Revised October 16, 2017

Special Provisions for: Johnson BF0248(4) & Johnson BF0248(7)

1. LABOR SUPPLY. Available workers for this Contract may be obtained from the Vermont Department of Employment & Training's webpage at the following address: http://www.vtlmi.info/region.cfm and from the VTrans Office of Civil Rights and Labor Compliance's webpage at the following address: http://vtrans.vermont.gov/sites/aot/files/civilrights/documents/edhc/EmploymentResourceList.pdf.

2. CONTRACT COMPLETION DATE. This Contract shall be completed on or before October 19, 2018.

3. NOTICE TO BIDDERS – MANDATORY PRE-BID MEETING. Prospective Bidders are hereby notified that there will be a mandatory pre-bid meeting for this project to be held at 1:00 p.m. Eastern Standard Time on October 3, 2017 at the National Life Building Montpelier VT in Davis Conference Room N413.

   Attendance at the pre-bid meeting is 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 October 2, 2017. Inquiries submitted by this time will be kept anonymous as to the author of the inquiry. Other questions will be taken, in writing, on the date of the pre-bid meeting and following the pre-bid meeting until the deadline specified in Special Provision No.6.

   Prior to the bid opening date of October 20, 2017, 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.

4. NOTICE TO BIDDERS. The contractor is hereby notified that no field work shall be performed between July 23, 2018 and August 3, 2018 inclusive, to allow for Lamoille County Fair related traffic.

5. 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.

6. 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 AOT.ConstructionContractingInquiry@vermont.gov.

   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 11, 2017*. No exceptions will be made to this requirement.*

7. 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.

8. NOTICE TO BIDDERS – ELECTRONIC DOCUMENT MANAGEMENT. The Contractor is hereby notified that the Contractor, their subcontractors, and suppliers shall create a Doc Express account and use the program for collection and management of electronic documents. Doc Express is a web based document management program which accepts electronic documents and provides security as appropriate for each submittal. All Contract required documents, such as Working Drawings as defined in subsection 105.03 of the 2011 Standard Specifications for Construction, Progress Schedules, Mix Designs, Weld Procedures, Requests for Information and Erosion Control Plans shall be submitted at the following link: https://docexpress.com. The entire submittal and review process shall occur within Doc Express except payroll and material acceptance requirements.

   All costs associated with the use of Doc Express will be considered incidental to Item 635.11, Mobilization/Demobilization. The State will manage the Doc Express platform including Contract setup upon Contract execution.

   To create an account and for more information regarding the use of Doc Express see the information at the following link:

   https://outside.vermont.gov/agency/vtrans/external/docs/construction/Contracting/DocExpressOverviewforContractors.docx

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

10. 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:

Standard Federal EEO Specifications
Workers' Compensation; State Contracts Compliance Requirement
General Special Provisions dated October 12, 2016
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
Johnson BF 0248(4) River Management Consultation #HD-04-100 (email) dated December 16, 2015
Johnson BF 0248(4) Army Corps of Engineers Category 1 Self-Verification Form
Johnson BF 0248(4) Project Impact Data Sheets dated February 23, 2015
Johnson BF 0248(4) Utility Relocation Agreement dated February 15, 2017
Johnson BF 0248(7) River Management Consultation #HD-4-005-2016 (email) dated February 18, 2016
Johnson BF 0248(7) Individual Wetland Permit #2016-090 dated May 25, 2016
Johnson BF 0248(7) Vermont Wetlands Program Start Work Notification
Johnson BF 0248(7) Vermont Wetlands Program Permit Work Completion Certification
Johnson BF 0248(7) Army Corps of Engineers Category 2, NAE-2016-01008 dated June 13, 2016
Johnson BF 0248(7) Project Impact Data Sheets dated March 3, 2016
Contractor's EEO Certification Form
Debarment & Non-Collusion Affidavit

11. 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.

12. 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.

13. NOTICE TO BIDDERS-CARGO PREFERENCE REQUIREMENT. The contractor is hereby notified that the Contractor and Subcontractor(s) are required to follow the requirements of 46 CFR 381.7 (a)-(b). For guidance on requirements of Part 381 – Cargo Preference – U.S.Flag Vessels please go to the following web link: https://www.fhwa.dot.gov/construction/cqit/cargo.cfm.

14. NOTICE TO BIDDERS – GEOTECHNICAL DATA REPORT. The Contractor is hereby notified of the Geotechnical Data Report for this project. This report is available from the Contract Administration FTP site and "Advertised Projects" website, and is being provided during the bid solicitation period for this project for information and bidding purposes only.

Johnson BF 0248(4) Geotechnical Engineering Report by CHA–December 2015
Johnson BF 0248(4) Geotechnical Recommendations – Addendum – May 11, 2016
Johnson BF 0248(7) Geotechnical Recommendations – March 14, 2016

15. NOTICE TO BIDDERS – TRAFFIC MANAGEMENT PLAN. The Contractor is hereby notified of the Traffic Management Plan (TMP) for this project. This report is available from the Contract Administration FTP site and "Advertised Projects" website, and is being provided during the bid solicitation period for this project for information and bidding purposes only.

Johnson BF 0248(4)(7) Combined Traffic Management Plan dated June 20,2016

16. 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;	Highway Safety and Design Program Manager
Structures Engineer	Structures Program Manager
Chief of Local Transportation Facilities	Director of Municipal Assistance Bureau
Construction Engineer	Construction Manager
Materials and Research Engineer	Materials Manager
Director of Operations	Director of Maintenance and Operations Bureau

17. NOTICE TO BIDDERS - INCENTIVE/DISINCENTIVE (I/D). The Agency's intent is to have the bridge closure periods (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) Work Completion Requirements.

(1) Johnson BF 0248(4), Bridge 1, Bridge 2.

a. During the BCP, access must be provided at all times to properties on the "island" between bridges 1 and 2 **except as otherwise specified herein. Access Plan for Romero property during construction, as detailed in Special Provision No. 131 on Page 66.**

(2) Johnson BF 0248(4), Bridge 1, Bridge 2 and Johnson BF 0248(7), Bridge 4.

a. No daily lane closures will be allowed before or after either BCP to progress work items outside EPSC and Traffic Control. Two-way, two lane traffic shall be maintained at both project sites for the time period between BCP's.

(b) Dates.

(1) Johnson BF 0248(4), Bridge 1, Bridge 2. The allowable BCP will be forty-two (42) consecutive calendar days between April 30, 2018 and July 20, 2018, inclusive. The forty-two (42) consecutive calendar day BCP is herein defined as the I/D period. During the BCP, the Contractor will be allowed to work on the Bridges for up to 14 hours per day between sunrise and sunset, 7 days per week, including holiday periods. **The duration between sunset and sunrise is herein defined as nighttime work.**

(2) Johnson BF 0248(7), Bridge 4. The allowable BCP will be twenty-eight (28) consecutive calendar days between August 6, 2018 and October 7, 2018, inclusive. The twenty-eight (28) consecutive calendar day BCP is herein defined as the I/D period. During the BCP, the Contractor will be allowed to work on the Bridge for 16 hours per day, 7 days per week, including holiday periods. **The duration between sunset and sunrise is herein defined as nighttime work.**

Night work will be allowed during the BCP. See Special Provision No. **18** NOTICE TO BIDDERS – REQUIREMENTS FOR NIGHTTIME WORK and No. **19** NOTICE TO BIDDERS – NIGHTIME WORK RESTRICTIONS for additional information and requirements.

(3) Johnson BF 0248(4), Bridge 1, Bridge 2 and Johnson BF 0248(7), Bridge 4. The Contractor shall submit to the VAOT Construction Section for review and approval a certified letter indicating the BEGIN CONSTRUCTION DATE for each BCP period. This letter shall be received by the Construction Section a minimum of twenty-one (21) calendar days prior to the BEGIN CONSTRUCTION DATE indicated in the letter. The BEGIN CONSTRUCTION DATE shall be determined by the Contractor.

The I/D period as established above for this Contract is a fixed date and will not be changed for any reason unless done so by the Secretary and only under extreme conditions as determined by, and at the sole discretion of the Secretary.

There shall be a pre-closure meeting held on site with the Contractor's Superintendent, Contractor's Project Manager, all subcontractors performing work within each BCP, the Engineer, the Project Manager, the Town of Johnson, the Johnson and Hyde Park Fire Departments, the local Ambulance Service, Vermont State Police and Lamoille County Planning Commission (LCPC) to discuss durations of work, types of night work, work sequencing, etc. The Contractor shall be responsible for setting this meeting up and making appropriate contacts. This meeting shall be held a minimum of 14 days prior to each BCP.

There shall be a public information meeting. The Contractor's Superintendent and Contractor's Project Manager shall be available to attend. The Contractor shall be prepared to discuss the construction schedule with the public. The Public Outreach Coordinator shall be responsible for setting this meeting up and making appropriate contacts. This meeting shall be held a minimum of Seven (7) days prior to each BCP.

In addition, weekly meetings between the Contractor, Engineer, and other pertinent parties as determined by the Engineer shall be held to discuss the project progress and future construction activities, and current CPM progress schedules and narratives.

All Prefabricated Bridge Units (PBU) and prefabricated concrete elements shall be authorized for shipment prior to each BCP. The bridge shall remain open to traffic until the prefabricated elements are authorized for shipment.

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

(1) Johnson BF 0248(4), Bridge 1, Bridge 2.

a. Wearing course of pavement placed,

b. Permanent pavement markings,

c. Permanent guardrail, and

d. All detour signs removed or covered.

(2) Johnson BF 0248(7), Bridge 4.

a. Wearing course of pavement placed,

b. Permanent pavement markings,

c. Permanent guardrail, and

d. All detour signs removed or covered.

(d) Pay Schedule.

(1) Johnson BF 0248(4), Bridge 1, Bridge 2.

The Contractor will receive a lump sum compensation of forty-eight-thousand dollars ($48,000) for completing the Identified Work before the end of the I/D period.

In addition, the Contractor will be compensated at a rate of four-hundred dollars ($400.00) per hour that the Identified Work is completed prior to the end of the I/D period, up to a maximum total payment as specified herein. Only full hours where the new bridge is opened by 6:00 a.m. will count toward this extra incentive payment.

