

APPENDIX A

STATE OF VERMONT
AGENCY OF TRANSPORTATION

November, 1985
CA-109

CONTRACTOR'S EEO CERTIFICATION FORM

Certification with regard to the Performance of Previous Contracts of Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports.

The bidder _____, proposed subcontractor _____, hereby certifies that he/she has _____, has not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246 as amended, and that he/she has _____, has not _____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Company	By	Title
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NOTE: The above certification is required by the Equal Employment Opportunity regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5 (Generally only contracts or subcontracts of \$10,000 or under are exempt.) Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7 (b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration, or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
DEBARMENT AND NON-COLLUSION AFFIDAVIT

I, _____, representing
(Official Authorized to Sign Contracts)

_____ of _____
(Individual, Partnership or Corporation) (City or State)

being duly sworn, depose and certify under the penalties of perjury under the laws of the State of Vermont and the United States that on behalf of the person, firm, association, or corporation submitting the bid certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid for the Vermont project:

(Project Name)

_____ project located on __
(Project Number) (Route or Highway)

bids opened at _____
(Town or City)

Vermont on _____, 20 __.
(Date)

I further depose and certify under the penalties of perjury under the laws of the State of Vermont and the United States that except as noted below said individual, partnership or corporation or any person associated therewith in any capacity is not currently, and has not been within the past three (3) years, suspended, debarred, voluntarily excluded or determined ineligible by any Federal or State Agency; does not have a proposed suspension, debarment, voluntary exclusion or ineligibility determination pending; and has not been indicted, convicted, or had a civil judgement rendered against (it, him, her, them) by a court having jurisdiction in any matter involving fraud or official misconduct within the past three (3) years.

Exceptions: _____ No _____ Yes. (If yes complete back of this form.)

Sworn to before me this _____

_____ day of _____, 20 ____

_____ L.S.
(Name of Individual, Partnership or Corporation)

_____ L.S.
(Signature of Official Authorized to Sign Contracts)

(Notary Public)

_____ L.S
(Name of Individual Signing Affidavit)

(My commission expires _____)

_____ L.S
(Title of Individual Signing Affidavit)

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosecution or administration sanctions.

EXCEPTIONS:

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

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

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this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

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applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants /

Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

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

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

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will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

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will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

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

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

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(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

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

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

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d. Apprentices and Trainees (programs of the U.S. DOT).

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

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

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VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

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

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

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

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

Shall be fined under this title or imprisoned not more than 5 years or both."

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

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

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

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

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i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

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department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

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

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

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ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

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

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

A Minority Group Member is:

 - ...American Indian or Alaskan Native
consisting of all persons having origins in any of the original people of North American and who maintain cultural identification through tribal affiliations or community recognition.
 - ...Black
consisting of all persons having origins in any of the Black racial groups of Africa.
 - ...Asian or Pacific Islander
consisting of all persons having origins in any of the original people of the Far East, Southeast Asia, the Indian Sub-Continent or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippines and Samoa.
 - ...Hispanic
consisting of all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin.
 - ...Cape Verde an
consisting of all persons having origins in the Cape Verde Islands.
 - ...Portuguese
consisting of all persons of Portuguese, Brazilian or other Portuguese culture or origin.
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000.00 the provisions of these specifications and the notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in the Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontract participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to make good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set for the Contractor in the solicitation from which this contract resulted are expressed as percentages in the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minority or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity . The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:
 - a. Ensure and maintain a working environment free of harassment, intimidation and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment with specific attention to minority or female individuals working at such sites or in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available and maintain a record of the organizations' responses.

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

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

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

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

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

Economic Areas	Timetables	Goals for Minority participation for each trade (%)	Goals for Female Participation in each trade (%)
Entire State of Vermont:			
<u>Vermont</u> 003 Burlington, VT Non-SMSA Counties NH Coos; NH Grafton; NH Sullivan; VT Addison; VT Caledonia; VT Chittenden; VT Essex; VT Franklin; VT Grand Isle; VT Lamoille; VT Orange; VT Orleans; VT Rutland; VT Washington; VT Windsor	Indefinite	0.8	6.9
<u>Connecticut (Mass)</u> 006 Hartford - New Haven Springfield, CT-MA Non-SMSA Counties CT Litchfield; CT Windham; MA Franklin; NH Cheshire; VT Windham	Indefinite	5.9	
<u>New York</u> 007 Albany - Schenectady - Troy, NY Non-SMSA Counties NY Clinton; NY Columbia; NY Essex; NY Fulton; NY Greene; NY Hamilton; NY Schoharie; NY Warren; NY Washington; VT Bennington	Indefinite	2.6	

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

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

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten working days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notifications shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any)

CERTIFICATION FOR FEDERAL-AID CONTRACTS

The prospective bidder, by signing and submitting this bid proposal, certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person or influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered to. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such sub-recipients shall certify and disclose accordingly.

APPENDIX F

CA101

Minimum Labor and Truck Rates
Under Title 19, Vermont Statutes
Annotated Section 18, as amended

April 3, 1997
Sheet 1 of 1

**STATE OF VERMONT
AGENCY OF TRANSPORTATION
MONTPELIER**

FOR OTHER THAN FEDERAL-AID. In accordance with the provisions of Title 19, VSA, Section 18, the following minimum rate for labor shall apply to this project:

The minimum wage for common labor will not be less than the State or Federal minimum wage, whichever is higher.

ON FEDERAL-AID PROJECTS ONLY.

The minimum rates for labor for Federal-Aid Projects shall be those set in the Wage Determination Decision of the U.S. Secretary of Labor for each project in accordance with the Federal-Aid Highway Act of 1956. When such wage rates are required they shall be included in the proposal. In the event these rates are lower than the Vermont rates, the Vermont rates shall prevail.

TRUCK RATES. In accordance with the provisions of Title 19, VSA, Section 18, the following minimum rates for trucks shall apply to this project:

<u>Trucks, not Including Driver Water Level Body Capacity</u>	<u>Minimum Rates Per YD per Hr.</u>
Trucks, Equipment Loaded	\$1.65

**VERMONT AGENCY OF TRANSPORTATION
CONTRACTOR WORKFORCE REPORTING REQUIREMENTS**

The Contractor/Subcontractor shall submit to the State Resident Engineer assigned to this project, monthly and cumulative workforce information, on reporting forms provided herein. The monthly and cumulative workforce information shall be listed by construction trade category with the percentage of minority and female project hours in each category indicated. Failure to provide this information to the Resident Engineer on a monthly basis will result in suspension of bi-weekly progress payments, or part thereof due under the contract, until such time as the Contractor or Subcontractor demonstrates compliance with these contract terms.

Note: In lieu of using the reporting forms provided herein, the Contractor may use U.S. Department of Labor form CC-257, "Monthly Employment Utilization Report".

