Special Provisions for: WAITSFIELD BHF 013-4(39)

1. LABOR SUPPLY. Available workers for this Contract may be obtained from Manager, Employment & Training, Barre, VT. The latest edition of the DBE Registry can be obtained from the Office of Civil Rights and Labor's Webpage at the following address: www.aot.state.vt.us/CivilRights/default.htm. Contractors that do not have access to the internet may obtain a copy from the Office of Contract Administration upon request.

2. CONTRACT COMPLETION DATE. This Contract shall be completed on or before September 23, 2016.

3. NOTICE TO BIDDERS. U.S. Department of Labor Davis-Bacon wage rates are applicable to this Contract. Copies of the applicable rates are included in this proposal.

   In the included wage rates, the requirements of Executive Order 13658 do not apply to this Contract.

4. CONTACT WITH THE AGENCY. From the time of advertising until the actual bid opening for this Contract, all prospective Contractors, subcontractors, and suppliers shall direct all inquiries related to this project solely to the Agency's Office of Contract Administration at (802) 828-2641. This number may also be accessed via the Agency's TTY/TDD Telecommunications Relay Service at 1-800-253-0191.

   The deadline for submitting inquiries related to this project to the Office of Contract Administration is 4:30 p.m. Eastern Standard Time on October 8, 2015. No exceptions will be made to this requirement.

5. NOTICE TO BIDDERS – PRE-BID MEETING. Prospective Bidders are hereby notified that there will be a pre-bid meeting for this project to be held at x:00 p.m. Eastern Standard Time on October 2, 2015 at the Waitsfield Town Office building located at 9 bridge Street, in Waitsfield, VT.

   Attendance at the pre-bid meeting is not required prior to submitting a bid for this project.

   Prospective Bidders are encouraged to submit inquiries related to this project to the Agency's Office of Contract Administration before 4:30 p.m. Eastern Standard Time on September 28, 2015. Inquiries submitted by this time will be kept anonymous as to the author of the inquiry. Other questions will be taken on the date of the pre-bid meeting and following the pre-bid meeting until the deadline specified in Special Provision No. 4.

   Prior to the bid opening date of October 16, 2015, the Agency's Office of Contract Administration will issue to Prospective Bidders both a written summary of the pre-bid meeting and, if necessary, an addendum to the proposal documents.

6. NOTICE TO BIDDERS. The Contractor is hereby notified that in the absence of the Engineer, the Agency's Safety Officer and the Agency's Hazardous Materials and Waste Coordinator shall each have the authority to suspend work when they determine that a serious safety or environmental violation exists on the job site. The period of time work is suspended due to a serious safety or environmental violation will not be justification for an extension of time.

7. STANDARD SPECIFICATIONS. The provisions of the 2011 STANDARD SPECIFICATIONS FOR CONSTRUCTION, as modified herein, shall apply to this Contract.

8. SUPPLEMENTAL SPECIFICATIONS AND CONTRACT REQUIREMENTS. The Contractor's attention is directed to the following specifications and contract requirements included in the Proposal form and effective for this Contract:

Required Contract Provisions for Federal-Aid Construction
Standard Federal EEO Specifications
VT Agency of Transportation Contractor Workforce Reporting Requirements
Workers' Compensation; State Contracts Compliance Requirement
General Special Provisions dated April 7, 2015
Bulletin 3.5 Attachment C: Standard State Provisions for Contracts and Grants
Vermont Minimum Labor & Truck Rates
Disadvantaged Business Enterprise (DBE) Policy Contract Requirements
U.S. Department of Labor Davis-Bacon Wage Rates
Asphalt Price Adjustment Provisions dated April 6, 2010
Section 520 – Membrane Waterproofing, Spray Applied dated August 6, 2013
Stream Alteration Consultation #HD-06-0001 (e-mail) dated February 3, 2015
Army Corps of Engineers Permit #NAE-2014-2332 dated December 10, 2014
Certification for Federal-Aid Contracts
Contractor's EEO Certification Form
Debarment & Non-Collusion Affidavit
Public Interest Finding Related to Materials Procurement for a Project

9. NOTICE TO BIDDERS – CONTRACT INSURANCE REQUIREMENTS. The Contractor is hereby notified that in the event of a discrepancy between the stated insurance requirements of Bulletin 3.5 Attachment C: Standard State Provisions for Contracts and Grants and those of Subsection 103.04 of the Standard Specifications for Construction, the requirements of Subsection 103.04 of the Standard Specifications for Construction shall govern.

10. NOTICE TO BIDDERS – ADDITIONAL CONTRACT REQUIREMENT. For construction and transportation projects over $250,000.00, a payroll process by which during every pay period the Contractor collects from the subcontractors or independent contractors a list of all workers who were on the jobsite during the pay period, the work performed by those workers on the jobsite, and a daily census of the jobsite. This information, including confirmation that Contractors, subcontractors, and independent contractors have the appropriate workers' compensation coverage for all workers at the jobsite, and similar information for the subcontractors regarding their subcontractors shall also be provided to the Department of Labor and to the Department of Banking, Insurance, Securities, and Health Care Administration, upon request, and shall be available to the public.

11. NOTICE TO BIDDERS – RE-DESIGNATION OF VTRANS OFFICIALS. The Contractor is hereby notified of the following re-designation of VTrans officials as referenced in the Contract Documents:

Where in the Contract Documents it reads:	It shall be read as and shall mean:

Director of Program Development	Chief Engineer
Assistant Director of Program Development	Deputy Chief Engineer
Roadway, Traffic, and Safety Engineer; Roadway Program Manager; Highway Safety & Design Engineer; Structures Engineer; Structures Program Manager	Director of Project Delivery Bureau
Chief of Local Transportation Facilities	Director of Municipal Assistance Bureau
Construction Engineer; Materials and Research Engineer	Director of Construction and Materials Bureau
Director of Operations	Director of Maintenance and Operations Bureau

12. NOTICE TO BIDDERS – STANDARD DRAWING MODIFICATION. The Contractor is hereby notified of the following Standard Drawing modification:

(a) STANDARD G-1: STEEL BEAM GUARDRAIL WITH STEEL POSTS; STEEL BEAM GUARDRAIL WITH WOOD POSTS. GUARDRAIL DELINEATOR, is hereby modified by deleting detailing note "REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER" and replacing it with the following:

DELINATION DEVICES SHALL MEET THE REQUIREMENTS OF SUBSECTION 728.04 AND 750.08. REFLECTIVE MATERIAL SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.

13. NOTICE TO BIDDERS - INCENTIVE/DISINCENTIVE (I/D). The Agency's intent is to have the bridge closure period (BCP) be as short a duration as possible. To encourage the Contractor to provide a maximum effort to complete the Identified Work for I/D within the period as defined below, the Agency is willing to pay an incentive.

(a) Dates. The allowable BCP is from 7:00 a.m. on Tuesday July 5, 2016 until 6:59 a.m. on Sunday August 7, 2016, herein defined as the I/D period. During the BCP, the Contractor will be allowed to work 24 hours per day, 7 days per week, including holiday periods.

Night work will be allowed during the BCP. See Special Provision Nos. 13 NOTICE TO BIDDERS - REQUIREMENTS FOR NIGHTTIME WORK and 14 NOTICE TO BIDDERS – NIGHTTIME WORK RESTRICTIONS for additional information and requirements.

The I/D period as established above for this Contract is absolutely fixed and will not be changed for any Act of God, omission, improper action, direction of the Engineer, or any other reason unless done so by the Secretary and only under extreme conditions as determined by the Secretary.

There shall be a pre-closure coordination meeting held on site with the Contractor's superintendent, the Engineer, and the Project Manager to discuss durations of work, types of night work,

work sequencing, etc. The Contractor shall set this meeting up a minimum of 60 days prior to the BCP.

In addition, a public information meeting will be scheduled by the Public Outreach Coordinator approximately 30 days prior to the BCP. The Contractor shall be available to attend and be prepared to discuss their construction schedule with the public.

(b) Identified Work. All work required to open the new bridge to two-way traffic including:

(1) Deck panels placed and joints cured;

(2) Vermont joint installed

(3) Spray applied membrane installed;

(4) Base course of pavement placed on approaches;

(5) Centerline of the approaches marked with line striping targets;

(6) Temporary traffic barrier placed allowing two (2) 11’-0” minimum wide lanes; and

(7) Detour signs removed or covered up.

No daily lane closures will be allowed before the 14 days prior to the BCP to progress work items except for work included in the EPSC Plan and Traffic Control Plan.

In the 14 days prior to the BCP, the Contractor shall maintain a minimum of one-lane (11 feet wide), two way traffic during daytime working hours and shall maintain two-lane, two-way traffic during nighttime working hours.

(c) Pay Schedule. The Contractor will receive a lump sum compensation of seventy-seven thousand dollars ($77,000) for completing the Identified Work on or before the end of the allowable BCP.

In addition, the Contractor will be compensated at a rate of four hundred seventy dollars ($470) per hour that the Identified Work is completed before the end of the I/D period (allowable BCP), up to a maximum total payment as specified herein. Only full hours where the bridge is opened before the end of the allowable BCP will count toward this extra incentive payment.

The maximum amount payable under the incentive clause shall be one hundred fifty-four thousand dollars ($154,000) (including the lump sum payment).

For each hour after the I/D period (allowable BCP) that the Identified Work remains uncompleted, the Contractor will be assessed a disincentive at a rate of four hundred seventy dollars ($470) per hour. The full hourly disincentive amount will be assessed for each hour, or portion thereof, that traffic is not allowed on the bridge following the end of the allowable BCP. There shall be no maximum on the disincentive amount.

This assessed disincentive is separate from, and will be imposed

in addition to, liquidated damages which may be imposed for failure to complete the Contract on time.

(d) Underruns and Overruns. The proposal indicates an estimated quantity for each Contract pay item. The fact that the actual amounts used in the construction of this project may vary from the estimate will not be a basis or cause for changing any of the conditions for I/D.

The Agency recognizes that additional work beyond the work indicated in the Plans is always possible in any construction contract. The Agency is willing to pay for necessary additional work in accordance with the terms and requirements of the Contract and the Standard Specifications for Construction, however, the Contractor shall absorb any resulting construction time within the original project and CPM Schedules, and there will be no adjustments or changes to the I/D dates or I/D conditions.

(e) Payment. Payment will be made as specified in Section 900.

14. NOTICE TO BIDDERS – WORK RESTRICTIONS. The Contractor is hereby notified that after the Identified Work as specified in Special Provision No. xx is completed and the bridge is opened to two lane, two-way traffic, the concrete placement of the curb shall take place between the hours of 8:00 p.m. and 5:00 a.m. only.

During the concrete placement, and for a minimum of two hours after placement is completed, traffic shall be reduced to one lane and the speed of traffic over the bridge shall be reduced to 5 MPH. Any flaggers required to maintain one-lane, two-way traffic will be paid for under Contract item 630.15. All other costs associated with the lane and speed reduction will be considered incidental to Special Provision (Traffic Control, All Inclusive).

15. NOTICE TO BIDDERS – REQUIREMENTS FOR NIGHTTIME WORK. The Contractor is hereby notified that night work will be allowed within the bridge closure period and is required for certain operations specified in Special Provision No. XX. For the purposes of this Contract, "night" shall mean from the hours of 7:00 p.m. until 5:00 a.m. of the following day. The Engineer may abbreviate this time period as necessary for safety considerations.

Night work shall be performed in accordance with the National Cooperative Highway Research Program (NCHRP) Report 476 – "Guidelines for Design and Operation of Nighttime Traffic Control for Highway Maintenance and Construction". A copy of this guideline specification may be downloaded from the following website: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_476.pdf.

Prior to beginning night work, the Contractor shall design a lighting system and present it to the Engineer for approval. The Contractor shall not perform any night work or activities within the project limits until the lighting system has been fully approved and is in place on the project.

The designed lighting system shall be mobile, shall be mounted separately from other construction equipment, shall illuminate the entire work area to daylight intensity with minimal glare, and shall be a surrounding design that minimizes shadows in the work area as much as possible.

All costs associated with the lighting system will be considered incidental to Contract item 900.645 Special Provision (Traffic Control, All-Inclusive).

16. NOTICE TO BIDDERS - NIGHTTIME WORK RESTRICTIONS. The Contractor is hereby notified that during the bridge closure period, no work shall be performed between the hours of 9:00 p.m. and 6:00 a.m. that creates a noise level exceeding 75 decibels. The decibel level shall be measured from the point of activity to the nearest occupied residence.

Construction activities expected to reach this noise threshold include pneumatic hammers, hoe-ram, and similar impact type equipment.

The Contractor shall provide the Engineer, for the duration of the nighttime work, with a sound level meter capable of measuring this noise criteria during the bridge closure period.

Sound level meters shall be Rion NL-20, CESVA SC-160, Extech 407780 or an approved equal capable of meeting IEC60651: 1979 Type 2 and IEC60804: 1985 Type 2 Standards.

The cost for providing this equipment and meeting the specified noise level criteria will not be paid for separately, but will be considered incidental to all other Contract items.

17. NOTICE TO BIDDERS. All temporary construction signs shall meet the following requirements:

A. Where sign installations are not protected by guardrail or other approved traffic barriers, all sign stands and post installations shall meet National Cooperative Highway Research Program (NCHRP) Report 350 or the AASHTO Manual for Assessing Safety Hardware (MASH). The appropriate resource shall be determined as described in the MASH publication. No sign posts shall extend over the top of the sign installed on said post(s). When anchors are installed, stub shall not be greater than 100 mm (4 inches) above existing ground.