The maximum amount payable under the incentive clause shall be ninety—six-thousand dollars ($96,000) (including the lump sum payment).

For each hour after the end of the I/D period that the Identified Work remains uncompleted, the Contractor will be assessed a disincentive at a rate of four-hundred dollars ($400.00) per hour. The full hourly disincentive amount will be assessed for each hour that traffic is not allowed on the bridge for any portion of the hour. 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.

(2) Johnson BF 0248(7), Bridge 4.

The Contractor will receive a lump sum compensation of twenty-seven-thousand-three-hundred dollars ($27,300) for completing the Identified Work before the end of the I/D period.

In addition, the Contractor will be compensated at a rate of four-hundred dollars ($400.00) per hour that the Identified Work is completed prior to the end of the I/D period, up to a maximum total payment as specified herein. Only full hours where the new bridge is opened by 6:00 a.m. will count toward this extra incentive payment.

The maximum amount payable under this incentive clause shall be forty-six-thousand-five-hundred dollars ($46,500) (including the lump sum payment).

For each hour after the end of the I/D period that the Identified Work remains uncompleted, the Contractor will be assessed a disincentive at a rate of four-hundred dollars ($400.00) per hour. The full hourly disincentive amount will be assessed for each hour that traffic is not allowed on the bridge for any portion of the hour. 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.

(e) 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.

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

18. NOTICE TO BIDDERS – REQUIREMENTS FOR NIGHTTIME WORK. The Contractor is hereby notified that night work will not be allowed during the bridge closure period for Johnson BF 0248(4), Bridge 1, Bridge 2, but will be allowed during the bridge closure period for Johnson BF 0248(7), Bridge 4.

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) **(**BF0248(7)).

19. NOTICE TO BIDDERS – NIGHTTIME WORK RESTRICTIONS. **Nighttime work shall be conducted in accordance with** the Town of Johnson noise ordinance adopted under authority of 24 V.S.A 2291 (14) and 24 V.S.A. Chapter 59. **http://townofjohnson.com/wp-content/uploads/2014/02/Noise-Waiver-request-form.pdf**

The Contractor is hereby notified that during the bridge closure period (BCP), no **nighttime** work shall be performed 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 **an unacceptable** noise threshold **during nighttime work** 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.

20. 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.

(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 signs installed on said posts.

(f) 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.

(g) 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.

21. 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.

22. ENVIROMENTAL.

Johnson BF 0248(4), Bridge 1, Bridge 2.

This project shall be subject to Avoidance and Minimization Measures to protect the habitat and hibernacula of the northern long-eared bat. Measures applicable to this project include, Time-of-Year (TOY) restrictions for any potential impacts to suitable bat habitat, which include, but are not limited to trees ≥ 3" and/or habitat features on bridge structures.

It is anticipated that the Contractor will be required to cut trees ≥3" in diameter and/or conduct bridge related activities within the identified project limits as part of the work. An acoustic survey of the project area resulted in no detected presence of the species. Therefore, tree cutting, and bridge related activities, within the project limits may occur without any TOY restrictions.

The Contractor is hereby made aware of the potential for TOY restrictions related to proposed Waste, Borrow and Staging areas. Cutting trees ≥ 3" in diameter outside of the contract project limits shall require review under Section 105.25 Control of Waste, Borrow, and Staging Areas.

Johnson BF 0248(7), Bridge 4.

This project shall be subject to Avoidance and Minimization Measures to protect the habitat and hibernacula of the northern long-eared bat. Measures applicable to this project include, Time-of-Year (TOY) restrictions for any potential impacts to suitable bat habitat, which include, but are not limited to trees ≥ 3" and/or habitat features on bridge structures.

It is anticipated that the Contractor will be required to cut trees ≥3" in diameter and conduct bridge related activities within the identified project limits as part of the work. An assessment of the project limits resulted in a finding of no suitable habitat. Therefore, tree cutting, and bridge related activities, within the project limits may occur without any TOY restrictions.

The Contractor is hereby made aware of the potential for TOY restrictions related to proposed Waste, Borrow and Staging areas. Cutting trees ≥ 3" in diameter outside of the contract project limits shall require review under Section 105.25 Control of Waste, Borrow, and Staging Areas.

23. UTILITIES.

Johnson BF 0248(4).

Existing aerial facilities owned by the Village of Johnson Water and Light Department, Comcast Communications and FairPoint Communications will be adjusted, as necessary, by employees or agents of the above companies in approximate accordance with the "Utility Relocation Layout" shown on the project plans.

Existing underground facilities, extending from the utility pole at plan station 17+03 RT to the utility pole at plan station 18+28 RT, which are owned by the Village of Johnson, Comcast Communications and FairPoint Communications will not require adjustment. The Contractor is cautioned to protect these facilities from damage.

Existing underground municipal sewer facilities owned by the Village of Johnson will not require adjustment. The Contractor is cautioned to protect these facilities from damage. Exploratory excavation may be necessary to protect these facilities from damage.

There is an existing private water line which crosses VT Route 100C at approximate plan station 13+90. The Contractor is cautioned to protect this water line from damage. Exploratory excavation may be necessary to protect this water line.

Contacts for these utilities are:

Village of Johnson
Troy Dolan (802)635-2301 [(802)730-2993 Cell]

Comcast Communications
Bruce Bowser (802) 255-1801 EXT 14 [(802)316-9324 Cell]

FairPoint Communications
John Pomeroy (802)295-8187 [(802)735-7029 Cell]

Johnson BF 0248(7).

Existing aerial facilities owned by Vermont Electric Cooperative, Comcast Communications and FairPoint Communications will not require adjustment. The Contractor is cautioned to protect these facilities from damage.

Contacts for these utilities are:

Vermont Electric Cooperative
Chris Sheltra (802)730-1139 [(802)793-7252 Cell]

Comcast Communications
Bruce Bowser (802)255-1801 EXT 14 [(802)316-9324 Cell]

FairPoint Communications
John Pomeroy (802)295-8187 [(802)735-7029 Cell]

Johnson BF 0248(4) and BF 0248(7).

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.

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."

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 the towns prior to excavation and it shall protect and restore any utilities damaged within the project limits as set forth 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.

24. 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 stopped or parked shall be at least 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.

25. SPECIAL CONSTRUCTION REQUIREMENTS.

(a) Unless otherwise permitted in writing by the Engineer, and except as otherwise allowed under Special Provision No. 16 the Contractor shall not work during the holiday periods Memorial Day, July Fourth, Labor Day, Columbus Day, Veterans Day, and Thanksgiving Day. 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, 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) There are special events throughout the year 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
Lamoille County Field Days (add days for setup and removal of equipment)	July 27-29, 2018 (See Special Provision #4)

Contacts to get more information on the above events:

Municipal Office Building
Hours: Mon-Friday; 7:30-4:00 Phone: (802) 635-2611 Fax: 635-2393

293 Lower Main West, P.O. Box 383 (mailing address)
Johnson, VT 05656

Town Administrator
Brian Story (802) 635-2611 ext. 308
tojadministrator@townofjohnson.com

Village Manager
Meredith Birkett (802) 635-2611 ext. 311
vojmanager@townofjohnson.com

Special events that may conflict with Contractor operations are not limited to that listed above. There will be no extra compensation paid to the Contractor for any inconvenience caused by working around these or other event(s).

ASPHALT PRICE ADJUSTMENT

26. 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.

27. 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 $ 420.00 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 item 900.680 Special Provision (Bituminous Concrete Pavement, Small Quantity) and item 900.680 Special Provision (Bituminous Concrete Pavement, Type IVB) will be included for adjustment.

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 652 – EROSION PREVENTION & SEDIMENT CONTROL PLAN

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

29. 652.01 DESCRIPTION. This work shall consist of designing, furnishing, and submitting for acceptance modifications to the Contract Erosion Prevention & Sediment Control Plan (here into 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.

30. 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.

31. 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.”

32. 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 900.620 Special Provision(CPM Schedule).

33. 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.

34. 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.

35. 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.

36. 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.

37. 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 (BF0248(4))	Lump Sum
652.20 Monitoring EPSC Plan (BF0248(4))	Hour
652.30 Maintenance of EPSC (N.A.B.I.)(BF0248(4))	Lump Unit
652.10 EPSC Plan (BF0248(7))	Lump Sum
652.20 Monitoring EPSC Plan (BF0248(7))	Hour
652.30 Maintenance of EPSC (N.A.B.I.)(BF0248(7))	Lump Unit

SECTION 690 – FUEL PRICE ADJUSTMENT

38. 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.

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

40. 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.

41. 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 first 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 $2.74 per gallon. The index price (retail) for diesel fuel is $2.72 per gallon. (Found on Contract Admin website – updated monthly: http://vtrans.vermont.gov/contract-admin/construction)

(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.

(c) 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.

(d) 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

(e) 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.