State of Vermont
Agency of Transportation

July 2015
CA-110

DISADVANTAGED BUSINESS ENTERPRISE (DBE) POLICY CONTRACT REQUIREMENTS

Disadvantaged Business Enterprise (DBE) Policy. It shall be the policy of the Vermont Agency of Transportation (VTrans) to ensure nondiscriminatory opportunity for Disadvantaged Business Enterprises (DBEs) to participate in the performance of all contracts and subcontracts financed with Federal funds as specified by the regulations of the United States Department of Transportation (USDOT), Federal Highway Administration and as set forth below.

1. **Policy.** It is the policy of USDOT that DBEs as defined in 49 Code of Federal Regulation (CFR) Part 26 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal funds. Consequently, the DBE requirements of 49 CFR Part 26 and 23 CFR, Chapter 1, Part 230, Subpart b apply to this contract.
2. **DBE Obligation.** The State and its Contractors agree to ensure that DBEs as defined in 49 CFR Part 26, have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds. **Each subcontract the prime contractor signs with a subcontractor must include this assurance:** *The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of USDOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as VTrans deems appropriate.*
3. **Sanctions for Noncompliance.** The Contractor is hereby advised that failure of the Contractor, or any Subcontractor performing work under this contract, to carry out the requirements set forth in paragraphs 1 and 2 above shall constitute a breach of contract and after the notification of the Vermont Agency of Transportation, Secretary of Transportation, may result in termination of this contract by the State or such remedy as the State deems necessary.
4. **Inclusion in Subcontracts.** The Contractor shall insert in each of its subcontracts this Disadvantaged Business Enterprise (DBE) Policy and also a clause requiring its subcontractors to include this same Policy in any lower tier subcontracts which they may enter into, together with a clause requiring the inclusion of the Policy in any further subcontract that may in turn be made. This Policy shall not be incorporated by reference.

Disadvantaged Business Enterprise (DBE) Program Goals. The Vermont Agency of Transportation (VTrans) is required to set an overall DBE goal for participation in all transportation related Federal-aid projects. The goal is determined following guidelines set forth in 49 CFR 26.45, and based on the availability of ready, willing and able DBEs who submitted bids and quotes for transportation related projects, compared as a percentage of all available contractors who submitted bids and quotes for transportation related projects during the same time period. The DBE goal may be adjusted to take into account other factors impacting DBE utilization, in an effort to narrowly tailor the overall DBE goal. The detailed goal setting methodology and current overall DBE goal may be viewed on the VTrans Civil Rights website.

VTrans currently utilizes a race/gender neutral policy to fulfill its overall DBE goals, and relies on the voluntary participation of contractors to utilize certified DBEs on every project sufficient to obtain the Agency's overall DBE goal. In order for this practice to continue, contractors must be proactive and solicit bids and quotes from certified DBEs for use when submitting their own bids, and employ certified DBEs when participating on transportation related projects. Otherwise, VTrans may have to implement specified contract goals on projects to ensure the overall DBE goals are met. VTrans may include specific DBE contract goals in certain cases to ensure DBE participation, if failure to obtain the project DBE goal would negatively impact the Agency's overall DBE goal because of the size of the contract.

Disadvantaged Business Enterprise (DBE) Definition. A DBE is defined as a business that is owned and controlled by one or more socially and economically disadvantaged person(s). For the purposes of this definition:

- (1) "Socially and economically disadvantaged person" means an individual who is a citizen or lawful permanent resident of the United States and who is a Woman, Black, Hispanic, Portuguese, Native American, Asian American, or a member of another group, or an individual found to be disadvantaged by the Small Business Administration pursuant to Section 3 of the Small Business Act.
- (2) "Owned and controlled" means a business which is:
 - a. A sole proprietorship legitimately owned and controlled by an individual who is a disadvantaged person.
 - b. A partnership, joint venture or limited liability company in which at least 51% of the beneficial ownership interests legitimately is held by a disadvantaged person(s).
 - c. A corporation or other entity in which at least 51% of the voting interest and 51% of the beneficial ownership interests legitimately are held by a disadvantaged person(s).

The disadvantaged group owner(s) or stockholder(s) must possess control over management, interest in capital, and interest in earnings commensurate with percentage of ownership. Disadvantaged participation in a joint venture must also be based on the sharing of real earnings, as above. If the disadvantaged group ownership interests are real, substantial and continuing and not created solely to meet the requirements of the program, a firm is considered a bona fide DBE.

Certified DBE Directory. The current Vermont Unified Disadvantaged Business Enterprise (DBE) Directory is available online at VTrans Civil Rights website . This directory contains all currently certified DBEs available for work in Vermont, and is updated continuously. Only firms listed in this directory are eligible for DBE credit on Vermont Federal-aid projects. If you have questions about DBE certification, or do not have access to the Internet, please call the DBE Program Manager at (802) 828-5858 for assistance.

Counting DBE Participation Towards Project Goals. In order for payments made to DBE contractors to be counted toward DBE goals, the DBE contractors must perform a commercially useful function (CUF). The DBE must be responsible for execution of the work of the contract and must carry out its responsibilities by actually performing, managing, and supervising the work involved, consistent with standard industry practices.

This means that:

- The DBE must also be responsible for ordering its own materials and supplies, determining quantity and quality, negotiating price, installing (where applicable) and paying for the material itself;
- The DBE must perform work commensurate with the amount of its contract;
- The DBE's contribution cannot be that of an extra participant or a conduit through which funds are passed in order to obtain the appearance of DBE participation;
- The DBE must exercise responsibility for at least fifty percent of the total cost of its contract with its own workforce;
- None of the DBE's work can be subcontracted back to the prime contractor, nor can the DBE employ the prime's or other subcontractor's supervisors currently working on the project;
- The DBE's labor force must be separate and apart from that of the prime contractor or other subcontractors on the project. Transferring crews between primes, subcontractors, and DBE contractors is not acceptable;
- The DBE owner must hold necessary professional or craft license(s) or certification(s) for the type of work he/she performs on the project;
- The DBE may rent or lease, at competitive rates, equipment needed on the project from customary leasing sources or from other subcontractors on the project.

Allowable credit for payments made to DBEs for work performed. A contractor may take credit for payments made to a certified DBE that satisfies CUF requirements at the following rate:

- A DBE Prime Contractor: Count 100% of the value of the work performed by own forces, equipment and materials towards the DBE goals.
- An approved DBE subcontractor: Count 100% of the value of work performed by the DBE's own forces, equipment and materials, excluding the following:
 - The cost of materials/supplies purchased from a non-DBE Prime Contractor.
 - The value of work provided by non-DBE lower tier subcontractors, including non-DBE trucking to deliver asphalt to a DBE contractor.
- A DBE owner-operator of construction equipment: Count 100% of expenditures committed.
- A DBE manufacturer: Count 100% of expenditures committed. The manufacturer must be a firm that operates or maintains a factory or establishment that produces on the premises the materials or supplies obtained by the Contractor.
- A regular DBE dealer/supplier: Count 60% of expenditures committed. A regular dealer/supplier is defined as a firm that owns, operates, or maintains a store, warehouse or other establishment, in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. A person may be a dealer in such bulk items as petroleum products, steel, cement, gravel, stone or asphalt without owning, operating or maintaining a place of business, if the person both owns and operates distribution equipment for the products, by the means of a long term agreement, and not by a contract by contract basis.
- A DBE broker: Count for DBE credit only the fees or commissions charged for assistance in the procurement, and, fees and transportation charges for the delivery of materials or supplies required at the job site, but not the cost of materials procured. A broker is defined as any person(s) or firm who arranges or expedites transactions for materials or supplies, and does not take physical possession of the materials or supplies at their place of business for resale.
- A DBE renter of construction equipment to a contractor: Count 20% of expenditures committed, with or without operator.