B. As a minimum, roll up sign material shall have ASTM D 4956 Type VI fluorescent orange retroreflective sheeting.

C. All post-mounted signs and solid substrate portable signs shall have ASTM D 4956 Type VII, Type VIII, or Type IX fluorescent orange retroreflective sheeting.

D. All retroreflective sheeting on traffic cones, barricades, and drums shall be at a minimum ASTM D 4956 Type III sheeting.

E. All stationary signs shall be mounted on two 4.5 kg/m (3 lb/ft) flanged channel posts or 51 mm (2 inch) square steel inserted in 57 mm (2 ¼") galvanized square steel anchors. No sign posts shall extend over the top edge of sign installed on said posts.

F. Prior to placing temporary work zone signs on the project, the Contractor must furnish for the Engineer's approval a detail for temporary work zone signs on steel posts showing stubs projecting a maximum of 100 mm (4 inches) above ground level and bolts for sign post.

G. Construction signs shall be installed so as to not interfere with nor obstruct the view of existing traffic control devices, stopping sight distance, and corner sight distance from drives and town highways.

H. Speed zones, if used, should be a maximum of 16 kph (10 mph) below existing posted speeds. Temporary speed limit certificates must be approved by the Chief Engineer.

18. NOTICE TO BIDDERS. All retroreflective sheeting on permanent signs (signs to remain after the project is completed) shall be at a minimum ASTM D 4956 Type III sheeting, unless otherwise shown on the Plans.

19. NOTICE TO BIDDERS – PUBLIC OUTREACH. This project is under separate contract for public outreach communications. The Waitsfield BRF 013-4(39) Contract will govern if any conflict arises with the information made available through the public outreach effort.

20. UTILITIES. Existing (aerial) facilities owned by Green Mountain Power and Waitsfield Champlain Valley Telecom will be adjusted, as necessary, by employees or agents of the above companies in accordance with the *"Approximate Aerial Utility Relocation Route"* shown on the project plans.

The contact for these utilities are:

Green Mountain Power	Brian Dooley	(802) 343-2723
Waitsfield Telecom	Jim Urquhart	(802) 496-8357

The Contractor is advised that exploratory excavation to locate existing underground facilities may be necessary to protect these facilities from damage. Where approved by the Engineer, these utilities shall be located and/or exposed by methods such as air/vacuum excavation and/or hand digging to determine their exact location. This exploratory work shall be classified as Trench Excavation of Earth, Exploratory and payment shall be through Pay Item 204.22, Trench Excavation of Earth, Exploratory.

Employees or agents of the above listed companies are to be allowed free and full access within the project limits with the tools, materials, and equipment necessary to install, operate, maintain, place, replace, relocate, and remove their facilities.

There will be no extra compensation paid to the Contractor for any inconvenience caused by working around and with the companies, or their facilities.

Vermont Statutes Annotated, Title 30, Chapter 86 (“Dig Safe”) requires notice to Dig Safe before starting excavation activities. The Contractor must telephone Dig Safe at 811 at least 48 hours (excluding Saturdays, Sundays and legal holidays) before, but not more than 30 days before, starting excavation activities at any location. In addition, before excavation and/or pavement grinding in or on the state highway right-of-way, the Contractor must contact the Agency’s District Transportation Administrator to obtain/verify the location of Agency’s underground utility facilities or to confirm the absence of such facilities.

The Contractor is advised that many towns are not members of Dig Safe. It is the Contractor’s responsibility to check with towns prior to excavation and shall protect and restore utilities damaged within

the project and as set forth in the Standard Specifications for Construction in subsection 107.13 Protection and Restoration of Utilities and Services.

Should the Contractor desire additional adjustments of the utility facilities for his/her convenience, proper arrangements shall be made in conformance with Subsection 105.07 of the Standard Specifications for Construction.

All Contractors, subcontractors or material suppliers involved in any project-related activity shall comply with all applicable codes and regulations related to working around live electrical lines; including, but not limited to maintaining the required minimum clear distance from an electrical utility facility. The Contractor's Competent Safety Officer shall be well versed in OSHA and VOSHA regulations, and shall be capable of implementing a plan to conform to these regulations during prosecution of work.

21. HIGHWAY PARKING RESTRICTIONS. Only such trucks and equipment as are necessary for the construction of this project will be permitted to stop or park on the shoulders or right-of-way of the highway trucks or equipment so stopped or parked shall be at least 1.2 m (4 feet) from the edge of the thru traffic lanes. Parking or stopping on the traveled portion of the roadway will not be permitted unless authorized by the Engineer to meet field conditions.

Private automobiles of workers will not be permitted to stop or park on the shoulders or right-of-way of the highway.

Each of the Contractor's trucks or equipment used for the construction of this project and permitted to park or stop as provided above shall be equipped with flashing light signals on the front and rear and the signals shall be operating at all times when parked or stopped on the highway unless otherwise authorized by the Engineer.

The flashing light signals shall be visibly distinct from and physically separate from the hazard warning system required by Federal and State motor vehicle laws and regulations. At least one of these flashing light signals shall be visible to traffic approaching from any angle at all times.

Qualified traffic control personnel shall be employed whenever the Contractor's vehicles or equipment (including that which belongs to the individual workers) enter or leave the traffic flow. All movement, in or out of the traffic flow, shall be with the flow of traffic.

22. SPECIAL CONSTRUCTION REQUIREMENTS.

A. Unless otherwise permitted in writing by the Engineer, and except as otherwise allowed under Special Provision No. 12(a), the Contractor shall not work during the holiday periods for Memorial Day and July Fourth. The Engineer shall give a written order designating the time of observance of these holidays and of any additional holidays required by the season, anticipated traffic, and local custom. As specified in Subsection 105.14, and except as otherwise allowed under Special Provision No. 12(a), construction operations shall not be performed on any Sunday without the specific authorization of the Engineer.

Designated holiday periods shall begin at 12:00 noon on the day before the weekend or holiday, whichever applies, and shall end at 7:00 a.m. on the day after the holiday or the weekend, as appropriate.

B. The Contractor shall maintain a safe access to all drives and intersecting side roads at all times during the construction of this project.

C. Two-way radios shall be provided by the Contractor when requested by the Engineer for use by traffic control personnel. All costs for furnishing and using two-way radios will not be paid for directly, but will be considered incidental to Contract item 900.645 Special Provision (Traffic Control, All-Inclusive).

D. The Contractor shall have available on the project the current editions of the Manual on Uniform Traffic Control Devices (MUTCD) and the Standard Highway Signs and Markings (SHSM) Book. Information for obtaining these publications may be found at: http://mutcd.fhwa.dot.gov/index.htm.

E. The Town of Waitsfield has special events that may require close communication and coordination between the Contractor and the municipality to reduce conflicts. The municipality will advise the Engineer and Contractor of the specifics of each event and the Engineer will direct the Contractor as to what actions, if any, may be necessary on the Contractor's part to minimize impacts to the event. The event schedule is as follows:

Event	Date(s)
Farmers' Market	May - October, 2016
Warren Parade	July 4, 2016
Round up on the River	July – September, 2016
Mad Marathon	July 18, 2016
Vermont Music Fest	Early August
Festival of the Arts	August, 2016
100 on 100	August 13, 2016
Green Mountain Stage Race	September 3, 2016
Mad River Valley Craft Fair	September 3-5, 2016

Special events that may conflict with Contractor operations are not limited to those listed above.

ASPHALT PRICE ADJUSTMENT

23. SUPPLEMENTAL SPECIFICATION - ASPHALT PRICE ADJUSTMENT, dated April 6, 2010, is hereby made a new Subsection of the Specifications, superseding all previous editions and their modifications.

24. SUPPLEMENTAL SPECIFICATION - ASPHALT PRICE ADJUSTMENT, dated April 6, 2010, GENERAL REQUIREMENTS AND CONDITIONS, part (b) text, is hereby modified by being deleted in its entirety and replaced with text "NOT USED".

The index price for asphalt cement is $629.00 per ton.

In addition to materials produced under Contract pay item(s) as allowed in GENERAL REQUIREMENTS AND CONDITIONS, part (a) of the Supplemental Specification, asphalt cement produced under Contract items 900.675 Special Provision (Hand-Placed Bituminous Concrete Material, Drives)

and 900.680 Special Provision (Bituminous Concrete Pavement, Small Quantity) will be included for adjustment.

The tonnage of Special Provision (Hand-Placed Bituminous Concrete Material, Drives) placed will be utilized in the adjustment calculation.

If an emulsified asphaltic liquid is used in the Contract work under any Contract item subject to the Asphalt Price Adjustment provisions and that liquid is not included in the table under subpart (5) of PRICE ADJUSTMENT PROCEDURES of the Supplemental Specification, the ACEA as defined in subpart (5) for that liquid will be that as determined by averaging Contractor certified test results for the project.

SECTION 108 – PROSECUTION AND PROGRESS

25. 108.11 DETERMINATION OF EXTENSION OF CONTRACT TIME FOR COMPLETION, part (b) Determination of Contract Completion Date Extension, is hereby modified by adding new subpart (11) as follows:

(11) The days from April 15th to December 1st, inclusive, on which the weather or condition of the ground caused suspension of the work.

SECTION 501 – HPC STRUCTURAL CONCRETE

26. 501.02 MATERIALS, is hereby modified by adding the following:

Where a shrinkage admixture will be used in placing concrete as allowed by the Contract Documents, the following requirements shall be met:

A shrinkage compensating admixture shall be added during the initial concrete mixing phase or as recommended by the chemical manufacturer product representative. The shrinkage compensating admixture shall be one of the products listed below. The final dosage rate will be determined by the product representative and the concrete producer. The dosage rate volume is computed into the final water/cementitious ratio.

Manufacturer: Sika Construction Product Division
Product name: – Sika Control 40
Tel.: 1-800-933-7452
Website: http://www.sikaconstruction.com/tds-cpd-SikaControl40-us.pdf

Manufacturer: The Euclid Chemical Company
Product name: Eucon SRA
Tel.: 1-800-321-7628
Website: http://www.euclidchemical.com/fileshare/ProductFiles/techdata/euconsra.pdf

Manufacturer: BASF (Master Builders)
Product name: Tetraguard AS20
Tel.: 1-800-628-9900
Website: http://www.basf-admixtures.com/NR/rdonlyres/84C7EC12-F527-44FD-A8B9-3A007609FF76/0/TETRAGUARD_AS20_DS307.pdf

Manufacturer: Grace Construction Products
Product name: Eclipse Plus
Tel.: 1-877-423-6491

Website: http://www.na.graceconstruction.com/concrete/download/EC-13B_2.pdf

SECTION 652 – EROSION PREVENTION & SEDIMENT CONTROL PLAN

27. SECTION 652 – EROSION PREVENTION & SEDIMENT CONTROL PLAN, is hereby made a new Section of the Specifications as follows:

28. 652.01 DESCRIPTION. This work shall consist of designing, furnishing, and submitting for acceptance modifications to the Contract Erosion Prevention & Sediment Control Plan (hereinto known as the EPSC Plan), becoming a co-permittee with the Agency of Transportation, State of Vermont on associated permits, monitoring the EPSC Plan using an On-Site Plan Coordinator, and maintaining the erosion prevention and sediment control measures to ensure the effectiveness of the EPSC Plan.

29. 652.02 MATERIALS. Materials required for the field work maintenance of the EPSC Plan shall meet all requirements of the appropriate Section of the VAOT Standard Specifications for Construction.

    Materials including manuals, checklists, forms, and other supporting documentation necessary to meet the requirements of these provisions and maintain compliance with associated permits shall be made available to the Engineer by the Contractor and maintained on site by the Contractor. Supporting documents associated with the requirements of General Permit 3-9020 are available upon request to ANR or from the ANR Stormwater web page. The VTrans Erosion Prevention and Sediment Control Plan Contractor Checklist and Low Risk Site Inspection Form are available from the VTrans Construction Environmental Engineer.

30. 652.03 QUALIFICATIONS. Modifications to the EPSC Plan shall be prepared and signed by a Licensed Professional Civil Engineer registered in the State of Vermont or a qualified professional in erosion prevention and sediment control, certified by CPESC, Inc. or equivalent, hereinafter called the “Preparer.”

31. 652.04 EROSION PREVENTION & SEDIMENT CONTROL PLAN. The EPSC Plan, developed using a combination of structural, non-structural, and vegetative practices to adequately prevent erosion and control sedimentation, and meeting the requirements of the VTrans Erosion Prevention & Sediment Control Plan Designer Checklist (Non-Jurisdictional and Low Risk) or the Vermont Standards & Specifications for Erosion Prevention & Sediment Control based on area of disturbance and risk, has been included in the Contract Documents.

    The Contractor shall use the EPSC Plan included in the Contract and, at the onset of construction as well as throughout the duration of the project, modify it to describe changing conditions and illustrate how the criteria of the determined risk will be upheld. For Non-Jurisdictional and Low Risk projects, the Contractor shall use the VTrans Erosion Prevention and Sediment Control Plan Contractor Checklist. For Moderate Risk projects, the Contractor shall modify the Contract EPSC Plan in accordance with the General Permit 3-9020 Parts 4 through 6. If a modification to the EPSC Plan at a Low or Moderate Risk project alters any criteria of the determined risk, an updated Risk Evaluation shall be prepared.

    The Contractor may use the Agency’s EPSC Plan sheet(s) as a basis for necessary modifications; however, if necessary to convey the sequential nature and phases of construction activities and associated erosion

prevention and sediment control measures, several plan sheets showing successive site conditions are recommended.

All work shown in the EPSC Plan shall be included in the Contractor's CPM Progress Schedule, as required by Subsection 108.03.