(f) 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
		English	English	English	English
Excavation	203.15	GAL/CY	0.29	0.15	3,000
	203.16	GAL/CY	0.39	0.18	2,500
	204.25	GAL/CY	0.35	0.16	2,500
	208.3	GAL/CY	0.35	0.16	2,000
	208.35	GAL/CY	0.39	0.18	2,000
Borrow	203.3	GAL/CY	0.29	0.15	3,000
	203.31	GAL/CY	0.29	0.15	3,000
	203.32	GAL/CY	0.29	0.15	3,000
Granular Backfill For Structures	204.3	GAL/CY	1	0.16	1,500
Cold Planing, Bituminous Pavement	210.1	GAL/SY	0.12	0	15,000
Subbase	301.25	GAL/CY	0.85	0.56	1,000
	301.35	GAL/CY	0.85	0.56	1,000
Reclaimed Stabilized Base	310.2	GAL/SY	0.04	0	35,000
Pavement	406.25	GAL/TON	3.06	0.86	500
	406.27	GAL/TON	3.06	0.86	500
	490.3	GAL/TON	3.06	0.86	500
Cold Mixed Recycled Bituminous Pavement, Portland Cement	900.675	GAL/SY	0.96	0.75	1
Hand-Placed Bituminous Concrete Material, Drives	900.675	GAL/SY	3.06	0.86	500
Bituminous Concrete Pavement, Small Quantity	900.680	GAL/TON	3.06	0.86	500
Material Transfer Vehicle	900.680	GAL/TON	0.1	0	1
Concrete	501.32	GAL/CY	0.75	0.25	1,000
	501.33	GAL/CY	0.75	0.25	1,000
	501.34	GAL/CY	0.75	0.25	1,000
Stone Fill	613.1	GAL/CY	0.39	0.18	2,000
	613.11	GAL/CY	0.39	0.18	2,000
	613.12	GAL/CY	0.39	0.18	2,000
	613.13	GAL/CY	0.39	0.18	2,000
Guardrail	621.2	GAL/LF	0.18	0.05	5,000
	621.205	GAL/LF	0.18	0.05	5,000
	621.21	GAL/LF	0.18	0.05	5,000
	621.215	GAL/LF	0.18	0.05	5,000

SECTION 900 – SPECIAL PROVISION ITEMS

E-STONE TYPE E4

42. DESCRIPTION. This work shall consist of furnishing and placing stone fill material inside of, as well as upstream and/or downstream of, a structure to facilitate aquatic organism passage and mimic the native channel

43. MATERIAL. Stone Fill shall be approved, hard, blasted, angular rock other than serpentine rock containing the fibrous variety chrysotile (asbestos) supplemented with material excavated from the channel and/or the tailings of a topsoil screening operation, with gradation adjusted to conform to the following:

Type EI. The longest dimension of the stone shall be at least eighteen (18) inches, and at least fifty (50) percent of the volume of the stone in place shall have a least dimension of twelve (12) inches, and at least twenty five (25) percent of the particles shall have a maximum dimension of two (2) inches and be well graded material.

Type E2. The longest dimension of the stone shall be at least twenty four (24) inches, and at least fifty (50) percent of the volume of the stone in place shall have a least dimension of eighteen (18) inches, and at least twenty five (25) percent of the particles shall have a maximum dimension of two (2) inches and be well graded material.

Type E3. The longest dimension of the stone shall be at least thirty six (36) inches, and at least fifty (50) percent of the volume of the stone in place shall have a least dimension of twenty four (24) inches, and at least twenty five (25) percent of the particles shall have a maximum dimension of two (2) inches and be well graded material.

Type E4. The longest dimension of the stone shall be at least forty eight (48) inches, and at least fifty (50) percent of the volume of the stone in place shall have a least dimension of thirty six (36) inches, and at least twenty five (25) percent of the particles shall have a maximum dimension of two (2) inches and be well graded material.

Bed material shall be approved by the Engineer and the Agency of Natural Resources prior to use.

44. PLACING. Stone fill shall be placed at as shown in the Plans. Place the stone such that it does not cause segregation or damage to the structure. Fill in voids in the stone with a mixture of fines from the existing stream bed material. Fill voids by hand tamping with metal tamping rods, plate compactors, and water pressure with a metal wand to reach between stones.

Once all material has been placed in the stream channel, the Contractor shall slowly wet the stream to minimize the effects of the initial sediment pulse. Every attempt shall be made to minimize the movement of sediment downstream of the site.

There shall be no subsurface flow upon final inspection.

45. METHOD OF MEASUREMENT. The quantity of Special Provision (E-Stone Type E2) to be measured for payment will be the number of cubic yards installed in the complete and accepted work, measured within the limits shown on the Plans or as directed by the Engineer.

46. BASIS OF PAYMENT. The accepted quantity of Special Provision (E-Stone Type E2) will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for furnishing, transporting, and placing the material specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.608 Special Provision (E-Stone Type E4)	Cubic Yard

HIGH PERFORMANCE CONCRETE, RAPID SET

47. 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.

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

High Early Strength Portland Cement……701.04

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

(a) The mix shall be classified as conventional or self-consolidating concrete (SCC) mix. If the intended slump is greater than 9” then it shall be classified as an SCC mix.

(b) Compressive Strength.

28 day compressive strength - 5000 psi

(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.

(2) Spread range will be established for the initial submittal of mix for approval. The J-Ring Test will be conducted per ASTM C1621. The upper and lower ranges of the spread shall not have a difference of greater than 2 inches between the J-Ring and spread test or VSI greater than 1. Spread test, ASTM C1611, will be done for the production mix only, unless the Engineer requests J-Ring testing to be done.

(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 by procedure 11.1.2 and 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.

50. 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) calendar days prior to the first placement, the Contractor shall produce and place a 2 cubic yard trial batch, 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) calendar 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 slump/spread shall be within +/- 2 inches for conventional mix or +/- 3 inches for SCC, but still be within the established range limits for conventional or SCC. J-Ring test will be done for SCC mix with the difference between the J-Ring and spread test not greater than 2 inches. The Contractor shall provide qualified personnel to test spread, air content, and temperature of the trial batch. A trial batch will be required for each mix design used on the project.

If SCC will be used in work with a sloped finished surface, the Contractor shall produce a mock-up during the trial batch to demonstrate that the mix can be finished with the sloped surface.

(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.

51. 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 compressive strength as specified in the contract documents, verified by testing of field cylinders.

52. 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 in the contract documents.

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. There shall also be a hand held grinding stone included with the compression testing machine. The hand held grinding stone will be used to grind the top of the cylinders to relieve any sharp projections on the cylinder surface. 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.

If an independent lab is proposed to be used to test the field-cured cylinders instead of a portable compression testing machine, 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 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.

53. METHOD OF MEASUREMENT. The quantity of Special Provision (High Performance Concrete, Rapid Set) to be measured for payment will be the number of 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 1 ½ inches or less in depth, or any pipe less than 8 inches in diameter.

54. 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 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

INCENTIVE/DISINCENTIVE (I/D)

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

To provide a common proposal for all bidders and expedite the incentive payment process, the Agency has entered an amount of ninety-six-thousand ($96,000) dollars in the proposal for Johnson BF0248(4), Bridge 1 and 2 and an amount of forty-six-thousand-five-hundred ($46,500) in the proposal for Johnson BF 0248(7), Bridge 4 to become part of the Contractor's total bid. The dollars amounts entered by the Agency are the maximum amount payable under the incentive clause but the actual payment/deduction will be computed and paid/deducted per this special provision and the stipulations of Special Provision No 15.

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

(a) The quantity of incentive to be paid will be the accepted quantity of incentive computed per the provisions of the special provision No 16. For the incentive payment as described in part (d) of Special Provision No. 16, the Contractor will be paid in the next bi-weekly estimate in which the Contractor has satisfactorily met the requirements of I/D.

(b) The quantity of disincentive to be deducted will be the quantity of disincentive computed per the provisions of the special provision No 16. For the assessed disincentive as described in part (d) of Special Provision No. 16, 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
900.615 Special Provision (Incentive/Disincentive) (N.A.B.I.)(BF 0248 (4))	Dollar
900.615 Special Provision (Incentive/Disincentive) (N.A.B.I.)(BF 0248 (7))	Dollar

CRITICAL PATH METHOD (CPM) SCHEDULE

56. 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.

57. 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 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 28 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.

58. 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.

59. 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:

    (a) Actual start dates of each activity started;

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

    (c) 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.

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

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

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

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

(c) 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;

(d) 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;

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

(f) 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.

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

62. 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.

63. 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.

64. 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

PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE

65. DESCRIPTION. This work shall consist of manufacturing, transporting, and erecting concrete/steel composite prefabricated bridge units (PBU's) as shown on the Plans.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Sections 501, 506, 507, and 508 of the Standard Specifications.

66. MATERIALS. Materials shall meet the requirements of Subsections 501.02, 506.02, 507.02, 508.02, and the following:

Concrete Repair Material.....780.01-780.04

67. GENERAL FABRICATION REQUIREMENTS. The structural steel furnished under this Section shall be fabricated in a plant meeting the requirements of Subsection 506.03. After fabrication, the structural steel shall be transported to a location, approved by the Agency where the steel will be shop galvanized/metallized/painted, or where the remainder of the composite superstructure unit shall be fabricated.

The Fabricator or Contractor constructing the reinforced concrete portion of the PBU's shall:

(a) have demonstrated experience in forming, casting, curing, and finishing High Performance Concrete superstructure decks in accordance with Section 501;

68. SUBMITTALS. As soon as practical after award of the Contract, all required information shall be prepared by the Contractor or Fabricator(s). All information shall be submitted by the Contractor as a single complete submittal. Submittals shall be in accordance with Subsection 105.03 and shall include the following:

(a) Structural Steel. In accordance with Subsection 506.04.

(b) Concrete. In accordance with Subsection 540.04, with the exception that when the PBU's have been designed by the Agency and no modifications to that design are being made by the Fabricator or Contractor, no structural design calculations are required.

(c) Reinforcing Steel. In accordance with Subsection 507.03.

(d) Temporary Assembly Plan and Procedure.

(e) Temporary Support Elevations.

(f) Method of Supporting the Screed.

(g) Design of Lifting Attachments.

(h) Shipping/Installation Procedures.

69. INSPECTION. Structural steel shall be inspected by the Agency in accordance with Subsection 106.04 and Section 506.

Concrete elements furnished and the work performed herein shall be inspected by the Agency. The inspector shall have the authority to reject any material or work that does not meet the requirements of these Specifications. Advance notification of at least two (2) weeks must be provided by the Contractor to the Agency's Engineer and the Structural Concrete Engineer concerning the proposed intention to commence work. A minimum of five (5) working days notification must be provided to the Structural Concrete Engineer by the Contractor to confirm the fabrication start date.

Prior to placing any concrete elements produced under these Specifications, all materials shall have all applicable certifications approved in accordance with Subsection 700.02.

70. FABRICATION.

(a) Forming Members. Forms and formwork shall meet the requirements of subsection 501.09. Relative bearing elevations shall be within ± 0.01' of that shown on the Plans.

(b) Structural Steel. Structural steel shall be fabricated in conformance with Section 506. All diaphragms shown on the Plans shall be installed prior to placing any concrete formwork.

(c) Welding. All welding shall conform to the requirements of Subsection 506.10.

(d) Reinforcing Steel. Bar reinforcement shall be furnished and installed in conformance with Section 507.

(e) Concrete. Concrete mix and proportioning shall meet the requirements of Subsection 501.03 for Concrete, High Performance Class A. Concrete shall be produced and tested in accordance with Subsections 501.04 through 501.07.