- A bona fide DBE service provider: Count 100% of reasonable fees or commissions. Eligible services include professional, technical, consultant, or managerial, services and assistance in the procurement of essential personnel, facilities, equipment, materials or supplies required for the performance of the contract. Eligible services also include agencies providing bonding and insurance specifically required for the performance of the contract.
- A trucking, hauling or delivery operation: Count 100% of expenditures committed when trucks are owned, operated, licensed and insured by the DBE and used on the contract and, if applicable, includes the cost of the materials and supplies. 100% of expenditures committed when the DBE leases trucks from another DBE firm including an owner-operator. 100% of reasonable fees, or commissions, the DBE receives as a result of a lease arrangement for trucks from a non-DBE, including an owner-operator.
- Any combination of the above.

Removal of Approved DBE From Transportation Related Project. Contractors may not terminate for convenience, any approved DBE subcontractor and perform the work with their own forces, without prior written consent from the VTrans DBE Program Manager or VTrans Chief of Civil Rights.

Federal-aid projects which specify a DBE contract goal. The provisions of the Vermont Agency of Transportation Supplemental Specification – Disadvantaged Business Enterprise (DBE) Utilization (CA 160) shall apply to all VTrans Federal-aid projects which specify a DBE contract goal.

Compliance With Prompt Payment Statute. In accordance with Vermont’s Prompt Payment Act and VTrans Standard Specifications for Construction, Section 107.01(g), the Contractor shall fully comply with the provisions of 9 V.S.A. Chapter 102, also referred to as Act No. 74 of 1991 or the Prompt Payment Act, as amended.

Subcontractor Payments. In accordance with VTrans Standard Specifications for Construction, Section 107.01(h), on all federal-aid and state funded contracts, the Contractor, during the life of the Contract and on a monthly basis, shall submit electronically, a listing of payments to subcontractors on the form specified by the State and made available at the VTrans Civil Rights website. Electronic reports shall be filed with the Agency Office of Civil Rights by an authorized representative and received in the Agency Office of Civil Rights on or before the tenth working day after month end. Contractors without access to the internet shall obtain and submit manual reports to the Agency Office of Civil Rights. Manual reports shall be signed by an authorized representative, sent to the Agency Office of Civil Rights, and postmarked on or before the tenth working day after month end. There shall be no direct compensation allowed the Contractor for this work, but the cost thereof shall be included in the general cost of the work. In accordance with 9 V.S.A. Section 4003, notwithstanding any contrary agreement, payments made to subcontractors after seven days from receipt of a corresponding progress payment by the State to the Contractor, or seven days after receipt of a subcontractor's invoice, whichever is later, violate this agreement. Violations shall be reported to the Agency Office of Civil Rights for review. Failure to resolve disputes in a timely manner may result in a complaint made to the Agency Pre-qualification Committee. In this Committee's judgment, appropriate penalties may be involved for failure to comply with this specification. Penalties may include suspension, reduction or revocation of the Contractor's pre-qualification rating. This clause shall be included in the prime Contractor's Contract made with all if its subcontractors.

APPENDIX I

VERMONT AGENCY OF TRANSPORTATION
GENERAL SPECIAL PROVISIONS
FOR ALL PROJECTS

SUMMARY LIST OF GENERAL SPECIAL PROVISIONS

The following list is a summary of all approved General Special Provisions for the *2018 Standard Specifications for Construction*. This list is only intended to serve as a general guide to identify which subsections have been modified. The full text must be referenced to determine the details of the change.

The list is organized by subsection. Not all General Special Provisions are listed individually – modifications which were made to adjacent subsections for the same general reason may be combined within this list. Entries in bold text indicate the most recent changes, which were approved for projects advertising on or after the date given in the header of this document.

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 101.02	Replaced “Columbus Day” with “Indigenous Peoples’ Day” to reflect change in state law.	7-23-2019
Subsection 101.02	Deleted all references to Supplemental Specifications.	10-22-2019
Subsection 103.03	Legal reference to sales tax regulations corrected.	8-8-2018
Subsection 105.05(a)	Deleted all references to Supplemental Specifications and modified the Contract Document Precedence to reflect the elimination of Supplemental Specifications.	10-22-2019
Subsection 105.05(d)	Deleted all references to Supplemental Specifications.	10-22-2019
Subsection 105.14	Corrected double numbering by re-lettering list parts.	8-8-2018
Subsection 105.16	Corrected legal reference.	8-8-2018
Subsection 106.09(c)	Revised the stockpiling requirements for raw materials.	10-22-2019
Subsections 203.03 and 204.03	Added a requirement to submit construction drawings when required by OSHA or VOSHA.	7-23-2019
Subsection 210.03	Modified requirements for length of time milled surface can remain unpaved	7-23-2019
Subsection 406.03B	Added requirements for the contractor to provide Hamburg Wheel-Track and FIT testing data in mix designs.	7-23-2019
Subsection 406.03C (Table 406.031)	Corrected an outdated reference and slightly modified Note 4.	7-23-2019
Subsections 406.03C(e) and 406.19(c)	Changed names of subsections to better match their contents and the names of other subsections.	8-8-2018
Subsection 406.14	Added a requirement to use a self-propelled pneumatic tired roller for the levelling course of pavement.	10-22-2019
Subsection 407.03	Deleted and replaced several paragraphs to correct equations and the table.	7-23-2019
Section 418	Created a new section for Asphaltic Approach Material.	10-22-2019
Subsection 501.03	Deleted and replaced the entire subsection to update testing and mix design requirements.	10-22-2019