32. 652.05 SUBMITTALS. Three sets of the modified EPSC Plan as well as the updated Risk Evaluation, stamped and signed by the Preparer, shall be submitted to the Construction Engineer as Construction Drawings in accordance with Section 105. Submittals shall occur after award of the Contract but not later than the Pre-Construction Conference to allow time for review by the Agency. An Acceptance Memo or comments will be provided to the Contractor within 10 working days.

The Contractor shall respond to comments as soon as possible, but not more than 10 days after the date of VTrans initial correspondence. Agency review time for response to comments will be completed within an additional 10 working days. Modifications or additions to the EPSC Plan will not be considered as an acceptable delay of the work under Subsection 108.11.

All subsequent modifications to the EPSC Plan and updates to the Risk Evaluation will be reviewed and forwarded to the ANR by the Agency as appropriate.

Construction activities for EPSC Plan modifications that do not require authorization from the ANR shall commence only after the EPSC Plan has been accepted by the Agency. Construction activities for EPSC Plan modifications that do require authorization from the ANR shall commence only after that authorization has been granted.

33. 652.06 MONITORING EROSION PREVENTION & SEDIMENT CONTROL PLAN. The Contractor shall designate a person (On-Site Plan Coordinator) who is directly responsible for the on-site implementation of the EPSC Plan. This person shall generally be on-site on a daily basis during active construction and have the authority to halt construction activities if necessary. The On-Site Plan Coordinator shall have demonstrated experience in construction practices as they relate to erosion prevention and sediment control as well as a general understanding of State and Federal environmental regulations and permits pertaining to the National Pollutant Discharge Elimination System Construction Program. The On-Site Plan Coordinator shall be proficient at reading and interpreting engineering and EPSC plans. Preference will be given to a Licensed Professional Civil Engineer registered in the State of Vermont or a qualified professional in erosion prevention and sediment control, certified by CPESC, Inc. or equivalent. The qualifications of the On-Site Plan Coordinator shall be included in the EPSC Plan. The Engineer, if not satisfied with the performance of this individual, may at any time request a replacement.

During active construction and periods of inactivity, the On-Site Plan Coordinator shall be responsible for inspections and reporting.

(a) Active Construction. Inspections shall occur once every seven calendar days and within 24 hours of the end of a storm event that results in a discharge of stormwater from the site. During the winter construction season (October 15th to April 15th, inclusive), inspections at all sites shall occur daily.

For Non-Jurisdictional and Low Risk projects, inspections shall be conducted using the Agency's EPSC Plan Inspection Report (Non-Jurisdictional and Low Risk Projects).

For Moderate Risk projects, inspections shall be conducted using the General Permit 3-9020 Inspection Report for Moderate Risk Projects referenced in the Permit and available upon award of the Contract.

Immediate action shall be taken to correct the discharges of sediment, including halting or reducing construction activities as necessary, until the discharge and/or the condition is fully corrected. Corrective actions shall be recorded on the monitoring reports and shown on the EPSC Plan. Each report shall be signed by the On-Site Plan Coordinator.

(b) Inactive Construction. Periods such as shutdown during the winter season shall require inspection and reporting of erosion prevention and sediment control measures. The Contractor shall contact the Engineer prior to conducting any inspections. The inspections shall be conducted at least once every 30 days and within 24 hours of any storm or significant snow melt event that may cause stormwater runoff to leave the construction site. The Contractor shall provide, within 24 hours, the necessary personnel, equipment, and materials to repair or correct any deficiencies identified during inspection. All deficiencies and corrective measures taken shall be documented on the reports.

Copies of all reports shall be submitted to the Engineer within 24 hours of inspection or when corrective measures were taken. Copies of all reports shall be kept on site in the Contractor's project files.

34. 652.07 MAINTENANCE OF EROSION PREVENTION & SEDIMENT CONTROL PLAN. This work shall consist of providing all labor and equipment necessary for field maintenance of erosion prevention and sediment control items in the Contract, and providing materials and labor necessary for installing, monitoring, maintaining and, where necessary, removing additional measures needed to correct deficiencies that develop during construction that lessen the performance of the EPSC Plan. Erosion prevention and sediment control measures shall be maintained by the Contractor and removed when authorized by the Engineer. The Contractor shall establish vegetation in all areas disturbed during removal of the erosion prevention and sediment control measures.

Any maintenance required due to the failure of the Contractor to follow the EPSC Plan in its accepted form shall be performed at no additional cost to the Agency.

35. 652.08 METHOD OF MEASUREMENT. The quantity of EPSC Plan to be measured for payment will be on a lump sum basis in the complete and accepted work.

The quantity of Monitoring EPSC Plan will be measured to the nearest 1/4 hour for the actual number of authorized hours spent monitoring, reviewing, and reporting on the construction site(s), including waste, borrow and staging areas or other support activities, as it relates to the EPSC Plan. Travel time and other time not spent at the construction site(s) or time not authorized will not be measured for payment (i.e. travel expenses, clerical staff time, copying, miscellaneous expenses, overhead, etc.).

The quantity of Maintenance of EPSC Plan will be on a lump unit basis for all such field maintenance provided for in the Contract, excluding waste, borrow and staging areas or other support activities.

36. 652.09 BASIS OF PAYMENT. The accepted quantity of EPSC Plan will be paid for at the Contract lump sum price. Payment will be full compensation for the initial preparation of modifications, submittals, and all incidentals necessary to complete the work. Subsequent modifications to the EPSC Plan during Construction will be considered incidental to Contract item 652.10.

Partial payments will be made as follows:

(a) The first payment of 50 percent of the lump sum price for the EPSC Plan will be paid for upon acceptance of the EPSC Plan for the entire project.

(b) The second payment of 35 percent of the lump sum price for the EPSC Plan will be made on the first estimate following the completion of 50 percent of the project.

(c) The third payment of 15 percent of the lump sum price for the EPSC Plan will be made when the project is substantially complete.

The accepted quantity of Monitoring EPSC Plan will be paid for at the Contract unit price per hour. Payment will be full compensation for performing the work specified. Payment will not be made unless a report for the monitoring is submitted to and accepted by the Engineer.

The accepted quantity of Maintenance of EPSC Plan will be paid for as specified for force account work in Subsection 109.06. Payments will be drawn against the Contract Lump Unit amount. To provide a common proposal for all bidders, the Agency has entered an amount in the proposal to become part of the Contractor’s total bid. Maintenance related to material supply and disposal areas shall be performed in accordance with Subsection 105.29.

Payment will be made under:

Pay Item	Pay Unit
652.10 EPSC Plan	Lump Sum
652.20 Monitoring EPSC Plan	Hour
652.30 Maintenance of EPSC Plan (N.A.B.I.)	Lump Unit

SECTION 690 – FUEL PRICE ADJUSTMENT

37. In addition to materials produced under Contract pay item(s) included in Table 1 Pay Item Fuel Usage Factors and Quantity Thresholds as allowed under this Section, fuel usage under Contract item 900.680 Special Provision (Bituminous Concrete Pavement, Small Quantity) will be included for adjustment, utilizing the Fuel Usage Factors for item 490.30 in Table 1.

38. SECTION 690 – FUEL PRICE ADJUSTMENT, is hereby made a new Section of the Specifications as follows:

39. 690.01 GENERAL REQUIREMENTS AND CONDITIONS

(a) This specification contains price adjustment provisions for fuel used on Vermont Agency of Transportation (Agency) construction projects. This price adjustment clause is being inserted in this Contract to provide for either additional compensation to the Contractor or a payment to the Agency, depending upon an increase or decrease in the average price of diesel fuel or gasoline during the construction of this project.

(b) These provisions apply to this Contract only as specified herein through the fuel usage factors set forth in Table 1. No further fuel price adjustments will be allowed under this Contract.

(c) It is understood by the Contractor that a price adjustment increase may cause the Agency to decrease the quantities of the Contract pay items subject to adjustment under these provisions. Provisions providing for decreased quantities and item cancellation in this paragraph are separate and take precedence, notwithstanding any other provisions of this Contract.

(d) No price adjustment will be paid for work performed after the Contract Completion Date, as modified by Change Order, if applicable.

(e) Price Adjustment, Fuel will be determined for a pay item if each of the following criteria is met:

(1) the pay item is included in the original awarded Contract;

(2) the original awarded Contract bid quantity for the pay item equals or exceeds the quantity threshold indicated in Table 1.

(f) Any increase in the total Contract amount due to fuel price adjustment will not be justification for an extension of time under Subsection 108.11.

In such cases that estimated quantities are used to determine estimated fuel price adjustments throughout the duration of the Contract, reconciliation of those estimated adjustments will be made upon the determination of actual final quantities and final adjustments to the total final quantity made by prorating those estimated adjustments over the applicable fuel price adjustment periods previously paid. Reconciliation of any fuel price adjustment will only be performed in those instances where the actual final quantity differs by more than five percent from the total estimated quantity. Payments owed to either the Contractor or VTrans will not be subject to any applicable interest claims.

40. 690.02 PRICE ADJUSTMENT PROCEDURES

(a) Prior to advertising for bids, Index Prices for both a gallon of diesel fuel and a gallon of gasoline will be established by the Agency using retail prices reported by the Energy Information Administration (EIA) for the New England Region. The Index Prices will be set monthly using the first EIA posting falling either on or after the 1st calendar day of that month. The Contract Index Prices will be the most recent Index Prices set by the Agency at the time of advertising for bids. These prices are included

below and will be the base from which price adjustments are computed.

The index price (retail) for gasoline is $3.12 per gallon. The index price (retail) for diesel fuel is $3.69 per gallon.

(b) For the duration of the Contract, Posted Prices for both a gallon of diesel fuel and a gallon of gasoline will be established monthly by the Agency. The Posted Prices will be established in the same manner as the Index Prices.

(c) A Price Adjustment will be paid or credited for diesel fuel and/or gasoline only when the Posted Price of diesel fuel and/or gasoline increases or decreases 5 percent or more over its respective Index Price.

(d) Payment for Price Adjustment, Fuel will be based upon the quantity of fuel incorporated in the work as determined by the fuel usage factors in Table 1 of this specification for both diesel fuel and gasoline, multiplied by the algebraic difference between the Posted Price and the Index Price for either diesel fuel or gasoline, respectively.

(e) Payment for Price Adjustment, Fuel shall be computed as follows:

PA = Price Adjustment (LU in $)
IPD = Index Price, Diesel Fuel ($/gallon)
IPG = Index Price, Gasoline ($/gallon)
PPD = Posted Price, Diesel Fuel ($/gallon)
PPG = Posted Price, Gasoline ($/gallon)
FUFD = Fuel Usage Factor, Diesel Fuel (gallon/unit)
FUFG = Fuel Usage Factor, Gasoline (gallon/unit)

For PPD/IPD <= 0.95 or >= 1.05 and PPG/IPG > 0.95 and < 1.05:
PA = FUFD X Pay Item Quantity X (PPD – IPD)

For PPD/IPD > 0.95 and < 1.05 and PPG/IPG <= 0.95 or >= 1.05:
PA = FUFG X Pay Item Quantity X (PPG – IPG)

For PPD/IPD and PPG/IPG <= 0.95 or >= 1.05:
PA = [FUFD X (PPD – IPD) + FUFG X (PPG – IPG)] X Pay Item Quantity

(f) The Contract bid prices for the applicable pay items will be paid under the Contract. The price adjustment, when such adjustment is required as specified in part (c) of this Subsection, will be made subsequent to the month in which the applicable Contract work was performed and will be entered on the next bi-weekly estimate.

(g) Payment for Price Adjustment, Fuel shall be debited or credited against the Contract price (Lump Unit) bid for Price Adjustment, Fuel.

Payment will be made under:

Pay Item	Pay Unit
690.50 Price Adjustment, Fuel (N.A.B.I.)	Lump Unit

Table 1
Pay Item Fuel Usage Factors and Quantity Thresholds

Work Category	Pay Item No.	Usage Factor Units		Diesel Fuel (FUFD)		Gasoline (FUFG)		Quantity Threshold	
		Metric	English	Metric	English	Metric	English	Metric	English
Excavation	203.15	GAL/CM	GAL/CY	0.38	0.29	0.2	0.15	2,500	3,000
	203.16	GAL/CM	GAL/CY	0.51	0.39	0.24	0.18	2,000	2,500
	204.25	GAL/CM	GAL/CY	0.46	0.35	0.21	0.16	2,000	2,500
	208.30	GAL/CM	GAL/CY	0.46	0.35	0.21	0.16	1,500	2,000
	208.35	GAL/CM	GAL/CY	0.51	0.39	0.24	0.18	1,500	2,000
Borrow	203.30	GAL/CM	GAL/CY	0.38	0.29	0.20	0.15	2,500	3,000
	203.31	GAL/CM	GAL/CY	0.38	0.29	0.20	0.15	2,500	3,000
	203.32	GAL/CM	GAL/CY	0.38	0.29	0.20	0.15	2,500	3,000
Granular Backfill For Structures	204.30	GAL/CM	GAL/CY	1.31	1.00	0.21	0.16	1,200	1,500
Cold Planing, Bituminous Pavement	210.10	GAL/SM	GAL/SY	0.16	0.12	0	0	11,000	15,000
Subbase	301.25	GAL/CM	GAL/CY	1.11	0.85	0.73	0.56	750	1,000
	301.35	GAL/CM	GAL/CY	1.11	0.85	0.73	0.56	750	1,000
Reclaimed Stabilized Base	310.20	GAL/SM	GAL/SY	0.05	0.04	0	0	30,000	35,000
Pavement	406.25	GAL/T	GAL/TON	3.37	3.06	0.95	0.86	450	500
	406.27	GAL/T	GAL/TON	3.37	3.06	0.95	0.86	450	500
	490.30	GAL/T	GAL/TON	3.37	3.06	0.95	0.86	450	500
Concrete	501.32	GAL/CM	GAL/CY	0.98	0.75	0.33	0.25	750	1,000
	501.33	GAL/CM	GAL/CY	0.98	0.75	0.33	0.25	750	1,000
	501.34	GAL/CM	GAL/CY	0.98	0.75	0.33	0.25	750	1,000
Stone Fill	613.10	GAL/CM	GAL/CY	0.51	0.39	0.24	0.18	1,500	2,000
	613.11	GAL/CM	GAL/CY	0.51	0.39	0.24	0.18	1,500	2,000
	613.12	GAL/CM	GAL/CY	0.51	0.39	0.24	0.18	1,500	2,000
	613.13	GAL/CM	GAL/CY	0.51	0.39	0.24	0.18	1,500	2,000
Guardrail	621.20	GAL/M	GAL/LF	0.59	0.18	0.16	0.05	1,500	5,000
	621.205	GAL/M	GAL/LF	0.59	0.18	0.16	0.05	1,500	5,000
	621.21	GAL/M	GAL/LF	0.59	0.18	0.16	0.05	1,500	5,000
	621.215	GAL/M	GAL/LF	0.59	0.18	0.16	0.05	1,500	5,000

SECTION 900 – SPECIAL PROVISION ITEMS

HIGH PERFORMANCE CONCRETE, RAPID SET

41. DESCRIPTION. This work shall consist of designing, furnishing, and placing a high early strength, high performance, Portland cement concrete at the locations indicated in the Plans and as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 501 of the Standard Specifications.

