated areas using water based spray paint. Any replacement reinforcement, if required, shall be black bar and tied directly to the existing reinforcement to ensure electrical continuity. The Contractor shall remove concrete from all spalled and delaminated areas to a depth of at least 1" (25 mm) below the top layer of reinforcing steel. All areas where concrete was removed shall be formed to the original concrete surface. Spalled and delaminated areas shall be patched with a concrete material having an electrical resistivity of less than 5,905 ohm-in (15,000 ohm-cm). Avoid high resistivity mortars, patching materials, and bonding agents that have electrical resistivities over 5,905 ohm-in (15,000 ohm-cm). Standard Portland cement concrete is an acceptable patching material (Type B patching according to Virginia Department of Transportation). Concrete patching material shall not contain fly ash or slag. Concrete with fly ash, slag, or other materials will increase resistivity of the patch and CP will not work well.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Pre-Installation Testing for Baseline Data

The Contractor shall clean the surface by pressure washing or light sand blasting. The Engineer shall identify the two most anodic locations in each zone via half-cell potential survey. Half-cell potential readings shall be taken at every one-foot interval. At the most anodic locations, additional readings shall be taken around that location to identify the most anodic spot. All half-cell readings shall be summarized in table form, along with the two most anodic locations for chloride sampling, and submitted to the Engineer for approval.

The Engineer will collect concrete powder samples from most anodic locations. It is important that concrete powder samples for chlorides be collected within 1/4" (6 mm) of the reinforcing steel. The exact location of the reinforcing steel shall be located with a cover meter, pachometer, or other suitable rebar locating device. Powder samples shall be collected adjacent to the intersection of two reinforcing steel components. Concrete powder samples shall be collected by the Engineer at two depths: at the surface (1/4" to 3/4" or 6 mm to 19 mm) and at the rebar (1" or 25 mm to top of rebar).

Samples shall immediately be placed into sealed airtight bags or other suitable containers. Samples should then be clearly marked with the contract name, date, sample location, and sample depth. All chloride samples shall be sent to a laboratory for testing.

The Engineer shall prepare an accurate sketch of chloride hole locations. The Contractor shall patch all chloride holes with a VDOT approved mortar mix.

Concrete Surface Preparation

The Contractor shall identify and seal all cracks that are wider than 1/32" (0.8 mm) prior to ECE treatment. The cracks shall be repaired by injecting VDOT approved epoxy material. Sealing of cracks is not included in ECE work. Concrete shall be identified and removed from all spalled and delaminated areas at least 1" (25 mm) below the reinforcing steel. All areas where concrete was removed shall be formed to the original surface.

The Contractor shall use light sand blasting to remove all dust, debris, rust stains, laitance, grease, and all other contaminants that may interfere with adhesion of the Cellulose Fiber. The sand blasting shall not remove excessive amounts of cement paste and expose aggregates, which may interfere with the adhesion of sprayed Al-Zn-In anode.

Survey of Repaired Concrete Surface

The Contractor shall locate all areas of insufficient cover (i.e., less than 3/8" or 9 mm) over the reinforcing steel by means of a cover meter/pachometer survey and selective chip-outs. If this area/length is less than 3" (76 mm), it shall be epoxied. If this area/length is 3" (76 mm) or more, the concrete shall be removed and replaced with VDOT's type B patching material until the cover is at least 0.4" (10 mm). The patch material shall not contain fly ash, slag or other additives that increase the resistivity of the patch material.

The Contractor shall survey the concrete surface at the end of all concrete repair work to ensure that there is no delaminated concrete left in place. The Contractor shall submit all relevant findings to the Engineer and include locations and sizes of delaminations, if any, present on the structure. If no delaminations are found, the inspector shall state as such and submit a letter to the Engineer.

The Engineer shall survey the repaired concrete surface just prior to ECE treatment (i.e. within 3 months) to ensure that there is no new delaminated concrete. The Engineer shall document findings with locations and sizes of delaminations, if any, present on the structure. If no delaminations are found, the Engineer shall state as such.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Enclosures for Debris

The Contractor shall provide appropriate enclosures to collect all debris during concrete removal, sandblasting, and power washing type operations. No debris shall be allowed to fall into the water below. The Engineer may stop work at any time if the enclosures to trap the debris and fines are not provided to the satisfaction of the Engineer. The Contractor shall immediately correct this situation to the satisfaction of the Engineer at no additional cost to the Department. The Engineer's decision is final and binding.

Electrical Connection to the Reinforcing Steel

Each ECE zone shall have two distinct system negative connections. The Contractor shall use black #6 AWG THHN for system negative wires from the junction box to the reinforcing steel. The wires shall be of sufficient length to reach the junction box without any splicing. The Engineer shall verify the electrical continuity of all system negative connections prior to coating the welding. This can be accomplished by testing electrical continuity between one end of the system negative wire and the reinforcing steel to which the system negative wire is attached. Any connection that fails the electrical continuity test shall be replaced by the Contractor at no additional cost to the Department. All wiring shall be routed to the appropriate junction box.

Welding of system negative wires to the reinforcing steel shall be accomplished by a commercially available exothermic weld kit. The exothermic weld kit shall include a mold and powder charge of suitable size for the wire and reinforcing steel. The reinforcing steel shall be thoroughly cleaned before welding. The weld and the wire shall be cleaned of all oil and grease with a solvent and a clean cloth. The mold shall rest on the reinforcing steel and securely hold the wire in place. When ignited, the charge in the mold shall burn and result in a mechanically secure and electrically conductive weld of the wire to the reinforcing steel. The Contractor shall test the integrity of the finished weld for mechanical strength by tapping it with a hammer. All failed welds shall be replaced by the Contractor at no additional cost to the Department.

Electrical Connection to the Anode

Each sub zone shall have two distinct anode connections. The Contractor shall use red #10 AWG THHN for wires from the junction box to anode subzones. The wires shall be of sufficient length to reach the junction box without any splicing. If a particular zone does not have any subzones, the anode wire from the junction box to that zone shall be #6 AWG THHN. The Contractor shall verify the integrity of anode wire connections. The data shall be recorded and submitted to the Engineer. Any connection that fails the electrical continuity test shall be replaced by the Contractor at no additional cost to the Department. All wiring shall be routed to the appropriate junction box.

Coating Welded Connections

The finished weld shall be cleaned of any slag. The weld and exposed copper of the wire shall be coated with two coats of the epoxy mentioned in this special provision. The second coat of epoxy shall be applied only after the first coat has completely cured. The epoxy shall be allowed to cure 100% prior to patching.

Electrical Continuity of Reinforcing Steel

The purpose of this test is to ensure that all the embedded reinforcing steel/metal in the structure is continuous. If the embedded reinforcing steel is not continuous, it may be subjected to corrosion during ECE treatment.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor shall check for electrical continuity of reinforcing steel at a minimum of 5 locations per zone (with at least three per sub zone) and between all exposed rebars (during the concrete repair stage) using the DC millivolt technique. The continuity test points shall be distributed uniformly throughout each zone. Testing shall be performed during the delamination/repair stage to avoid unwanted excavations to expose the rebars for testing purposes. Test equipment for this procedure consists of a standard digital voltmeter, test leads, and wire reel. Continuity between two metallic elements is considered to exist if the DC millivolt between the two is not greater than 1mV, the DC resistance is not greater than 1ohm, and the difference in DC ohms measured in forward and reverse is not greater than 1ohm. The readings shall be obtained using a digital multimeter with at least 10-mega ohms internal resistance and shall be calibrated within six months of testing. The multimeter shall have a resolution of 0.1mV in the lowest DC Volts scale and 0.1ohm in the lowest DC ohms scale.

All metals (including existing electrical surface mounted conduits and junction boxes) that are identified as discontinuous shall be made electrically continuous by the Contractor by bonding the metal to the reinforcing steel (with one #10 AWG wire with THHN insulation) using the thermite welding procedure.

The Contractor shall prepare and submit drawings that detail the continuity test points. The drawing, along with the continuity data, shall be submitted to the Engineer for approval.

Labeling of Wires

All wires (i.e. system negatives and anode wires from each sub zone) shall be labeled clearly at the junction box. All wires from the junction box to the rectifier shall also be labeled clearly both at the junction box and at the rectifier. The Engineer shall verify all labeling and termination.

Routing Wires

All wire connections are temporary in nature in the ECE process (i.e. may stay in place only as long as required for ECE treatment). However, these wires carry large amounts of current and operate up to 40VDC. Wires from the anode and steel to the junction box shall be installed such that safety of the public is ensured. The wires shall also be protected from being vandalized. The wires from the anode and reinforcing steel to the junction box shall be routed through a PVC conduit. The wires from the junction box to the rectifier shall also be routed through a PVC conduit. The PVC conduit shall be attached to the concrete surface using plastic clamps and anchors.

Anode Application

The concrete surface shall be cleaned by light sandblasting and/or pressure washing prior to installing the #4 gage steel anode mesh. Wooden spacers, 1" x 2" (25 mm x 51 mm), shall be attached to the concrete surface using plastic anchors. Distance between spacers shall not exceed 4ft. (1220 mm). The anode shall be laid out as shown in the construction plans. The anode shall be securely fastened to the concrete surface via plastic anchors in order to prevent any electrical short with rebar or other metals in the structure. Anode mesh shall be placed at least 6" (152 mm) away from all exposed metals. When necessary, the anode shall be cut/bent to accommodate installation requirements.

The anode mesh panels shall be placed one against the other. No spacing is necessary between two adjacent anode mesh panels. All anode mesh panels shall be made continuous to adjoining anode mesh panel(s) in at least two distinct locations. The anode mesh shall extend 1" (25 mm) below soil/ground level.

The concrete surface to be treated is divided into isolated anode zones. Each anode zone is then further divided into anode sub zones. The spacing between anode sub zones shall not exceed 3" (76 mm). The spacing between anode zones shall not exceed 6" (152 mm). The anode zones and sub zones are spaced apart to ensure electrical isolation from one another.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

All bearing pads 6" (152 mm) or taller shall receive ECE treatment on all sides except the top. The anode mesh on the side of the bearing pad shall be made electrically continuous with the anode mesh on the top of the pier cap or other nearest sub zone (at least two connections per pad).

Test Window

Provide a 2" (51 mm) circular knock out (prior to spraying the Cellulose Fiber) to access the concrete surface for testing. The knock out shall be centered on the space between steel wires in the anode mesh. There shall be at least two knock out windows per zone. The locations of the test windows shall be marked in the field by Engineer

Inspection of ECE Installation

The installed anode system, its electrical connection, power cables, rectifier grounding, and other connections shall be inspected by the Engineer prior to starting the ECE process. Cable insulation shall be checked for any cuts and nicks occurred during installation. Any damaged insulation shall be repaired using a generous amount of an appropriate insulation material (i.e. heat shrink tubes followed by electrical taping), or by making new joints, all of which shall be provided at no additional cost to the Department. The integrity of the cables throughout the ECE treatment process is the responsibility of the Contractor. The Contractor shall repair/replace all cable that has lost its integrity before or during ECE treatment at no additional cost to the Department.

Electrolyte Media

The Electrolyte Media shall be sprayed Cellulose Fiber. The Cellulose Fiber shall be sprayed to encapsulate the welded steel mesh anode. The Cellulose Fiber material shall provide high moisture retention and shall be easily applied to awkward and uneven surfaces. The Cellulose Fiber and the electrolyte shall be delivered through separate hoses, then mixed at a nozzle and sprayed directly onto the concrete surface. The Fiber-electrolyte mixture shall be applied only after the anode is securely installed. The Fiber-electrolyte layer shall be approximately 2" (51 mm) thick. The welded steel mesh anode shall have at least 1" (25 mm) Cellulose Fiber on either side.

Wetting of Electrolyte Media

The Electrolyte Media must be kept wet at all times. The Contractor shall set up an automatic, timed irrigation system to ensure that all surfaces stay continuously wetted throughout the ECE treatment period. The treatment areas shall be tightly wrapped in plastic to minimize moisture loss due to evaporation. The Contractor shall take precautions to prevent external water from entering the wrapped Electrolyte Media. Without this precaution, a loss of adhesion of the Cellulose Fiber may result, leading to loss of the ECE treatment process for this section.

Placement of Rectifiers

Suitable and safe locations for placement of rectifiers shall be chosen to provide minimal disturbance. If any locations are outside of the Contractor's trailer, they shall be enclosed behind a secured chain link fence. The Contractor shall ensure that the rectifiers are properly protected from vandalism. Any damage to the rectifier shall be corrected promptly by the Contractor at no additional cost to the Department. The chassis of the rectifiers shall be grounded in accordance with relevant NEC codes and standards. All AC power cables shall be installed in accordance with relevant NEC and local codes and standards.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

System Operation and Maintenance

1. System Start Up
Circuit Verification - Prior to energizing, all circuits shall be tested to ensure that all cables are wired correctly and labeled properly. The Contractor shall coordinate with the Engineer at least one week prior to starting ECE treatment.
2. Energizing
Energization shall be performed in the presence of the Engineer. Each circuit shall be energized in steps of 1% of full current up to 5%, then in steps of 5% of full current up to 20%, then in steps of 20% of full current up to 100%. The current and voltage of each circuit shall be recorded at each step. The current to each anode sub zone shall be recorded as well. The polarity of the reinforcing steel and the anode shall be recorded using a digital voltmeter and a half-cell. The energizing shall be discontinued immediately if there is any discrepancy in the measured polarity. Any discrepancy in the polarity shall be immediately investigated and corrected by the Contractor at no additional cost to the Department.
3. Setting current output.
The initial current for the ECE treatment shall generally be between 0.1A/ft^2 (1.1 A/m^2) to 0.2A/ft^2 (2.1 A/m^2) but shall not exceed 0.35 A/ft^2 (4.0 A/m^2) at any time. The total current can be adjusted by decreasing or increasing the applied voltage. During the treatment, the current output shall be measured individually on each anode cable. If the results indicate an unexpected current distribution, the Contractor shall immediately inspect and take appropriate remedial action at no additional cost to the Department.
4. Monitoring of System Operation
During the treatment, the operation of the system shall be verified by the Engineer at least once a day, and the following shall be recorded: (i) structure name (ii) substructure number/name under ECE (iii) date and time, (iv) current (to each zone and sub zone as appropriate), (v) voltage (to each zone), and (vi) calculation of total ampere-hours passed for each zone.

The operating parameters (i.e. rectifier circuit voltage, current, and current to individual sub zones) of each circuit shall be recorded two times a day until the values stabilize. Subsequently, these parameters shall be recorded once a day. All operating parameters shall be recorded and submitted to the Engineer.

Any problems that develop during the ECE process shall be identified, recorded, corrected, and reported. Visual inspection of cable connections, cable insulation, anode condition, and wetting of the Electrolyte Media shall be conducted regularly and recorded by the Contractor. Any interruption in the operation shall be recorded and reported to the Engineer immediately.

In addition to regular inspection, determination of the chloride content in the concrete adjacent to the steel (per AASHTO T 260 Method A or as approved by the Engineer) shall be carried out at predetermined locations by the Engineer. The concrete samples for chloride evaluation shall be taken at locations within 1/4" (6.4 mm) of the baseline chloride locations. All chloride samples shall be obtained by the Engineer and be sent to the laboratory for testing. The Engineer shall test the samples for chloride levels and calculate percentage reductions in chloride concentration before and after ECE treatment.

Remedial Work - During the treatment, remedial work shall be conducted whenever any inspection indicates the system is not performing properly. This remedial work shall include, but not necessarily be limited to, the following: (i) repair or replacement of defective components of the system and (ii) modification to correct any electrical short circuits or to prevent stray currents. The materials and workmanship for remedial works shall be in accordance with standard concrete repair practices except when otherwise agreed.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Terminating the ECE Treatment

The ECE treatment shall be performed until a total charge of 84 Ampere-hours/ft² (900 Ampere-hours/m²) is achieved. It may not be possible to achieve a total charge of 84Ampere-hours/ft² at all times. In such cases, the Contractor shall inform the Engineer and obtain the approval of the Engineer prior to terminating the ECE treatment. The Engineer's decision is final and binding. The expected treatment period is approximately 60 days. It is possible that treatment, on occasion, may take more than 60 days. The Contractor shall take this into account in planning and scheduling all work.