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 501.04	Deleted and replaced paragraphs 1 through 3 to update the batching requirements.	10-22-2019
Subsection 501.05(a)	Deleted and replaced parts (2) and (3) to update the mixing and delivery requirements.	10-22-2019
Subsection 506.02	Updated the name of the subsection for one of the materials and added a new material subsection to the list.	7-23-2019
Subsection 506.03	Deleted and replaced multiple paragraphs to clarify requirements for fabrication drawings, the use of subcontractors for fabrication, and the level of plant certification required.	7-23-2019
Subsection 506.03(c)(1)	Deleted and replaced the subsection to provide additional details about inspectors.	7-23-2019
Subsections 506.03(d)(3) and 506.03(e)	Minor wording changes.	7-23-2019
Subsection 506.04(c)	Deleted and replaced subsection to modify welding procedures.	7-23-2019
Subsection 506.05(b)	Deleted a sentence.	7-23-2019
Subsection 506.06(b)	Deleted and replaced subsection to modify inspector requirements.	7-23-2019
Subsection 506.10(d)	Minor wording changes.	7-23-2019
Subsection 506.10(e)(1)	Deleted two paragraphs.	7-23-2019
Subsection 506.12(d)	Minor wording changes.	7-23-2019
Subsection 506.14	Deleted and replaced subsection to clarify surface preparation requirements.	7-23-2019
Subsection 506.18(b)	Deleted and replaced parts (2) and (3) to clarify alignment, drilling and reaming requirements.	7-23-2019
Subsections 506.19(a) and 506.19(b)	Minor wording changes.	7-23-2019
Subsection 506.19(c)	Added a sentence stating that standard bolts are to be Grade A 325.	8-8-2018
Subsection 506.19	Relabeled existing part (d) as part (e) and broke the existing part (c) in half, creating a new part (d) in the process. Done to correct duplicate list numbering in part (c). Also corrected internal cross references.	8-8-2018
Subsections 506.19(d)(1) and 506.19(e)	Minor wording changes.	7-23-2019
Subsection 506.23	Deleted and replaced entire subsection to add additional coating requirements.	7-23-2019
Subsection 506.25	Deleted and replaced entire subsection.	7-23-2019
Subsections 510.12(b) and 540.11(b)	Corrected internal cross references.	8-8-2018
Subsection 516.02	Updated materials listing to reflect name change of Subsection 707.15	10-22-2019

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 519.02	Deleted and replaced subsection to reflect changes made in Subsection 726.11.	10-22-2019
Subsection 524.02	Updated materials listing to reflect name change of Subsection 707.15	10-22-2019
Subsection 540.02	Updated material listing to reflect changes made in Subsection 726.11.	10-22-2019
Subsection 540.10	Updated internal cross reference to reflect changes made in Subsection 726.11.	10-22-2019
Subsection 540.12	Corrected internal cross reference.	8-8-2018
Subsection 540.14(b)	Replaced the word “prestressed” with the word “precast”.	10-22-2019
Subsection 543.04	Deleted and replaced sentence to correct submittal requirements.	7-23-2019
Subsection 605.02	Updated materials listing to reflect name change of Subsection 707.15	10-22-2019
Subsection 605.02	Added a new material subsection to the list and deleted internal cross reference. Changes made to conform to new Section 720.	8-8-2018
Subsection 625.02	Deleted incorrect material reference.	1-18-2019
Subsection 630.01	Minor wording changes.	7-23-2019
Subsection 630.02(b)	Deleted and replaced subsection to modify flagger apparel requirements.	7-23-2019
Subsection 630.04(a)	Modified flagger training requirements.	1-18-2019
Subsection 631.06	Added additional required bituminous testing equipment.	1-28-2020
Subsection 631.08	Modified requirements for grout molds.	1-18-2019
Subsection 631.09	Deleted a sentence that dictated an Agency process.	10-22-2019
Subsection 641.02	Deleted and replaced several paragraphs in order to add new subparts and clarify the difference between the traffic control items.	7-23-2019
Subsection 641.03	Added paragraph requiring security system for PCMS.	1-18-2019
Subsection 641.07	Deleted and replaced entire subsection to clarify basis of payment.	7-23-2019
Subsection 646.02	Deleted and replaced multiple entries in the materials list.	7-23-2019
Subsection 646.04	Minor wording changes.	7-23-2019
Subsection 646.07	Deleted and replaced parts (a) and (b) to redefine marking tape types.	7-23-2019
Subsection 646.07	Deleted parts (c) and (d).	7-23-2019
Subsection 646.07	Relabeled parts (e) and (f) as the new parts (c) and (d).	7-23-2019
Subsection 646.07	Inserted a new part (e) for preformed thermoplastic and relabeled part (g) as part (f).	1-18-2019
Subsections 646.07(c)(1) and 646.07(f)(1)	Minor wording changes.	1-18-2019
Subsection 646.08	Changed the name of part (a) to reflect redefined marking tape types.	7-23-2019

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 646.09 (Table 646.09A)	Replaced the column headers of the table.	1-18-2019
Subsections 646.13 and 646.14	Deleted all references to “Raised Pavement Markers, Type II”, including the pay item.	7-23-2019
Subsection 649.02	Deleted and replaced existing subsection so it would conform with the new Section 720.	8-8-2018
Subsection 653.02	Added new material subsections to the list and deleted internal cross reference. Changes made to conform to new Section 720.	8-8-2018
Subsection 653.08(a)(1), 653.09(a), 653.09(b)(1) and 653.09(b)(3)	Corrected references to various geotextile requirements to conform to new Section 720.	8-8-2018
Subsection 675.02	Deleted internal cross reference.	1-18-2019
Subsection 675.07(b)(2)	Deleted and replaced subsection to modify the requirements.	7-23-2019
Subsection 675.07(d)	Added two new sentences to add additional requirements for fasteners.	7-23-2019
Subsection 677.03	Added a sentence removing the requirement for field verification of DTI’s.	8-8-2018
Subsection 679.02	Deleted one materials section listing and added two new ones to match changes in Subsection 753.04.	1-18-2019
Subsection 679.05	Deleted existing first sentence and added two new paragraphs	1-18-2019
Subsection 679.09	Added a sentence removing the requirement for field verification of DTI’s.	8-8-2018
Subsection 680.02	Deleted internal cross reference.	1-18-2019
Subsection 702.06 (Table 702.06A)	Deleted and replaced table to correct some temperatures and add a new row.	7-23-2019
Subsection 704.01(b)	Corrected ambiguity associated with organic impurities.	1-28-2020
Subsection 704.10(a)	Corrected AASHTO references.	7-23-2019
Subsection 706.06	Deleted and reserved entire subsection.	1-28-2020
Subsection 707.14 (Table 707.14A)	Corrected AASHTO references.	1-18-2019
Subsection 707.15	Deleted and replaced entire subsection to update requirements.	10-22-2019
Subsection 707.17	Added a new subsection to provide material requirements for the new Section 418.	10-22-2019
Subsection 708.03	Deleted and replaced entire subsection to provide new requirements.	7-23-2019
Subsection 708.06	Deleted and reserved entire subsection.	1-18-2019
Subsection 708.08 (Table 708.08C)	Added two rows to the table	7-23-2019
Subsection 708.11	Deleted and reserved entire subsection.	7-23-2019
Subsection 708.12	Deleted and replaced entire subsection to provide new requirements.	7-23-2019

GENERAL SPECIAL PROVISIONS FOR ALL PROJECTS
2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION

SECTION 101 – DEFINITIONS AND TERMS

101.02 DEFINITIONS, the definition for “Holidays” is hereby modified by deleting the phrase “Columbus Day” from the first column and replacing it with the phrase “Indigenous Peoples’ Day”.

101.02 DEFINITIONS, is hereby modified by deleting the phrase “Supplemental Specifications,” from the definitions for “Contract”, “Project Special Provisions”, and “Specifications”.

101.02 DEFINITIONS, is hereby modified by deleting the entry for, and definition of, “Supplemental Specifications”.

SECTION 103 – TAXES AND INSURANCE

103.03 STATE SALES TAX is hereby modified by deleting the phrase “(see *Vermont Sales and Use Tax Regulations, No. 226-2 and 226-7 and 32 V.S.A. § 9743(4)*)” and the phrase “(see 32 V.S.A. § 9741(44)).” from the first paragraph.