42. MATERIALS. Materials shall meet the requirements of Subsection 501.02 and the following:

High Early Strength Portland Cement……701.04

43. MIX DESIGN SUBMISSION CRITERIA. Concrete shall meet the following requirements:

(a) The mix shall be classified as self-consolidating concrete (SCC) mix. If the project will only be using this mix in flat work application, then the mix will be classified and tested as a conventional concrete with a slump not to exceed 9 inches.

(b) Compressive Strength.

28 day compressive strength - 5000 psi

In addition to this requirement, the Contractor shall be aware that a minimum compressive strength of 4000 psi, as determined by field-cured test cylinders, shall be achieved prior to allowing traffic on the structure.

(c) Permeability. 56 Day Permeability - 2500 coulombs (The permeability may be tested prior to 56 days but results must still be 2500 coulombs or less). Test shall be performed in accordance with Subsection 510.04(b)(6)f.

(d) Air Content. 7 ± 1.5%.

(e) Slump/Spread. The mix shall not exhibit segregation at the slump /spread being used.

(1) For SCC mix the visual stability index (VSI) shall be equal to or less than 1.

(f) Alkali-Silica Reactivity (ASR). Test shall be performed in accordance with Subsections 510.04(b)(6)g and 510.04(b)(7).

(g) The mix may contain shrinkage–compensating admixture such that there will be no separation of concrete from adjacent precast units. The Contractor shall include results for the unrestrained shrinkage test method, ASTM C 157, procedure 11.1.2. Take readings for a minimum of 28 days after the curing period is complete. The maximum shrinkage allowed shall be 0.04%. Testing shall be performed by an independent lab that is CCRL accredited in AASHTO T 30 or ASTM C 1260.

(h) A proprietary concrete mix design meeting the same performance requirements may also be considered for use.

44. SUBMITTALS. A minimum of fourteen (14) calendar days prior to placement (or prior to the pre-placement meeting, if one is required), the Contractor shall submit the mix design for approval. The mix design shall be submitted to the Agency's Materials Laboratory, attention Composite Materials Engineer. Concrete under this provision shall not be placed until the mix design has been approved.

(a) Trial Batch. Twenty-one (21) to seven (7) days prior to the first placement, the Contractor shall produce and place a 2 cubic yard trial batch, as an SCC, at a location agreed upon by the Contractor and the Engineer. The purpose of this trial batch is to demonstrate that the mix is capable of producing the wet test results within the specified ranges. The Engineer shall be given a minimum notice of seven (7) days prior to the trial batch pour. The trial batch shall be poured in the presence of the Engineer and the Composite Materials Engineer. The trial batch shall be produced and poured in the same manner, estimated concrete temperature, and time frames that will occur during construction. The Contractor shall provide qualified personnel to test spread, air content, and temperature of the trial batch.

If this mix will be used in flat work application, a second trial batch will be required at the anticipated slump the Contractor will need; this trial batch will be tested for the same properties, except for the spread, where it will be for slump. If the mix will only be used in flat work application for the project, the requirement for testing the mix as an SCC will be disregarded. If the trial mix falls outside of any of the listed ranges for the testing criteria, the trial batch shall be subject to rejection.

(b) Mix Acceptance Criteria. The placed concrete will be tested for all mix design criteria as specified herein, with the exception of permeability, shrinkage, and ASR. The Contractor may test the load in accordance with 501.06(a)(2) for initial QC in order to make any needed adjustments. The sample shall be taken in accordance with AASHTO R-60 or ASTM C172. If the test results fall outside of the specified ranges for the tested criteria, the mix shall be subject to rejection.

45. CURING CONCRETE. The method of wet curing used shall meet the requirements of Subsection 501.17. Concrete shall be wet cured until it has reached the minimum design strength as specified herein, verified by testing of field cylinders.

46. LOADING OF CONCRETE. After the concrete has been placed and the finishing operations concluded, it shall not be walked on or disturbed in any manner, including the removal of forms, until curing is complete as specified herein.

The concrete shall obtain the specified minimum design strength prior to any vehicular loading.

A portable compression testing machine calibrated in accordance with Section 5 of ASTM C 39 shall be provided by the Contractor and available on-site for cylinder testing of field-cured cylinders for construction progress. All testing and equipment shall conform to ASTM C 39. Testing shall be performed, and equipment operated by, a qualified Agency project individual(s). The individual(s) shall be trained in the operation of the machine by the owner or representative of the machine who is proficient in the operations and functions of the machine. Once the Agency individual(s) is confident in the operation and test procedure, a Materials Lab individual shall complete a proficiency check on-site of the individual(s) operating the machine, using practice cylinders, for the purpose of qualifying the individual(s).

If an independent lab is proposed to be used to test the field-cured cylinders, the Contractor shall submit documentation providing verification for the following:

(a) Calibration of the compression machine in accordance with Section 5 of ASTM C 39.

(b) Compression machine meets the requirements of ASTM C 39.

(c) Proficiency of the technician who will be performing the test methods.

The Engineer may approve barring any other unforeseen requirements. The State at any time reserves the right to perform an independent proficiency of the technician for the test methods used and review of the testing facility.

47. METHOD OF MEASUREMENT. The quantity of Special Provision (High Performance Concrete, Rapid Set) to be measured for payment will be the number of cubic meters (cubic yards) of concrete placed in the complete and accepted work, as determined by the prismoidal method using dimensions shown on the Plans or as directed by the Engineer, including the volume of precast concrete stay-in-place forms, but excluding the volume of steel or other stay-in-place forms and form filling materials. No deductions will be made for the volume of concrete displaced by steel reinforcement, structural steel, expansion joint material, scuppers, weep holes, conduits, tops of piles, scoring, chamfers or corners, inset panels of 38 mm (1 ½ inches) or less in depth, or any pipe less than 200 mm (8 inches) in diameter.

48. BASIS OF PAYMENT. The accepted quantity of Special Provision (High Performance Concrete, Rapid Set) will be paid for at the Contract unit price per cubic meter (cubic yard). Payment will be full compensation for performing the work specified, including designing the mix, satisfactory finishing and curing, and for furnishing all forms, materials, including joint filler and bond breaker, labor, tools, admixtures, equipment, including automatic temperature recording units, trial batches, and incidentals necessary to complete the work.

The cost of heating materials and protecting the concrete against cold weather, and any additional cost for cement, will not be paid for

separately but will be considered incidental to Special Provision (High Performance Concrete, Rapid Set).

The cost of furnishing testing facilities and supplies at the batch plant and the setting of inserts, bench marks, and bridge plaques furnished by the Agency will not be paid for separately but will be considered incidental to Special Provision (High Performance Concrete, Rapid Set).

Costs for all materials, labor, and incidentals for steel or other stay-in-place forms and form filling materials will not be paid for separately, but will be considered incidental to Special Provision (High Performance Concrete, Rapid Set).

Payment will be made under:

Pay Item	Pay Unit
900.608 Special Provision (High Performance Concrete, Rapid Set)(FPQ)	Cubic Yard

ULTRA-HIGH PERFORMANCE CONCRETE

49. DESCRIPTION. The Contractor shall furnish all materials, tools and labor necessary for the performance of all work to form, cast, cure & finish Ultra High Performance Concrete (UHPC) where required per plan. Before casting UHPC for actual construction, the Contractor will cast mockups (trial batch) per the requirements of this Special Provision for a trial batch to understand the properties and placement of UHPC prior to the bridge closure.

All UHPC shall be produced using “DUCTAL” concrete materials manufactured by Lafarge North America.

The work under this section shall be performed in accordance with these provisions, the Plans, and the following sections of Section 501 of the Standard Specifications:

Forms.....501.09
Finishing Concrete.....501.16

50. MATERIALS. Use the UHPC mixture JS1000 produced by Lafarge Corp supplied by Lafarge North America. Material supplier for DUCTAL concrete:

Lafarge North America
#1200, 10655 Southport RD SW
Calgary, Alberta T2W 4Y1
Phone (403) 225-5456
Fax (403) 278-7420

UHPC components shall meet the following Ductal component recommendations:

(a) Premix: Silica fume, ground quartz, sand, & cement

(b) High Tensile Steel Fibers: -0.2mm (0.008 in) diameter x 14mm (0.5 in) long (>2000MPa/290 psi)

(c) Admixture: High range water reducer/3rd generation

51. SUBMITTALS. A minimum of twenty eight (28) calendar days prior to placement of the trial batch the Contractor shall submit the mix design for acceptance. The mix design shall be submitted to the Agency's Materials and Research Laboratory, attention Structural Concrete Engineer. Concrete under this provision shall not be placed until the mix design has been accepted. The mixing sequence shall include the order and time of introduction of the materials, mixing time and QA/QC procedure for verification of the mix uniformity.

52. PRE-POUR MEETING. Prior to the trial batch placement of the UHPC for the mockup, the Contractor shall arrange for an onsite meeting with the Lafarge Representative, Engineer and VTrans Structural Concrete Engineer. The Contractor shall attend the site meeting. The objective of the meeting will be to clearly outline the procedures for mixing, transporting, finishing and curing of the UHPC material. The Contractor shall arrange for a representative of Lafarge to be on site during placement of the UHPC. The Lafarge representative shall be knowledgeable in the supply, mixing, delivery, placement and curing of the Ductal Material. The Engineer may request a second Pre-pour meeting after the placement of the trial batch.

53. Trial Batch & Mockup. The Contractor shall produce and place a trial batch at a location agreed upon by the Contractor and the Engineer. The Engineer shall be given a minimum of seven (7) days notice prior to the trial batch pour. Two (2) mockups shall be constructed, one (1) of the longitudinal precast deck panel joint and one (1) of the transverse precast deck panel joint. Each mockup will be a minimum of 4 (four) feet in length and shall match the dimensions on the approved precast deck panel fabrication drawings. Each mockup shall have reinforcing steel projecting into the joint that matches the reinforcing steel shown on the Contract Plans. The trial batch shall be poured in the mockups in the presence of the Engineer, the Structural Concrete Engineer and representative of Lafarge. The trial batch shall be produced, poured, and cured in the same manner that will occur during construction. The Contractor shall provide qualified personnel to test spread, air content, and unit weight of the trial batch. Cylinders shall be cast to determine whether the concrete meets the strength requirements required for the project.

54. STORAGE. The Contractor shall assure the proper storage of DUCTAL premix including powder, fibers and other additives, obtained by Lafarge North America, as required by the Lafarge specifications in order to protect materials against loss of physical and mechanical properties.

55. FORMING, BATCHING, PLACEMENT, AND CURING. Forming, batching placing and curing shall be in accordance with the procedures by Lafarge and as submitted and accepted by the Structural Concrete Engineer.

Grinding of the UHPC surface can be performed when a strength of 10 ksi has been achieved. If significant fiber pullout is observed during grinding operations, grinding shall be suspended and not resumed until approved by the Engineer.

Construction loads applied to the bridge during UHPC placement and curing are the responsibility of the Contractor. The Contractor shall submit the weight and placement of concrete buggies, grinding equipment

and other significant construction loads to the Engineer for review prior to the pre-pour meeting described above.

The design and fabrication of forms shall follow approved installation drawings and shall follow the recommendations of Lafarge.

Two portable batching units will be supplied by Lafarge to the Contractor for mixing of the UHPC. The contractor shall follow the batching sequence as specified by Lafarge and approved by the Structural Concrete Engineer.

Each UHPC placement shall be cast using one continuous pour. No cold joints are permitted.

The bridge can be opened to traffic when a strength of 15 ksi has been achieved.

The concrete in the form shall be cured according to Lafarge's recommendations to attain design strength.

56. TESTING. The following tests shall be performed following casting of the mockup and for each day of UHPC placement:

(a) Compressive Strength: Concrete compressive strength test according to ASTM C39. 12 specimens 3 inch diameter by 6 inches shall be tested. Prior to grinding UHPC, three specimens shall be tested to validate achievement of 10 ksi compressive strength. Three specimens shall be tested to validate the achievement of 15 ksi compressive strength prior to opening the bridge to traffic. Three final specimens shall be tested at 28 days to verify final strength. The remaining three specimens shall be treated as reserves.