(f) Pre-Production Meeting. Unless the Engineer deems, in writing, that a pre-production meeting is unnecessary, then a pre- production meeting shall be held a minimum of seven (7) calendar days prior to beginning concrete placement. The pre-production meeting shall be attended by, and including but not limited to, the Crew Supervisor, Contractor Project Manager, Concrete Producer, Resident Engineer, Construction Structures Engineer, and Design Project Manager and/or Designer.

(g) Placing Concrete. Concrete placement shall conform to the requirements of Subsection 501.10.

Concrete shall not be deposited in the forms until the Agency representative has approved placement of the reinforcement and inserts. The concrete shall be vibrated internally, externally, or a combination thereof to the required consolidation. The vibrating shall be done with care and in such a manner that:

(1) Concrete is uniformly consolidated.

(2) Displacement of reinforcement and inserts is avoided.

(3) Acceptable finish surfaces are produced.

(h) Curing. Curing shall meet the requirements of Subsection 501.17.

(i) Removal of Forms. Forms shall not be removed until the curing period has ended.

(j) Concrete Finishing. Finishing shall conform to the requirements of Subsection 501.16.

(k) Dimensional Tolerances.

(1) Geometry of PBU.

a. Length (Each Unit). ± 3/4" (Adjacent unit lengths shall not vary by more than 3/4"

b. Width. ± 3/8"

c. Deck Thickness. + 3/8", - 1/4"

d. Deviation from Diagonals. ± 3/4" (horizontal)

e. Deviation from End Squareness or Skew. ± 3/4" (horizontal)

f. Girder Spacing. ± 1/2" (within a unit)

g. Horizontal Alignment. ± 3/8" (Deviation from straight line parallel to the centerline of the unit)

h. Insert Location. ± 3/8"

(2) Reinforcing.

a. Spacing. ± 1" (non-cumulative)

b. Cover (Top and Bottom Mat). ± 1/4"

(3) Field Installation.

a. Vertical deviation between units prior to closure pour concrete placement shall not exceed 1/4".

b. Deviation in joint width between units shall be ± 1/2".

(l) Acceptance of Units. Individual precast units will not be accepted for any of the following reasons:

(1) Fractures or cracks passing through the deck.

(2) Camber that does not meet the requirements in the approved Fabrication Drawings.

(3) Honeycombed open texture.

(4) Dimensions not within the allowable tolerances as specified.

(5) Separation of the concrete deck from the steel girders.

(6) Defects that indicate proportioning, mixing, and molding not in compliance with the Specifications.

(7) Damaged ends where such damage would prevent making a satisfactory joint.

(8) Units with crack(s) within any part of the concrete that is/are greater than 0.03" in width.

(9) Significant damage to the units during transportation, erection, or construction as determined by the Engineer.

(10) Units not fabricated in accordance with the Contract Documents.

(m) Repairing/Patching. Units that contain minor defects caused by manufacture or handling may be repaired at the manufacturing site. Repair procedures shall be in accordance with the approved Quality Control Plan and require approval by the Engineer. Minor defects are defined as holes, honeycombing, or spalls which are 6 inches or less in diameter and do not penetrate deeper than 1 inch into the concrete. Surface voids or "bugholes" that are less than 5/8 inch in diameter and less than 1/4 inch deep need not be repaired. Repairs shall be made using an overhead and vertical concrete repair material satisfactory to the Engineer. The repair material shall be cured as specified by the manufacturer. The Engineer shall approve final repairs.

(n) Cracking. Crack widths less than 0.01" shall be sealed with a penetrating sealer using Agency approved materials and procedures. Crack widths measuring 0.01" to 0.03" shall be epoxy injected using Agency approved materials and procedures. At the Engineer's discretion, cracked members shall be repaired or replaced at the Contractor's expense.

(o) Labeling. Each unit shall be clearly and permanently labeled on the underside of the deck (in the vicinity of the upstation end diaphragm) with the following information:

(1) Manufacturer

(2) Date of Manufacture

(3) Mark Number

(p) Production Site Handling. Units shall not be lifted, moved, or otherwise disturbed until the concrete has reached full design strength.

(q) Pre-Assembly. The units shall be pre-assembled at the fabrication location to assure proper match between adjacent units before shipping to the project site, to the satisfaction of the Agency.

(r) Shipping. Units shall not be shipped until the minimum 28-day strength is attained and they have been stamped by the Agency. A 48-hour advance notice of the loading and shipping schedule shall be provided. The units shall be secured on the vehicle in order that no fatigue cracking will occur during transport. The Contractor shall secure the necessary hauling permits.

71. HANDLING. Handling shall be performed in accordance with Subsection 540.09.

72. INSTALLATION.

(a) General. The PBU's shall be fabricated in accordance with the applicable Sections of the specifications and/or the Special Provisions for each respective item. Construction procedures and permissible variations other than those contained herein shall be submitted for approval.

(b) Erection Plan. Cranes, lifting devices, and other equipment for erecting PBU superstructure shall be of adequate design and capacity to safely erect, align, and secure all members and components in their final positions without damage. The Contractor is solely responsible for the methods and equipment employed for the erection of the precast concrete/steel composite superstructure units.

The Contractor shall submit Construction Drawings in accordance with Section 105 for the methods and sequence of precast concrete/steel composite superstructure unit erection, the temporary bracing, and the equipment to be used for the erection. The erection plan shall include the necessary computations to indicate the magnitude of stress in the segments during erection and to demonstrate that all of the erection equipment has adequate capacity for the work to be performed. The erection plan shall contain provisions for all stages of construction, including temporary stoppages.

The PBU's may be used to support equipment prior to placement of the closure pour concrete only with written permission of the Engineer. The proposed use of the precast concrete/steel composite superstructure units for support of equipment shall be detailed in the erection plan.

Submittal of the erection plan is for the Agency's information only, and shall in no way be construed as approval of the proposed method of erection. Unless otherwise directed by the Engineer, the Contractor shall follow the erection plan as submitted.

(c) Erection of Units. Erection of units shall not proceed until substructure concrete has been cured for the minimum length of time specified in the Plans or appropriate Specifications. Units shall be installed to the correct line and grade as shown on the approved drawings and as indicated in the approved erection procedure. Prior to setting units and to avoid torsion stresses, bearing elevations within a given PBU shall be adjusted to match relative elevations used during the deck casting operations. After all the units are erected, they shall be inspected to ensure the correctness of their location.

(d) Matching Elevation of Units During Erection. Adjacent units shall match elevation within 1/4 inch vertically (along longitudinal edges) and 1/4 inch vertically at the end of units.

(e) Filling and Sealing Longitudinal Joints. Prior to placement of closure pour concrete or grout material, the surface of the joint shall be free of any material, such as oil, grease, or dirt, which may prevent bonding of the sealing materials.

(f) Sealing of Lifting Holes. After the units are in their final locations, a bonding agent shall be applied and the lifting holes filled with a Mortar, Type IV. A removable form shall be provided at the bottom surface of the deck to retain the grout.

(g) Loading. Units may be loaded upon erection and before the joints are sealed only with written permission of the Engineer and in accordance with the approved erection procedure. Once the joints are sealed, no further loading or unloading of the units will be allowed until joint material has properly and finally cured and as approved by the Engineer.

(h) Final Repairs. After the installation work is complete, remaining concrete defects, holes for inserts, and lifting holes shall be repaired as indicated and approved by the Engineer.

(i) Grout. Grout shall be placed in accordance with the requirements of Subsection 540.11.

73. METHOD OF MEASUREMENT. The quantity of Special Provision (Prefabricated Bridge Unit Superstructure) to be measured for payment will be the number of Linear Foot installed in the complete and accepted work. Measurement shall be the end to end length of the girder along centerline.

74. BASIS OF PAYMENT. The accepted quantity of Special Provision (Prefabricated Bridge Unit Superstructure) will be paid for at the Contract unit price per Linear Foot. Payment will be full compensation for detailing, fabricating, repairing, quality control testing, transporting, handling, and installing the materials specified, including concrete, reinforcing steel, structural steel, shear studs, connectors, and shims; for designing and installing lift brackets and any other material contained within or attached to the members; for any grouting work required; for furnishing and implementing the erection plan; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.640 Special Provision (Prefabricated Bridge Unit Superstructure)(FPQ)	Linear Foot

PRESTRESSED CONCRETE SOLID SLABS

75. DESCRIPTION. This work shall consist of manufacturing, transporting, and erecting precast prestressed concrete members.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 510 of the Standard Specifications.

76. DESIGN AND DRAWINGS. All design details shall be in accordance with the most recent edition of the VTrans Structures Design Manual available on the Agency's website, the AASHTO LRFD Bridge Design Specifications, and the AASHTO LRFD Bridge Construction Specifications.

77. METHOD OF MEASUREMENT. The quantity of Special Provision (Prestressed Concrete Solid Slabs) to be measured for payment will be the number of linear feet of the specified type used in the complete and accepted work.

78. BASIS OF PAYMENT. The accepted quantity of Special Provision (Prestressed Concrete Solid Slabs) will be paid for at the Contract unit price per linear foot for the type specified. Payment will be full compensation for detailing, fabricating, repairing, quality control testing, transporting, handling, and installing the materials specified, including the concrete, reinforcement, prestressing steel, transverse ties, enclosures for prestressing steel, anchorages, mortar, anchor rods, any other material contained within or attached to the members, for furnishing and implementing the erection plan, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Any grouting work other than shear keys, such as fairing out unevenness between adjacent units and filling leveling screw holes, transverse anchor recesses, and dowel holes, is considered incidental to the work for Special Provision (Prestressed Concrete Solid Slabs).

Payment will be made under:

Pay Item	Pay Unit
900.640 Special Provision (Prestressed Concrete Solid Slabs)(15” x 36”)(FPQ)	Linear Foot
900.640 Special Provision (Prestressed Concrete Solid Slabs)(15” x 48”)(FPQ)	Linear Foot

CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE

79. DESCRIPTION. This work shall consist of manufacturing, transporting, handling, and erecting precast concrete structure components fabricated by the Contractor at a location other than a Precast Concrete Institute (PCI) or National Precast Concrete Association (NPCA) certified precast concrete facility.