Dismantling and Disposing the ECE System

After completion of the ECE treatment, the Contractor shall obtain the approval of the Engineer prior to turning off the ECE treatment. The Contractor shall remove all electrical cables, conduits, hangers, and power supplies from the site. The anode, Electrolyte Media and wooden battens or dams (if used) shall also be removed from the site or be disposed in accordance with all applicable federal and local disposal and safety regulations. The system negatives from the reinforcing steel (terminated at the junction boxes) and the junction boxes shall be left in place. The Engineer shall test to ensure that the system negatives were not damaged during the dismantling process. The Contractor shall repair/replace any damaged system negatives at no additional cost to the Department.

Surface Cleaning and Patching of the Concrete after ECE Treatment

The surface of all treated concrete shall be either pressure washed using clean, potable water or using light abrasive blasting. There shall be no rust stains on the concrete surface. The entire treated structure shall then be inspected; the occurrence, location, and extent of any physical damage or changes to the concrete shall be noted. Any defects in the concrete shall then be repaired. This concrete repair is a part of the ECE process.

Sealing the Treated Concrete Surface

Typically, the surface of all ECE treated concrete shall be sealed with a penetrating sealer to prevent further intrusion of chlorides. For substructure of I-95 Bridge over Overbrook Road, seal all the ECE treated surface soon after the completion of ECE treatment (i.e. within 30 days). The site shall be clean at the end of ECE treatment. Since the sacrificial CP system will be installed on substructures of I-95 Bridge over Hermitage Road, no surface sealant is required after the ECE treatment. The Contractor shall apply this sealer only after the Engineer approves and accepts the ECE treatment. The sealer shall be graffiti resistant. The following graffiti resistant sealer is in VDOT's approved list:

Prmakote – This is a non-sacrificial sealer. It is water based and breathable. It is manufactured by Visual Pollution Technologies, Inc. (480) 657-9183. The Contractor shall provide a catalog cut sheet and the MSDS for this sealer along with other submittals prior to commencing any work.

Providing Access to the Structure

The Contractor shall provide safe access to the Engineer at no additional cost to the Department. Such access shall be provided in a timely manner so that the Engineer can perform testing and evaluations called for in this Special Provision. The Engineer shall coordinate his need for access with the Contractor.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Final Report

After completion of the work, the Engineer (with input and data obtained from the Contractor, where appropriate) shall prepare a final report as defined below. The final report shall include the following:

- Project name and location.
- Reinforcing steel continuity testing performed on the structure and locations of all continuity bondings.
- Surface preparation performed before treatment.
- Description of the ECE installation and procedure used.
- Materials used and the manufacturer's data sheets.
- Description of test locations and test procedures.
- Current and voltage readings during treatment.
- All test results including pre and post treatment chloride levels.
- Pre and post treatment corrosion potential survey data.
- Locations and repair of all damage to concrete arising from ECE treatment.
- Discussion of results, including consideration of all local anomalies or variations in results.
- Statement on the effectiveness of the treatment.

Corrosion Engineering Services

The Contractor shall employ the services of a CP Specialist for overseeing the ECE process. The Contractor shall submit the qualifications of the CP specialist and Corrosion Technician (within thirty days after notice to proceed) for Engineer's review and approval.

CP Specialist: The CP Specialist shall be a registered Professional Engineer (registered in Virginia) or a National Association of Corrosion Engineers (NACE) certified Cathodic Protection (CP) specialist. The CP Specialist (either the Professional Engineer registered in Virginia or the NACE certified Cathodic Protection specialist) shall have at least 8 years of experience in corrosion control investigation and evaluation, corrosion control system design and installation, inspection and energizing of Cathodic Protection systems/ECE for steel reinforced concrete structures exposed to atmosphere. The CP Specialist shall also be directly responsible for all corrosion engineering services on this project. The CP Specialist shall perform pre-energizing testing (including verifying and confirming anode sub zone layout drawing, wiring, labeling, and proper connection and termination at the rectifier) and ECE energizing.

Corrosion Technician (CT): The Corrosion Technician shall be a National Association of Corrosion Engineers (NACE) certified Corrosion Technician (CT). The CT shall assist the Contractor's CP specialist in accomplishing field inspections by performing delamination surveys, half-cell potential surveys, electrical continuity, and anode to reinforcement isolation testing. The CT shall have at least two years of experience in performing the testing and inspection services required on this project.

Consultant Services: The Department has retained a corrosion Consultant to perform the following:

- Submittals: Review all submittals related to the ECE treatment process for compliance with all project specifications. This shall include as built drawings prepared by the Contractor. Written communication detailing all conclusions and recommendations for each submittal shall be provided to the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- Continuity Testing: Electrical continuity testing between two metallic elements shall be tested to ensure electrical continuity. Testing shall be performed between all system negative leads, all anode wires from each sub zone, and between all exposed rebars during concrete repair. Any connection or rebar found to be electrically discontinuous should be made continuous by the Contractor at no additional cost to the Department. Any connections formerly found to be continuous, but made discontinuous by the Contractor during the repair and rehabilitation process, shall be repaired by the Contractor per the method provided in the specifications at no additional cost to the Department. A final decision as to the event which caused the discontinuity shall be determined by the Engineer.
- Anode to Reinforcing Isolation Testing: The electrical isolation between the reinforcing steel and the steel anode mesh shall be checked prior to energizing. All data shall be recorded and submitted to the Engineer. Any electrical short identified shall be eliminated by the Contractor using methods approved by the Engineer. The elimination of electrical shorts shall be performed at no additional cost to the Department.
- Check for Labeling: The Consultant shall check and confirm proper installation of all components including labeling of wires. All identified defects shall be immediately corrected by the Contractor at no additional cost to the Department.
- Chloride sampling before the ECE Treatment: The Consultant will extract concrete powder samples (for baseline data prior to ECE) from locations decided based on half-cell potential survey data prior to ECE treatment.
- Chloride sampling after ECE Treatment: The Consultant will extract concrete powder samples at locations adjacent to the baseline sampling. Chloride samples shall immediately be placed into sealed airtight bags or other suitable containers. They should then be clearly marked with the contract name, date, location of the sample, depth from which the sample was removed, cover depth of the reinforcing steel at that location, and lateral distance to the nearest reinforcing bar. The Consultant will test or arrange to get these samples tested per AASHTO T260 Method A or as approved by the Engineer. The chloride content before and after ECE treatment will be compared, and the results will be summarized in table form and presented to the Engineer. The Consultant will also provide conclusions and recommendations along with chloride testing results.
- ECE Energization: The Consultant will be present at the site while the Contractor performs the following:
 - a. Record the static potentials at the most anodic locations in each sub zone.
 - b. Measure the AC resistance between the anode and the reinforcing steel.
 - c. Measure the concrete temperature.
 - d. Obtain rectifier output data including currents to individual sub zones.
 - e. Calculate the Ampere-hours of charge applied to each sub zone and submit a signed copy to the Engineer.
 - f. The Consultant will perform steps “d” and “e” once a day until the ECE process is terminated.
- Documentation: The results of electrical testing, half cell potential survey, chloride testing before and after treatment, rectifier output data, current to each anode sub zones, total charge applied to each zone, and other relevant information shall become a part of the final report. The final report will also include analysis of all test data, a table listing the total charge applied to each zone, conclusions, and recommendations.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

IV. Measurement and Payment

ECE Treatment: The items for ECE treatment process shall be measured and paid on a lump sum basis. The lump sum price shall include any and all patent or royalty costs, all materials, engineering, surface preparation, sealant application, continuity bonding, welding, conduits, wires, equipment, tools, and labor for completion of this item.

Payment will be made under:

Pay Item	Pay Unit
ECE Treatment (Structure no.)	Lump Sum per Structure

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS1D009-0610

February 19, 2010c

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL DIVISION I—GENERAL PROVISIONS

SECTION 101—DEFINITIONS OF ABBREVIATIONS, ACRONYMS, AND TERMS

Section 101.02—Terms of the Specifications is amended to replace the definition for **Notice to Proceed** with the following:

Notice to Proceed. A date selected by the Contractor that is no earlier than 15 nor later than 30 calendar days after the date of contract execution on which the Contractor intends to begin the work, or a contract specific date on which the Contractor may begin the work identified as the Notice to Proceed date in the Contract Documents.

SECTION 102—BIDDING REQUIREMENTS AND CONDITIONS

Section 102.04(c) Notice of Alleged Ambiguities of the Specifications is amended to replace the first paragraph with the following:

If a word, phrase, clause, or any other portion of the proposal is alleged to be ambiguous, the Bidder shall submit to the State Contract Engineer a written notice of the alleged ambiguity not later than 10 days prior to the date of receipt of bids and request an interpretation thereof. This written notice shall be submitted via the CABB (Contractor Advertisement Bulletin Board) system located on the Construction website at www.VDOT.Virginia.gov. Authorized interpretations will be issued by the State Contract Engineer to each person who received a proposal and will be posted on the CABB system.

SECTION 105—CONTROL OF WORK

Section 105.01—Notice to Proceed of the Specifications is replaced with the following:

Unless otherwise indicated in the Contract, the Notice to Proceed date will be the date selected by the Contractor on which the Contractor intends to begin the work. That date shall be no earlier than 15 nor later than 30 calendar days after the date of contract execution. The State Contract Engineer will contact the Contractor on the date of contract execution to inform him that the contract has been executed. The State Contract Engineer will also confirm this date in the Letter of Contract Execution.

Copies of the Letter of Contract Execution will be distributed to Department personnel involved in the administration of the Contract and to the Contractor. Within 10 calendar days after the date of contract execution the Contractor shall submit to the Engineer written notice of the date he has selected as his Notice to Proceed date. If the Contractor fails to provide written notice of his selected Notice to Proceed Date within 10 calendar days of contract execution, the selected Notice to Proceed Date will become the date 15 calendar days after the date of contract execution. The Contractor shall begin work no later than 10 calendar days after the date he has selected as his Notice to Proceed date, unless the Notice to Proceed date is otherwise indicated in the Contract, in which case the Contractor shall begin work within 10 calendar days after the specific Notice to Proceed date indicated in the Contract.

Contract Time will commence on the date of the Notice to Proceed. The Letter of Contract Execution will identify the Chief Engineer's authorized representative, hereafter referred to as the Engineer, who is responsible for written directives and changes to the Contract. The Engineer will contact the Contractor after notice of award to arrange a pre-construction conference.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

In the event the Contractor, for matters of his convenience, wishes to begin work earlier than 15 calendar days or later than 30 calendar days after the date of contract execution, he shall make such a request in writing to the Engineer within 10 calendar days of the date of contract execution or once a Notice to Proceed Date has been established, if he wishes to begin work more than 10 calendar days after his selected Notice to Proceed date or the Notice to Proceed Date indicated in the Contract, he shall make such a request to the Engineer in writing no later than 5 calendar days after the Notice to Proceed date. If this requested start date is acceptable to the Department, the Contractor will be notified in writing; however, the Contract fixed completion date will not be adjusted but will remain binding. The Contractor's request to adjust the start date for the work on the Contract will not be considered as a basis for claim that the time resulting from the Contractor's adjusted start date, if accepted by the Engineer, is insufficient to accomplish the work nor shall it relieve the Contractor of his responsibility to perform the work in accordance with the scope of work and requirements of the Contract. In no case shall work begin before the Department executes the Contract or prior to the Notice to Proceed date unless otherwise permitted by the Contract or authorized by the Engineer. The Contractor shall notify the Engineer at least 24 hours prior to the date on which he will begin the work.

Section 105.02—Pre-Construction Conference of the Specifications is amended to replace the first paragraph with the following:

After notification of award and prior to the Notice to Proceed date the Contractor shall attend a pre-construction conference scheduled by the Engineer to discuss the Contractor's planned operations for prosecuting and completing the work within the time limit of the Contract. At the pre-construction conference the Engineer and the Contractor will identify in writing the authorities and responsibilities of project personnel for each party. The pre-construction conference may be held simultaneously with the scheduling conference when the Engineer so indicates this in advance to the Contractor. When these are simultaneously held, the Contractor shall come prepared to discuss preparation and submittal details of the progress schedule in accordance with the requirements of the Contract.

Section 105.10(c)(1)—Steel Structures of the Specifications is replaced with the following:

Working drawings for steel structures, including metal handrails, shall consist of shop detail, erection, and other working drawings showing details, dimensions, sizes of units, and other information necessary for the fabrication and erection of metal work.

Section 105.14—Maintenance During Construction of the Specifications is amended to add the following:

The Contractor shall provide at least one person on the project site during all work operations who is currently verified either by the Department in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor (TCS). This person must have the verification card with them while on the project site. This person shall be responsible for the oversight of work zone traffic control within the project limits in compliance with the contract requirements involving the plans, specifications, the VWAPM, and the MUTCD. This person's duties shall include the supervision of the installation, adjustment (if necessary), inspection, maintenance and removal when no longer required of all traffic control devices on the project.

If none of the Contractor's on-site personnel responsible for the supervision of such work has the required verification with them or if they have an outdated verification card showing they are not currently verified either by the Department in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor (TCS) all work on the project will be suspended by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor shall provide at least one person on site who is, at a minimum, verified by the Department in Basic Work Zone Traffic Control for each construction and/or maintenance operation that involves installing, maintaining, or removing work zone traffic control devices. This person shall be responsible for the placement, maintenance and removal of work zone traffic control devices.

In the event none of the Contractor's on-site personnel of any construction/maintenance operation has, at a minimum, the required verification by the Department in Basic Work Zone Traffic Control, that construction/maintenance operation will be suspended by the Engineer until that operation is appropriately staffed in accordance with the requirements herein.

Section 105.15(b) Mailboxes and Newspaper Boxes of the Specifications is replaced with the following:

- (b) **Mailboxes and Newspaper Boxes:** When removal of existing mailboxes and newspaper boxes is made necessary by construction operations, the Contractor shall place them in temporary locations so that access to them will not be impaired. Prior to final acceptance, boxes shall be placed in their permanent locations as designated by the Engineer and left in as good condition as when found. Boxes or their supports that are damaged through negligence on the part of the Contractor shall be replaced at his expense. The cost of removing and resetting existing boxes shall be included in other pay items of the Contract. New mailboxes designated in the plans shall be paid for in accordance with the provisions of Section 521 of the Specifications.

SECTION 107—LEGAL RESPONSIBILITIES

Section 107.13—Labor and Wages of the Specifications is amended to add the following:

- (c) **Job Service Offices:** In advance of the Contract starting date, the Contractor may contact the Job Service Office of the Virginia Employment Commission at the nearest location to secure referral of available qualified workers in all occupational categories. The closest office may be obtained by accessing the VEC website at <http://www.vec.virginia.gov> and "clicking" on "VEC Workforce Centers".

Section 107.14(f) Training of the Specifications is amended to replace 5 and 6 with the following:

5. If the Contract provides a pay item for trainees, training shall be in accordance with the requirements of Section 518 of the Specifications.