All specimens shall be tested at the VTrans Material and Research (M&R) Central Laboratory in Berlin, VT, or a VTrans approved alternate location.

57. METHOD OF MEASUREMENT. The quantity of Special Provision (Ultra High Performance Concrete) to be measured for payment will be the number of cubic meters (cubic yards) of concrete placed with the complete and accepted work, as determined by the prismoidal method using dimensions shown on the Plans or as directed by the Engineer. No deductions will be made for the volume of concrete displaced by steel reinforcement, structural steel and expansion joint material.

58. BASIS OF PAYMENT. The accepted quantity of Special Provision (Ultra High Performance Concrete) will be paid for at the Contract unit price per cubic meter (cubic yard). Payment will be full compensation for performing the work specified, including constructing forms and mockups for the trial batch, designing the mix, satisfactory finishing and curing, and for furnishing all forms, materials, including joint filler and bond breaker, labor, tools, admixtures, equipment, including automatic temperature recording units, trial batches, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.608 Special Provision (Ultra High Performance Concrete)(FPQ)	(Cubic Yard)

REINFORCED BACKFILL

59. DESCRIPTION. This work shall consist of fabricating, transporting, and constructing a mechanically stabilized earth (MSE) abutment backfill system, in accordance with the specifications, and in reasonably close conformity with geometry and dimensions shown on the Plans or as established by the Engineer.

The mechanically stabilized earth abutment backfill system shall consist of connecting high adherence reinforcing strips (with ribs perpendicular to their long axis) to Precast Concrete Structure (Abutment No. 2), and placing/compacting select granular backfill in multiple lifts to specified elevations. The high adherence reinforcing strips allowed for this project shall correspond with the approved (and fully evaluated) systems associated with Mechanically Stabilized Earth (MSE) Walls noted in the Agency's "VAOT Earth Retaining System Selection Chart", located at the following link.

https://outside.vermont.gov/agency/vtrans/external/docs/construction/03GeotechEng/Engineering/MandRSoilAPPROVED_Retaining_Walls_8-2012_Final%20Engineering.pdf

60. MATERIALS. The Contractor shall make arrangements to purchase from the supplier the materials covered herein, including ribbed steel reinforcement strips, attachment devices, fasteners, and all necessary incidentals. The Contractor, or the supplier as the Contractor's agent, shall furnish the Engineer a certificate of compliance certifying that the applicable materials comply with these provisions. Materials not conforming to these provisions shall not be used without written consent of the Engineer.

(a) Soil Reinforcing and Attachment Devices. All reinforcing and attachment devices shall be carefully inspected to ensure these are true size and free from defects that may impair their strength and durability.

(1) Ribbed Steel Reinforcing Strips. Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to ASTM A-572 Grade 65. Galvanizing shall conform to the minimum requirements of ASTM A-123 or AASHTO M111. The galvanizing thickness shall be 2 oz/ft^2.

(2) Tie Strips. Tie strips shall be shop fabricated from hot rolled steel conforming to the minimum requirements of ASTM A1011 (formerly A-570), Grade 50. Galvanizing shall conform to ASTM A-123 or A-153. The minimum coating thickness shall be 2 oz/ft^2.

(3) Fasteners. Fasteners shall consist of galvanized hexagonal cap screw bolts and nuts conforming to the requirements of ASTM A449 and galvanized per ASTM A-153.

(b) Select Granular Backfill. Select granular backfill material shall be reasonably free from organic and otherwise deleterious materials, and shall conform to the following gradation limits as determined in accordance with AASHTO T 27:

Sieve Size	**Percent Passing**
101.6 mm (4 inch)	100
75 mm (3 inch)	75 – 100
.425 mm (No. 40)	0 - 60
75 mm (No. 200)	0 - 12

In addition the backfill shall conform to the following requirements.

(1) Plasticity Index. The Plasticity Index (P.I.), as determined by AASHTO T 90, shall not exceed six.

(2) Soundness. The material shall be substantially free of shale or other soft particles with poor durability characteristics. The material shall have a sodium sulfacte soundness loss of less than 8 percent after five (5) cycles, as determined by AASHTO T 104.

(3) Electrochemical Requirements. The backfill material shall conform to the following requirements.

PROPERTY	REQUIREMENT	TEST METHOD
Resistivity at 100% saturation	Minimum 3000 ohm-cm	AASHTO T288
pH	Acceptable Range 5 - 10	AASHTO T289
Sulfates	Maximum 200 ppm	AASHTO T290
Chlorides	Maximum 100 ppm	AASHTO T291
Organic Content	<1%	AASHTO T267

Backfill not conforming to these provisions shall not be used without the written consent of both the Engineer and supplier.

(4) Uniformity Coefficient. Backfill material shall have a minimum uniformity coefficient, C_u, of 2.

(c) Geomembrane Liner. An impervious geomembrane and drain system shall be designed and provided over the reinforced soil zone. The impervious geomembrane shall have a minimum thickness of 0.75 mm (30 mil) and shall consist of virgin polyvinyl chloride (PVC) resins, plasticizer, stabilizers, and such materials that, when compounded, will meet the physical requirements listed in the Table below.

Individual widths of PVC materials shall be fabricated into large sections by dielectric seaming into a single piece, or into a minimum number of panels, as required to fit the application. Lap joints with a minimum joint width of 19 mm (3/4 inch) shall be used. The 150 mm (6 inch) plastic pipe subsurface drains shall conform to the requirements of Section 605 and the filter material shall conform to the requirements of Section 649 for Geotextile for Roadbed Separator.

Physical Requirements for Geomembrane

PROPERTY	REQUIREMENT	TEST METHOD

Thickness, mm (mil) (Normal ± 5%)	0.75 (30)	ASTM D 1593
Specific Gravity, min.	1.23	ASTM D 792
Tensile Strength, kPa (psi), min. ((Breaking Factor, kN/m (pound/in) width, min.))	15,859 (2,300) ((12.19 (69.6)))	ASTM D 882
Elongation, at Break, %min.	350	ASTM D 882
Modulus at 100% Elongation, kPa (psi), ((kN/m (pound/in) width))	6895 (l,000) ((5.3 (30.3)))	ASTM D 882
Tear Resistance, kN/m (pound/in), min, ((N (pound), min.))	52.98 (302.5) ((40.34 (9.1)))	ASTM D 1004
Low Temperature, C° (F°)	-28 (-18.4)	ASTM D 1790
Dimensional Stability, % change, max.	3.5	ASTM D 1204 (l00 ° C, 15 min.)
Water Extraction % loss change (max.)	0.35	ASTM D 3083
Volatility % loss, max.	0.70	ASTM D 1203
Resistance to Soil Burial, % loss (max.) Tensile strength, Elongation at Break, Modulus at 100% Elongation %change, max	-5 20	ASTM D 3083
Hydrostatic Resistance, kPa (psi), min.	856 (85)	ASTM D 751
Factory Seam Requirements* Bonded Seam Strength (Factory Seam, breaking factor, kN/m (pound/in) width)	9.75 (55.7)	ASTM D 3082 Modified

*Factory bonded seam strength is the responsibility of the fabricator

A nominal 300 mm (12 inches) of Drainage Aggregate conforming to Subsection 704.16 shall be placed over the PVC lining. The Drainage Aggregate shall be approved by the Engineer prior to placement. The Contractor may choose the equipment and manner with which to place the Drainage Aggregate over the liner, provided the Contractor satisfactorily demonstrates to the Engineer that both the equipment and manner used to place the chosen cover material over the lining will not have any detrimental effects on the liner.

Field seams will be made to seal factory fabricated panels of PVC together in the field. Seams shall be formed by lapping the edges of panels a minimum of 150 mm (6 inches). The contact surfaces of the panels shall be wiped clean to remove all dirt, dust, or other substance. Sufficient vinyl to vinyl bodies solvent shall be applied to the contact surface in the seam area, and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out. Field seams shall have a strength of at least 85% of the specified sheet strength.

All curing compounds and coatings shall be completely removed from the joint area. Joining of the PVC to the back of panel shall be done with an adhesive. Unless required otherwise by design, the minimum width of concrete to PVC joint shall be 150

mm (6 inches). In addition, mechanical attachments may be necessary.

Any necessary repairs to the PVC shall be made with the lining material itself and cold applied vinyl to vinyl splicing adhesives. Patches should be cut so as to cover the area to be repaired by a minimum of i00 mm (4 inches) in all directions. Patches should be cut with rounded corners. The splicing adhesive shall be applied to the contact surface between the patch and the lining, and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

61. SUBMITTALS. The Contractor shall submit five (5) sets of fabrication and construction drawings for approval prior to beginning of construction.

(a) Working drawings shall be submitted to the Engineer for review and approval a minimum of four (4) weeks before work is to begin and shall include but not limited to the following:

(1) An elevation view(s) of Abutment No. 2, which shall include elevations at all horizontal and vertical break points, the length of reinforcing strips, the distance along the face of the wall to where changes in length of the reinforcing strips occur, and an indication of the final ground line.

(2) Typical cross section(s) showing the elevation relationship between ground conditions and proposed grades, including existing ground elevations that have been verified by the Contractor for entire abutment and wingwall elements.

(3) General notes pertaining to the wall construction.

(4) A listing of the summary of quantities on the elevation sheet for each element.

(5) The details for diverting reinforcing strips around Wingwall 3.

(6) The details for the connection between the abutment and reinforcing strips.

(7) Other information required in the Contract Documents or requested by the Engineer.

(b) Approval of the Contractor’s Working Drawings shall not relieve the Contractor of any responsibility under the Contract for the successful completion of the work.

62. CONSTRUCTION REQUIREMENTS.

(a) Manufacturer's Representative. The Contractor shall make the necessary arrangements with the wall supplier to have a technical representative on the project to supervise the initial placement of the mechanically stabilized earth abutment backfill system. The technical representative shall also be required to be on-site any time during wall installation as requested by the Engineer. The representative shall be available for a minimum of XX work days.

(b) Placement of Reinforcements. Prior to the first layer of reinforcements, backfill shall be placed and compacted in accordance with part (c) of this Subsection. Soil reinforcements shall be placed normal to the face of the wall, unless otherwise shown on the Plans or directed by the Engineer.

If skewing of the soil reinforcements is required due to obstructions in the reinforced fill, the maximum skew angle shall not exceed 15 degrees from the normal position.

(c) Backfill Placement. Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the abutment. Any precast materials which become damaged or disturbed during backfill placement shall be corrected or removed and replaced at the Contractor's expense, as directed by the Engineer.

No backfill shall be placed until test results from a qualified independent testing laboratory have been submitted for the proposed material. Test results shall demonstrate conformance with the backfill requirements included in these provisions.

Backfill shall be compacted to 95 percent of the maximum density as determined in accordance with AASHTO T 99, Method C or D (with oversize correction). The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniform and acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T 99, Method C or D (with oversize correction).

The frequency of sampling of Select Granular Backfill material, necessary to assure gradation control throughout construction, shall be as directed by the Engineer. If 30 percent or more of the Select Granular Backfill material is greater than 19 mm (3/4 inch) in size, AASHTO T 99 is not applicable. For such material, the acceptance criterion for control of compaction shall be either a minimum of 70 percent of the relative density of the material, as determined by ASTM D 4253 and D 4254 or a method specification (based on a test compaction section) which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content.

The maximum lift thickness after compaction shall not exceed 250 mm (i0 inch), regardless of the vertical spacing between the reinforced soil layers. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density. Prior to placement of the reinforcements, the backfill elevation, after compaction, shall be 50 mm (2 inches) above the attachment device elevation from a point approximately 300 mm (12 inches) behind the back face of the panels to the free end of the soil reinforcements, unless otherwise shown on the Plans.

Compaction within 900 mm (3 feet) of the back face of the panels shall be achieved by a minimum of three (3) passes of a lightweight mechanical tamper, roller or vibratory system. The

specified lift thickness shall be adjusted as warranted by the type of compaction equipment actually used, but no soil density tests need be taken within this area. Care shall be exercised in the compaction process to avoid misalignment of the panels or damage to the attachment devices. Heavy compaction equipment shall not be used to compact backfill within 900 mm (3 feet) of the wall face.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

63. METHOD OF MEASUREMENT. The quantity of Special Provision (Mechanically Stabilized Earth Abutment Backfill System) (FPQ) to be measured for payment will be the number of cubic yards complete in place in the accepted work, measured within the limits specified on the Plans or as directed by the Engineer.

64. BASIS OF PAYMENT. The accepted quantity of Special Provision (Mechanically Stabilized Earth Abutment Backfill System) (FPQ) will be paid for at the Contract unit price per cubic yard. Payment shall include full compensation for detailing, fabricating, furnishing, transporting, and erecting the mechanically stabilized earth abutment backfill system, including preparing all required submittals; for materials required but not limited to select granular backfill, PVC pipe, drainage aggregate, soil reinforcements, attachment devices, fasteners, geomembrane, and geotextiles; for preparing the wall foundation, proof rolling foundation soils,and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
900.608	Special Provision (Mechanically Stabilized Earth Abutment Backfill System) (FPQ)	Cubic Yard

CRITICAL PATH METHOD (CPM) SCHEDULE

65. DESCRIPTION. This work shall consist of developing and furnishing a CPM Schedule, including narratives, updates, and revisions for the duration of the Contract.

These provisions shall supersede Subsection 108.03(a) of the Standard Specifications.