103.03 STATE SALES TAX is hereby further modified by adding the following reference to the end of the first paragraph:

(see 32 V.S.A. § 9743(4), 32 V.S.A. § 9741(30), 32 V.S.A. § 9741(44), and the *Vermont Sales and Use Tax Regulations, Reg. § 1.9741(34)-5 and Reg. § 1.9743*).

SECTION 105 – CONTROL OF THE WORK

105.05 COORDINATION OF CONTRACT DOCUMENTS, part (a), is hereby modified by deleting the phrase “Supplemental Specifications,” from the first sentence.

105.05 COORDINATION OF CONTRACT DOCUMENTS, part (a)(1), is hereby modified by deleting subpart g. in its entirety, relabeling subpart h. as subpart g., and relabeling subpart i. as subpart h.

105.05 COORDINATION OF CONTRACT DOCUMENTS, part (d), is hereby modified by deleting the phrase “Supplemental Specifications,” from the last sentence.

105.14 SUNDAY, NIGHT, AND HOLIDAY WORK is hereby modified by relabeling part (c), “Application.”, as “(d) Application.” and part (d), “Other Provisions Not Affected.”, as “(e) Other Provisions Not Affected.”

105.16 LOAD RESTRICTIONS, part (c), Penalty and Reduction for Overweight Operation., is hereby modified by changing the phrase “23 V.S.A. § 1391(a)” to read “23 V.S.A. § 1391a”.

SECTION 106 – CONTROL OF MATERIALS

106.09 STOCKPILING, part (c), is hereby modified by being deleted in its entirety and replaced with the following:

- (c) Raw Materials. In addition to the criteria set out above for other materials, raw material stockpiles shall be approved by the Construction Engineer and meet the following additional criteria:
- (1) The various components of the finished product shall include all of the appropriate certifications, passing samples, passing tests, and any other documentation that may be required to certify that the materials are acceptable.
 - (2) For stockpiles of structural steel, invoices or quotes from the fabricator shall include supporting documentation such as mill invoices or quotes that show actual dimensions, quantities, and costs to the fabricator for the raw materials. The intent of this raw material payment is to reimburse the actual amount it cost the fabricator to purchase the raw materials for the specific Contract item. There will be no allowance for mark up of any type by the Contractor or fabricator. Stockpile payments will be limited to one payment per 6 months, per Contract item. There will be no raw material stockpile payment allowed for materials that do not meet the dimensions provided on the mill invoices.
 - (3) Any other criteria the Engineer deems necessary to allow for payment.

SECTION 203 – EXCAVATION AND EMBANKMENTS

203.03 GENERAL CONSTRUCTION REQUIREMENTS is hereby modified by adding the following as the last sentence of the ninth paragraph:

Construction Drawings shall be submitted in accordance with Section 105 whenever OSHA or VOSHA regulations require a design by a Professional Engineer.

SECTION 204 – EXCAVATION FOR STRUCTURES

204.03 GENERAL CONSTRUCTION REQUIREMENTS is hereby modified by adding the following as the last sentence of the third paragraph:

Construction Drawings shall be submitted in accordance with Section 105 whenever OSHA or VOSHA regulations require a design by a Professional Engineer.

SECTION 210 – COLD PLANING

210.03 GENERAL CONSTRUCTION REQUIREMENTS, part (b) is hereby modified by being deleted in its entirety and replaced with the following:

- (b) The Contractor shall repave any coarse-milled areas within 14 Calendar Days and any fine-milled areas within 28 Calendar Days of milling, or when directed by the Engineer. Should the area remain unpaved for a period longer than specified herein, without the approval of the Engineer, no payment whatsoever will be made for the milled areas left exposed in excess of the 14 or 28 Calendar Day periods. If the Contractor lays down temporary pavement to avoid the above non-payment for milling, temporary pavement and subsequent milling shall be at the Contractor's expense.

SECTION 406 – BITUMINOUS CONCRETE PAVEMENT

406.03B COMPOSITION OF MIXTURE – SUPERPAVE, part (c), is hereby modified by adding “, unless otherwise noted in this section.” to the end of the sentence which begins with “For Superpave bituminous concrete pavement mixes, *AASHTO R 35*...”.

406.03B COMPOSITION OF MIXTURE – SUPERPAVE, part (c), is hereby further modified by deleting the word “four” from the sentence which currently reads “The four principal parts of the Superpave Mix Design Method are:” and replacing it with the word “five”.

406.03B COMPOSITION OF MIXTURE – SUPERPAVE, part (c), is hereby further modified by deleting subpart (4) in its entirety and replacing it with the following:

- (4) Evaluate moisture sensitivity and rutting susceptibility using *AASHTO T 324*. Test specimens for Hamburg Wheel-Track (HWT) testing shall be 150 mm (6.0 inches) in diameter with a 60 ± 1 mm (2.36 ± 0.04 inch) thickness and shall be short term conditioned in accordance with Section 7.2 of *AASHTO R 30*. HWT specimens shall be tested at $45 \pm 1^\circ$ C ($113 \pm 1.8^\circ$ F), with the machine pre-set to end the test once a maximum rut depth of 12.5 mm (0.50 inches) is reached. If the difference in the rut depth between the two pairs of specimens is 6 mm (0.24 inches) or more, and/or only one pair of specimens has a final rut depth of 12.5 mm (0.50 inches), the test results will be deemed invalid and not acceptable for mix design qualification. Slab specimens shall not be used.
- (5) Determine cracking susceptibility using *AASHTO TP 124*. Test specimens for the FIT shall be fabricated in a Superpave Gyratory Compactor and short term conditioned in accordance with Section 7.2 of *AASHTO R 30*. Specimens that are fabricated to a height of 50 mm (2.0 inches), in lieu of fabricating 160 mm (6.30 inch) or 115 mm (4.50 inch) specimens as part of the test specimen preparation procedures outlined in *AASHTO TP 124*, will be allowed.

406.03C REQUIREMENTS FOR BOTH MARSHALL AND SUPERPAVE BITUMINOUS MIXTURES is hereby modified by changing the name of part (e) from “Pay Factor Determination.” to “Air Voids Pay Factor (PF_{AV}) Determination.”

406.03C REQUIREMENTS FOR BOTH MARSHALL AND SUPERPAVE BITUMINOUS MIXTURES, Table 406.03I, is hereby modified by deleting the phrase “*ASTM D 5821*” and replacing it with the phrase “*AASHTO T 335*” in the third column of the fifth row.

406.03C REQUIREMENTS FOR BOTH MARSHALL AND SUPERPAVE BITUMINOUS MIXTURES, Table 406.03I, Note 4, is hereby modified by deleting the word “more” and replacing it with the word “less”.

406.14 COMPACTION is hereby modified by adding “Leveling courses shall be compacted using a self-propelled pneumatic tired roller for intermediate rolling, unless otherwise permitted in writing by the Engineer.” as the second sentence.