80. MATERIALS. Materials shall meet the requirements of Subsections 501.02, 507.02, and 540.02.

(a) Concrete. Concrete shall meet the requirements of Subsection 540.05, with the exception that the requirements of part (a) do not apply. In lieu of a mix meeting the requirements of Subsection 540.05, the Contractor may provide a mix meeting the requirements of Section 501 for Concrete, High Performance Class A or Concrete, High Performance Class B, provided that the design strength as shown in the Plans as well as that required for lifting and handling is met.

81. GENERAL FABRICATION REQUIREMENTS. Unless noted otherwise herein, Contractor-fabricated Precast Concrete (CFPC) produced and paid under this Special Provision shall meet the requirements of Sections 501, 507, and 540.

82. SUBMITTALS. As soon as practical after award of the Contract, all required information shall be prepared and submitted. Fabrication drawings, mix designs, and erection plans shall be submitted as separate submittals.

If the contractor proposes a different configuration than what is provided in the contract plans then a complete copy of the structural design calculations for the CFPC shall be submitted accompanying / with Construction Drawings in accordance with Section 105. The design calculations shall substantiate that the proposed precast concrete satisfies the design parameters of the Contract. The applicable design code will be the latest edition of the AASHTO LRFD Bridge Design Specifications unless indicated otherwise in the Contract Documents.

Fabrication Drawings for the precast concrete shall be submitted in accordance with Section 105, with an additional copy to the Composite Materials Engineer. In addition to the requirements for Fabrication Drawings in Section 105, the following shall be included:

(a) Dimensions and tolerances of the precast concrete to be fabricated.

(b) The concrete mix design, including but not limited to the following:

(1) Batch weights specifying dry or saturated surface dry.

(2) Material names and sources.

(3) Aggregate properties and date tested.

(4) Chemical and physical properties of cementitious material.

(5) Admixture names and sources.

(6) Lab data that shall include, but not be limited to:

a. Slump.

b. Air Content.

c. Temperature.

d. Ratio of Water/Cementitious Material.

e. Cylinder breaks for 28 days standard cured.

f. 56-day Rapid Chloride Ion Permeability – AASHTO T 277 test data. The results shall be the average from testing 3 specimens, but the individual specimen results shall also be included. Testing shall be performed by an independent laboratory accredited by AMRL in this test method.

g. Alkali-Silica Reactivity (ASR) – AASHTO T 303 data from testing of both the fine and coarse aggregates. Testing shall be performed by an independent laboratory accredited by AMRL in this test method.

(7) Alkali-Silica Reactivity (ASR). If potentially reactive aggregates are to be used in a mix design, then proposed mitigation method(s) and test results must be provided. The AASHTO T 303 test must be run again with the proposed mitigation method(s) and using the proposed job cementitious material proportioning. The proposed mitigation method(s) shall reduce expansion to below 0.10%.

If a mix design, including the testing results, has been submitted and approved within a 12 month period, it may be used in lieu of submitting an additional mix design. However, if any change in the material sources, properties, or proportions has occurred, then a new mix design with lab test data will be required regardless of previous approval.
The requirements for testing in Subsections 540.04(b)(6)f, 540.04(b)(6)g, and 540.04(b)(7) above shall be waived if the submitted mix design has a minimum proportion of the cementitious material content of that allowed for use in High Performance Concrete in Section 501.

The mix design shall be approved by the Composite Materials Engineer prior to fabrication.

(c) The sources and properties of the materials proposed for use.

(d) The reinforcement schedule, placement of reinforcing steel, welded wire fabric, mechanical bar connectors, and inserts.

(e) The type of surface finish and how the finish will be obtained. Include details of potential repair procedures.

(f) The curing method, detailing sequence, and duration.

(g) The minimum required concrete strength for design strength and form removal.

(h) The design of the lifting attachments.

(i) Transportation, handling, and storage details along with calculations to substantiate the proposed CFPC units will not be cracked/damaged by handling and/or transport.

(j) The installation procedures, including a detailed grouting procedure.

(k) A Quality Control Plan that identifies a Quality Control Manager and provides previous experience for work of this nature. A Description of Quality Control Processes addressing but not limited to:

(1) Concrete production including batching, delivery, and placement.

(2) Formwork.

(3) Reinforcing.

(4) Concrete finishing.

(5) Concrete cure.

(6) Shipping/Installation procedures.

83. INSPECTION. Materials furnished and the work performed herein shall be inspected by the Agency. The Agency will test all concrete incorporated into the work in accordance with Section 501. The inspector shall have the authority to reject any material or work that does not meet the requirements of the Specifications. Advance notification of at least two (2) weeks shall be provided by the Contractor to the Agency's Engineer and the Composite Materials Engineer concerning the proposed intention to commence work. A minimum of five (5) working days notification shall be provided by the Contractor to the Agency's Engineer and the Composite Materials Engineer to confirm the fabrication start date.

Prior to placing any precast concrete elements produced under these Specifications, all materials shall have all applicable certifications approved in accordance with Subsection 700.02.

84. FABRICATION.

(a) Pre-Production Meeting. Unless the Engineer deems, in writing, that a pre-production meeting is unnecessary, then a pre- production meeting shall be held a minimum of seven (7) calendar days prior to beginning concrete placement. The pre-production meeting shall be attended by, as a minimum but not limited to, the Crew Supervisor, Contractor Project Manager, Concrete Producer, Resident Engineer, Project Manager, and Composite Materials Engineer.

(b) Placing Concrete. Concrete placement shall be in accordance with Subsection 501.10 and as specified herein. Concrete shall not be deposited in the forms until the appropriate Agency representative has approved placement of the reinforcement, conduits, and anchorages.

(c) Repairs/Patching. CFPC structure components that contain minor defects caused by manufacture or handling may be repaired at the manufacturing site. Minor defects are defined as holes, honeycombing, or spalls which are 150 mm (6 inches) or less in diameter and that do not penetrate deeper than 25 mm (1 inch) into the concrete. Surface voids or "bugholes" that are less than 16 mm (5/8 inch) in diameter and less than 6 mm (1/4 inch) deep need not be repaired. Repairs shall be made using a material from the Agency's Approved Products List for overhead and vertical concrete repair. The repair material shall be cured as specified by the manufacturer. Repairs shall be approved by the Engineer.

(d) Cracking. Cracks less than 0.25 mm (0.01 inch) in width shall be sealed by a method approved by the Engineer. Cracks in excess of 0.25 mm (0.01 inch) may be cause for rejection. At the Engineer's discretion, cracked CFPC structure components shall be repaired or replaced at the Contractor's expense.

(e) Dimensional Tolerances. All tolerances shall be in accordance with the latest editions of both PCI MNL 116 *Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products* and PCI MNL 135 *Tolerance Manual for Precast and Prestressed Concrete Construction*, or with the National Precast Concrete Association (NPCA) *Quality Control Manual for Precast Concrete*, unless otherwise noted in the Contract Documents or as approved by the Engineer.

(f) Marking. The date of manufacture, the production lot number, and the piece mark shall be clearly marked on each individual piece of precast concrete. The mark shall be in a location that will not be visible in the finished product.

85. HANDLING, STORAGE, AND SHIPPING. Each CFPC structure shall be handled, stored, and shipped in such a manner as to minimize chipping, cracks, fractures, discoloration, and excessive bending stresses. A unit damaged by handling, storage, or shipping shall be replaced at the Contractor's expense.

A CFPC structure shall not be installed until the respective unit has been inspected. This inspection shall verify that the pieces are free from defects, and that all specification requirements, including but not limited to those for compressive strength and tolerance requirements, have been achieved. In addition, a CFPC structure will not be considered for shipment until the completion of the cure period and the required strength has been attained as demonstrated by field- cured cylinder breaks.

86. INSTALLATION METHODS, EQUIPMENT, AND ERECTION. Cranes, lifting devices, and other equipment for CFPC structure erection shall be of adequate design and capacity to safely erect, align, and secure all members and components in their final positions without damage. The Contractor is solely responsible for the methods and equipment employed for the erection of the CFPC structure components.

Construction Drawings for CFPC structure component erection shall be submitted in accordance with Section 105. The erection plan shall include the necessary computations to indicate the magnitude of stress in the units during erection and to demonstrate that all of the erection equipment has adequate capacity for the work to be performed, and provisions for all stages of construction, including temporary stoppages.

Post tensioning shall comply with Subsection 540.12.

Submittal of the erection plan is for the Agency's documentation only and shall in no way be construed as approval of the proposed method of erection. The Contractor shall follow the erection plan as accepted.

87. GROUT.

(a) Unless otherwise noted grout shall be used to fill shear keys, leveling screw voids, transverse tie anchor recesses, dowel holes, and for fairing joints as detailed in the Contract Documents or as ordered by the Engineer.

Grout shall be Mortar, Type IV. Acceptable grout materials shall be those included on the Approved Products List on file with the Agency's Materials and Research Section. Additional aggregates shall not be added to the material during field mixing.

The Contractor, with written permission from the Engineer, has the option to use ready-mixed mortar for the grouting process. The Contractor shall prepare and submit for approval the mix design for the grout. The maximum quantity that may be delivered in a single load is one cubic meter (1.25 cubic yards), which shall be delivered and placed within the time limits specified by the manufacturer.

For testing, 6 neat 50 mm (2 inch) cubes shall be molded and cured in accordance with AASHTO T 106 (ASTM C 109). The average compressive strength of 3 cubes shall be a minimum of 7 MPa (1000 psi) at 3 days and a minimum of 35 MPa (5000 psi) at 28 days.

(b) The surface to be grouted shall be thoroughly cleaned, wetted, and free of all standing water. The grout shall be mixed using a mechanical mixer according to the manufacturer's recommendations and shall be readily pourable so that it completely fills the shape of the shear keys or holes, depending on the product being installed. The placement of grout shall be continuous so as to produce a monolithic key absent of any voids or cold joints.

(c) All exposed grout shall be cured for a period of no less than three days by the wetted burlap method in accordance with Section 501. Curing shall commence as soon as practical after grout placement.

88. METHOD OF MEASUREMENT. The quantity of Special Provision (Contractor-Fabricated Precast Concrete Structure) of the type and size specified to be measured for payment shall be on a lump sum basis. The lump sum shall include all of the CFPC structure components in the complete and accepted work for each location specified in the Contract.