66. SUBMISSIONS.

(a) The Contractor is responsible for the scheduling of all Contract work, which shall include, but is not limited to subcontracted work, complete and acceptable submissions, work component fabrications, and delivery of materials. The schedule shall include allowance for time for all aspects of the work including sufficient time for VTrans to perform its functions as indicated in the Contract, including but not limited to acceptance inspection and/or testing, and review and acceptance/approval of

any required Working Drawings as defined in Section 105 or otherwise in the Contract Documents.

(b) Provide the following items with each schedule submission. The schedule shall be prepared with MS Project.

(1) An electronic copy in MS Project format with run date and version of the schedule;

(2) A PDF illustrated in color, depicting no more than 50 activities on each 280 by 430 mm (11 by 17 in.) sheet, and with each sheet including title, project name and number, match data for diagram correlation, and a key;

(3) A four-week look-ahead narrative to provide a more detailed plan of upcoming work highlighting the near term priorities. Indicate the anticipated workdays per week, number of shifts per day, number of hours per shift, crew sizes, and assumed resources. If the project requires a road closure, identify any changes in anticipated resources, or work schedule during the closure period.

(c) The CPM schedule shall include the following:

(1) Activities that describe the essential features of the work, activities that might delay Contract completion, and which activities are on the critical path;

(2) The planned start and completion dates for each activity and the duration of each activity stated in work days (field activities of more than 15 work days in duration shall be broken into two or more activities distinguished by location or some other logical feature); this estimated figure shall include considerations for permit limitations, seasonal limitations, and any other anticipated delays.

(3) When the project contains a defined Road or Bridge Closure Period of a minimum of 24 hours and up to a maximum of 33 days, the duration for work within the closure period shall be shown in hours instead of days. The maximum duration of each activity within the closure period shall be limited to twelve (12) hours;

(4) Finish-to-Start relationships among activities, without leads or lags unless justified in the narrative, and approved by the Engineer;

(5) Distinct columns showing Predecessors, Successors, Duration, Actual Start, and Actual Finish for each Activity;

(6) Project suspension or work inactivity that is three (3) days or longer;

(7) Dates related to the procurement of materials, equipment, and articles of special manufacture;

(8) Dates related to the submission of Working Drawings, plans, and other data specified for review or approval by the Agency;

(9) Key milestone dates specified in the Contract including but not limited to; Notice to Proceed, Interim Completion, Permit Restriction Dates, and Contract Completion Date. These shall be the only constraints in the schedule logic;

(10) Activities related to Agency or Third Party reviews and inspections.

(d) For contracts with an original Contract amount in excess of $8,000,000.00 the following additional information shall be shown on the CPM schedule:

(1) Each Contract bid item identified with at least one activity, except:

Lump Sum items, Lump Unit items, Contract items paid by the "Hour", Contract items paid by the "Dollar", Section 641 pay items, and Section 653 pay items.

(2) Each compensable activity shall identify the applicable Contract item(s), along with the total quantity intended to be placed during that activity.

67. BASELINE SCHEDULE. The CPM Schedule submittal shall be received by the Engineer a minimum of seven (7) calendar days prior to the preconstruction meeting. The Engineer and Contractor may review the schedule at the preconstruction meeting. Any requested information and a revised schedule shall be submitted within seven (7) calendar days after receiving the Engineer's request. The Engineer shall be allowed twenty-one (21) calendar days to review the schedule and provide a response. The Engineer will review the schedule by assessing the schedule's compliance with these provisions and conformance with the Contract requirements. By accepting the schedule, the Engineer does not modify the Contract in any way. The Baseline schedule shall be accepted before any field work begins. The accepted schedule will be used as the Baseline Schedule for the remainder of the project.

The schedule shall define and sequence activities so as to accurately describe the project and to meet Contract requirements for scope of work, phasing, accommodations for traffic, and interim, and project completion dates. Create the schedule, beginning with the date of the Notice to Proceed.

68. SCHEDULE UPDATES. The schedule shall be updated during active construction at the end of every other bi-weekly estimate period (update period) and when directed by the Engineer. Projects with short duration road closures are of particular importance as the project

float will be limited. The Contractor shall promptly inform the Engineer of any schedule delays or changes that occur during these periods. The Engineer shall be allowed ten (10) calendar days to review the update for compliance with these provisions and provide a response. Include the following with each update:

(1) Actual start dates of each activity started;

(2) Actual finish dates of each activity finished, or remaining durations of activities started but not yet completed;

(3) Narrative report describing progress during the update period, shifts in the critical activities from the previous update, sources of delay, potential problem areas, work planned for the next update period, and changes made to the schedule. Changes include additions, deletions, or revisions to activities due to the issuance of a Contract revision, changes to an activity duration, changes to relationships between activities, or changes to the planned sequence of work or the method and manner of its performance.

(4) The Original schedule shall be shown as a Baseline

69. REVISIONS. Schedule revisions shall be submitted within ten (10) calendar days after any of the following:

(1) A written request to revise the schedule from the Engineer;

(2) A delay (actual or projected) to scheduled milestones or project completion dates;

(3) When actual progress falls behind the most recent schedule accepted by the Engineer, either by falling more than two (2) weeks behind schedule or by 5% of the total Contract time, the Contractor shall immediately inform the Engineer in writing. The Engineer may require the Contractor to submit a revised schedule. Neither the Engineer's acceptance of such revised schedule nor any Agency feedback regarding the revised schedule shall be construed as an approval of the revised schedule, nor should it be construed as the Agency's dictation of the Contractor's means and methods;

(4) Issuance of a Change Order/Supplemental Agreement(s) that by adding, deleting, or revising activities, changes the planned sequence of work or the method and manner of its performance;

(5) Issuance of a Change Order/Supplemental Agreement(s) that adds time to the Contract;

(6) The Contractor shall participate in progress meetings at the request of the Engineer to review and discuss the updated schedule information including any activity delay, coordination requirements, change orders, potential delays, and other relevant issues.

The Engineer shall review the revised schedule for compliance with these provisions, and provide a response within ten (10) calendar days.

70. FLOAT. Any float in the schedule is to be credited to the project only.

71. FAILURE TO SUBMIT SCHEDULE. Failure to submit a schedule (i.e. original baseline schedule, required updates, revisions, and when requested by the Engineer) in accordance with these provisions may be grounds for suspension of partial payments, as identified in Subsection 109.08, until a satisfactory schedule meeting the requirements of these provisions is received by the Engineer.

72. METHOD OF MEASUREMENT. The quantity of Special Provision (CPM Schedule) to be measured for payment will be the number of each CPM Schedule (i.e. original baseline schedule, required updates, revisions, and when requested by the Engineer), accepted by the Engineer through the duration of the Contract.

73. BASIS OF PAYMENT. The accepted quantity of Special Provision (CPM Schedule) will be paid for at the Contract unit price for each. Payment will be full compensation for preparing and submitting a schedule as specified, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
900.620	Special Provision (CPM Schedule)	Each

TRAFFIC CONTROL

74. DESCRIPTION. This work shall consist of establishing and maintaining traffic control measures to protect the traveling public and construction operations as indicated in the Plans and as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 641 of the Standard Specifications.

75. SUBMITTALS. The Contractor shall submit to the Engineer for approval a site-specific traffic control plan in accordance with Subsection 105.03. The traffic control plan shall conform to the requirements of the MUTCD and all applicable Agency Standard Drawings. Where conflicts exist, the MUTCD will govern. Each phase of construction shall be included in the submitted traffic control plan. The Contractor shall allow the Agency 14 calendar days to review and respond to the proposed traffic control plan.

76. TRAFFIC CONTROL DEVICES. Temporary traffic barrier shall meet the requirements of Section 621. Traffic control devices shall meet the requirements of Section 641.

77. METHOD OF MEASUREMENT. The quantity of Special Provision (Traffic Control, All-Inclusive) to be measured for payment will be on a lump sum basis for providing traffic control in the complete and accepted work.

The quantities for Uniformed Traffic Officers and Flaggers will be measured separately in accordance with Section 630.

78. BASIS OF PAYMENT. The accepted quantity of Special Provision Traffic Control, All-Inclusive) will be paid for at the Contract lump sum price.

Partial payments will be made as follows:

(a) The first 15% of the Contract lump sum price will be paid upon approval of the Contractor's traffic control plan.

(b) The remaining 85% of the Contract lump sum price will be paid on a prorated basis for the estimated duration of the Contract work remaining.

Payment will be full compensation for preparing, implementing, inspecting, maintaining, and removing the applicable traffic control plan and required traffic control devices, including but not limited to temporary traffic barrier, temporary pavement markings, and signing; and for furnishing all labor, tools, materials, equipment, and incidentals necessary to complete the work.

Uniformed Traffic Officers and Flaggers will be paid for separately under Contract items 630.10 and 630.15, respectively.

Payment will be made under:

Pay Item	Pay Unit
900.645 Special Provision (Traffic Control, All-Inclusive)	Lump Sum

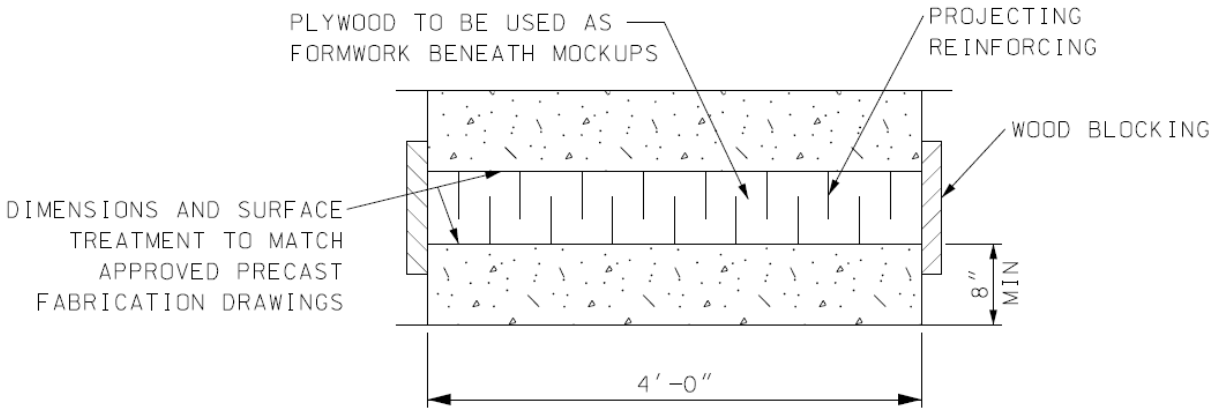
PRECAST MOCKUP

79. DESCRIPTION. This work shall consist of manufacturing and transporting two (2) precast concrete mockups for performing a trial batch placement of Ultra High Performance Concrete (UHPC).

80. MATERIALS All work under this section shall be performed in accordance with these provisions, the Contract Plans, and the following sections of Sections of the Standard Specifications:

Precast Concrete.....540.

81. FABRICATION Two (2) mockups shall be constructed, one (1) of the longitudinal precast deck panel joint and one (1) of the transverse precast deck panel joint. Each mockup shall consist of two (2) concrete pieces representing each side of the joint. Each mockup will be a minimum of 4 (four) feet in length. The dimensions of joints where the UHPC will be placed shall match the dimensions on the approved precast deck panel fabrication drawings. Each mockup shall have reinforcing steel projecting into the joint that matches the reinforcing steel shown on the Contract Plans. A representative sketch of one (1) precast mockup is provided below:



82. METHOD OF MEASUREMENT The quantity of the Special Provision (Precast Mockup)(FPQ) to be measured for payment will be on a lump sum basis. The lump sum shall include all of the precast mockup components in the complete and finished state.

83. BASIS OF PAYMENT The accepted quantity of Precast Mockup will be paid at the Contract lump sum price. Payment shall be full compensation for fabricating, transporting and handling, and for furnishing all labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under

Pay Item	Pay Unit
900.645 Special Provision (Precast Mockup)	Lump Sum

LOCAL ROADWAY MAINTENANCE

84. DESCRIPTION. This work shall consist of maintaining the pre-closure conditions along the detour route on German Flats Road and Sugarbush Access Road, as designated in the Plans, including maintenance of line striping and roadway. The pavement maintenance shall consist of performing all necessary repair work, including pothole repairs, raveling repairs, and other repairs as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and the applicable provisions of the Standard Specifications.

85. GENERAL REQUIREMENTS. The Engineer, Contractor, and a representative from the Towns of Fayston and Warren shall conduct pre- and post-closure surveys using video, pictures, and hand-written notes to document the roadway condition prior to and following the bridge closure period (BCP) designated in the Contract Documents.

The pre-closure survey shall occur a minimum of seven (7) calendar days prior to the beginning of the BCP. The Contractor shall provide the pre-closure survey in writing, and on a DVD if video is included, to the Engineer and a representative of the Towns of Fayston and Warren a maximum of five (5) calendar days following performance of the pre-closure survey.

The post-closure survey shall occur a maximum of five (5) calendar days following the end of the BCP. The Contractor shall provide the post-closure survey in writing, and on a DVD if video is included, to the Engineer and a representative of the Towns of Fayston and Warren a maximum of two (2) calendar days following performance of the post-closure survey.

The Engineer and a representative of the Towns of Fayston and Warren will monitor the condition of the detour route on German Flats Road and Sugarbush Access Road. Any work required during and after the BCP shall be performed by the Contractor within two (2) calendar days of being notified by the Engineer.

86. MATERIALS. Materials for roadway maintenance of the detour route shall meet all applicable requirements of the appropriate Sections of the Standard Specifications, including but not limited to Subsections 104.04 and 105.01, and Sections 404, 406, 417, 490, 646, 702, 704, and 708.