Section 107.16(a) Erosion and Siltation of the Specifications is amended to replace the fourth paragraph with the following:

For projects that disturb 10,000 square feet or greater of land or 2,500 square feet or greater in Tidewater, Virginia, the Contractor shall have within the limits of the project during land disturbance activities, an employee certified by the Department in Erosion and Sediment control who shall inspect erosion and siltation control devices and measures for proper installation and operation and promptly report their findings to the Inspector. Inspections shall include all areas of the site disturbed by construction activity and all off site support facilities covered by the project's Stormwater Pollution Prevention Plan. Inspections shall be conducted at least once every 14 calendar days and within 48 hours following any runoff producing storm event (Note: If an inspection is conducted as a result of a storm event, another inspection is not required for 14 calendar days following provided there are no more runoff producing storm events during the that period). For those areas that have been temporarily stabilized or runoff is unlikely to occur due to winter conditions (e.g., the site is covered with snow or ice or frozen ground exists), inspections shall be conducted at least once a month. Those definable areas where final stabilization has been achieved will not require further inspections provided such areas have been identified in the project's Stormwater Pollution Prevention Plan. Failure of the Contractor to maintain a certified

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

employee within the limits of the project will result in the Engineer suspending work related to any land disturbing activity until such time as a certified employee is present on the project. Failure on the part of the Contractor to maintain appropriate erosion and siltation control devices in a functioning condition may result in the Engineer notifying the Contractor in writing of specific deficiencies. Deficiencies shall be corrected immediately. If the Contractor fails to correct or take appropriate actions to correct the specified deficiencies within 24 hours after receipt of such notification, the Department may do one or more of the following: require the Contractor to suspend work in other areas and concentrate efforts towards correcting the specified deficiencies, withhold payment of monthly progress estimates, or proceed to correct the specified deficiencies and deduct the entire cost of such work from monies due the Contractor. Failure on the part of the Contractor to maintain a Department certified erosion and sediment control employee within the project limits when land disturbance activities are being performed will result in the Engineer suspending work related to any land disturbance activity until such time as the Contractor is in compliance with this requirement.

Section 107.16(e) Storm Water Pollution Prevention Plan of the Specifications is replaced with the following:

(e) **Storm Water Pollution Prevention Plan and Virginia Stormwater Management Program General Permit for the Discharge of Stormwater from Construction Activities**

A Stormwater Pollution Prevention Plan (c) identifies potential sources of pollutants which may reasonably be expected to affect the stormwater discharges from the construction site and any off site support areas and describes and ensures implementation of practices which will be used to reduce pollutants in such discharges.

The SWPPP is comprised of, but not limited to, the Erosion and Sediment Control (ESC) Plan, the Stormwater Management (SWM) Plan and related Specifications and Standards contained within all contract documents and shall be required for all land-disturbing activities that disturb 10,000 square feet or greater, or 2,500 square feet or greater in Tidewater, Virginia.

Land-disturbing activities that disturb one acre or greater, or 2,500 square feet or greater in an area designated as a Chesapeake Bay Preservation Area, require coverage under the Department of Conservation and Recreation's Virginia Stormwater Management Program (VSMP) General Permit for the Discharge of Stormwater from Construction Activities (hereafter referred to as the VSMP Construction Permit). Where applicable, the Department will apply for and retain coverage under the VSMP Construction Permit for those land disturbing activities for which it has contractual control.

The required contents of a SWPPP for those land disturbance activities requiring coverage under the VSMP Construction Permit are found in Section II D of the General Permit section of the VSMP Regulations (4VAC50-60-1170). While a SWPPP is an important component of the VSMP Construction Permit, it is only one of the many requirements that must be addressed in order to be in full compliance with the conditions of the permit.

The Contractor and all other persons that oversee or perform activities covered by the VSMP Construction Permit shall be responsible for reading, understanding, and complying with all of the terms, conditions and requirements of the permit and the project's SWPPP including, but not limited to, the following:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

1. Project Implementation Responsibilities

The Contractor shall be responsible for the installation, maintenance, inspection, and, on a daily basis, ensuring the functionality of all erosion and sediment control measures and all other stormwater and pollutant runoff control measures identified within or referenced within the SWPPP, plans, Specifications, permits, and other contract documents.

The Contractor shall take all reasonable steps to prevent or minimize any stormwater or non-stormwater discharge that will have a reasonable likelihood of adversely affecting human health or public and/or private properties.

2. Certification Requirements

In addition to satisfying the personnel certification requirements contained herein, the Contractor shall certify his activities by completing, signing, and submitting Form C-45 VDOT SWPPP Contractor and Subcontractor Certification Statement to the Engineer at least 7 days prior to commencing any project related land-disturbing activities, both on-site and off-site.

3. SWPPP Requirements for Support Facilities

Where not included in the plans, the Contractor shall develop erosion and sediment control plan(s) and stormwater pollution prevention plan(s) for submission and acceptance by the Engineer prior to usage of any on-site or off-site support facilities including but not limited to, borrow and disposal areas, construction and waste material storage areas, equipment and vehicle storage and fueling areas, storage areas for fertilizers or chemicals, sanitary waste facilities and any other areas that may generate a stormwater or non-stormwater discharge directly related to the construction process. Such plans shall document the location and description of potential pollutant sources from these areas and shall include a description of the controls to reduce, prevent and control pollutants from these sources including spill prevention and response. The Contractor shall submit such plans and documentation as specified herein to the Engineer and, upon review and approval, they shall immediately become a component of the project's SWPPP and VSMP Construction Permit (where applicable) and shall be subject to all conditions and requirements of the VSMP Construction Permit (where applicable) and all other contract documents.

4. Reporting Procedures

a. Inspection Requirements

The Contractor shall be responsible for conducting inspections in accordance with the requirements herein. The Contractor shall document such inspections by completion of Form C-107 (a) and (b), Construction Runoff Control Inspection Form and Continuation Sheet, in strict accordance with the directions contained within the form.

b. Unauthorized Discharge Requirements

The Contractor shall not discharge into state waters sewage, industrial wastes, other wastes or any noxious or deleterious substances nor shall otherwise alter the physical, chemical, or biological properties of such waters that render such waters detrimental for or to domestic use, industrial consumption, recreational or other public uses.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

(1) Notification of non-compliant discharges

The Contractor shall immediately notify the Engineer upon the discovery of or potential of any unauthorized, unusual, extraordinary, or non-compliant discharge from the land disturbing activity. Where immediate notification is not possible, such notification shall be not later than 24 hours after said discovery.

(2) Detailed report requirements for non-compliant discharges

The Contractor shall submit to the Engineer within 5 days of the discovery of any actual or potential non-compliant discharge a written report describing details of the discharge to include its volume, location, cause, and any apparent or potential effects on private and/or public properties and state waters or endangerment to public health, as well as steps being taken to eliminate the discharge. A completed Form C-107 (a) and (b) shall be included in such reports.

5. Changes, Deficiencies and Revisions

a. Changes and Deficiencies

The Contractor shall report to the Engineer when any planned physical alterations or additions are made to the land disturbing activity or deficiencies in the project plans or contract documents are discovered that could significantly change the nature or increase the quantity of the pollutants discharged from the land disturbing activity to surface waters.

b. Revisions to the SWPPP

Where site conditions, construction sequencing or scheduling necessitates revisions or modifications to the erosion and sediment control plan or any other component of the SWPPP for the land disturbing activity, such revisions or modifications shall be approved by the Engineer and shall be documented by the Contractor on a designated plan set (Record Set).

Such plans shall be maintained on the project site or at a location convenient to the project site where no on site facilities are available and shall be available for review upon request during normal business working hours.

Section 107.21—Size and Weight Limitations of the Specifications is amended to add the following:

- (d) **Construction Loading of Structures** - In the construction, reconstruction, widening, or repair of bridge, culvert, retaining wall and other similar type structures including approaches, the Contractor shall consider construction loads during the planning and prosecution of the work. If the loading capacity of these type structure(s) is not shown in the contract documents, the Contractor is responsible for contacting the office of the appropriate district bridge engineer to obtain the loading capacity information. Construction loads include but are not limited to the weight of cranes, trucks, other heavy construction or material delivery equipment, as well as the delivery or storage of materials placed on or adjacent to the structure or parts thereof during the various stages (phases) of the work in accordance with the Contractor's proposed work plan. The Contractor shall consider the effect(s) of construction loads on the loading capacity of these type structure(s) in his sequencing of the work and operations, including phase construction. At the Engineer's request the Contractor shall be prepared to discuss or review his proposed operations with the Engineer with regard to construction loads to demonstrate he has taken such into consideration in the planning and execution of the work.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SECTION 108—PROSECUTION AND PROGRESS OF WORK

Section 108.01—Prosecution of the Work of the Specifications is amended to replace the first paragraph with the following:

The Contractor shall begin work on the Contract within 10 calendar days after the date selected by the Contractor as his Notice to Proceed date or within 10 calendar days after the specific Notice to Proceed date indicated in the Contract, unless otherwise altered or amended by specific language in the Contract or as permitted by the provisions of Section 105.01 or Section 108.02 of the Specifications.

Section 108.04—Determination and Extension of Contract Time Limit of the Specifications is amended to replace the second paragraph with the following:

With a fixed date contract when contract execution is not within 60 calendar days after the opening of bids, or when the Contractor is unable to commence work because of any failure of the Department, or when the Contractor is delayed because of the fault of the Department, the Contractor will be given an extension of time based on the number of days delayed beyond the 60 calendar days. No time extension will be allowed for a delay in the date of contract execution when the delay is the fault of the Contractor.

Section 108.04(a) Fixed Date of the Specifications is amended to add the following after the first paragraph as currently written:

If the Contract identifies a contract-specific Notice to Proceed date and the Contract is not executed by that date, the Contractor will receive an extension of time equal to the number of days between the contract-specific Notice to Proceed date and the eventual date of contract execution. If the Notice to Proceed date is selected by the Contractor and after prior approval the Engineer directs the Contractor not to begin work on that date, the Contractor will receive an extension of time equal to the number of days between the Contractor's selected Notice to Proceed date and the eventual date the Engineer informs the Contractor that he may commence the work.

Section 108.07—Default of Contract of the Specifications is amended to replace condition (a) with the following:

- (a) fails to begin the work under the Contract within 10 calendar days after the Contractor's selected Notice to Proceed date, or within 10 calendar days after a contract specific Notice to Proceed date indicated in the Contract, except as otherwise permitted by specific contract language or the provisions of Section 105.01 or Section 108.02 of the Specifications.

SECTION 109—MEASUREMENT AND PAYMENT

Section 109.01—Measurement by Weight is amended to replace the first paragraph and second paragraph including subparagraphs 1-4 with the following:

- (a) **Measurement by Weight:** Materials that are measured or proportioned by weight shall be weighted on accurate scales as specified in this Section. When material is paid for on a tonnage basis, personnel performing the weighing shall be certified by the Department and shall be bonded to the Commonwealth of Virginia in the amount of \$10,000 for the faithful observance and performance of the duties of the weighperson required herein. The bond shall be executed on a form having the exact wording as the Weighpersons Surety Bond Form furnished by the Department and shall be submitted to the Department prior to the furnishing of the tonnage material.

The Contractor shall have the weighperson perform the following:

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

1. Furnish a signed weigh ticket for each load that shows the date, load number, plant name, size and type of material, project number, schedule or purchase order number, and the weights specified herein.
2. Maintain sufficient documentation so that the accumulative tonnage and distribution of each lot of material, by contract, can be readily identified.
3. Submit by the end of the next working day a summary of the number of loads and total weights for each type of material by contract.

Section 109.01—Measurement by Weight is also amended to delete the third paragraph.

Section 109.09—Payment For Material On Hand of the Specifications is replaced with the following:

When requested in writing by the Contractor, payment allowances may be made for material secured for use on the project. Such material payments will be for only those actual quantities identified in the contract, approved work orders, or otherwise **authorized and documented by the Engineer** as required to complete the project and shall be in accordance with the following terms and conditions:

- (a) **Structural Steel or Reinforcing Steel:** An allowance of 100 percent of the cost to the Contractor for structural steel **or reinforcing steel** materials secured for fabrication not to exceed 60 percent of the contract price may be made when such material is delivered to the fabricator and has been adequately identified for exclusive use on the project. **The provisions of this section for steel reinforcement will only apply where the quantity of steel reinforcement is identified as a separate and distinct bid item for payment.** An allowance of 100 percent of the cost to the Contractor for superstructure units and reinforcing steel, not to exceed 90 percent of the contract price, may be made when fabrication is complete. Prior to the granting of such allowances, the materials and fabricated units shall have been tested or certified and found acceptable to the Department and shall have been stored in accordance with the requirements specified herein. Allowances will be based on invoices, bills, or the estimated value as approved by the Engineer and will be subject to the retainage requirements of Section 109.08. **For the purposes of this section fabrication is defined as any manufacturing process such as bending, forming, welding, cutting or coating with paint or anti-corrosive materials which alters, converts, or changes raw material for its use in the permanent finished work.**
- (b) **Other Materials:** For aggregate, pipe, guardrail, signs and sign assemblies, and other nonperishable material, an allowance of 100 percent of the cost to the Contractor for materials, not to exceed 90 percent of the contract price, may be made when such material is delivered **to the project** and stockpiled or stored in accordance with the requirements specified herein. Prior to the granting of such allowances, the material shall have been tested and found acceptable to the Department. Allowances will be based on invoices, bills, or the estimated value of the material as approved by the Engineer and will be subject to the retainage provisions of Section 109.08.
- (c) **Excluded Items:** No allowance will be made for fuels, form lumber, falsework, temporary structures, or other work that will not become an integral part of the finished construction. **Additionally, no allowance will be made for perishable material such as cement, seed, plants, or fertilizer.**

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- (d) **Storage:** Material for which payment allowance is requested shall be stored in an approved manner in areas where damage is not likely to occur. If any of the stored materials are lost or become damaged, the Contractor shall repair or replace them **at no additional cost to the Department. Repair or replacement of such material will not be considered the basis for any extension of contract time.** If payment allowance has been made prior to such damage or loss, the amount so allowed or a proportionate part thereof will be deducted from the next progress estimate payment and withheld until satisfactory repairs or replacement has been made.

When it is determined to be impractical to store materials within the limits of the project, the Engineer may approve storage on private property or, for structural units and reinforcing steel, on the manufacturer's or fabricator's yard. Requests for payment allowance for such **stored** material shall be accompanied by a release from the owner or tenant of such property or yard agreeing to permit the removal of the materials from the property without cost to the Commonwealth.

- (e) **Materials Inventory:** If the Contractor requests a payment allowance for properly stored material, he shall submit a certified and itemized inventory statement to the Engineer no earlier than five days and no later than two days prior to the progress estimate date. The statement shall be submitted on forms furnished by the Department and shall be accompanied by **supplier's or manufacturer's** invoices or other documents that will verify the material's cost. Following the initial submission, the Contractor shall submit to the Engineer a monthly-certified update of the itemized inventory statement within the same time frame. The updated inventory statement shall show additional materials received and stored with invoices or other documents and shall list materials removed from storage since the last certified inventory statement, with appropriate cost data reflecting the change in the inventory. If the Contractor fails to submit the monthly-certified update within the specified time frame, the Engineer will deduct the full amount of the previous statement from the progress estimate.

At the conclusion of the project, the cost of material remaining in storage for which payment allowance has been made will be deducted from the progress estimate.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS21105-0610

February 9, 2010cc

VIRGINIA DEPARTMENT OF TRANSPORTATION
 2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 211—ASPHALT CONCRETE

SECTION 211—ASPHALT CONCRETE of the Specifications is amended as follows:

Section 211.01—Description is replaced with the following:

Asphalt concrete shall consist of a combination of mineral aggregate and asphalt material mixed mechanically in a plant specifically designed for such purpose.