406.19 METHOD OF MEASUREMENT is hereby modified by changing the name of part (c) from “Longitudinal Joint Pay Factor.” to “Longitudinal Joint Pay Adjustment.”

SECTION 407 – BONDED WEARING COURSE

407.03 COMPOSITION OF MIXTURE is hereby modified by deleting the portion of the Subsection beginning with “PG Binder percentage shall be based on a minimum film thickness of 10.0 microns...” and ending with Table 407.03B, and replacing the deleted text and table with the following:

The asphalt cement content shall be based on a minimum asphalt film thickness of 0.394 mils (10.0 microns). The minimum asphalt cement content shall be calculated according to the following formulas and the factors in Table 407.03B.

For English units: $W = 0.0052 \times A_s \times T \times G_b$

For metric units: $W = 0.001 \times A_s \times T \times G_b$

and, for consistent units: $P_{bmin} = \frac{W}{1+W} \times 100$

where:

W = Intermediate variable

A_s = Total aggregate surface area* (square feet per pound or square meters per kilogram of aggregate)

T = Minimum asphalt film thickness (mils or microns)

G_b = Specific gravity of asphalt cement

P_{bmin} = Minimum asphalt cement content (percent by mass)

* The total aggregate surface area is calculated by multiplying the percent passing each sieve (as a decimal, i.e. 30% = 0.30) in the JMF by the corresponding factor in Table 407.03B and summing the resultant values.

TABLE 407.03B – AGGREGATE SURFACE AREA FACTORS

Sieve Designation	Surface Area Factors					
	Type A		Type B		Type C	
	SF/lb	SM/kg	SF/lb	SM/kg	SF/lb	SM/kg
3/4 inch (19.0 mm)	--	--	--	--	2.0	0.41
1/2 inch (12.5 mm)	--	--	2.0	0.41	0	0
3/8 inch (9.50 mm)	2.0	0.41	0	0	0	0
No. 4 (4.75 mm)	2.0	0.41	2.0	0.41	2.0	0.41
No. 8 (2.36 mm)	4.0	0.82	4.0	0.82	4.0	0.82
No. 16 (1.18 mm)	8.00	1.64	8.00	1.64	8.00	1.64
No. 30 (0.600 mm)	14.0	2.87	14.0	2.87	14.0	2.87
No. 50 (0.300 mm)	30.0	6.14	30.0	6.14	30.0	6.14
No. 100 (0.150 mm)	60.00	12.29	60.00	12.29	60.00	12.29
No. 200 (0.075 mm)	160.0	32.77	160.0	32.77	160.0	32.77

SECTION 418 – ASPHALTIC APPROACH MATERIAL

SECTION 418 – ASPHALTIC APPROACH MATERIAL is hereby made a new section of the specifications as follows:

SECTION 418 – ASPHALTIC APPROACH MATERIAL

418.01 DESCRIPTION. This work shall consist of furnishing and installing asphaltic approach material at the transition between bituminous concrete pavement and Portland cement concrete, steel or other materials.

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

Asphalt Plug Joint Binder707.17

418.03 INSTALLATION. Asphaltic approach material shall be installed at the locations(s) and to the depth and configuration shown in the Plans and as directed by the Engineer.

418.04 METHOD OF MEASUREMENT. The quantity of Asphaltic Approach Material to be measured for payment will be the number of square feet used in the complete and accepted work.

418.05 BASIS OF PAYMENT. The accepted quantity of Asphaltic Approach Material will be paid for at the Contract unit price per square foot. Payment will be full compensation for detailing, furnishing, handling, transporting, and placing the material specified, including surface preparation, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Tack, prime, or seal coats of bituminous material required for the installation of asphaltic approach material will not be paid for separately, but will be considered incidental to the Contract unit price for Asphaltic Approach Material.

Removal of any existing asphaltic, bituminous or Portland cement concrete materials to allow for the installation of asphaltic approach material will not be paid for separately, but will be considered incidental to the Contract unit price for Asphaltic Approach Material.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
418.10 Asphaltic Approach Material.....	Square Foot

SECTION 501 – PERFORMANCE BASED STRUCTURAL CONCRETE

501.03 CLASSIFICATION AND PROPORTIONING is hereby modified by being deleted in its entirety and replaced with the following:

501.03 CLASSIFICATION AND PROPORTIONING. The following classes of concrete, shown in Table 501.03A, are included in these Specifications and shall be used as shown on the plans.

TABLE 501.03A – PERFORMANCE-BASED CONCRETE CLASSES AND PROPERTIES

Class of Concrete ¹	28-Day Compressive Strength (psi) ²	Target W/CM Ratio ³	VSI	Slump/Spread Target and Range (in.)	Max. Slump (in.)	Air Content Limits ⁴	Free Shrinkage ⁵	Max. 56-Day Surface Resistivity ⁶
PCD	4,000	TBD	--	TBD ± 1.5 ⁷	9	5.5% – 8.5%	0.032%	Low
PCS	3,500	TBD	--	TBD ± 2.5 ⁷	9	5.5% – 8.5%	0.042%	Low
SCC	4,000	TBD	≤ 1	TBD ⁸	--	6.5% – 8.5%	--	Low

¹ PCD = Performance Concrete, Deck

PCS = Performance Concrete, Substructure

SCC = Self Consolidating Concrete

² The listed 28-day compressive strength is the minimum strength required to meet the design intent.

³ The target W/CM ratio is to be determined by the contractor. During production the W/CM ratio shall be within + 0.05 of the target W/CM ratio. At no time may the W/CM ratio exceed 0.500, nor the total water content exceed 280 lbs/yd³. For Class SCC, the maximum W/CM ratio shall be determined by the Contractor.

⁴ See Subsection 501.03(b)(2).

⁵ The Contractor shall determine the free shrinkage in accordance with Subsection 501.03(c)(3).

⁶ The Contractor shall determine the surface resistivity in accordance with Subsection 501.03(c)(4).

⁷ The Contractor shall determine a slump target that will allow enough workability to be placed and finished per Contract requirements. The slump shall be maintained within the specified range for the placement. The mix shall not exhibit segregation. If the mix does exhibit segregation or exceeds the maximum slump, the load shall be rejected and subsequent loads shall be tested by the Contractor until the mix meets the allowable limits.

⁸ The Contractor shall determine the spread target and limits in accordance with Subsection 501.03(b)(1). The spread shall be maintained within the determined spread limits for the placement. The mix shall not exhibit segregation. If the mix does exhibit segregation or exceeds the upper spread limit, the load shall be rejected and subsequent loads shall be tested by the Contractor until the mix meets the allowable limits. The Engineer may perform a J-ring test at the time of placement if blocking is a concern.

If a nominal maximum aggregate size is not specified, the Contractor shall determine the nominal maximum aggregate size using guidance from *ACI 211.1* to do so. In no case will the maximum aggregate size exceed 1/5 of the narrowest dimension between sides of the forms, 1/3 the depth of slabs, nor 3/4 of the minimum clear spacing between individual reinforcing bars, bundles of bars, or pre-tensioning strands unless approved by the Engineer.