87. METHOD OF MEASUREMENT. The quantity of Special Provision (Local Roadway Maintenance)(N.A.B.I.) to be measured for payment will be on a lump unit basis in the complete and accepted work for performing local roadway maintenance along the designated detour streets.

88. BASIS OF PAYMENT. Payment for Special Provision (Local Roadway Maintenance)(N.A.B.I.) will be as follows:

(a) A lump unit of ten thousand dollars ($10,000) has been included in the bid proposal for local roadway maintenance. Payment will be for reimbursing the Contractor for all actual field maintenance work agreed upon and approved by the Engineer and a representative of the Towns of Fayston and/or Warren, and subsequently completed by the Contractor at the agreed upon price for completing the work.

Prior to receiving approval from the Engineer and a representative of the Towns of Fayston and/or Warren to perform the work, the Contractor shall provide the Engineer with an itemized invoice for the work to be completed and all supporting documentation used by the Contractor in determining the cost of the work, including material, labor, and equipment costs. Once the work is completed and accepted by the Engineer and a representative of the Towns of Fayston and/or Warren, the Contractor will be reimbursed for the work at the previously agreed upon price shown on the itemized invoice.

(b) The lump unit will be adjusted to the actual amount paid to the Contractor for maintaining the designated detour streets in the pre-closure survey condition during the BCP.

No additional payment will be made under this Contract item. All costs for performing the pre- and post-closure surveys, providing written surveys, and a DVD as required, to the Engineer and a representative of the Towns of Fayston and/or Warren and other coordination required for reviewing roadway conditions will be considered incidental to all Contract items.

Payment will be made under:

Pay Item	Pay Unit

900.650 Special Provision (Local Roadway Maintenance) Lump Unit
(N.A.B.I.)

INCENTIVE/DISINCENTIVE (I/D)

89. INCENTIVE/DISINCENTIVE (I/D), is hereby made a new Section of the Specifications as follows:

The payment of monies for performance under the Incentive/Disincentive (I/D) specifications contained in these Special Provisions shall be as follows:

1. For the incentive payment as described in part (c) of Special Provision No. 12, the Contractor will be paid in the next bi-weekly estimate in which the Contractor has satisfactorily met the requirements of I/D.

2. For the assessed disincentive as described in part (c) of Special Provision No. 12, the Engineer will deduct the amount due the Agency from the monies due the Contractor on the next bi-weekly estimate.

Payment will be made under:

Pay Item	Pay Unit
900.650 Special Provision (Incentive/Disincentive) (N.A.B.I.)	Lump Unit

PRE-ASSEMBLY

90. DESCRIPTION. The Contractor shall furnish all materials, tools and labor necessary for pre-assembly of the steel plate girders and precast concrete deck panels prior to the road closure portion of the project.

Pre-assembly is intended to ensure that proper fit up of the precast concrete deck panels, steel girders, shear connectors and Vermont Expansion Joint is confirmed prior to the roadway closure. Pre-assembly is also intended to determine required precast deck panel blocking distances prior to the roadway closure. Survey of the beam profiles will not be required during the bridge closure phase of the project if the precast deck panel blocking is constructed during the pre-assembly.

91. CONSTRUCTION REQUIREMENTS. Pre-assembly of the steel plate girders shall follow the requirements of the following sections of the Standard Specifications:

Erection.....506.18

Temporary beam seats are to be constructed at the same relative elevation and profile of those required for the final condition. Temporary bearings (if used) shall be an elastomeric pad. Cost for the temporary beam seats and bearing pad shall be included in Item 900.608 “Special Provision Pre-Assembly)”.

Cross frames are not required to be installed during pre-assembly. If cross frames are not installed, stability of the system is required by the contractor during the entire pre-assmebly operation. Field splice connections shall be made to ensure stability of the girders. All bolts

used during pre assembly are to be discarded after the pre-assembly operation is complete.

92. METHOD OF MEASUREMENT. The quantity of Special Provision (Pre-Assembly) to be measured for payment will be on a lump sum basis for pre-assembling the precast concrete deck panels and steel plate girders.

93. BASIS OF PAYMENT. The accepted quantity of Special Provision (Pre-Assembly) will be paid for at the Contract Lump sum price. Payments will be full compensation for initial preparation, submittals, pre-assembly, removal and all incidentals necessary to complete the work.

Payment will be made under

Pay Item	Pay Unit
900.608 Special Provision (Pre-Assembly)	Lump Unit

RETAINING WALL

94. DESCRIPTION. This work shall consist of detailing, fabricating, furnishing, and erecting a retaining wall at the location(s) specified and in conformance with the lines and grades shown on the Plans or as directed by the Engineer.

95. DESIGN REQUIREMENTS. Alternate designs shall be performed in accordance with the AASHTO LRFD Bridge Design Specifications and the design criteria specified in the Plans.

Acceptable earth retaining systems are those included in the "VAOT Earth Retaining System Selection Chart", available on the Agency's website at the following address:

https://outside.vermont.gov/agency/vtrans/external/docs/construction/03GeotechEng/Engineering/MandRSoilAPPROVED_Retaining_Walls_8-2012_Final%20Engineering.pdf

Prefabricated earth retaining systems shall employ concrete facing.

All wall components shall have a minimum design life of 75 years.

96. MATERIALS. Materials shall meet the following requirements:

(a) Precast Concrete. Precast concrete for retaining wall blocks shall meet the requirements of Section 540. Precast concrete for deadmen blocks shall meet the requirements of Section 541 for Concrete, Class B.

(b) Cast-in-Place Concrete. Cast-in-place concrete shall meet the requirements of Section 501 for Concrete, High Performance Class B, unless otherwise specified in the Contract Documents.

(c) Concrete Color. Concrete color for precast concrete retaining wall blocks shall meet the requirements of INTEGRATED COLOR CONCRETE PIGMENT of Section 900.

(d) Reinforcing Steel. Reinforcing Steel shall meet the requirements of Section 507.

(e) Backfill. Backfill shall meet the following requirements:

(1) Gradation Limits. Select granular backfill material used in walls shall be reasonably free from organic and otherwise deleterious materials, and shall conform to the following gradation limits as determined in accordance with AASHTO T 27:

SIEVE SIZE	PERCENT PASSING
101.6 mm (4 inch)	100
75 mm (3 inch)	75 – 100
0.425 mm (40)	0-60
75 µm (200)	0 - 12

(2) Plasticity Index. The Plasticity Index (P.I.), as determined in accordance with AASHTO T 90, shall not exceed six.

(3) Soundness. The material shall be substantially free of shale or other soft particles with poor durability characteristics. The material shall have a sodium sulfate soundness loss of less than 8 percent after five (5) cycles, as determined in accordance with AASHTO T104.

Select granular backfill shall have a minimum uniformity coefficient, Cu, of 2.

In addition to these requirements, backfill for walls using metallic soil reinforcing shall meet the following:

PROPERTY	REQUIREMENT	TEST METHOD
Resistivity at 100% saturation	Minimum 3000 ohm-cm	AASHTO T 288
pH	Acceptable Range 5 - 10	AASHTO T 289
Sulfates	Maximum 200 ppm	AASHTO T 290
Chlorides	Maximum 100 ppm	AASHTO T 291
Organic Content	< 1%	AASHTO T 267

Backfill not conforming to this specification shall not be used unless approved in writing by the Engineer and wall supplier.

Backfill material shall be compacted in accordance with the manufacturer’s recommendations and Contract specifications.

(f) Geotextile. Geotextile shall be a non-woven fabric meeting the requirements of Section 649 for Geotextile for Roadbed Separator, unless otherwise specified by the wall supplier.

(g) Wall Tie-Back System and Accessories. All tie-back bars shall consist, at a minimum, of Grade 150, galvanized, continuous thread bar with a nominal diameter of 25 mm (1 inch). The bars shall consist of pre–stressing steel conforming to ASTM A 722.

Tie-back steel shall be handled and stored in such a manner as to avoid damage or corrosion. Damage to the rock anchor steel as a result of abrasion, cuts, nicks, welds, and weld splatter will be cause for rejection by the Engineer.

Tie-back steel shall be protected from dirt, rust, and deleterious substances. All exposed parts of the rock anchor, bearing plate, and spherical nuts shall be galvanized in accordance with ASTM A 123/ASTM A 153. Bar ends, where cut, shall be painted with a cold galvanizing compound following installation.

Bearing plates shall be of steel conforming to the requirements of ASTM A 36 and be as detailed in the Plans.

Beveled or spherical washers shall be steel or malleable iron. Flat washers shall be quenched and tempered steel and shall conform to the requirements of ASTM F 436.

Anchor nuts shall be the manufacturer's standard heavy-duty hexagon head type designed for use with continuous thread bar and shall be galvanized in accordance with ASTM A 153. Anchor nuts shall conform to ASTM A 436.

97. SUBMITTALS. Working Drawings shall be submitted to the Structures Engineer in accordance with Section 105. The submittal shall include all details, dimensions, quantities and cross sections necessary to construct the wall. In addition, the submittal shall include, but not be limited to, all of the following that apply to the particular wall system being constructed:

(a) A plan view of the wall showing the limit of the widest module, tiebacks, nails, mesh, or strip and the centerline of any drainage pipe which is behind or passes under or through the wall.

(b) An elevation view of the wall which shall include the elevation at the top of the wall at all horizontal and vertical break points and at least every 15 m (50 ft) along the face of the wall, all steps in the leveling pads, the designation as to the type of panel, the length of soil reinforcing elements, the distance along the face of the wall to where changes in length of the soil reinforcing elements occur, and an indication of the final ground line and maximum calculated bearing pressures.

(c) A typical cross section or cross sections showing the elevation relationship between ground conditions and proposed grades.

(d) All details for foundations and leveling pads, including details for steps in the footings or leveling pads, as well as design maximum and minimum bearing pressures.

(e) Details of the drainage systems or other facilities required to accommodate the system.

(f) The details for connection between the wall and the tie backs.

(g) The details for diverting tieback elements around obstructions such as piles, catch basins, and other utilities.

(h) All reinforcing details, including reinforcing bar bending details.

(i) Any general notes required for the construction of the wall.

(j) A listing of the summary of quantities on the elevation sheet for each wall.

Any construction drawings required for elements meeting the requirements of Section 540 shall be submitted and shall meet the requirements of Subsection 540.04.

All design and construction details will be checked by the Agency's Structures and Materials and Research Sections. Approval of the detailed design and plans, and notification to begin the work, will be made by the Structures Section. The Contractor shall allow the Agency 30 calendar days to review and approve the Working Drawings.

Approval of the Contractor's Working Drawings shall not relieve the Contractor of any responsibility under the Contract for the successful completion of the work.

98. PRECAST CONCRETE INSPECTION. Precast concrete inspection will be in accordance with Subsection 540.06.

The Fabricator shall provide a tentative casting schedule to the Engineer and Structural Concrete Engineer for the following casting week a minimum of 3 calendar days prior (a casting week will be Sunday to Saturday). The Fabricator shall maintain a Quality Control file that shall contain at a minimum the piece identification, date and time cast, concrete test results, quantity of concrete used per element, batch quantity printout, cylinder results, and aggregate gradation and moisture.

99. METHOD OF MEASUREMENT. The quantity of Special Provision (Retaining Wall) to be measured for payment will be on a lump sum basis in the complete and accepted work.

100. BASIS OF PAYMENT. The accepted quantity of Special Provision (Retaining Wall) will be paid for at the Contract lump sum price.

Payment will be made as follows:

(a) When required Working Drawings have been submitted and approved in accordance with Section 105, a payment of 15 percent of the Contract lump sum price will be allowed.

(b) Further payments totaling 70 percent of the Contract lump sum price will be made on a pro-rated basis for the duration of the work.

(c) The remaining 15 percent of the Contract lump sum price will be paid when the retaining wall has been fully constructed and accepted by the Engineer.

Payment will be full compensation for detailing, fabricating, and installing the materials specified, including but not limited to the tieback system, geotextile fabric, concrete, bar reinforcement and welded steel wire fabric, drainage pipe, drainage aggregate, precast concrete blocks, soil reinforcements, attachment devices, fasteners, geotextile, and expansion material; preparing and submitting Working

Drawings; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Any grouting work, such as fairing out unevenness between adjacent concrete pieces and filling leveling screw holes, shear keys, transverse anchor recesses, and dowel holes, is considered incidental to the work for Special Provision (Retaining Wall).

Excavation will be paid separately under Contract item 204.25.

Backfill will be paid separately under Contract item 204.30.

Payment will be made under:

Pay Item	Pay Unit
900.670 Special Provision (Retaining Wall)	Square Foot

HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES

101. DESCRIPTION. This work shall consist of the placement of one or more courses of bituminous concrete material by hand (non-mechanical) methods on a prepared foundation in conformance with the Plans or as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans and Section 406 or Section 490 of the Standard Specifications, as appropriate.

102. GENERAL. This work will include only that bituminous concrete material placed by hand methods as required at public and/or private drives and permitted drives (such as field drives for agriculture) measured from the outside edge of shoulder to outside limit of drive, within the project limits as identified on the Plans or as directed by the Engineer. Bituminous concrete material placed by mechanical methods at these locations is excluded.

All other bituminous materials placed within the project limits, whether by hand or mechanical methods, shall be paid under the appropriate Contract pay item for bituminous mix or as otherwise specified in the Contract Documents.

103. MATERIALS. Materials shall meet the requirements of the following Subsections:

Subbase, RAP	301.02
Aggregate Shoulders, RAP	402.02
Performance-Graded Asphalt Binder	702.02
Emulsified Asphalt	702.04
Crushed Gravel for Subbase	704.05
Aggregate for Surface Course and Shoulders	704.12

Bituminous concrete material of the type specified in the Contract or as specified by the Engineer shall meet the requirements of Section 406 or Section 490, as applicable. For the purpose of this Section, bituminous concrete material to be used shall be of the type specified in the Contract or, by default, of a matching material to that adjacent material placed by mechanical methods.