An equivalent single-axle load (ESAL) will be established by the Engineer, and SUPERPAVE mix types may be specified as one of the types listed as follows:

Mix Type	Equivalent Single-Axle Load (ESAL) Range (millions)	Minimum Asphalt Performance Grade (PG) ²	Aggregate Nominal Maximum Size ¹
SM-9.0A	0 to 3	64-16	3/8 in
SM-9.0D	3 to 10	70-16	3/8 in
SM-9.0E	Above 10	76-22	3/8 in
SM-9.5A	0 to 3	64-16	3/8 in
SM-9.5D	3 to 10	70-16	3/8 in
SM-9.5E	Above 10	76-22	3/8 in
SM-12.5A	0 to 3	64-16	1/2 in
SM-12.5D	3 to 10	70-16	1/2 in
SM-12.5E	Above 10	76-22	1/2 in
IM-19.0A	Less than 10	64-16	3/4 in
IM-19.0D	10 to 20	70-16	3/4 in
IM-19.0E	20 and above	76-22	3/4 in
BM-25.0A	All ranges	64-16	1 in
BM-25.0D	Above 10	70-16	1 in

¹**Nominal Maximum Size** is defined as one sieve size larger than the first sieve to retain more than 10 percent aggregate.

²**Minimum Asphalt Performance Grade (PG)** is defined as the minimum binder performance grade for the job mixes as determined by AASHTO T170 or AASHTO M320.

Asphalt concrete shall conform to the requirements for the mix type designated.

At the Contractor's option, Warm Mix Asphalt (WMA) additive or process may be used in lieu of the appropriate Hot Mix Asphalt (HMA).

Section 211.02(h) antistripping additive is amended by adding the following to the second paragraph:

When a Warm Mix Asphalt (WMA) additive or process, as described in 211.02(i) of the Specifications, is used in lieu of Hot Mix Asphalt (HMA) in the production of asphalt concrete, the minimum TSR requirement shall be 0.80 for the design and production tests.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 211.02(j)1 is replaced with the following

1. Asphalt surface, intermediate and base mixtures containing RAP should use the performance grade (PG) of asphalt cement as indicated in Table II-I4A, however, the choice of PG to use in the mix shall be the responsibility of the Contractor in order to meet the requirements of Section 211.01 of the Specifications.

Section 211.02—Materials is amended by adding the following:

- (k) **Warm Mix Asphalt (WMA)** additives or processes shall be approved by the Department prior to use. Approved materials and processes shall be obtained from the Department's approved list which is included in the Materials Division's Manual of Instructions.

TABLE II-12A AGGREGATE PROPERTIES is amended to add Mix Type IM-19.0E as follows:

TABLE II-12A
Aggregate Properties

Mix Type	Coarse Aggregate Properties			Fine Aggregate Properties	
	CAA		ASTM D4791	SE	FAA
	1 fractured face	2 fractured faces	F & E "(5:1) % by weight		
IM-19.0 E	95% min.	90% min.	10% max. ¹	45% min.	45% min.

TABLE II-13 ASPHALT CONCRETE MIXTURES: DESIGN RANGE is amended to add Mix Type IM-19.0E to IM-19.0 A,D as follows:

TABLE II-13
Asphalt Concrete Mixtures: Design Range¹

Mix Type	Percentage by Weight Passing Square Mesh Sieves										
	2 in	1 1/2 in	1 in	3/4 in	1/2 in	3/8 in	No. 4	No. 8	No. 30	No. 50	No. 200
IM-19.0 A,D,E			100	90-100	90 max.	--	--	28-49			2-8

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

TABLE II-14 MIX DESIGN CRITERIA is replaced with the following:

TABLE II-14
Mix Design Criteria

Mix Type	VTM (%) Production	VFA (%) Design	VFA (%) Production	Min. VMA (%)	Fines/Asphalt Ratio (Note 3)	No. of Gyration			Density (%) at
						N Design	N Initial	N Max	N Initial
SM-9.0A ^{Notes 1,2,3}	2.0-5.0	75-80	70-85	16	0.6-1.3	65	7	100	≤ 90.5
SM-9.0D ^{Notes 1,2,3}	2.0-5.0	75-80	70-85	16	0.6-1.3	65	7	100	≤ 89.0
SM-9.0E ^{Notes 1,2,3}	2.0-5.0	75-80	70-85	16	0.6-1.3	65	7	100	≤ 89.0
SM-9.5A ^{Notes 1,2,3}	2.0-5.0	73-79	68-84	15	0.6-1.2	65	7	100	≤ 90.5
SM-9.5D ^{Notes 1,2,3}	2.0-5.0	73-79	68-84	15	0.6-1.2	65	7	100	≤ 89.0
SM-9.5E ^{Notes 1,2,3}	2.0-5.0	73-79	68-84	15	0.6-1.2	65	7	100	≤ 89.0
SM-12.5A ^{Notes 1,2,3}	2.0-5.0	70-78	65-83	14	0.6-1.2	65	7	100	≤ 90.5
SM-12.5D ^{Notes 1,2,3}	2.0-5.0	70-78	65-83	14	0.6-1.2	65	7	100	≤ 89.0
SM-12.5E ^{Notes 1,2,3}	2.0-5.0	70-78	65-83	14	0.6-1.2	65	7	100	≤ 89.0
IM-19.0A ^{Notes 1,2,3}	2.0-5.0	69-76	64-81	13	0.6-1.2	65	7	100	≤ 90.5
IM-19.0D ^{Notes 1,2,3}	2.0-5.0	69-76	64-81	13	0.6-1.2	65	7	100	≤ 89.0
IM-19.0E ^{Notes 1,2,3}	2.0-5.0	69-76	64-81	13	0.6-1.2	65	7	100	≤ 89.0
BM-25.0A ^{Notes 2,3,4}	1.0-4.0	67-87	67-92	12	0.6-1.3	65	7	100	≤ 89.0
BM-25.0D ^{Notes 2,3,4}	1.0-4.0	67-87	67-92	12	0.6-1.3	65	7	100	≤ 89.0

¹SM = Surface Mixture; IM = Intermediate Mixture; BM = Base Mixture.

Note 1: Asphalt content should be selected at 4.0 % Air Voids,

Note 2: During production of an approved job mix, the VFA shall be controlled within these limits.

Note 3: Fines-asphalt ratio is based on effective asphalt content.

Note 4: Base mix shall be designed at 2.5% air voids. BM-25.0 A shall have a minimum asphalt content of 4.4% unless otherwise approved by the Engineer. BM-25.0D shall have a minimum asphalt content of 4.6% unless otherwise approved by the Engineer.

Section 211.03—Job-Mix Formula is amended to replace (c) with the following:

- (c) Three trial blends for gradation shall be run at one asphalt content.

Section 211.03—Job-Mix Formula is amended to replace (d)8 with the following:

8. For surface mixes, permeability test data shall be submitted in accordance with VTM 120 using either single point verification or the regression method for each surface mix having a different gradation. If the average of the permeability results from the single point verification method exceeds 150×10^{-5} cm/sec, or if the regression method predicts a permeability exceeding 150×10^{-5} cm/sec at 7.5% voids, the Contractor shall redesign the mixture to produce a permeability number less than 150×10^{-5} cm/sec.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 211.03—Job-Mix Formula is amended to replace (f) with the following:

- (f) A determination will be made that any asphalt concrete mixture being produced conforms to the job-mix formula approved by the Department. The Department and Contractor will test the mixture using samples removed from production. The following tests will be conducted to determine the properties listed:

Property	Test
Asphalt content	VTM-102, (VTM-36 when approved)
Gradation	AASHTO T-30
SUPERPAVE properties	AASHTO R35
Asphalt cement material	AASHTO T316 or T-201

For Warm Mix Asphalt (WMA), SUPERPAVE properties will be determined by the Department and Contractor once the WMA has been allowed to cool to 100 degrees F or less and reheated based on the mix designation in Section 211.03(d)6 of the Specifications.

The Department will perform rut testing in accordance with the procedures detailed in VTM-110. If the results of the rut testing do not conform to the following requirements, the Engineer reserves the right to require adjustments to the job-mix formula:

Mix Designation	Maximum Rut Depth, mm
A	7.0
D	5.5
E, (S)	3.5

After calibration of the gyratory compactor is completed, adjustments to the job-mix formula may be required by the Engineer.

In the event the Department determines that the mixture being produced does not conform to the approved job-mix formula and volumetric properties specified in Table II-14 based on the Department's or Contractor's test results, the Contractor shall immediately make corrections to bring the mixture into conformance with the approved job-mix formula or cease paving with that mixture.

Subsequent paving operations using either a revised or other job-mix formula that has not been verified as described herein shall be limited to a test run of 100 to 300 tons of mixture if such material is to be placed in Department project work. No further paving for the Department using that specific mixture shall occur until the acceptability of the mixture being produced has been verified using the 100 to 300 ton constraint.

TABLE II-14A
Recommended Performance Grade of Asphalt Cement

Mix Type	Percentage of Reclaimed Asphalt Pavement (RAP) in Mix		
	%RAP ≤ 20.0%	20.0% < %RAP ≤ 30%	20.0% < %RAP ≤ 35%
SM-9.0A, SM-9.5A, SM-12.5A	PG 64-22	PG 64-22	
SM-9.0D, SM-9.5D, SM-12.5D	PG 70-22	PG 64-22	
IM-19.0A	PG 64-22	PG 64-22	
IM-19.0D	PG 70-22	PG 64-22	
BM-25.0A	PG 64-22		PG 64-22
BM-25.0D	PG 70-22		PG 64-22

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Based on rut testing performed by the Department and/or field performance of the job mix, the Engineer reserves the right to require adjustments to the job-mix formula.

Section 211.04—Asphalt Concrete Mixtures is amended by replacing (b) with the following:

- (b) **Types IM-19.0A, IM-19.0D, and IM-19.0E asphalt concrete** shall consist of crushed stone, crushed slag, or crushed gravel and fine aggregate, slag or stone screenings, or a combination thereof combined with asphalt cement.

NOTE: At the discretion of the Engineer, an intermediate mix may be designated as either SM-19.0A or SM-19.0D. When designated as such, no more than 5 percent of the aggregate retained on the No. 4 sieve may be polish susceptible. All material passing the No. 4 sieve may be polish susceptible.

Section 211.04—Asphalt Concrete Mixtures is amended to replace (e) with the following:

- (e) **Type SM-9.5, SM-12.5, IM-19.0 and BM-25.0 asphalt concrete** may be designated E (polymer modified), or stabilized (S). Asphalt concrete mixtures with the E designation may not be stabilized.

1. **Type E asphalt mixtures** shall consist of mixes incorporating a neat asphalt material with polymer modification complying with the requirements of PG 76-22 and have a rolling thin film oven test residue elastic recovery at 77 degrees F of a minimum of 70 percent when tested in accordance with ASTM D 6084 procedure A. E designated mixtures shall not contain more than 15 percent reclaimed asphalt pavement (RAP) material.
2. **Type (S) asphalt mixtures** shall consist of mixes incorporating a stabilizing additive from the Department's approved list found in the Materials Division's Manual of Instructions. These mixes shall be designated with an (S) following the standard mix designation. The minimum required additive shall be as specified on the Department's approved list found in the Materials Division's Manual of Instructions.
3. **Type L asphalt mixtures** will be allowed to contain a 100 percent polishing coarse and fine aggregate. These mixes shall be designated with a L following the standard mix designation.

Section 211.06—Tests is replaced with the following:

The Department may sample materials entering into the composition of the asphalt concrete, the mixture, or the completed pavement. The Contractor shall cooperate with the Engineer in obtaining these samples. When samples are obtained from the pavement, the resulting voids shall be filled and refinished by the Contractor without additional compensation.

Abson recovery samples shall be PG graded according to the requirements of AASHTO M 320-05. Samples meeting the required grades specified in Section 211.01 of the Specifications shall be acceptable.

When the Department performs PG grading on the asphalt in a Contractor's liquid asphalt storage tank, the Engineer will notify the asphalt concrete producer and binder supplier if tests indicate that the binder properties of the asphalt material differ from those of the approved job-mix. The asphalt concrete producer and binder supplier shall determine corrective action with the approval of the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 211.08—Acceptance is amended to replace the second paragraph with the following:

Acceptance for gradation and asphalt cement content will be based on the mean of results of eight tests performed on samples taken in a stratified random manner from each 4,000-ton lot (8,000-ton lots may be used when the normal daily production of the source from which the material is being obtained is in excess of 4,000 tons). Unless otherwise approved by the Engineer, samples shall be obtained from the approximate center of the truckload of material. Any statistically acceptable method of randomization may be used to determine when to take the stratified random sample; however, the Department shall be advised of the method to be used prior to the beginning of production.

Table II-15 PROCESS TOLERANCE is replaced with the following:

TABLE II-15
Process Tolerance

Tolerance on Each Laboratory Sieve and Asphalt Content: Percent Plus and Minus												
No. Test s	Top Size¹	1 ½"	1"	¾"	½"	3/8"	No. 4	No. 8	No. 30	No. 50	No. 200	A.C.
1	0.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	6.0	5.0	2.0	.60
2	0.0	5.7	5.7	5.7	5.7	5.7	5.7	5.7	4.3	3.6	1.4	0.43
3	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.3	2.8	1.1	0.33
4	0.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	2.5	1.0	0.30
5	0.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.7	2.2	0.9	0.27
6	0.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.4	2.0	0.8	0.24
7	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.3	1.9	0.8	0.23
8	0.0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.1	1.8	0.7	0.21
12	0.0	2.3	2.3	2.3	2.3	2.3	2.3	2.3	1.7	1.4	0.6	0.17

¹Defined as the sieve that has 100% passing as defined in Table II-13.

Section 211.09 is amended to delete the last three paragraphs.

Section 211.10—Referee System is amended to replace (a) and (b) with the following:

- (a) In the event the test results obtained from one of the eight samples taken to evaluate a particular lot appear to be questionable, the Contractor may request in writing that the results of the questionable sample be disregarded, whereupon the Contractor shall have either an AASHTO-accredited lab or Department lab perform tests on five additional samples taken from randomly selected locations in the roadway where the lot was placed.

In the event the Engineer determines that one of the 8 test results appears to be questionable, the Department will perform tests on five additional samples taken from the randomly selected locations in the roadway where the lot was placed. The test results of the seven original, i.e. unquestioned, samples will be averaged with the test results of the five road samples, and the mean of the test values obtained for the twelve samples will be compared to the requirements for the mean of twelve tests as specified in Table II-15.

- (b) In the event the Contractor questions the mean of the eight original test results obtained for a particular lot, the Contractor may request in writing approval to have either an AASHTO-accredited lab or Department lab perform additional testing of that lot.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

In the event the Engineer determines that the mean of the eight original test results are questionable, the Department will perform additional testing of that lot. The test results of the eight samples will be averaged with the test results of the four additional samples taken from randomly selected locations in the roadway where the lot was placed, and the mean of the test values obtained from the twelve samples will be compared to the requirements for the mean of twelve tests as specified in Table II-15.

If the Contractor requests additional tests, as described in (a) or (b) herein, the Contractor shall sample the material and have either an AASHTO-accredited lab or Department lab test the material in accordance with Department-approved procedures. The Engineer reserves the right to observe the sampling and testing.

In the event the mean of the test values obtained for the twelve samples conforms to the requirements for the mean of twelve tests, the material will be considered acceptable. In the event that the mean of the test values obtained for the twelve samples does not conform to the requirements for the mean result of twelve tests, the lot will be adjusted in accordance with the adjustment rate specified in Section 211.09 of the Specifications.

Samples of the size shown herein shall be saw cut by the Contractor for testing without the use of liquids:

Application Rate	Minimum Sample Size
125 lb/yd ²	8 by 8 in
150 lb/yd ²	7 by 7 in
200 lb/yd ²	6 by 6 in
300 lb/yd ²	5 by 5 in

Section 211.15—Initial Production is replaced with the following:

- (a) **Warm Mix Asphalt (WMA):** At the start of production, the Contractor shall place no more than 500 tons or up to one day's production as directed by the Engineer at an approved site, which may be the project site, so the Engineer can examine the process control of the mixing plant, the Contractor's placement procedures, surface appearance of the mix, compaction patterns of the Contractor's roller(s), and correlation of the nuclear density device.
- (b) **Hot Mix Asphalt (HMA):** At the start of production of a mix not previously used on a state roadway, the Contractor shall place 100 to 300 tons or up to one day's production as directed by the Engineer at an approved site, which may be the project site, so the Engineer can examine the process control of the mixing plant, the Contractor's placement procedures, surface appearance of the mix, compaction patterns of the Contractor's roller(s), and correlation of the nuclear density device.