The Contractor may use industry methods to develop gradations not specified in Section 704 in order to create better optimized gradations to satisfy the required concrete performance characteristics. If the Contractor is using a combined gradation, they shall provide the method or methods of how they will monitor gradation, the limits of the gradation ranges, and the frequency of monitoring.

Lightweight fine aggregate may be used up to 30% by volume replacement for normal weight sand. The gradation of the lightweight fine aggregate shall conform to the requirements of *AASHTO M 195*. The lightweight fine aggregate shall be conditioned for enough time to fully saturate the material.

The stockpile shall be constructed so that it contains uniform moisture content throughout the pile. The stockpile will be allowed to drain 12 to 15 hours immediately prior to use, unless an alternate procedure is approved by the Structural Concrete Engineer. The Contractor shall state the method, duration and procedure used to confirm that the material is at or above its saturated surface dry (SSD) value, by weight, throughout the pile.

The mix may contain a shrinkage compensating admixture conforming to the requirements of *AASHTO M 194* *M/M 194* or *ASTM C 494/C 494 M*.

The use of chlorides or admixtures containing chlorides is prohibited. All admixtures will be considered incidental to the work and included in the Contract Unit Price of the concrete.

The concrete shall have air content by volume as specified. The entrained air shall be obtained using an approved admixture.

The concrete materials may be proportioned using the absolute volumes method in accordance with the specified requirements. The volumetric proportioning method such as that outlined in *ACI 211.1* or other approved volumetric proportioning methods, shall be employed in the mix design.

A minimum of 30 Calendar Days prior to placement of the trial pour (or prior to the pre-placement meeting, if the trial pour is waived by the Engineer), the Contractor shall submit for approval the mix design for the class of concrete specified. The mix designs shall be submitted to the Structural Concrete Engineer at the Agency's Materials Section Central Laboratory. No class of concrete shall be placed on a project, including the trial pour, until the mix design is approved.

- (a) The mix design must contain the following information:
- (1) Class of concrete.
 - (2) Type of mix, conventional or self-consolidating concrete (SCC).
 - (3) Specify if saturated surface dry or dry weights.
 - (4) Aggregates – Types, sources, specific gravities, and absorption values.
 - (5) Specified 28-day design compressive strength, psi.
 - (6) Cementitious content and the amount of each, pounds per cubic yard.
 - (7) Air content lower limit and upper limit, percent.

- (8) Specified surface resistivity value.
- (9) Slump range for conventional concrete, inches.
- (10) Determined spread lower limit and upper limit for SCC.
- (11) Water/cementitious materials (W/CM) ratio target value.
- (12) Volumetric quantities of each material in the mix design.
- (13) Design unit weight of the mix.
- (14) Chemical Admixtures – Types, brand names, and dosages.

Concrete test mix or mixes shall be used to obtain the test results where applicable. All wet testing shall be done by personnel with current ACI Concrete Field Testing Technician Grade I certifications. All other tests shall be performed by an independent Laboratory that is accredited in the particular test method, or as allowed by the Engineer.

- (b) The following preliminary mix qualification tests shall be performed:
 - (1) The contractor shall determine the lower and upper spread limit for SCC concrete. The J-Ring Test and the Spread Test will be conducted at both the lower and upper spread limits. The J-Ring Test will be conducted per the requirements of *ASTM C 1621/C 1621 M*, and the Spread Test will be conducted per the requirements of *ASTM C 1611/C 1611 M*.

The J-Ring test results shall be compared to the Spread Test results at both the upper and lower limits. The difference between the two tests at both the upper and lower limit shall not be greater than 2 inches. At both the upper and lower limits, the Visual Stability Index (VSI) shall not be greater than 1.
 - (2) The contractor shall provide test results that establish the quality of the entrained air void structure and the freeze-thaw durability of the concrete. Sampling shall be performed in accordance with *AASHTO R 60* on a trial batch of concrete that is a minimum of 3 cubic yards, and which meets the following requirements:
 - a. For all concrete, the air content shall be no more than 1.5% above the lower limit established in Table 501.03A.
 - b. For conventional concrete, the slump shall not exceed 5 inches.
 - c. For SCC concrete, the spread shall not be more than 5 inches greater than the minimum spread determined as specified in Subsection 501.03(b)(1), nor shall the spread exceed the maximum spread determined as specified in Subsection 501.03(b)(1).

Conventional concrete shall be tested for slump (*AASHTO T 119 M/T 119*), air content (*AASHTO T 152*), concrete temperature (*ASTM C 1064/C 1064 M*), and characterization of the air-void system of freshly mixed concrete by the sequential pressure method (*AASHTO TP 118*). The Contractor shall make a minimum of 2 concrete cylinders per *AASHTO T 23*.

SCC concrete shall be tested for spread (*ASTM C 1611/C 1611 M*, Procedure B), air content (*AASHTO T 152*), concrete temperature (*ASTM C 1064/C 1064 M*), and characterization of the air-void system of freshly mixed concrete by the sequential pressure method (*AASHTO TP 118*). The Contractor shall make a minimum of 2 concrete cylinders per *AASHTO T 23*.

The cylinders shall be cured for a minimum of 5 Calendar Days prior to being tested according to the requirements of *ASTM C 457*. The wet test results shall be included with the *ASTM C 457* results.

The tests required in Subsection 501.03(b)(2) will be used by the Agency to evaluate the quality of the entrained air void structure of the concrete. These test results will be used for informational purposes only and will not be used to determine the acceptability of the mix design.

- (c) The additional mix qualification test results specified below shall accompany the mix design. Testing should be done on the same test batch where applicable.
- (1) The concrete used to determine the additional mix qualification properties shall meet the following requirements:
 - a. For all concrete, the air content shall be not be more than 1.5% above the lower limit.
 - b. For conventional concrete, the slump shall be between 5 inches and 9 inches, and the W/CM ratio shall be 0.05 above the target.
 - c. For SCC concrete, the spread shall be within 5 inches of the maximum spread limit, and the W/CM ratio shall be the maximum W/CM ratio, as determined by the contractor.
 - (2) The compressive strength of the concrete shall be measured based on the requirements of *AASHTO T 22* for 7, 14, and 28-Calendar Day standard cured cylinders.
 - (3) The free shrinkage rate of the concrete shall be tested per the requirements of *AASHTO T 160*. The test specimen shall be a prism of 4 inch square cross section. Procedure 11.1.2 of *AASHTO T 160* shall be followed for storage and measurements, and all specified test age results shall be submitted. Specimen testing may be terminated after 28 Calendar Days of drying. Testing shall be performed by an independent Laboratory accredited in the specific test method.

- (4) The surface resistivity of the test mix shall be measured at 28 and 56 Calendar Days based on the requirements of *AASHTO T 358*. Results shall be categorized as Low, Very Low, or Negligible in accordance with *AASHTO T 358*, Table 1.
- (d) The Alkali-Silica Reactivity (ASR) of each type of aggregate shall be measured separately based on the requirements of *AASHTO T 303*. If one or more of the aggregates exceeds 0.10% expansion, then the aggregate shall be tested again according to the requirements of *ASTM C 1567*.