104. CONSTRUCTION REQUIREMENTS. The existing surface and/or bed (subbase) upon which the bituminous concrete material is to be placed shall be

compacted to the line, grade, and shape shown on the Plans or as directed by the Engineer. All vegetation and soft, yielding, or unsuitable material shall be excavated and replaced with properly compacted material meeting the requirements of Section 301 for Subbase of Crushed Gravel, Fine Graded. Crushed RAP generated from the project may be substituted for Subbase of Crushed Gravel, Fine Graded.

The existing edge of pavement shall be saw cut to provide a vertical edge for placing the hand-placed bituminous concrete material.

Emulsified asphalt shall be applied uniformly and completely to all vertical and horizontal surfaces to be paved. All surfaces shall be free of moisture, dust, and debris prior to applying emulsified asphalt.

If cross slope allows, as determined by the Engineer, existing paved drives shall be cold planed the entire drive width to the depth of the wearing course, not to exceed 50 mm (2 inches). Unless the drive is to be paved that day, all cold planed vertical edges shall have temporary fillets placed the same day cold planning takes place.

All existing paved drives shall have all temporary fillets removed; any existing joints, cracks, and holes cleaned; all vertical and horizontal surfaces to be paved coated with emulsified asphalt; all holes filled with bituminous concrete material compacted to the level of the existing surface; and be thoroughly cleaned and dried prior to any hand-placed bituminous concrete material being placed.

Hand-Placed bituminous concrete material shall be rolled with a 1 metric ton (1 ton) mechanical roller with steel drums, or approved equal, until compacted to the satisfaction of the Engineer.

105. METHOD OF MEASUREMENT. The quantity of Special Provision (Hand-Placed Bituminous Concrete Material, Drives) to be measured for payment will be the number of square meters (square yards) complete in place in the accepted work.

Hand-placed bituminous concrete material placed less than 12.5 mm (½ inch) thick will not be measured for payment.

When any portion or all of Special Provision (Hand-Placed Bituminous Concrete Material, Drives) is removed from the project under any provisions of the Contract or as directed by the Engineer, no payment will be made for the removal, disposal, or replacement of said material.

106. BASIS OF PAYMENT. The measured quantity of Special Provision (Hand-Placed Bituminous Concrete Material, Drives) will be paid for at the Contract unit price per square meter (square yard). Payment shall be full compensation for furnishing, mixing, hauling, placing, compacting, and finishing the material specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Emulsified asphalt used as specified and backfill material meeting the requirements specified in the Plans will be considered incidental to Special Provision (Hand-Placed Bituminous Concrete Material, Drives).

When not specified for payment under separate Contract item(s), the costs of placing subbase material, cleaning existing paved surfaces, including power equipment, and for filling joints, cracks, and holes

will not be paid for directly, but will be considered incidental to Special Provision (Hand-Placed Bituminous Concrete Material, Drives).

Payment will be made under:

Pay Item	Pay Unit
900.675 Special Provision (Hand-Placed Bituminous Concrete Material, Drives)	Square Yard

BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY

107. DESCRIPTION. This work shall consist of constructing one or more courses of bituminous mixture on a prepared foundation in accordance with these specifications and the specific requirements of the type of surface being placed, and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the Plans or established by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and the appropriate provisions of Section 406 or Section 490 of the Standard Specifications.

108. MATERIALS. Materials shall meet the requirements of the following Subsections:

Performance-Graded Asphalt Binder.....702.02
Emulsified Asphalt, RS-1H or CRS-1H.....702.04
Aggregate for Marshall Bituminous Concrete Pavement...704.10(a)
Aggregate for Superpave Bituminous Concrete Pavement..704.10(b)

Aggregate shall meet requirements relating to Section 406 or 490, where so specified.

The grade of PG asphalt binder used to produce bituminous concrete pavement shall be 58-28. Substitutions will be accepted based on availability where the upper end temperature value is greater than 58°C (136°F) and/or the lower end temperature value is less than -28°C (-18°F).

109. DESIGN MIX TYPES. Design mix types may be substituted based on mix availability. Allowable mix type substitutions will be accepted on a one to one thickness relationship, except as listed in Tables A and B below.

TABLE A – ALLOWABLE 40 MM (1½") MIX TYPE IVS SUBSTITUTIONS

Design ESALs (millions)	Design	Allowable Substitution	
	490.30 Superpave Bituminous Concrete Pavement	406.25 Bituminous Concrete Pavement*	406.27 Med. Duty Bituminous Concrete Pavement*
< 0.3	TYPE IVS	TYPE III	TYPE III
0.3 to < 10	TYPE IVS	TYPE III	-

*Per Section 406.

TABLE B – ALLOWABLE 90 MM (3½") MIX TYPE IIS SUBSTITUTIONS

Design ESALs (millions)	Design	Allowable Substitution	
	490.30 Superpave Bituminous Concrete Pavement	406.25 Bituminous Concrete Pavement*	406.27 Med. Duty Bituminous Concrete Pavement*
< 0.3	TYPE IIS	TYPE I	TYPE I
0.3 to < 10	TYPE IIS	TYPE I	-

*Per Section 406

110. COMPOSITION OF MIXTURE.

(a) Gradation. Gradation shall meet the requirements of Section 406 or 490, as appropriate.

(b) Design Criteria. Design Criteria shall meet the requirements of Section 406 or 490, as appropriate.

(c) Mix Design. Standard mix design will be in accordance with Subsection 490.03 with an n value of 65 gyrations. Allowable substitutions based on pre-existing approved mix designs and/or n values for intended Contract suppliers are listed in Table C below. A request for substitutions must be submitted in writing to the Engineer a minimum of 10 working days prior to production. Any substitutions from the standard mix design or mix types as detailed in the Plans shall not result in any increase in cost to the Agency.

TABLE C – ALLOWABLE SPECIFICATION SUBSTITUTIONS

Design ESALs (millions)	Acceptable Specification Substitution		
	Superpave Bituminous Concrete Pavement (Gyrations)	Bituminous Concrete Pavement* (75 Blow)	Med. Duty Bituminous Concrete Pavement* (50 Blow)
< 0.3	50	✓	✓
0.3 to < 10	65[1]	✓	-

[1]Standard mix design specification.
*Per Section 406

(d) Quality Acceptance.

(1) General. Acceptance sampling and testing will be conducted in accordance with the Agency's Quality Assurance Program as approved by FHWA. Bituminous concrete mixtures designated under these specifications will be sampled a minimum of once per day of production or 500 metric tons (sublot), or other sublot size deemed appropriate, and evaluated by the Agency for each mix type (each mix design) in accordance with the following acceptance guidelines.

(2) Acceptance Guidelines. Temperature of the bituminous mixture shall be tested using the Verified Thermometer test method and PG Asphalt Binder content determined from the batch slip. Gradation shall be tested in accordance with

AASHTO T 30. Mixture volumetric properties (air voids and VMA) shall be calculated in accordance with Subsections 406.03(b) or 490.03(b), as appropriate.

(3) Non-Compliant Material.

a. Rejection by Contractor. The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material at no expense to the Agency. Any such new material will be sampled, tested, and evaluated for acceptance.

b. For any non-compliant material outside the production testing tolerances contained in the applicable Table 406.03C or 490.03C, the representative material (sublot) shall be assessed a mixture pay adjustment factor, PF(mix), of (-0.200).

(e) Boxed Samples. If Agency plant inspectors are not available for daily testing and inspection functions, then box samples will be taken by the Engineer at the project site to afford verification of mixture volumetrics /properties. Boxed samples will be processed and results reported to the Engineer within ten working days of being received at the Agency Central Laboratory in Berlin, Vermont. Gradation shall be tested in accordance with AASHTO T 30. Maximum Specific Gravity shall be tested in accordance with AASHTO T 209. Boxed samples will be assessed a mixture pay adjustment factor of 0.000.

111. COMPACTION. Special Provision (Bituminous Concrete Pavement, Small Quantity) will be analyzed for density according to the procedure specified below.

The density of the compacted pavement shall be at least 92.0%, but not more than 97.0%, of the corresponding daily average maximum specific gravity for each mix type (each mix design) of bituminous mix placed during each day, or placed per bridge for any bridge project. For material that falls outside of this range, payment will be made by adjusting the daily production totals in accordance with Table D:

TABLE D – DENSITY PAY FACTORS

AVERAGE DENSITY	DENSITY PAY FACTOR, PF(d)
89.0% - 90.4%	- 0.150
90.5% - 91.9%	- 0.100
92.0% - 93.4%	0.000
93.5% - 95.4%	0.150
95.5% - 97.0%	0.000
97.1% - 98.5%	- 0.100

When the Contract allows for a pay adjustment for mat density and the Agency elects to not take cores of any pavement course, the Density Pay Factor (PF(d)) will be considered equal to 0.000.

Bridges with a length equal to, or greater than, six meters (20 feet) will be cored for analyzing density of the bridge deck pavement. The minimum number of cores (taken from the center of the travel lane) shall be two, or as directed by the Engineer. Bridges with a length less than six meters (20 feet) will not be cored. Bridge decks or approaches will not be cored within three meters (10 feet) of a bridge or construction joint.

Bridge deck core areas shall be repaired with hot bituminous mix to the satisfaction of the Engineer at no additional cost to the Agency.

The cores taken for acceptance testing will be the final cores taken for determination of densities.

When the Contract does not allow for a pay adjustment for mat density the Contractor shall, prior to performing any construction operations, submit to the Engineer for approval the proposed rolling pattern and compaction equipment to be used on the project. Random investigative cores will be taken by Agency personnel on the first day's production of any pavement course, with the exception of the leveling course, to verify effectiveness of the proposed rolling pattern and equipment.

Pending results of the investigative cores, necessary adjustments to the proposed rolling pattern and/or equipment shall be made by the Contractor to achieve densities as directed by the Engineer.

112. METHOD OF MEASUREMENT. The quantity of Special Provision (Bituminous Concrete Pavement, Small Quantity) to be measured for payment will be the number of metric tons (tons) for a lot of mixture (each type) complete in place in the accepted work (Q) as determined from the weigh tickets.

The quantities of all applicable Pay Adjustments calculated for the project will be determined as specified below.

When applicable, and when the mixture pay factor, PF(mix), for a lot of Special Provision (Bituminous Concrete Pavement, Small Quantity) is less than 0.000, the measured quantity of Special Provision (Bituminous Concrete Pavement, Small Quantity) placed will be multiplied by such pay factor to determine a Mixture Pay Adjustment, (PA(mix)), to the accepted tonnage placed (Q) for that lot based on the Contract bid price (B), as follows:

$$PA(mix) = PF(mix) \times Q \times B$$

When applicable, and when the density pay factor, PF(d), for a lot of Special Provision (Bituminous Concrete Pavement, Small Quantity) is less than 0.000, the measured quantity of Special Provision (Bituminous Concrete Pavement, Small Quantity) placed that day, or placed per bridge for any bridge project, will be multiplied by such pay factor to determine a Mat Density Pay Adjustment, (PA(d)), to the accepted tonnage placed (Q) for that lot based on the Contract bid price (B), as follows:

$$PA(d) = PF(d) \times Q \times B$$

113. BASIS OF PAYMENT. The measured quantity of Special Provision (Bituminous Concrete Pavement, Small Quantity) will be paid for at the Contract unit price per metric ton (ton). Payment shall be full compensation for furnishing, mixing, hauling, and placing the material

specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment for Pay Adjustments shall be debited against the Contract prices (Lump Units) bid for the Pay Adjustment items.

The cost of repairing bridge deck core areas will not be paid for separately, but will be considered incidental to Special Provision (Bituminous Concrete Pavement, Small Quantity).

The costs of furnishing testing facilities and supplies at the plant will be considered included in the Contract unit price of Special Provision (Bituminous Concrete Pavement, Small Quantity).

The costs of obtaining, furnishing, transporting, and providing the straightedges required by Subsection 406.16 or Subsection 490.16, as appropriate, will be paid for under the appropriate Section 631 pay item included in the Contract.

The costs associated with obtaining samples for acceptance testing will be incidental to the cost of Special Provision (Bituminous Concrete Pavement, Small Quantity).

When not specified as items in the Contract, the costs of cleaning and filling joints and cracks, sweeping and cleaning existing paved surfaces, the emulsified asphalt applied to tack these surfaces, and tacking of manholes, curbing, gutters, and other contact surfaces will not be paid for directly, but will be incidental to Special Provision (Bituminous Concrete Pavement, Small Quantity).

Special Provision (Bituminous Concrete Pavement, Small Quantity) mixture approved by the Engineer for use in correcting deficiencies in the base course constructed as part of the Contract will not be paid for as Special Provision (Bituminous Concrete Pavement, Small Quantity), but will be incidental to the Contract item for the specified type of base course.

Special Provision (Bituminous Concrete Pavement, Small Quantity) mixture used to correct deficiencies in an existing pavement or to adjust the grade of a bituminous concrete surface completed under the Contract will be paid for at the Contract unit price for Special Provision (Bituminous Concrete Pavement, Small Quantity).

Payment will be made under:

Pay Item	Pay Unit
900.650 Special Provision (Mat Density Pay Adjustment, Small Quantity)(N.A.B.I.)	Lump Unit
900.650 Special Provision (Mixture Pay Adjustment) (N.A.B.I.)	Lump Unit
900.680 Special Provision (Bituminous Concrete Pavement, Small Quantity)	Ton