The material shall be placed at the specified application rate and will be paid for at the contract unit price for the specified mix type. The Engineer will determine the disposition of material that was not successfully produced and/or placed due to negligence in planning, production, or placement by the Contractor.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

SS31505-0410

February 9, 2010c

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 315—ASPHALT CONCRETE PLACEMENT

SECTION 315—ASPHALT CONCRETE PAVEMENT of the Specifications is amended as follows:

The Table of Contents for the 2007 Road and Bridge Specifications is revised to rename **SECTION 315—ASPHALT CONCRETE PAVEMENT** as **SECTION 315—ASPHALT CONCRETE PLACEMENT**.

Section 315.01—Description is replaced with the following:

This work shall consist of constructing one or more courses of asphalt concrete on a prepared foundation in accordance with the requirements of these specifications and within the specified tolerances for the lines, grades, thicknesses, and cross sections shown on the plans or as established by the Engineer. At the Contractor's option, the asphalt concrete mix may be produced using a warm-mix additive or process approved by the Department. When used, the temperature placement limitations for Warm Mix Asphalt (WMA) shall be applied.

Section 315.02(d) Liquid asphalt coating (emulsion) for rumble strip is replaced with the following:

- (d) **Liquid asphalt coating (emulsion) for rumble strip** shall conform to the requirements of Section 210 of the Specifications. For centerline rumble strips, CSS-1h or CQS-1h conforming to Section 210 of the Specifications shall be used. The CSS-1h or CQS-1h may be diluted by up to 30 percent at the emulsion manufacturer's facility.

Section 315.03(a) Hauling Equipment is replaced with the following:

- (a) **Hauling Equipment:** Trucks used for hauling asphalt mixtures shall have tight, clean, smooth metal or other non-absorptive/inert material bodies equipped with a positive locking metal tailgate. Surfaces in contact with asphalt mixtures shall be given a thin coat of aliphatic hydrocarbon invert emulsion release agent (nonpuddling), a lime solution, or other material on the Department's list of approved release agents. Except where a nonpuddling release agent is used, the beds of dump trucks shall be raised to remove excess agent prior to loading. Only a nonpuddling agent shall be used in truck beds that do not dump. Each truck shall be equipped with a tarpaulin or other cover that will protect the mixture from moisture and foreign matter and prevent the rapid loss of heat during transportation.

Section 315.03—Equipment is amended by adding the following:

- (e) **Material Transfer Vehicle (MTV):** When required in the Contract, a MTV shall be a self-propelled storage unit capable of receiving material from trucks, storing the material and transferring the material from the unit to a paver hopper insert via a conveyor system. The required paver hopper insert and unit shall have a combined minimum storage capacity of 15 tons. Prior to placing the asphalt material on the roadway surface, the storage unit or paver hopper insert must be able to remix the material in order to produce a uniform, non-segregated mix, having a uniform temperature.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Section 315.04—Placement Limitations is replaced with the following:

Asphalt concrete mixtures shall not be placed when weather or surface conditions are such that the material cannot be properly handled, finished, or compacted. The surface upon which asphalt mixtures are to be placed shall be free of standing water, dirt, and mud and the base temperature shall conform to the following:

(a) **Warm Mix Asphalt (WMA):**

1. **When the base temperature is above 40 degrees F**, laydown will be permitted at any temperature below the maximum limits given in Section 211.08 of the Specifications.
2. **When the laydown temperature is between 301 degrees F and 325 degrees F**, the number of compaction rollers will be the same number as required for 300 degrees F or less.

(b) **Hot Mix Asphalt (HMA):**

1. **When the base temperature is above 80 degrees F**, mixture laydown will be permitted at any temperature conforming to the limits specified in Section 211 of the Specifications.
2. **When the base temperature is between 40 degrees F and 80 degrees F**, the Nomograph, Table III-2, shall be used to determine the minimum laydown temperature of the asphalt concrete mixes. At no time should the minimum base temperature for base (BM) and intermediate (IM) mixes be less than 40 degrees F. At no time should the minimum laydown temperature for base (BM) and intermediate (IM) mixes be less than 250 degrees F.

For surface mixes (SM), at no time should the minimum base and laydown temperatures be less than the following:

PG Binder/Mix Designation	Percentage of Reclaimed Asphalt Pavement (RAP) Added to Mix	Minimum Base Temperature	Minimum Placement Temperature
PG 64-22 (A)	<=20%	40 °F	250 °F
PG 64-22 (A)	>20%	50 °F	270 °F
PG 70-22 (D)	<=30%	50 °F	270 °F
PG 76-22 (E)	<=15%	50 °F	290 °F
PG 64-22 (S)	<=30%	50 °F	290 °F

- (3) **When the laydown temperature is between 301 degrees F and 325 degrees F**, the number of compaction rollers will be the same number as required for 300 degrees F.

Intermediate and base courses that are placed at rates of application that exceed the application rates shown in Table III-2 shall conform to the requirements for the maximum application rate shown for 8-minute and 15-minute compaction rolling as per number of rollers used.

Should the Contractor be unable to complete the compaction rolling within the applicable 8-minute or 15-minute period, the placing of asphalt mixture shall either cease until sufficient rollers are used or other corrective action is taken to complete the compaction rolling within the specified period.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Compaction rolling shall be completed prior to the mat cooling down to 175 degrees F. Finish rolling may be performed at a lower mat temperature.

The final asphalt pavement finish course shall not be placed until construction pavement markings are no longer required.

Section 315.05(b) Conditioning Existing Surface is replaced with the following:

- (b) **Conditioning Existing Surface:** When the surface of the existing pavement or base is irregular, it shall be brought to a uniform grade and cross section as directed by the Engineer. The surface on which the asphalt concrete is to be applied shall be prepared in accordance with the requirements of the applicable specifications and shall be graded and compacted to the required profile and cross section.

When specified, prior to placement of asphalt concrete, longitudinal and transverse joints and cracks shall be sealed by the application of an approved joint sealing compound.

Contact surfaces of curbing, gutters, manholes, and other structures projecting into or abutting the pavement and cold joints of asphalt shall be painted with a thick, uniform coating of asphalt prior to placement of asphalt mixture.

A tack or prime coat of asphalt will be required as specified below and shall conform to the applicable requirements of Section 310 and Section 311 of the Specifications. Asphalt classed as cutbacks or emulsions shall be applied ahead of the paving operations, and the time interval between applying and placing the paving mixture shall be sufficient to ensure a tacky residue providing maximum adhesion of the paving mixture to the base. The mixture shall not be placed on tack or prime coats that have been damaged by traffic or contaminated by foreign material. Traffic shall be excluded from such sections.

1. **Priming and Tacking:**

- a. **Priming aggregate base or subbase:** Unless otherwise specified in the contract documents, priming with asphalt material will not be required on aggregate subbase or base material prior to the placement of asphalt base, intermediate or surface layers.
- b. **Tacking:** Application of tack at joints, adjacent to curbs, gutters, or other appurtenances, shall be applied with a hand wand or with spray bar at the rate of 0.2 gallon per square yard. At joints, the tack applied by the hand wand or a spray bar shall be 2 feet in width with 4 to 6 inches protruding beyond the joint for the first pass. Tack for the adjacent pass shall completely cover the vertical face of the mat edge, so that slight puddling of asphalt occurs at the joint, and extend a minimum of 1 foot into the lane to be paved.

Milled faces that are to remain in place shall be tacked in the same way for the adjacent pass. Use of tack at the vertical faces of longitudinal joints will not be required when paving in echelon.

On rich sections or those that have been repaired by the extensive use of asphalt patching mixtures, the tack coat shall be eliminated when directed by the Engineer.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Tack shall not be required atop asphalt stabilized open-graded material drainage layers.

Tack shall be applied between the existing asphalt surface and each asphalt course placed thereafter.

2. **Removing depressions and elevating curves:** Where irregularities in the existing surface will result in a course more than 3 inches in thickness after compaction, the surface shall be brought to a uniform profile by patching with asphalt concrete and thoroughly tamping or rolling until it conforms with the surrounding surface. The mixture used shall be the same as that specified for the course to be placed.

When the Contractor elects to conduct operations to eliminate depressions, elevate curves, and place the surface course simultaneously, he shall furnish such additional spreading and compacting equipment as required to maintain the proper interval between the operations.

Section 315.05(c) Placing and Finishing is amended to replace the second paragraph with the following:

A continuous line to mark the edge of pavement and provide proper control of pavement width and horizontal alignment will not be required for this contract.

And to add the following paragraphs:

Prior to application of tack coat and commencement of paving operations the Contractor shall clean the existing pavement surface of all accumulated dust, mud, or other debris that may affect the bond of the new overlay, as determined by the Engineer. The Contractor shall ensure the surface remains clean until commencement and during paving operations. The cost for cleaning and surface preparation shall be included in the bid price for asphalt concrete.

When required in the Contract, a MTV shall be used during the placement of designated asphalt mixes on full lane width applications.

Section 315.05(d) Compacting is amended by replacing the fifth paragraph with the following:

Rolling shall begin at the sides and proceed longitudinally parallel with the center of the pavement, each trip overlapping at least 6 inches, gradually progressing to the crown of the pavement. When abutting a previously placed lane, rolling shall begin at the outside unconfined side and proceed toward the previously placed lane. On superelevated curves, rolling shall begin at the low side and proceed to the high side by overlapping of longitudinal trips parallel with the centerline.

Section 315.05(e) is replaced with the following:

(e) **Density:** Density shall be determined in accordance with the following:

1. The Contractor shall perform roller pattern and control strip density testing on surface, intermediate, and base courses in accordance with the requirements of VTM-76. The Contractor shall have a certified Asphalt Field Technician perform all density testing.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Density shall be determined with a thin-lift nuclear gauge conforming to the requirements of VTM-81 or from the testing of plugs/cores taken from the roadway where the mixture was placed. Density test locations shall be marked and labeled in accordance with the requirements of VTM-76. When acceptance testing is performed with a nuclear gauge, the Contractor shall have had the gauge calibrated within the previous 12 months by approved calibration service. In addition, the Contractor shall maintain documentation of such calibration service for the 12-month period from the date of the calibration service. The required density of the compacted course shall not be less than 98.0 percent and not more than 102.0 percent of the target control strip density.

Nuclear density roller pattern and control strip density testing shall be performed on asphalt concrete overlays placed directly on surface treatment roadways and when overlays are placed at an application rate less than 125 pounds per square yard, based on 110 pounds per square yard per inch, on any surface. In these situations, sawed plugs or core samples will not be required and the minimum control strip densities as specified in Table III-3 will be waived. The required density of the compacted course shall be not less than 98.0 percent and not more than 102.0 percent of the target control strip.

TABLE III-3
Density Requirements

Mixture Type	Min. Control Strip Density (%) ¹
SM-9.5A, 12.5A	92.5
SM-9.5D, 12.5D	92.2
SM-9.5E, 12.5E	92.2
IM-19.0A, IM-19.0D, IM-19.0E	92.2
BM-25.0A, BM-25.0D	92.2

¹The control strip density requirement is the percentage of theoretical maximum density of the job-mix formula by SUPERPAVE mix design or as established by the Engineer based on two or more production maximum theoretical density tests.

The project will be divided into "control strips" and "test sections" by the Engineer for the purpose of defining areas represented by each series of tests.

- a. Control Strip: Control strips shall be constructed in accordance with the requirements of these specifications and VTM-76.

The term *control strip density* is defined as the average of 10 determinations selected at stratified random locations within the control strip.

One control strip shall be constructed at the beginning of work on each roadway and shoulder course and on each lift of each course. An additional control strip shall be constructed when a change is made in the type or source of materials or compaction equipment; whenever a significant change occurs in the composition of the material being placed from the same source; or when there is a failing control strip. During the evaluation of the initial control strip, paving operations may continue. However, paving and production shall be discontinued during construction and evaluation of additional control strips. In the event that two consecutive control strips fail, subsequent paving operations shall cease until corrective action(s) has been taken with the approval of the Engineer. If it is determined with the Engineer's approval that the density cannot be obtained because of the condition of the existing pavement structure, the target control strip density shall be determined from the

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

roller pattern that achieves the optimum density and shall be used on the remainder of the roadway that exhibits similar pavement conditions.

Either the Engineer or Contractor may initiate an additional control strip at any time.

The length of the control strip shall be approximately 300 feet and the width shall not be less than 6 feet. On the first day of construction or beginning of a new course, the control strip shall be started between 500 and 1,000 feet from the beginning of the paving operation. The control strip shall be constructed using the same paving, rolling equipment, procedures, and thickness as shall be used on the remainder of the course being placed.

One reading shall be taken at each of 10 stratified random locations. No determination shall be made within 12 inches of the edge of any application width for surface and intermediate mixes or within 18 inches of the edge of any application width for base mixes. The average of these 10 determinations shall be the control strip density recorded to the nearest 0.1 pound per cubic foot. The minimum control strip density shall be determined in accordance with the requirements of VTM-76.

The control strip shall be considered a lot. If the control strip density conforms to the requirements specified in Table III-3, the control strip will be acceptable and the control strip density shall become the target control strip density. If the density does not conform to the requirements specified in Table III-3, the tonnage placed in the control strip and any subsequent paving prior to construction of another control strip will be paid for in accordance with Table III-4 on the basis of the percentage of the Table III-3 value achieved. The Contractor shall take corrective action(s) to comply with the density requirement specified in Table III-3.

TABLE III-4
Payment Schedule for Lot Densities

% of Target Control Strip Density	% of Payment
Greater than 102.0	95
98.0 to 102.0	100
97.0 to less than 98.0	95
96.0 to less than 97.0	90
Less than 96.0	75

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- b. Test section (lot): For the purposes of acceptance, each day's production shall be divided into lots (test sections). The standard size of a lot shall be 5,000 linear feet of any pass 6 feet or greater made by the paving train for the thickness of the course. Pavers traveling in echelon will be considered as two passes. Each lot shall be divided into five sublots of equal length. When a partial lot occurs at the end of a day's production or upon completion of the project, the lot size shall be redefined as follows: If the partial lot contains one or two sublots, the sublots will be added to the previous lot. If the partial lot contains three or four sublots, the partial lot will be redefined to be an entire lot. Each lot shall be tested for density by taking a nuclear density reading from two random locations, or by taking one plug/core from a random location, selected by the Engineer within each subplot. Tests shall not be taken within 12 inches of the edge of any application width for surface and intermediate mixes or within 18 inches of the edge of any application width for base mixes. The average of the subplot results will be compared to the target control strip density to determine the acceptability of the lot. Once the average density has been determined, the Contractor will not be permitted to provide additional compaction to raise the average. If two consecutive sublots produce density results less than 98 percent or more than 102 percent of the target control strip density, the Contractor shall immediately notify the Engineer and institute corrective action. By the end of the day's operations, the Contractor shall furnish the test data developed during the day's paving to the Engineer.

The tonnage of each lot will be based on the lot's width and length and the mixture application rate as designated in the Contract or as revised by the Engineer. Payment will be made in accordance with the requirements of Table III-4.

The Engineer at any time on any project may perform lot density verification testing. Lot density verification is performed by testing plugs.

The Contractor shall be responsible for taking plugs for testing. Testing of the plugs will be done by the Engineer.