89. BASIS OF PAYMENT. The accepted quantity of Special Provision (Contractor-Fabricated Precast Concrete Structure) of the type and size specified will be paid for at the Contract lump sum price. Payment shall be full compensation for designing, detailing, fabricating, repairing, transporting, handling, and erecting the materials specified, for furnishing and implementing the erection plan, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Any grouting work, such as fairing out unevenness between adjacent precast concrete structure components and filling leveling screw holes, shear keys, transverse anchor recesses, and dowel holes, is considered incidental to the work for Special Provision (Contractor-Fabricated Precast Concrete Structure).

Payment will be made under:

Pay Item	Pay Unit
900.645 Special Provision (Contractor-Fabricated Precast Concrete Structure)(Approach Slab #1)	Lump Sum
900.645 Special Provision (Contractor-Fabricated Precast Concrete Structure)(Approach Slab #2)	Lump Sum
900.645 Special Provision (Contractor-Fabricated Precast Concrete Structure)(Approach Slab #3)	Lump Sum
900.645 Special Provision (Contractor-Fabricated Precast Concrete Structure)(Approach Slab #4)	Lump Sum
900.645 Special Provision (Contractor-Fabricated Precast Concrete Structure)(Headwall)	Lump Sum

TEMPORARY RELOCATION OF STREAM

90. DESCRIPTION. This work shall consist of temporary stream relocation including erosion prevention and sediment control, channel maintenance, and debris removal in accordance with these specifications.

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

Geotextile Fabrics..... 649.02
Stone Fill, Type II.....706.04(b)

Other materials may be used. These shall be detailed on the EPSC Plan and are subject to approval.

92. GENERAL. Prior to their construction, the Contractor shall submit to the Engineer site-specific plans, including all construction, erosion prevention and sediment control, and maintenance details, for providing temporary stream relocations at stream crossings specified in the Plans. These details shall be developed in accordance with the requirements of Section 900 and will be considered a component of the overall project EPSC Plan.

All relocation plans must be approved by the Agency of Natural Resources prior to beginning work. These plans shall provide for storm generated flows of 1 cfs, as a minimum, and shall be designed and stamped by a Professional Engineer registered in the State of Vermont. The plans shall address erosion prevention and sediment control, channel maintenance, debris removal, and the materials and methods of creating the upstream diversion from the existing stream channel. These plans shall conform to any permits, both State and Federal, which have been issued for this project.

The Contractor shall provide for crossing the relocated stream channel for the duration of its existence so as not to impact the free flow of the stream or to increase any flood levels or potential for property damage upstream or downstream of the project site. This work shall be scheduled such that it is performed during a period that no heavy rains or storm events are anticipated.

It shall be incumbent upon the Contractor to determine the level of protection required to protect the work. However, the protection of existing facilities, structures, and property must also be undertaken and any damage thereto shall be repaired by the Contractor at no additional expense to the State. In addition, the temporary diversion shall not increase in any way flood levels or property damage upstream or downstream of the project site.

In-stream construction shall be undertaken during the period from June 1st through October 1st. Any changes to this period shall be approved in writing by the Vermont Agency of Natural Resources. It shall be the responsibility of the Contractor to obtain any variances to the in-stream construction period.

Excavation for the relocated stream channel shall be made in conformance with the requirements for channel excavation as specified in Subsection 203.06.

Furnishing and installing Geotextile Fabrics and Stone Fill shall be in conformance with the requirements of Sections 649 and 613, respectively.

Furnishing and installing pipes shall be in conformance with Section 601.

The upstream diversion shall be done in such a manner as to minimize erosion and sedimentation. Upstream diversion shall not be done when stream conditions are such that the possibility of excessive erosion and sedimentation will occur.

The relocation shall be maintained, throughout the time it is in place, free from debris, logs, stumps, and other obstructions which might impair the free-flow of water through the diversion.

After completion of the new permanent channel improvements and the rediversion of channel flow through the new permanent channel, the entire length of the temporary channel shall be excavated to remove all muck, sediment, debris, and foreign matter.

Any portion of the temporary channel which falls outside of the embankment limits shall be restored to match the existing ground and shall be included in the unit price bid for Temporary Relocation of Stream.

Any turf establishment required outside of the embankment limits shall be paid for under the appropriate Contract items.

93. METHOD OF MEASUREMENT. The quantity of Special Provision (Temporary Relocation of Stream) to be measured for payment shall be on a unit basis for each temporary stream location specified, installed, maintained, and removed.

Where a temporary relocation of stream is constructed for the convenience of the Contractor and is not specified in the Plans or ordered by the Engineer, the costs for the temporary relocation shall be considered incidental to all other Contract items.

94. BASIS OF PAYMENT. The accepted quantity of Special Provision (Temporary Relocation of Stream) will be paid for at the Contract lump sum price for each temporary stream relocation. Payment will be full compensation for designing, as necessary, constructing, including all required materials, maintaining, and removing each temporary stream relocation.

Payment for the design and detailing of erosion prevention and sediment control measures for Temporary Relocation of Stream will be **considered incidental to Contract item 652.10.**

Payment for the monitoring and maintenance of erosion prevention and sediment control measures for Temporary Relocation of Stream will be **considered incidental to Contract items 652.20 and 652.30, respectively.**

Payment for erosion prevention and sediment control measures for Temporary Relocation of Stream will be made under **the appropriate Contract items in the Contract.**

When the construction of the temporary stream relocation is completed, operational, and accepted, a payment of 75 percent of the Contract lump sum price will be allowed. The remaining 25 percent of the Contract lump sum price will be paid when the temporary stream relocation has been removed and the site restored and stabilized to the satisfaction of the Engineer.

Payment will be made under:

Pay Item	Pay Unit
900.645 Special Provision(Temporary Relocation of Stream)	Lump Sum

TRAFFIC CONTROL, ALL INCLUSIVE

95. 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.

96. SUBMITTALS. The Contractor shall submit to the Project Manager for acceptance 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. Field operations will not commence until the submittal has been accepted.

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

98. 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, Flaggers, and Portable Changeable Message Signs will be measured separately in accordance with Section 630 and 641.

99. 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, Flaggers, and Portable Changeable Message Signs will be paid for separately under Contract items 630.10, 630.15, and 641.15 respectively.

Payment will be made under:

Pay Item	Pay Unit
900.645 Special Provision (Traffic Control, All-Inclusive) (BF 0248(4))	Lump Sum
900.645 Special Provision (Traffic Control, All-Inclusive) (BF 0248(7))	Lump Sum

BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY

100. 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.

101. 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 70-28. Substitutions will be accepted based on availability where the upper end temperature value is greater than 70°C (158°F) and/or the lower end temperature value is less than -28°C (-18°F).

102. 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 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 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

103. 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 according to Table D Mixture Pay Adjustment.

TABLE D - MIXTURE PAY ADJUSTMENT

Criteria	Deductions to be applied to materials outside production testing tolerance.		
	< 1.5X testing tolerance	=1.5-2.0X testing tolerance	>2.0X testing tolerance
AIR Voids	-5%	-25%	Remove
VMA	-5%	-25%	Remove
Aggregate passing 200 sieve	-5%	-25%	Remove
Aggregate larger than the 200 sieve.	-5% applied to each sieve out of toll.	-10% applied to each sieve out of toll.	Remove if any sieve out of toll.
Filler/AC Ratio	See note 2	See note 2	See note 2

(1) Deductions will be applied per the table above in conjunction with the testing tolerances as contained in the applicable table 406.03C or 490.03C – PRODUCTION TESTING TOLERANCES.

(2) A 5% deduction will be applied and coupled with any other applicable deduction in any case that the filler/asphalt ratio is outside the criteria as contained in the applicable table 406.03B or 490.03B – DESIGN CRITERIA.

(3) The total deduction to be applied to any mix will be the sum total of all applicable deductions as contained in the table above.

(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.

104. 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 E:

TABLE E – 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, 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 20 feet will not be cored. Bridge decks or approaches will not be cored within 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.

105. METHOD OF MEASUREMENT. The quantity of Special Provision (Bituminous Concrete Pavement, Small Quantity) to be measured for payment will be the number of 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:

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

106. BASIS OF PAYMENT. The measured quantity of Special Provision (Bituminous Concrete Pavement, Small Quantity) will be paid for at the Contract unit price per 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

BITUMINOUS CONCRETE PAVEMENT, TYPE IVB

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 490 of the Standard Specifications.

108. MATERIALS. Materials shall meet the requirements of Section 490 of the Standard Specifications.

109. COMPOSITION OF MIXTURE.

(a) Design Criteria. Design criteria shall meet the requirements of Subsection 490.03 of the Standard Specifications and additional requirements as specified herein.

(1) Type IVB Material shall have an air void target of 3.0% (with a 1.0% production tolerance).

(2) Type IVB bituminous material shall be designed and produced with a 0.0% RAP content.

(3) Type IVB material shall meet the gradation requirements of Superpave Bituminous Concrete Pavement Type IVS as contained in Table 490.03A of Section 490.

110. COMPACTION. Compaction shall meet the requirements of Subsection 490.14 of the Standard Specifications as modified herein.

The density of the compacted pavement shall be at least 92.0%, but not more than 97.0%, of the corresponding average maximum specific gravity for each mix type (each mix design) of bituminous mix placed upon any individual bridge deck and a pay factor adjustment applied as per the table below. For material that falls outside of this range, payment will be made by adjusting the production totals in accordance with the table below.

TABLE 490.14A – DENSITY PAY FACTORS (BRIDGE MIX)

Average Density, %	Density Pay Factor, PF(d)
89.0 - 90.4	- 0.250
90.5 - 91.9	- 0.150
92.0 - 93.4	0.000
93.5 - 95.4	0.150
95.5 - 97.0	0.000
97.1 - 98.5	-0.150

For material with an average density that is less than 89.0% or in excess of 98.5%, the material will be removed and replaced by the Contractor at no expense to the Agency.

It shall be the responsibility of the Contractor to conduct proper process control the Contractor deems necessary. Acceptance testing will be conducted by Agency personnel using cores extracted and provided by the Contractor. The cores taken for acceptance testing will be the final cores taken for determination of density.