Surface, Intermediate, and Base mixes:

Two plugs shall be taken by the Contractor per Verification, Sampling and Testing (VST) lot at locations identified by the Engineer. If the density of the plugs does not conform to the requirements for the lot in question or the same payment percentage determined by the Contractor's testing for that lot, then the Contractor may request the referee procedure to be invoked. One additional plug from the remaining sublots will be taken. Payment for that lot, based on the results of the initial two plugs/cores or referee procedure, will be in accordance with the specifications in Table III-4 on the basis of the percentage of the Table III-3 value achieved.

2. **Surface, intermediate, and base courses** not having a sufficient quantity of material to run a roller pattern and control strip shall be compacted to a minimum density of 91.5 percent of the theoretical maximum density as determined in accordance with the requirements of VTM-22. The Contractor shall be responsible for cutting cores or sawing plugs for testing by the Department. If the density is less than 91.5 percent, payment will be made in accordance with the requirements of Table III-5.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

TABLE III-5

Payment Schedule for Surface, Intermediate and Base Courses (Not sufficient quantity to perform density roller pattern and control strip)

% TMD	% of Payment
Greater than 91.5	100
90.2-91.4	95
88.3-90.1	90
Less than 88.2	75

Any section in which a mixture (e.g., SM-9.0) is being placed at an application rate of less than 125 pounds per square yard, based on 110 pounds per square yard per inch, that does not have a sufficient quantity of material for a roller pattern and control strip shall be compacted by rolling a minimum of three passes with a minimum 8-ton roller. No density testing will be required.

Section 315.05(g) Rumble Strips is amended to replace fourth paragraph with the following:

Following the cutting and cleaning of the depressions of waste material, the entire rumble strip area shall be coated with liquid asphalt coating (emulsion) using a pressure distributor. For rumble strips installed on the shoulder, the approximate application rate shall be 0.1 gallons per square yard. For rumble strips installed in a new asphalt concrete surface (new construction or overlay) along the centerline, no sealing of the rumble strip area shall be performed. When the rumble strip is installed along the centerline in an existing asphalt concrete surface (i.e. more than one year since placement), the approximate application rate shall be 0.05 gallons per square yard. The application temperature shall be between 160 degrees F and 180 degrees F. For shoulder rumble strips only, overspray shall not extend more than 2 inches beyond the width of the cut depressions and/or shall not come in contact with pavement markings.

Section 315.08—Measurement and Payment is amended to include the following:

Material Transfer Vehicle (MTV), when required in the Contract, will not be measured for separate payment. The cost for furnishing and operating the MTV shall be included in the price bid for other appropriate items.

Warm Mix Asphalt (WMA) additive or process will not be measured for separate payment, the cost of which, shall be included in the price bid for other appropriate items.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02
TRANSPORTATION MANAGEMENT PLAN

June 4, 2010

for

Interstate 95 Bridge Replacements
Richmond Metropolitan Area
Project No. 7095-127-115
B-692, B-693, B-694, B-695, B-696, B-697,
B-698, B-699, B-601, B-602, B-603

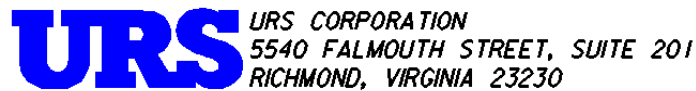
Prepared for:



Prepared by:



Under sub-contract to:



June 4, 2010

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Emergency Contacts

The following is a list of contact persons for emergency situations:

	Office	Cell
Police, Fire and Rescue	911	911
Richmond Police (non emergency)	646-5100	
State Police (non emergency)	1-800-552-9965	
Fire, Hazardous Materials	646-6660	
VDOT Area Construction Engineer		
Traffic Operations Center	796-4520	
VDOT Richmond District Administrator	524-6000	
City of Richmond Traffic	646-0999	
GRTC	358-4782	
Traffic Control Supervisor	_____	_____

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Table of Contents

1.0	Introduction	356
2.0	Temporary Traffic Control	357
2.1	Maintenance of Traffic Drawings	357
2.2	Special Provisions	357
2.3	Mainline Control Strategies	357
2.4	Cross Street Control Strategies	359
2.5	Asset Maintenance	359
3.0	Communications Plan	360
3.1	Traffic Impacts	360
3.2	Communication Plan Goals	361
3.2.1	Objectives	361
3.2.2	Challenges	361
3.2.3	Target Audiences	361
3.3	Necessary Communications Tools	361
3.3.1	Media	362
3.3.2	Community Outreach Efforts/Public Involvement Meetings	362
3.3.3	Internet Pages	362
3.3.4	Collateral Materials	362
3.3.5	Advertising	362
3.4	Proposed Milestones	363
3.5	Communications Partners	363
3.6	Detour/Lane Closure Communications Timeline	363
3.7	Crisis Communications Plan	364
3.7.1	Emergency Contacts	364
4.0	Transportation Operations Strategies	364
4.1	Project Coordination	365
4.1.1	Oversized Loads	365
4.1.2	Coordination with I-64 Repaving Project	365
4.1.3	Coordination with City of Richmond	365
4.1.4	Coordination with GRTC	365
4.2	TMP Roles and Responsibilities	366
4.3	Transportation Operations Plan	367
4.3.1	Time Restrictions	367
4.3.2	Truck Restrictions	367
4.3.3	368
4.3.4	Speed Limit Reduction	368

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

4.4	Demand Management Strategies	368
4.5	Corridor/Network Management Strategies.....	369
4.6	Work Zone Management Strategies.....	369
4.6.1	Safety Meetings.....	369
4.6.2	Communication Equipment	370
4.6.3	TMP Monitoring	370
4.6.4	Dynamic Message Signs	370
4.6.5	Excessive Congestion	370
4.6.6	Cross Street Congestion	370
4.7	Traffic Incident Management Strategies.....	370
4.7.1	Dedicated Emergency Access Lane.....	370
4.7.2	Automobile Crash.....	371
4.7.3	Traffic Operations Center.....	371
4.7.4	Police Patrols	371

Tables

Table 1 - Bridges within Phases	356
Table 2 - MOT Plan Sheet Numbers.....	357
Table 3 - Detour Plan Sheet Numbers.....	359
Table 4 - Time Restrictions.....	368
Table 5 - Truck Restrictions	368

Figures

Figure 1 - MUTCD Figure 6H-39. Median Crossover on Freeway (TA-39).....	358
-------------------------------------------------------------------------	-----

Bibliography

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Introduction

In September of 2004, the Federal Highway Administration published the Final Rule on Work Zone Safety and Mobility to “encourage broader consideration of the safety and mobility impacts of work zones across project development, and the implementation of strategies that help manage these impacts during project delivery.”¹ The rule requires all state and local governments receiving federal-aid funding to comply with the provisions of the rule no later than October 12, 2007. In response to this rule, the Virginia Department of Transportation (VDOT) has issued IIM-LD-241 defining the requirements of Transportation Management Plans.

This Transportation Management Plan (TMP) has been prepared in accordance with the standards for a Type C Project as defined in IIM-LD-241.4, dated January 23, 2009. The TMP, accompanied by the Maintenance of Traffic (MOT) design plans and the Special Provisions, seeks to minimize and mitigate work zone impacts associated with this bridge repair project, protect the traveling public and personnel working within the work zone. The TMP will not only focus on moving traffic through the work zones, but also on reducing the number of motorists within the work zone by informing motorists (using advanced notice signs and public outreach) to enable them to avoid the work zones.

The rehabilitation of 11 bridges along I-95 in the Richmond metropolitan area will require that I-95 be reduced to one lane in each direction, with one emergency lane, weekdays between the hours of 8:00 p.m. and 6:00 a.m. The project consists of five separate phases. Each Phase is a bridge or group of bridges. The Phases are shown in Table 1.

Table 1 - Bridges within Phases

Phase	Bridge(s)	Location
III	B-692	Lombardy Street / CSX Bridge
IV	B-693 B-694 B-695	Overbrook Rd., Sherwood Ave., Robin Hood Rd.
V	B-696 B-697 B-698	Hermitage Rd., Boulevard, Ramp A (SB I-95 off-ramp to Boulevard)
VI	B-699 B-601	Westwood Ave., Laburnum Ave.
VII	B-602 B-603	Upham Brook

Phase III has five separate stages, the remaining phases each have two stages. At each stage within a phase, traffic will be reduced to one lane in each direction with one additional lane provided for emergency services. Typically, for those phases with two stages, the first stage will have all traffic shifted to the northbound lanes to allow work on the southbound lanes; in stage two, all traffic is shifted to the southbound lanes to allow work on the northbound lanes.

The majority of the construction will occur within the existing right-of-way at the 11 bridge locations along I-95. The work is anticipated to last approximately four years

The bridge work will also impact traffic on cross streets that pass under the bridges. Depending upon their configuration, cross streets will be either partially, or completely, closed at I-95 at night to allow refurbishment, repair, or replacement of the bridge substructures.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Temporary Traffic Control

The Temporary Traffic Control requirements for a Type C project include detailed maintenance of traffic drawings, typical sections, special provisions, and details of specific items that may be required.

Maintenance of Traffic Drawings

The Maintenance of Traffic (MOT) construction plans shall be considered part of this TMP. The plans and TMP have been prepared in accordance with the VDOT "Work Area Protection Manual" dated May, 2005, the VDOT Road and Bridge Standards dated 2008, the VDOT Specifications dated 2007, and the Manual of Uniform Traffic Control Devices (MUTCD) dated 2003. In the case of a conflict between this document and the Maintenance of Traffic Drawings, the Maintenance of Traffic Drawings shall be considered the controlling document.

The Maintenance of Traffic Drawings are shown in plan sheets under the sheet numbers shown in Table 2.

Table 2 - MOT Plan Sheet Numbers

Phase	Sheet Numbers
III	23(197) – 23(242)
IV	24(36) – 24(70)
V	27(39) – 27(68)
VI	30(32) – 30(62)
VII	32(35) – 32(63)

Special Provisions

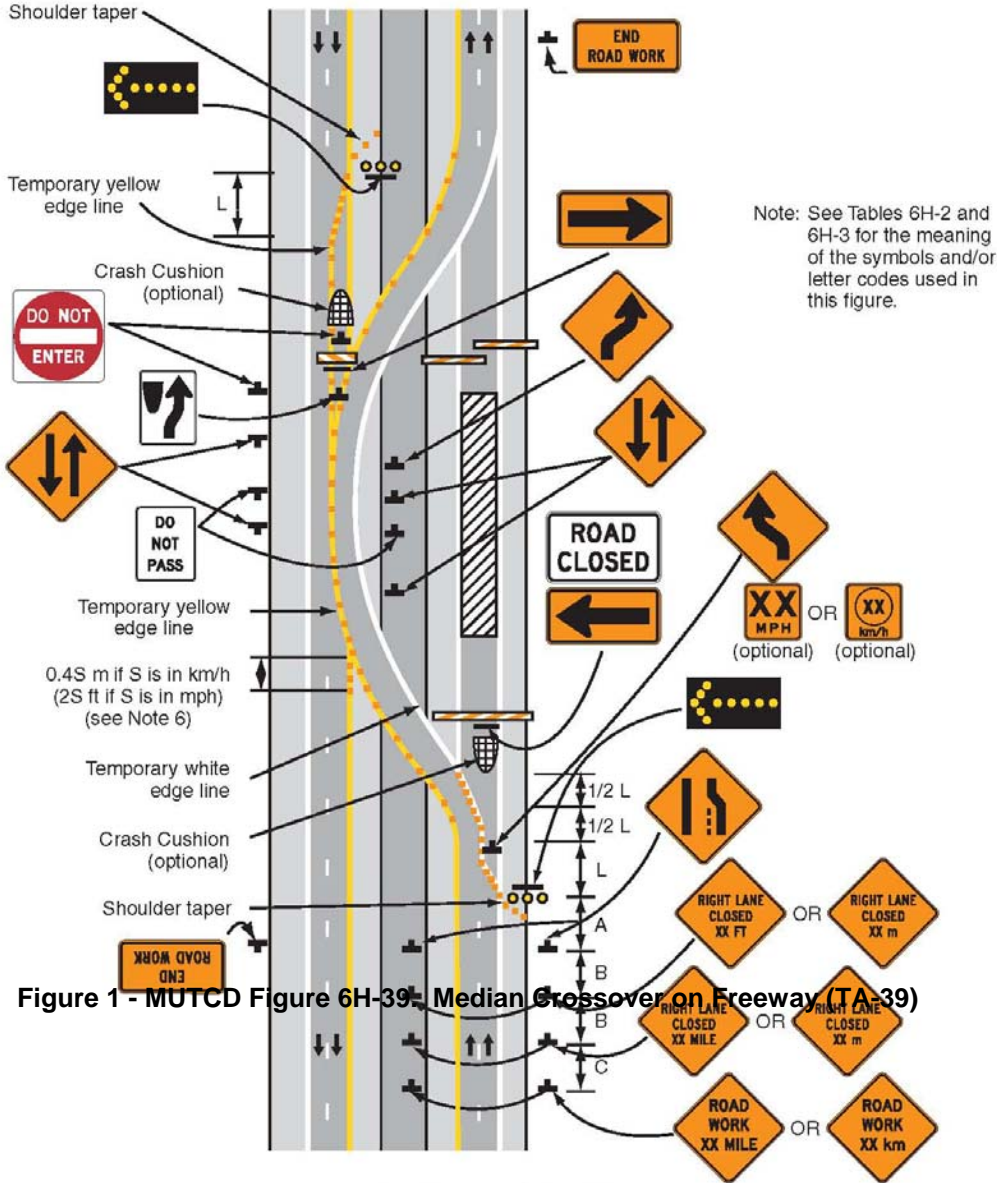
Special provisions have been prepared addressing traffic operations and other critical issues. In the case of a conflict between this document and the Special Provisions, the Special Provisions shall be considered the controlling document.

Mainline Control Strategies

The Contractor shall use the VDOT standard signs, devices, special design sign details and layout configurations as shown on the plans and as necessary to complete the project. The plans have been designed in accordance with several Typical Traffic Control (TTC) Details from the 2005 version of the Virginia Work Area Protection Manual. The primary strategy used along the mainline, and developed in the MOT plans, is TTC-30.0. Other standard details required for this project include TTC-4.0, TTC-12.0, TTC-13.0, TTC-14.0, TTC-15.0, TTC-16.0, TTC-31.0, and TTC-35.0.

Figure 1 – MUTCD Figure 6H-39. Median Crossover on Freeway (TA-39) is taken from the MUTCD and more accurately depicts the required crossovers on I-95. The crossovers typically follow an alignment rather than the standard tapers.

Figure 6H-39. Median Crossover on Freeway (TA-39)



ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Cross Street Control Strategies

The primary work zones will be along I-95 but several local streets that cross under the I-95 bridges will also be affected and require work zones. Cross streets will require either total or partial closure, depending upon the whether the roadway has a median containing a pier. Roadways with a pier in the median will require partial closure with traffic reduced to one lane in each direction. Roadways without a pier in the median will require total closure with a detour.

Three streets, Robin Hood Road, Boulevard, and Laburnum Avenue will be partially closed for the over-night construction. These three streets are four-lane divided roadways with piers in the medians resulting in the I-95 bridges having two spans over the cross street. Therefore, for these three local streets, traffic shall be confined to two lanes under one span while the other span is repaired. The plans for these work zones are provided in the MOT plans and were prepared in accordance with standard drawing TTC-30.0 of the Work Area Protection Manual.

Lombardy Street, Overbrook Road, Sherwood Avenue, Hermitage Road, the I-95 southbound off-ramp at the Boulevard, Westwood Avenue, and the ramp from Robin Hood Road to southbound I-95, will require total closure while the bridge work is being completed. Detour plans are provided in the MOT plans. Only one cross street may be closed for construction in any given night without authorization from the VDOT Inspector.

Table 3 - Detour Plan Sheet Numbers

Phase	Stage	Cross Street	MOT Plan Sheet	Type of Closure
III	I & II	Lombardy Street	23(240)	Total
IV	I & II	Overbrook Road	24(66)	Total
IV	I & II	Sherwood Avenue	24(66)	Total
IV	I & II	Robin Hood Road	24(68)	Partial
IV	I	Robin Hood Road Entrance Ramp to Southbound I-95	24(67)	Total
V	I & II	Hermitage Road	27(64)	Total
V	I & II	Boulevard	27(66)	Partial
V	I & II	Boulevard Exit Ramp from Southbound I-95	27(65)	Total
VI	I & II	Westwood Avenue	30(58)	Total
VI	I	Boulevard Exit Ramp from Southbound I-95	27(65)	Total
VI	II	Boulevard Entrance Ramp to Northbound I-95	30(59)	Total
VI	I & II	W. Laburnum Avenue	30(60)	Partial

Partial lane closures may be required along the local cross streets to repair the piers and abutments for the I-95 bridges. These substructure repairs may be completed prior to the superstructure repair/replacement. Lanes along the medians and shoulders will need to be closed for short periods of time. These short term lane closures shall be accomplished using TTC-12.0 and TTC-13.0 as necessary, and comply with the time restrictions in Section 4.2.1 of this document.

Asset Maintenance

The Contractor shall be responsible for the repair or replacement of traffic control devices in the work zone that are damaged by either the Contractor's forces or as a result of vehicle crashes or other incidents occurring within the work zone. This shall include, but is not limited to, pavement markings, signs, guardrail, and barrier.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor will take every precaution to ensure that existing VDOT Closed Circuit Video (CCTV) sites in this corridor are not damaged or otherwise impacted by construction activities. The Contractor will be responsible to repair, at Contractor's expense, any damage to CCTV cameras, cabinets, structures, or underground cables caused by the Contractor. If a CCTV site is rendered inoperable due to damage caused by the Contractor, the Contractor shall make repairs within 24 hours. After which, the Contractor will be penalized \$500 per day, or portion thereof, that the CCTV remains inoperable.

Communications Plan ⁱⁱ

The I-95 bridge replacement project is expected to begin during the latter part of the I-64 repaving project. VDOT project managers for both projects are coordinating their efforts to reduce the impact on travelers through the Bryan Park interchange. Project information meetings may run concurrently and could cause some confusion as to how VDOT will manage both projects without causing major impacts to motorists and area businesses. Therefore, frequent communication with stakeholders is critical for project success. Stakeholders include the traveling public, government agencies, major employers, industry associations, and any institution that may be impacted by the project.

The Contractor shall coordinate with the VDOT Project Manager to provide information as required for execution of the Public Communications Plan.

Traffic Impacts

Traffic along both I-64 and I-95 is heavy, particularly near the I-95/I-64/I-195 split (Bryan Park interchange). The following are 2007 traffic counts for areas within the project limits:

<u>I-64 Westbound</u>	<u>Vehicles/day</u>
I-95 (Exit 187) to Staples Mill Rd. (Exit 185)	72,359
Staples Mill Rd. (Exit 185) to Glenside Dr. (Exit 183)	56,861
Glenside Dr. (Exit 183) to Parham Rd. (Exit 181)	50,762
<u>I-64 Eastbound</u>	
Parham Rd. (Exit 181) to Glenside Dr. (Exit 183)	47,224
Glenside Dr. (Exit 183) to Staples Mill Rd. (Exit 185)	55,634
Staples Mill Rd. (Exit 185) to I-95 (Exit 187)	60,740
<u>I-95 Northbound</u>	
Maury St. (Exit 73) to the James River Bridge	51,056
James River Bridge to the Downtown Expwy. (Exit 74A)	51,056
Downtown Expwy. (Exit 74A) to Broad St. (Exit 74C)	56,306
Broad St. (Exit 74C) to Boulevard (Exit 78)	71,314
Boulevard (Exit 78) to I-64/I-195 interchange (Exit 79)	62,321
I-64/I-195 (Exit 79) to Hermitage/Lakeside (Exit 80)	45,916
Hermitage/Lakeside (Exit 80) to Brook Rd. (Exit 81)	45,916
Brook Rd. (Exit 81) to Chamberlayne Ave. (Exit 82)	44,038
Chamberlayne Ave. (Exit 82) to Parham Rd. (Exit 83A/B)	49,547
Parham Rd. (Exit 83A/B) to I-295 interchange (Exit 84A/B)	44,778
<u>I-95 Southbound</u>	
I-295 interchange (Exit 84A/B) to Parham Rd. (Exit 83A/B)	39,746
Parham Rd. (Exit 83A/B) to Chamberlayne Ave. (Exit 82)	49,361
Chamberlayne Ave. (Exit 82) to Brook Rd. (Exit 81)	51,409
Brook Rd. (Exit 81) to Hermitage/Lakeside (Exit 80)	56,072
Hermitage/Lakeside (Exit 80) to I-64/I-195 (Exit 79)	56,072
I-64/I-195 interchange (Exit 79) to Boulevard (Exit 78)	78,776
Boulevard (Exit 78) to Broad St. (Exit 74C)	73,650
Broad St. (Exit 74C) to the Downtown Expwy. (Exit 74A)	53,590
Downtown Expwy. (Exit 74A) to James River Bridge	46,022
James River Bridge to Maury St. (Exit 73)	46,022

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Communication Plan Goals

- Inform stakeholders about the I-95 bridge rehabilitation projects.
- Gather stakeholder support before, during, and after construction to ensure a smooth project and minimize complaints.
- Promote 511 to travelers as a primary tool for lane closure and detour information.
- Attain measurable reductions in traffic volumes through the construction zones to reduce congestion and delays.
- Promote safe driving through the work zone.

Objectives

- Hold one public hearing and at least two public information meetings.
- Meet with Henrico and Richmond officials and key business leaders who represent the areas impacted by construction prior to advertisement.
- Zero crash-related fatalities in the work zone during construction
- Increase 511 requests for the Richmond metro area by 25% (from 2,479 requests in May 2008 to 3,099 by May 2011)

Challenges

- Managing citizen expectations regarding the purpose of public information meetings versus public hearings
- Construction of two major projects taking place in close proximity to one another in 2011
- Work taking place in a heavily-traveled and highly-congested area
- Mitigating complaints about delays
- Limited public affairs staff resources
- No firm traffic data showing us where traffic that is going to encounter this construction is coming from or going to
- Coordinating with the City of Richmond Public Works department regarding bridge/lane closures that may impact city travelers

Target Audiences

- I-64 and I-95 travelers
- Commuters
- Long-distance, through-traffic motorists
- Transportation/shipping industry
- Public safety community
- VDOT audiences
- Media
- Government
- Businesses
- Travel/Tourism
- Civic leaders
- Homeowners in area
- Schools

Necessary Communications Tools

It will be necessary to use several communication methods to get the I-95 message out to the public. The methods identified below may be supplemented by other methods such as billboards (used during the James River Bridge project).

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Media

Generally, the media is the best source of communication with the general public. Because these projects will impact two major interstates in the Richmond area, media relations efforts will have to include local print, radio and television reporters, as well as regional media and travel publications.

Targeted outlets include

- Richmond TV, radio & print outlets
- Richmond Web sites and blogs not affiliated with a media outlet (ex. Richmond.com)
- Metro Traffic
- Travel trade magazines
- Trucking trade magazines
- Employer/business publications
- Charlottesville, Fredericksburg, northern Virginia and Hampton Roads media

Community Outreach Efforts/Public Involvement Meetings

- Preliminary meetings with Henrico and City of Richmond officials (to include emergency services) to raise awareness of projects and receive feedback (Sept.-Dec. 2008)
- Civic organization presentations (2010)
- Public Hearing (2010)
- Presentations to City of Richmond officials, businesses (Fall 2010)
- Emergency services briefing (Spring 2011)
- Pre-construction public information meeting for citizens/businesses (Summer 2011)—just after contract is awarded and at least 10 days before lane closures/bridge work begins
- Public information meeting to update citizens/businesses on progress of project (Summer 2011)—may be combined with the public information meeting for the I-64 repaving project
- Public information meeting to update citizens/businesses on progress of project (Summer 2012)—may be substituted with a media release/briefing if project is not causing significant public concern

Internet Pages

- Project Web page
- Facebook Page
- Twitter
- Will include a mechanism for the public to sign up for electronic project updates/lane closure information
- During construction, post project photos, schedule, maps, detour information, fact sheets, traffic advisories
- VDOT I-64 corridor Web site will highlight both projects to include project schedule, lane/ramp closures and upcoming public information meetings

Collateral Materials

- Project fact sheet/map for distribution at public information meetings and other informative meetings
- Project detour maps, if needed
- PowerPoint presentation for meetings with local officials, businesses and civic groups
- Weekly traffic and lane closure updates (electronic)
- Project lane closure information in VDOT's quarterly "Road Construction Ahead" brochure and annual I-95 Corridor Coalition brochure

Advertising

Media are a necessary part of this communications effort to reinforce alternate routes, promote 511 usage and to reach desired audiences during construction phase changes and alterations in traffic patterns.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VDOT will include planned lane closures in daily traffic advisories and in the weekly highway alert that is sent to the media every Friday for the following week's closures. Should significant traffic impacts or detours be expected, public affairs will secure radio advertising on both Metro Traffic and ClearChannel Radio (6 stations in metro Richmond). This will require the project manager to contact public affairs **at least two weeks** before the expected closure in order to give public affairs time to develop and place the ads. Costs for advertising would be charged to the project budget.

Proposed Milestones

- By spring 2011
 - Maps, fact sheets and fliers to show construction phases
 - Meetings with businesses & homeowners affected
 - Project Web page posted
- By fall 2011
 - News release announcing construction schedule, traffic pattern changes, etc.
 - Promote project Web page
 - Encourage people to sign up for email updates

Communications Partners

To reach all of our intended audiences, it is necessary to enlist the help of various organizations and agencies to help build awareness. Enlisting their help and using their existing publications to carry our message will allow us to reach a wider segment of our target audience. These include:

- | | |
|----------------------------------------------------------------------------|----------------------------------------------------------------|
| • AAA | • Richmond Metropolitan Authority |
| • Arthur Ashe Athletic Center | • Richmond Metropolitan Convention and Visitors Bureau |
| • Chesterfield County | • Richmond Fire & Emergency Services |
| • Children's Hospital | • Richmond Police Department |
| • FHWA | • Richmond Public Works Department, Public Information Manager |
| • Greater Richmond Chamber of Commerce | • Sports Backers Stadium |
| • Greyhound Bus Terminal | • VCU / MCV |
| • GRTC | • Virginia Hospitality and Travel Association |
| • Hanover County | • Virginia Motorcoach Association |
| • Henrico County | • Virginia Road and Transportation Association |
| • Henrico Police Department | • Virginia State Police |
| • I-95 Corridor Coalition | • Virginia Trucking Association |
| • Maggie Walker Governor's School for Government and International Studies | • Virginia Tourism Corporation |
| • Philip Morris | • Virginia Union University |
| • Port of Richmond | |
| • Retail Merchants Association of Greater Richmond | |

Detour/Lane Closure Communications Timeline

Two weeks prior to a detour or major lane closure

- Contact Metro Traffic and ClearChannel Radio to put them on alert as to when commercials will start; have them send estimate of charges
- Contact procurement to begin advertisement purchasing
- Alert emergency services to upcoming detour
- Update maps & fact sheets if needed
- Alert AAA & other communication partners about detour
- Check with project manager to ensure variable message signs will be put out one week prior to detour

**ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02**

One week prior to a detour or major lane closure

- Draft 15- and 30-second radio commercials and send to station
- Have project manager contact central office management to alert them to upcoming detour
- Draft talking points & news release
- Send talking points and/or fact sheet to residency staff, district staff and central office public affairs
- Arrange for 511 floodgate message

2-3 days before detour or major lane closure

- Send news release about detour to all media & external contacts (email lists)
- Have surrounding districts send the news release to their local media outlets
- Update project Web site
- Set up morning show interviews (Lite 98, WRVA, Q94, etc.), if needed
- Include detour in weekly highway alert
- Get after-hours contact numbers for on-site supervisors in the event media wants to set up for an interview

During detour or major lane closure

- Run radio commercials
- Media interviews (on and off-site)
- Traffic advisory
- Record updates on media pager if needed.

Crisis Communications Plan

- Compile list of what ifs
- Contact lists and emergency phone numbers
- Create media lists
- Develop key messages for possible incidents
- Practice

Emergency Contacts

The following is a list of contact persons for emergency situations:

	Office	Cell
Police, Fire and Rescue	911	911
Richmond Police (non emergency)	646-5100	
State Police (non emergency)	1-800-552-9965	
Fire, Hazardous Materials	646-6660	
VDOT Area Construction Engineer		
Smart Traffic Center	796-4520	
VDOT Richmond District Administrator	524-6000	
City of Richmond Traffic	646-0999	
GRTC	358-4782	
Traffic Control Supervisor	_____	_

Transportation Operations Strategies

Interstate 95 is a heavily used, limited access facility and shall not be closed for routine maintenance or construction. The bridge replacement work along the mainline shall be completed using partial roadway closures at night between 8:00 p.m. and 6:00 a.m. All travel lanes shall be open to traffic by 6:00 a.m. regardless of whether the lane is on I-95 or a local street. Incentives and disincentives related to project schedules are described in the Project Specifications.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor shall maintain access to all private entrances off the affected cross streets. As roads are temporarily closed and barricaded, local traffic shall be allowed access to their property. The Boulevard, Robin Hood Road, and Laburnum Avenue will be temporarily modified to allow lane closures, but access to local residents and businesses shall be maintained.

Project Coordination

Coordination between the Contractor, VDOT, State Police, local jurisdictions, and other contractors, will be critical to the successful completion of this project. Coordination between these entities must be continuous throughout the project.

Oversized Loads

Materials and equipment, including oversized loads, will need to be transported to areas near individual bridge sites. This material and equipment may be staged and/or stored within the limited access areas to facilitate construction. Oversized loads shall be transported to staging areas between the hours of 8:00 p.m. and 6:00 a.m. The movement of oversized loads shall be coordinated with VDOT. The Contractor shall perform all necessary studies and obtain all required permits prior to moving oversized loads along either local roads or I-95.

Coordination with I-64 Repaving Project

Deteriorating pavement along I-64 in west Richmond has prompted the need for repair and overlay of I-64 between I-95 and Parham Road. This area is in close proximity to the Bryan Park (I-95/I-195) interchange and may cause additional congestion in the area during construction. With approximately 5½ miles of pavement repair and overlay needed, this project is expected to disrupt travel for thousands of motorists in the Richmond area. The project is expected to begin in October 2009, with a projected completion date of November 2010.

The project limits and scope are as follows:

- Concrete pavement repair and overlay will take place along I-64 east and west between the I-95/I-64 “Bryan Park interchange” (Exit 187) and Parham Road (Exit 181).
- I-64 will be rehabilitated in three sections: Parham Rd. to Glenside Dr., Glenside Dr. to Staples Mill Rd., Staples Mill Rd. to I-95. This takes into account the unique traffic conditions for each section
- Contractor will apply 3 ½ inches of asphalt.
- Advertisement in Feb. 2009, patching to begin in summer/fall 2009, heavy work impacting traffic begins in 2010.

The I-95 Contractor shall coordinate with the I-64 VDOT engineer, and if necessary, the I-64 Contractor to minimize conflicts between the two projects. This coordination shall include, but not be limited to, lane closures, detour signing, and the movement of traffic around and through both work zones.

Coordination with City of Richmond

The Contractor shall coordinate with the City of Richmond Traffic Engineer 72 hours prior to closing any lanes on streets maintained by the City. In addition, the Contractor shall obtain all permits required by the City.