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

Bridge decks with a length equal to or greater than 6m (20 feet) will be cored for the purpose of analyzing density of the bridge deck pavement per this Subsection. The minimum number of cores samples, or "sublots", to be analyzed per bridge deck shall not be less than 4. Core sublots will be restricted to travel and passing lanes only and will be taken at the rate of 2 sublots per bridge deck lane for those bridges less than or equal to 400 feet in length. For those bridges greater than 400 but less than or equal to 650 feet in length, core samples will be taken at the rate of 3 sublots per bridge deck lane. For those bridges greater than 650 feet in length, core samples will be taken at the rate of 4 sublots per bridge deck lane. Core samples will not be taken within 150 mm (6 inches) of a longitudinal construction joint nor within 5 m (15 feet) of a mechanical bridge joint. Random and independent mat and / or shoulder core sampling locations may be selected by the Engineer to afford verification of this Subsection.

Additionally, for those Contracts having single, or multiple, bridge decks within the project limits, each individual bridge deck shall be considered a "lot" for the purpose of analyzing for density with any associated density pay factor adjustment applied to that lot. Bridge decks of a length less than 6m (20 feet) will not be analyzed for density.

All compaction equipment used to achieve bridge deck compaction shall be "static" in nature. Vibratory equipment may be used provided that equipment is operated in "static" mode. All requirements of this provision and Subsection 490.14 shall apply regardless of the type of compaction equipment used.

When the Contract does not provide for a mat density pay adjustment, the Contractor shall, prior to performing any construction operations, submit to the Engineer for approval the proposed rolling pattern and compaction equipment intended to be used on the project. Random investigative cores shall be taken by Contractor personnel and submitted to the Engineer for the purpose of verifying the effectiveness of the compaction equipment and rolling pattern used. Pending results of any investigative cores, the Contractor shall make any necessary adjustments to achieve acceptable densities as defined herein.

111. METHOD OF MEASUREMENT. The quantity of Special Provision (Bituminous Concrete Pavement, Type IVB) 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 density pay factor, PF(d), for a lot of Special Provision (Bituminous Concrete Pavement, Type IVB) is less than or greater than 0.000, the measured quantity of Special Provision (Bituminous Concrete Pavement, Type IVB) 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:

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

112. BASIS OF PAYMENT. The measured quantity of Special Provision (Bituminous Concrete Pavement, Type IVB) 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, Type IVB).

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, Type IVB).

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, Type IVB).

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, Type IVB).

Special Provision (Bituminous Concrete Pavement, Type IVB) 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, Type IVB), but will be incidental to the Contract item for the specified type of base course.

Special Provision (Bituminous Concrete Pavement, Type IVB) 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, Type IVB).

Payment will be made under:

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

CONCRETE BRIDGE DECK SURFACE PREPARATION

113. DESCRIPTION. This work shall consist of blanket diamond grinding the concrete bridge deck.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 509 of the Standard Specifications, as appropriate.

114. CONSTRUCTION REQUIREMENTS. The construction shall be performed in accordance with these specifications, the Contract Plans, and recommendations of the equipment provider.

(a) Concrete Bridge Deck Grinding Equipment. Provide grinding equipment that is power driven, self-propelled, and specifically designed to smooth and texture Portland cement concrete with diamond blades or diamond impregnated cylinder rings. The equipment shall be at a minimum 35,000 pounds including the grinding head, and of a size that will grind a strip at least 4 feet wide. The effective wheelbase of the machine shall be no less than 12 feet. The equipment shall have a positive means of vacuuming the grinding residue from the deck pavement surface, leaving the surface in a clean, near-dry condition.

The equipment shall have a set of pivoting tandem bogey wheels at the front of the machine and rear wheels or tandem bogies that travel and track in the fresh cut surface. The equipment shall be maintained to ensure it is in the proper working order, with attention paid to the "roundness" of the match and depth control wheels. Any wheels found to be out of round shall be immediately replaced.

The equipment shall be capable of grinding the surface in the longitudinal direction without causing spalls or other damage at cracks, joints, and other locations. Grinding equipment that causes raveling, aggregate fractures, or disturbance to the joints shall not be permitted. The equipment shall be capable of correcting the bridge deck profile and provide the proper cross slope.

The equipment shall be capable of grinding the longitudinal joint material whether it be Rapid Set Concrete or Ultra High Performance Concrete (UHPC). If UHPC is specified for use within the Contract Documents the grinding of the UHPC surface shall be performed when a strength of 10 ksi has been achieved and per the manufacturers recommendations. If significant fiber pullout is observed during grinding operations, grinding shall be suspended and not resumed until approved by the Engineer.

(b) Concrete Bridge Deck Grinding. Grinding operations shall be performed in a longitudinal direction and provide a uniform finished texture. The beginning and end grinding lines shall be normal to the bridge centerline or along the deck skew. Grinding shall also be terminated in accordance to the limits identified in Subsection 509.03.

The equipment shall be supported to maintain the appropriate grinding depth if it is required to extend over the end of the deck during grinding.

(1) Geometric Requirements. Each pass shall grind a strip at least 4 feet wide and not exceed the following vertical criteria:

a. Unless otherwise noted on the Plans, do not exceed 0.5 inches of material removed by diamond grinding without approval from the Engineer.

b. The maximum vertical difference between longitudinal passes shall be 1/8 inch.

c. Depressions exceeding the allowable grinding depth shall be addressed in the Blanket Grinding Work Plan. All depressions shall meet the specified grinding smoothness and texture requirements post remediation.

(2) Smoothness. Provide uniform transverse and longitudinal slope of the concrete deck with no depressions or misalignment of slope greater than 1/8 inch in 10-ft when tested with a 10-ft straightedge. The surface will be checked at random by the Engineer during the grinding operation to assure that no depressions exist that will pond water. The straightedge shall be placed in contact with the surface in successive positions parallel to and perpendicular to the centerline of the structure. If existing concrete surface is parabolic, the straight edge test shall not be used across the parabolic.

(3) Texture. The surface texture shall be a parallel, corduroy-type consisting of grooves between 1/16 and 1/8 inches wide. The peaks of the ridges need to be approximately 1/16 inch higher than the bottom of the grooves.

(4) Cleaning. Remove grooving and grinding residue with a vacuum attached to the grooving or grinding machine. The vacuum shall leave the deck surface in a clean, near dry condition. Dispose of grooving and grinding residue at an appropriate disposal facility.

(5) Grinding operations. Grinding shall continue until one of the following criteria are approved by the Engineer:

a. Grind the concrete bridge deck until the surface meets the smoothness and texture required or,

b. Maximum depth of grinding, texture, and depression remediation measures are met

115. SUBMITTALS.

(a) Blanket Grinding Work Plan. For exposed concrete bridge decks, the Contractor shall submit a written Blanket Grinding Work Plan to the Engineer. The Blanket Grinding Work Plan shall be approved prior to commencing the bridge closure period. Blanket diamond grinding of the exposed concrete bridge deck shall be completed in accordance with the approved Blanket Diamond Grinding Plan.

At a minimum, the plan shall include detailed procedures for the following information:

(1) Determining initial grinding depth,

(2) Monitoring depth of grinding,

(3) Determine location of wheel paths,

(4) Depth of grinding for subsequent passes.

(5) Repair procedures if the deck is damaged during grinding operations.

(6) How the equipment will be supported to maintain its grinding depth if its required to pass beyond the end of the bridge deck

(7) Remedial action if depressions exceed geometric limits of grinding.

a. Means of determining remaining clear cover over reinforcing steel for further grinding.

b. Subsequent grinding patterns if sufficient clear cover remains over the reinforcing steel.

c. Where the depression does not provide clear cover for subsequent grinding, procedures may include removing and replacing concrete to an extent below the top mat of reinforcing steel or other methods approved by the Engineer.

116. METHOD OF MEASUREMENT. The quantity of Special Provision (Concrete Bridge Deck Surface Preparation) to be measured for payment will be the number of square feet of concrete bridge deck surface prepared in the complete and accepted work. Measurement will be based on the horizontal distance between the face of curbs as shown on the Plans and the longitudinal length of the bridge deck.

117. BASIS OF PAYMENT. The accepted quantity of Special Provision (Concrete Bridge Deck Surface Preparation) will be paid for at the Contract unit price per square foot. Payment will be full compensation for furnishing, transporting, handling, all materials required; submittals; quality control testing and for furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.670 Special Provision (Concrete Bridge Deck Surface Preparation)	Square Foot

RETAINING WALL

118. DESCRIPTION. This work shall consist of designing, 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.

119. DESIGN REQUIREMENTS. The design shall be performed in accordance with the AASHTO LRFD Bridge Design Specifications and the design criteria specified in the Plans. **This work shall be performed in accordance with these provisions, the plans and with the Geotechnical Recommendations included in the Contract Documents.**

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.

120. MATERIALS. Materials shall meet the following requirements:

(a) Precast Concrete. Precast Concrete shall meet the requirements of Section 540.

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

(d) 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 Tl04.

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.

(e) 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.

(f) Soil Reinforcing and Attachment Devices for MSE wall systems. All reinforcing and attachment devices shall be carefully inspected to ensure they are true size and free from defects that may impair their strength and durability.

(1) Reinforcing Mesh Elements. Reinforcing mesh elements shall be shop fabricated from cold drawn steel rod conforming to the minimum requirements of AASHTO M 32M/M 32 and shall be welded at the junctions between longitudinal and transverse wires in accordance with AASHTO M 55M/M 55. Galvanization shall be applied after mesh fabrication and shall conform to the minimum requirements of AASHTO M 111M/M 111. The galvanizing thickness shall be determined and specified based on the design life requirements of the structure.

(2) Loop Embeds. Loop embeds shall be fabricated from cold drawn steel rod conforming to AASHTO M 32M/M 32. Loop embeds shall be welded in accordance with AASHTO M 55M/M 55. Loop embeds shall be galvanized in accordance with AASHTO M 232M/M 232.

(3) Reinforcing Strips. Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to AASHTO M 223 or equal. Galvanization shall conform to the minimum requirements of AASHTO M 111M/M 111. The galvanizing thickness shall be determined and specified based on the design life requirements of the structure.

(4) Tie Strips. The tie strips shall be shop fabricated of hot rolled steel conforming to the minimum requirements of ASTM A 570, Grade 50 or equivalent. Galvanization shall conform to AASHTO M 111M/M 111 or AASHTO M 232M/M 232. The minimum coating thickness shall be 0.610 kg/m^2.

(5) Fasteners. Fasteners shall consist of galvanized hexagonal cap screw bolts and nuts conforming to the requirements of AASHTO M 164 or equivalent. Fasteners shall be galvanized in accordance with AASHTO M 232M/M 232.

(6) Joint Material. Joint material shall meet the requirements of Subsection (s) 707.06, 707.07, 707.08, or 707.09, unless otherwise specified in the Contract Documents or as part of an approved retaining wall system.

(7) Bearing Pads. Bearing pads shall be preformed EDPM rubber pads conforming to ASTM D 2000 M2AA 807, having durometer hardness equal to 80±5.

(8) Joint Cover. Horizontal and vertical joints between panels shall be covered by a geotextile. The geotextile may be either a non-woven needle punched polyester geotextile or a woven monofilament polypropylene geotextile meeting the requirements of Section 720 for Geotextile Under Stone Fill. The wall supplier shall approve adhesive used to hold the geotextile filter fiber material to the rear of the facing panels prior to backfill placement.

121. SUBMITTALS. Working Drawings shall be submitted to the Structures Engineer in accordance with Section 105. The submittal shall include all detailed design computations and 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) Complete design calculations substantiating that the proposed design satisfies the design parameters in the Contract Documents. The wall design calculations shall be signed, stamped, and dated by a Professional Engineer. The Contractor shall not start work on any earth retaining system for which Working Drawings are required until the Engineer has approved such drawings.

(b) 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.

(c) 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.

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

(e) 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.

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

(g) The details for connection between the wall and the soil reinforcements.

(h) The details for diverting soil reinforcements around obstructions such as piles, catch basins, and other utilities.

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

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

(k) 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.

122. 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.

123. METHOD OF MEASUREMENT. The quantity of Special Provision (Retaining Wall) to be measured for payment will be the number of exposed square meters (square feet) of wall surface area complete and in place in the accepted work. The height of exposed face shall be the difference between the top of the wall and the top of the finish ground along the front face of the retaining wall.

124. BASIS OF PAYMENT. The accepted quantity of Special Provision (Retaining Wall) will be paid for at the Contract unit price per square meter (square foot). Payment will be full compensation for designing, detailing, fabricating, and installing the materials specified, including but not limited to the geotextile fabric, backfill material, concrete, bar reinforcement and welded steel wire fabric, drainage pipe, drainage aggregate, precast concrete facing panels, soil reinforcements, attachment devices, fasteners, bearing blocks, shims, geomembrane, geotextile, and expansion material; any excavation, sheeting, bracing, dewatering, and siltation control; 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).
Payment will be made under:

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

UNIT BLOCK RETAINING WALL

125. DESCRIPTION. This work shall consist of constructing a concrete unit block retaining wall in accordance with these specifications, in reasonably close conformity with the lines and grades shown in the Contract Documents, and as directed by the Engineer.

This work shall be performed in accordance with these provisions, the Plans, and with reference to the Geotechnical **Recommendations** included in the Contract Documents.

See Additional Special Provision No. 132 on Page 66.

126. MATERIALS.

(a) Unit Block Wall. The concrete block wall shall have a rough, irregular stone-like surface. Each block shall have a minimum compressive strength of 3000 psi. Calcium styrate-based water repellent shall be added to the blocks at the dosage recommended by the water repellent manufacturer. Individual block faces shall be textured to resemble multiple irregular stone pieces. All visible sides shall have a textured finish. The blocks shall be of uniform color and texture and be capable of providing all corners or radii shown in the Plans. All blocks shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or degrade the strength or performance of the construction.

(b) Drainage Aggregate. Drainage Aggregate shall meet the requirements of Subsection 704.16.

(c) Geotextile. Geotextile shall meet the requirements of Section 649 for Underdrain Trench Lining.

(d) Concrete. Concrete for leveling pad shall meet the minimum requirements of Section 541 for Concrete, Class B or as specified by the manufacturer.

127. DESIGN AND SUBMITTALS. The wall shall be designed to support the embankment. Filter fabric shall be included in the design and sized to prevent soil migration.

The Contractor shall submit manufacturer's product data for proposed materials and method of installation to the Engineer prior to ordering materials.

The Contractor shall submit a manufacturer's certification to the Engineer, prior to the start of work, that the retaining wall system components meet the requirements of these specifications.

The Contractor shall submit to the Engineer detailed Construction Drawings and calculations prepared by a licensed Professional Engineer experienced with unit block retaining wall systems and registered in the State of Vermont. Engineering designs, techniques, and material evaluations shall be performed in accordance with manufacturer's requirements and these specifications.

128. CONSTRUCTION REQUIREMENTS.

(a) General. The Contractor shall verify that layout dimensions are correct and substrate is in proper condition for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

The Contractor shall confirm the location of existing structures and utilities prior to excavation. The Contractor shall ensure all surrounding structures are protected from the effects of wall excavation.

The Contractor shall provide one foreman, experienced in the construction of at least 20,000 square feet of soil-reinforced unit block walls, to oversee the construction of the wall.

Materials shall be stored and handled based on manufacturer's requirements. Any material damaged due to improper storage and handling shall be replaced at the expense of the Contractor.

The Contractor shall construct a 15 foot mock-up section of wall in place for approval by the Engineer for wall pattern and color. If approved, the mock-up section will be accepted as part of the wall.

(b) Excavation. The Contractor shall excavate to the lines and grades shown on the Construction Drawings.

(c) Unit Block Wall. The wall shall be designed to support the embankment. Filter fabric shall be included in the design and sized to prevent soil migration.

The Contractor shall follow the manufacturer's recommendations and the requirements below while constructing the unit block wall:

(1) The units shall be placed on the approved base to conform to the required line and grade. Units shall be fitted tightly together and aligned to provide a continuous face with no gaps.

(2) The drainage aggregate and backfill shall be placed and compacted to 95% of the maximum Standard Proctor density in layers not to exceed 6 inches.

(3) Follow manufacturer's instructions for placement and protection of geogrid.

(4) Drainage pipe shall be installed in accordance with the Construction Drawings.

(5) The top course of the wall shall consist of cap units that fit together without excessive or irregular gapping. Apply adhesive continuously to both the cap course and the course directly beneath the cap.

(6) Where wall is exposed on both sides, the Contractor shall use freestanding block units, and where wall is exposed on only one side, the Contractor shall use retaining wall block units, installed in accordance with the manufacturer's specifications.

(d) Geogrid. Geogrid shall be as recommended by the wall system manufacturer to meet the requirements of these specifications.

(e) Drainage Aggregate. A minimum 12 inch depth of drainage aggregate shall be placed as specified by the Manufacturer.

Filter fabric shall be wrapped around the drainage aggregate layer as shown on the Plans.

(f) Backfill. Backfill in the reinforced soil zone shall meet the requirements of Subsection 704.08 for Granular Backfill for Structures, with a maximum aggregate size of 0.8 inch, unless more restrictive requirements are specified on the Construction Drawings.

The Contractor shall be responsible for independent soil testing services during earthwork operations to ensure that materials and compaction conform to the specifications.

129. METHOD OF MEASUREMENT. The quantity of Special Provision (Unit Block Retaining Wall) to be measured for payment will be the number of square square yards of wall placed in the complete and accepted work, rounded to the nearest square yard for the full front face of wall from top to bottom and end to end.

130. BASIS OF PAYMENT. The accepted quantity of Special Provision (Unit Block Retaining Wall) will be paid for at the Contract unit price per square yard. Payment will be full compensation for fabricating, detailing, furnishing, transporting, handling, assembling, and placing the materials specified, including unit concrete blocks, cap units, leveling pad, concrete adhesive, geosynthetic reinforcement, drainage aggregate, and geotextile fabric; for excavating, stockpiling, replacing, and compacting existing fill material; for providing wall mock-up(s) as specified; and for furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work.

The installation of temporary earth support system(s) and underdrain pipe, if required as specified by the manufacturer, will be considered incidental to Special Provision (Unit Block Retaining Wall).

Granular Backfill for Structures will be paid separately under Contract item 204.30.

Payment will be made under:

Pay Item		Pay Unit
900.675	Special Provision (Unit Block Retaining Wall)	Square Yard

ADDITIONAL SPECIAL PROVISIONS

131. NOTICE TO BIDDERS - THE CONTRACTOR IS HEREBY NOTIFIED THAT THE FOLLOWING SHALL BE MET.

(1) During the approved BCP, the Contractor will be permitted to demolish only one bridge at a time (either Bridge 1 or 2), so safe vehicular access is possible from the remaining bridge for only emergency vehicles and access to the Town Pumping station.

(2) Vehicles used by persons residing on the "island" between the two bridges (or deliveries, etc.) shall be parked outside the active work zone as directed by the Resident Engineer. Pedestrian access to and from the residence shall be provided on a designated 5' wide walkway, which may be on grade or elevated, as needed. The Contractor shall relocate the walkway during construction depending on which bridge is in service at the time.

(3) Pedestrian access may be disrupted in the event construction activities prevent safe pedestrian access over the walkway. The contractor shall notify the Engineer in writing a minimum of 24 hours in advance of pedestrian access disruption and shall conform to the following requirements at no additional cost to the Agency. The contractor shall re-establish pedestrian access within 3 hours of disruption. If the contractor cannot re-establish safe pedestrian access within 3 hours the contractor shall relocate the pedestrian access unless otherwise approved in writing by the Engineer.

(4) During the remaining Construction period (before and after the BCP), personal vehicles (or deliveries, etc.) for persons residing on the "island" between the 2 structures may be parked within project limits only with the permission of the VTrans Resident Engineer.

(5) The location and description of the pedestrian access-way and its potential relocation shall be detailed in the site-specific Traffic Control Plan.

(6) The payment for the temporary pedestrian walkway, including relocation, and its inclusion into the site-specific Traffic Control Plan shall be included in the payment of 900.645 Special Provision (Traffic Control, All Inclusive).

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

Added October 16, 2017

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.