Coordination with GRTC

Bus routes and stops are located along local roads that will need to be closed for construction. The Contractor shall coordinate with GRTC whenever a GRTC route will be interrupted by work on the local streets or work will block either pedestrian or vehicular access to a bus stop so that alternate routes and stops may be considered. The temporary relocation of bus stops is to be completed by GRTC. The following cross streets have GRTC routes; there may be other cross streets with GRTC routes that are not listed.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

- Lombardy Street
- Overbrook Road
- Boulevard
- Westwood Avenue
- Laburnum Avenue

TMP Roles and Responsibilities

In order to execute a traffic management plan successfully, responsibilities must be identified and assigned to specific people. The work along I-95 is expected to create significant delays and responsibility will be divided among a traffic management team. Within the team, three roles are identified. The project superintendent shall assign the following roles:

Traffic Control Supervisor (TCS) – The Contractor shall provide at least one person on the project site during all work operations who is currently verified, either by VDOT in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor. This person must have the verification card with them while on the project site. This person shall be responsible for the oversight of work zone traffic control within the project limits in compliance with the contract requirements involving the plans, specifications, TMP, Virginia Work Area Protection Manual, and the MUTCD.

The TCS(s) shall coordinate all work zone traffic control operations for the duration of the contract, including those of subcontractors, utility companies, and suppliers, to ensure that all work zone traffic control is in place and fully operational prior to the commencement of any work.

The Department recognizes that the Contractor does not have direct control over the work zone traffic control operations of the utility companies. The coordination provided by the TCS when dealing with utility companies is for the purpose of coordinating concurrent utility work zone traffic control with any other construction/maintenance work zone traffic control to avoid conflicts.

The TCS(s) shall perform daily reviews of work zone traffic control when work activities are underway. The TCS shall document, in the work zone traffic control daily diary, activities taking place and any deviation from the traffic control plan, length and/or timing. The TCS shall also document any mitigation of excessive traffic queues; conflicts or problems with the work zone traffic control and corrective actions taken. The TCS shall perform weekly reviews of the work zone traffic control and document the review, in detail, using Forms TE-97001 and 97002. Every other detailed weekly review shall be performed during nighttime hours or as directed by the Area Construction Engineer.

The TCS (or TMP Monitor) shall inspect traffic control devices in use for compliance with the ATSSA Quality Standards for Work Zone Traffic Control Devices, the VDOT Road and Bridge Specifications, and the Virginia Work Area Protection Manual. The TCS shall provide for the immediate repair, cleaning, or replacement of traffic control devices not functioning as required.

The traffic control devices shall be inspected by the TCS during working and nonworking hours on a schedule approved, in writing, by the Area Construction Engineer. At a minimum, traffic control devices shall be inspected at the beginning and end of each workday or night and once during non-working weekends and holidays, and daily on restricted days due to inclement weather or during any work shutdown.

Traffic control devices in use longer than fourteen (14) days shall be inspected by the TCS at least once every other week during nighttime periods.

The TCS(s) shall prepare and submit statements concerning road closures, delays, and other project activities to the District Public Affairs office as required.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The TCS(s) shall be responsible for notifying the VDOT Project Maintenance of Traffic (MOT) Coordinator or designee, of all accidents related to the project traffic control. The time and date of notification shall be documented in the daily diary.

The TCS(s) assigned to the project shall attend the preconstruction conference and any other meeting that involves traffic control.

The TCS(s) shall be responsible for the maintenance, cleanliness, and replacement of traffic control devices of the existing traffic control plan during working and non-working hours.

If none of the Contractor's on-site personnel responsible for the supervision of the work zone traffic control has the required verification with them or if they have an outdated verification card showing they are not currently verified, either by the Department in Intermediate Work Zone Traffic Control, or by ATSSA as a Traffic Control Supervisor, all work on the project will be suspended by the Engineer.

TMP Monitors – The Contractor shall provide at least one TMP Monitor on-site during all work operations. At a minimum, the TMP Monitor(s) shall be verified by the Department in Basic Work Zone Traffic Control.

The TMP Monitor shall assist the TCS. The TMP Monitor shall conduct windshield inspections and observations of the work zones to assess the effectiveness of the phasing and staging plans and TMP strategies. They shall inform the TCS when the strategies are not working according to plan. In addition to a TMP Monitor along I-95, an additional TMP Monitor shall be required to observe the operations and detours associated with the local cross streets that need to be either totally or partially closed during construction.

During the bridge superstructure rehabilitation and replacement phase of this project, the Contractor shall provide a minimum of two maintenance of traffic crews to work at the direction of the TMP Monitors. Each of these crews shall be equipped with adequately equipped service patrol vehicles including approved high intensity amber strobe vehicle warning lights, safety equipment, truck mounted attenuators, hand and mechanical equipment necessary for making repairs to or replacing signs, barricades, warning devices, attenuators, and movable barriers. The crews shall provide a constant patrol of the entire work zone with coverage of the entire zone at least one time each hour. Adjustments, repairs, or replacements shall be made immediately. The crews' vehicles shall be equipped with a portable radio system to provide communications with the TCS and others as may be designated by the engineer.

Project Superintendent – The Project Superintendent is the person representing the Contractor.

VDOT Inspector – The VDOT Inspector is the representative of the Department of Transportation that observes the work being completed by the Contractor in accordance with the VDOT specifications.

Transportation Operations Plan

The work zone shall be configured as shown in the maintenance of traffic plans and notes. When not working, the work zones shall be reset in accordance with the "Undeployed" configurations shown in the plans to allow three lanes of traffic in both directions.

Time Restrictions

The Contractor shall not deploy the work zone in the interstate on holidays. The work zone will be allowed on weekends.

The Contractor shall not close any lanes of traffic on I-95 between the hours of 6:00 a.m. – 8:30 a.m. and 3:00 p.m. – 6:00 p.m. or as directed by the Engineer. The Contractor may not close the shoulder, other than when working behind barrier, between the hours of 6:00 a.m. – 9:00 a.m. and 3:00 p.m. – 7:00 p.m.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

The Contractor may work at any time when behind barrier. The major bridge work, involving lane closures along I-95 shall only be completed between the hours of 8:00 p.m. – 6:00 a.m.

Table 4 - Time Restrictions

Roadway	Travel Lane / Shoulder	Restricted Period
I-95	Travel Lane	6:00 a.m. – 8:30 a.m. 3:00 p.m. – 6:00 p.m.
I-95	Shoulder	6:00 a.m. – 9:00 a.m. 3:00 p.m. – 7:00 p.m.
I-95	Behind Barrier	No time restrictions
Local Streets	Travel Lane & Shoulder	6:00 a.m. – 9:00 a.m. 3:00 p.m. – 7:00 p.m.

Truck Restrictions

To the extent possible, the local detours have been planned to avoid routes that prohibit trucks. However, when it becomes necessary to detour traffic to a truck restricted route, the Contractor shall coordinate with the VDOT Engineer and the City of Richmond prior to implementing the detour. The Contractor shall be responsible for covering and uncovering the truck restriction signs and the truck routing signs and making necessary intersection improvements to allow for the larger vehicles. Truck restrictions that have been identified are shown in Table 5; other routes may also have truck restrictions.

Table 4 - Truck Restrictions

Roadway	Between
Brook Road	Westbrook Avenue & Brookland Parkway
Brook Road	Sherwood Avenue & Lombardy Street
Overbrook Road	I-95 and Brook Road
Brookland Parkway	Hermitage Road / Boulevard & Robin Hood Road

Speed Limit Reduction

The mainline work zones shall have a posted speed limit of no less than 45 mph unless approved by the Regional Traffic Engineer.

Demand Management Strategies

Holidays and Special Events – The Contractor shall not deploy a work zone on I-95 on the night of, or the night before the following holidays and/or special events:

Holidays

- New Years Day
- Martin Luther King Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- The days before and after Thanksgiving
- Christmas Eve
- Christmas
- New Years Eve

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Special Events

- NASCAR Sprint Cup Series race event weekends at Richmond Raceway Complex (dates beyond 2010 to be determined):
 - May 1 & 2, 2010
 - September 11 & 12, 2010
 - May, 2011
 - September, 2011
 - May, 2012
 - September, 2012
 - May, 2013
 - September, 2013
 - May, 2014
 - September, 2014

- Major Richmond Convention Center Events:
 - Jehovah's Witness Event – Date TBD

- Major Political Events

Additional special events may be scheduled at the major venues in Richmond. The TCS shall be responsible for contacting the Richmond Raceway Complex, the Richmond Convention Center, the Diamond, and Sports Backers Stadium at least 1 month prior to closing lanes on I-95 to confirm that no major events are planned.

Corridor/Network Management Strategies

Depending upon the length of the queue, the motorist's familiarity with the local roadway system, and their ultimate destination, motorists may choose to use alternate routes around and through the City.

Traffic on I-95 may divert to several different routes including US Route 1, US Route 301, I-195, I-295, Route 150 (Chippenham Parkway), and Route 288. Northbound motorists may choose to use exit I-95 at I-195, the Maury Street exit, the Bells Road exit, or the Chippenham exit to avoid the work zone, while southbound motorists may choose to exit I-95 at Route 301, the Parham Road exit, I-295, and the Elmont exit.

I-64 traffic is also expected to divert to alternate routes in order to avoid the work zone. The most effective strategy to alleviate the congestion on local roads such as Route 250 and Route 60 will be to direct drivers to Route 288 and I-295, prior to approaching the work area.

In order for the diversion of traffic to be effective while minimizing the impact to local streets, the management of the permanent Dynamic Message Signs (DMS) will be critical. The TCS shall provide a schedule of closures to the Richmond Traffic Operations Center (TOC) at least 24 hours in advance of lane closures. The TCS will need to work closely with the TOC keeping them posted on any incidents and delays that are being created by the work zone.

Work Zone Management Strategies

The Contractor shall provide the services described below in addition to the direction provided in the Traffic Operations Special Provision.

Safety Meetings

The Contractor shall discuss work zone safety at daily safety meetings.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Communication Equipment

The Contractor shall provide communication equipment using a communication provider(s) best able to provide constant communication and adequate service for the area served by this contract. It shall be the Contractor's responsibility to choose the means of communication that best serves the overall project and meet the following requirements:

- Each TCS and TMP shall have the ability for voice communication with all other TCS's and TMP's while on site.
- Each TCS or TMP shall be capable of voice communication with the Transportation Operations Center and the Contractor's base of operations for all points within the project area.
- In addition to voice communication, the equipment shall provide a means for one-way text messaging or paging.
- All equipment shall be supplied and maintained by the Contractor.
- The Contractor shall obtain and maintain all necessary licenses.
- The Contractor shall be responsible for all communications costs throughout the term of this contract including monthly and usage fees.

TMP Monitoring

At least two TMP monitors shall be appointed by the TCS. The TMP monitors shall periodically (once an hour) tour and observe the work zone areas along the mainline and the cross streets. Any discrepancies shall be corrected and/or reported to the TCS.

Dynamic Message Signs

The Contractor shall coordinate with the VDOT Richmond Traffic Operations Center (TOC) to post information on the permanent dynamic message signs (DMS) along I-95 to inform drivers of congestion in Richmond. VDOT shall compose the message and post it on the DMS. The Contractor shall provide information on the work schedule and shall notify the TOC anytime the queues caused by the work zone exceed one (1) mile. Drivers will be advised to use various alternate routes to alleviate congestion through the work zones.

Excessive Congestion

The Contractor shall be aware of the congestion being caused by the particular work zone. The TMP Monitor shall regularly assess the length of queuing behind the work zone.

Cross Street Congestion

Construction will affect the local cross streets as well as the I-95 mainline. Cross streets will need to be either partially or completely closed at various times to facilitate bridge construction. The Contractor shall close no more than one cross street at a time to minimize impacts to local traffic. The Contractor shall acquire written authorization from the VDOT District Engineer to close more than one cross street in a given night if necessary.

Traffic Incident Management Strategies

The Contractor shall include incident management strategies when developing the Work Plan required by the Traffic Operations Special Provision. These strategies shall include the coordination strategies with VDOT and Virginia State Police, removal of disabled vehicles, and the handling of emergency response within the work zone.

Dedicated Emergency Access Lane

Because of limited travel-way widths, the plans provide a lane for emergency access along I-95. Typically, the highway will be reduced to one lane in each direction with an emergency access lane between. The use of this lane is intended for emergency services (ambulance, fire, police, wrecker, etc.). The contractor shall not use this lane except when acting in an emergency capacity and shall not park or store vehicles, equipment, or material in the lane at any time.

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Automobile Crash

If an automobile crash occurs within the work zone, the Contractor shall stop work in the area and make room for any emergency assists that are required. The Contractor shall ensure that the police are present and fully cooperate. The Contractor shall document the incident with photographs and a written account for future reference. The Contractor should be aware that driver distractions, such as an automobile crash, could lead to additional incidents.

The Contractor shall be prepared to close I-95 completely if necessary. In the event of an incident that requires an interstate closure, such as a major crash in the work zone, the Contractor shall coordinate with the VDOT Engineer, police, and the Richmond Traffic Operations Center.

Traffic Operations Center

When an incident occurs, the TCS shall contact the Richmond Traffic Operations Center and provide information on the incident, including, but not limited to, location, direction of travel affected, lane(s) affected, and estimated duration (if known). Once the incident is cleared, the TCS shall contact the TOC and inform them the incident has been cleared.

Police Patrols

The Contractor shall coordinate with police in accordance with the Traffic Operations Special Provision to the specifications

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

Bibliography

ⁱ http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm

ⁱⁱ Adapted from the "I-64 Repaving/I-95 Bridge Replacement Communications Plan" provided by the Virginia Department of Transportation, November 18, 2008

ORDER NO.: D28
CONTRACT ID. NO.: C00018944C02

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS FOR
MOVEABLE BARRIER SERVICE

June 14, 2010

I. DESCRIPTION

This provision establishes requirements for furnishing a moveable traffic barrier system to be used in the construction operations involved in the replacement and rehabilitation of the superstructures included in this contract. This includes furnishing the Moveable Barrier System with incidental hardware and transport system, and Impact Attenuator System (Type II-11) that is typically required on each end.

II. MATERIALS

Materials shall be in accordance with the Specifications and plan details.

The Moveable Barrier System shall be as manufactured by Quickchange® Moveable Barrier (QMB™) by Barrier Systems Inc. or equal. Please note: Equal systems must meet the same design and crashworthiness criteria, deflection restrictions (0.61 to 1.35 m or as indicated on the plans or as dictated by site specific conditions), and ability to be deployed and removed when no longer required at the same rate as necessitated by location and maintenance of traffic, limitations of operations and/or other contract and site specific requirements. Alternate barrier systems will be evaluated by the Engineer on a case by case basis. Equal barrier systems to be considered shall be furnished with appropriate end treatments (if applicable), hardware and incidentals so as to result in a complete installation (including transportation) when deployed. The barrier shall be placed at locations designated on the plans or as directed by the Engineer. The Contractor shall furnish the necessary equipment to shift the barrier for a distance of one foot to sixteen feet at a rate of not less than seven miles per hour.

III. PROCEDURES

Method of installation and maintenance shall be in accordance with the TMP, Work Area Protection Manual, plan details, system manufacturer's recommendations\criteria and as directed by the Engineer.

IV. MEASUREMENT AND PAYMENT

Moveable Barrier Service will be paid for on a lump sum basis. The unit price bid shall include furnishing, placing, moving as necessary, and removal of Traffic Barrier Service Concrete (double face), Moveable Barrier System with incidental hardware and transport system, and Impact Attenuator System (Type II-11). The lump sum price bid shall be payment for Movable Barrier Service at all locations in the Contract.

The Contractor will be paid forty percent of the total bid price when the items are furnished to the site at the beginning of superstructure rehabilitation/replacement phase of the contract. An additional twelve percent will be paid after each phase of construction is complete and the barrier has been relocated to the subsequent phase of construction.

Payment will be made under:

Pay Item	Pay Unit
Moveable Barrier Service	Lump Sum