The Contractor may elect to go directly to *ASTM C 1567* testing if they suspect that the aggregate may exceed the 0.10% expansion if tested by *AASHTO T 303*. Testing shall be performed by an independent Laboratory accredited in the specific test method.

- (e) After the mix design furnished by the Contractor has been reviewed and approved by the Structural Concrete Engineer, no new materials shall be incorporated. In no case shall concrete from more than one mix design be permitted to be used during the same pour without prior written approval of the Engineer.

Mix design approvals will be valid for a 12-month period. The approved mix design will be allowed a two consecutive year re-approval if no material proportioning or material sources have changed from the previous year's approved mix design and the mix design is submitted with updated aggregate properties and volumes adjusted accordingly. The aggregate properties shall be tested within 60 Calendar Days of the mix design submission. The properties to be tested include, but are not limited to, specific gravity, unit weight, and absorption. The mix design shall be accompanied by the previously completed and accepted test mix data and any applicable updated test information.

501.04 BATCHING is hereby modified by deleting paragraphs one, two and three in their entirety and replacing them with the following:

501.04 BATCHING. Measuring and batching of materials shall be done at an approved batch plant. Batch plants shall have an inspection completed prior to the first concrete placement on an Agency project if it has been longer than 12 calendar months from the last inspection. Request for inspection and required documentation must be received by the Materials Testing and Certification Section a minimum of 21 Calendar Days prior to the date of the requested inspection.

All deficiencies shall be corrected and verified a minimum of 5 Calendar Days prior to the first concrete placement for any Agency project. The batch plant shall meet the requirements of *AASHTO M 157*, except as modified in these Specifications, and shall always be maintained in good repair. The batch plant shall be subject to periodic inspections by Authorized Representatives of the Agency. The batch plant shall have approved methods of storing, measuring, and dispensing approved mineral admixtures.

All concrete batch plants offered for Agency approval shall be equipped for semi-automatic batching and proportioning of all cementitious material, aggregates, water, and for the automatic insertion of admixtures. The plants shall be equipped to automatically and accurately record, report, and print batch weight tickets in English units the quantity of all aggregates, cementitious material, and the water incorporated into each batch and shall identify and record the addition of the required admixtures. All materials added to the concrete batch after initial batching shall be added to the printed batch weight ticket prior to delivery.

501.05 MIXING AND DELIVERY, parts (a)(2) and (a)(3), are hereby modified by being deleted in their entirety and replaced with the following:

- (2) Authorization by Field Inspection personnel must be obtained prior to the addition of water or admixtures at the project site. If water is added in excess of the specified maximum W/CM ratio, the concrete shall not be used.
- (3) Each load of concrete delivered at the job site shall be accompanied by a State of Vermont Batch Slip signed by the authorized Agency representative, if present, at the plant. If an Agency representative is not present at the time of batching, a batch weight ticket meeting the requirements of Subsection 501.04 shall accompany the delivery vehicle.

SECTION 506 – STRUCTURAL STEEL

506.02 MATERIALS is hereby modified by deleting the second entry in the Subsection listing and replacing it with the following:

Structural Steel Coating Systems.....708.03

506.02 MATERIALS is hereby modified by inserting the following as the third entry in the Subsection listing:

Grease Rustproofing Compound.....708.04

506.03 GENERAL FABRICATION REQUIREMENTS is hereby modified by deleting paragraphs three, four, five, and six in their entirety and replacing them with the following:

Prior to performing any work under this Section, the fabricator must have received approval for all Fabrication Drawings, welding procedures and any special Contract requirements and have notified the Agency’s Structural Steel Fabrication Engineer in writing at least 10 Working Days in advance of fabrication. The Contractor shall bear full responsibility and costs for all materials ordered, raw materials stockpiled, or for work performed prior to approval of the Fabrication Drawings or written authorization from the Structures Engineer.

Excepted as noted in this Subsection, all work shall be performed by the fabricator indicated on the approved Fabrication Drawings, unless otherwise authorized in writing by the Structural Steel Fabrication Engineer. For coatings, if the fabricator intends to use a Subcontractor, it shall be clearly outlined on the fabrication drawings to be submitted for review. At a minimum, the provided information shall include the Subcontractor's name and address; the name, phone number and e-mail address of the quality control (QC) contact; and an acknowledgement of the VTrans quality assurance (QA) inspection requirements which apply to the Subcontractor.

If the fabricator wishes to request the use of a Subcontractor for material processing (e.g. cutting, drilling, bending, rolling, punching, machining, etc.), they shall submit a set of the previously approved shop drawings to the Agency for review, with the requested changes and required information clearly marked and indicated (e.g. by making all additional notes red). At a minimum, the submittal shall include the Subcontractor's name and address; the name, phone number and e-mail address of the quality control (QC) contact; an acknowledgement of the VTrans quality assurance (QA) inspection requirements which apply to the Subcontractor; and clear information on the extent and limits of work to be performed by the Subcontractor

Requests will be evaluated on a case by case basis and may be rejected by the Agency for any reason. Use of a Subcontractor does not relieve the fabricator of any responsibilities or quality control requirements specified by the Contract.

Structural steel furnished under this Section shall be fabricated in a plant having an AISC Certified Bridge Fabricator – Advanced (ABR), or Intermediate (IBR) Certification, and in a plant approved by the Agency prior to Contract Execution. Structural steel components (such as bridge rail, bridge joints, and overhead sign structures) which are fabricated under this Section may be fabricated in a plant that does not have an ABR or IBR Certification, provided that the fabrication plant has either an AISC Certified Bridge Fabricator – Simple (SBR) Certification, or an AISC Bridge Component QMS Certification, and is approved by the Agency prior to Contract Execution.

Minor steel components, including, but not limited to, downspouts, scuppers, and pedestrian hand railings may be fabricated in a plant that does not have an ABR or IBR Certification, provided that the fabrication plant is approved in writing by the Structures Engineer prior to Contract Execution. All plants without certification shall have an organization, operation and equipment capable of producing a product equal to a certified plant.

Structural steel that is to be painted or metalized under this section shall be coated in a plant having an AISC Sophisticated Paint Endorsement – Enclosed, or SSPC-QP 3 – Enclosed Shop certification and which has been approved by the Agency prior to Contract Execution.

When certified fabrication or coating plants are required, the plant shall maintain certified status throughout the duration of the work under the Contract.

506.03 GENERAL FABRICATION REQUIREMENTS, part (c), is hereby modified by deleting subpart (1) in its entirety and replacing it with the following:

- (1) Inspectors. Quality control inspectors shall be onsite full time during any hot work (e.g. burning, heating, welding, etc.), as well during as any operations that may affect the quality of the coating system.
 - a. Fabrication Inspectors. The fabricator’s representative responsible for fabrication inspection, testing and quality matters shall be qualified and certified in accordance with the provisions of *AWS QC 1*.
 - b. Coating Inspectors. The fabricator’s coatings quality control manager shall possess a minimum classification as a NACE Coating Inspector Level 2 – Certified. The coatings quality control inspector shall possess a minimum classification as a NACE Coating Inspector Level 1 – Certified.

506.03 GENERAL FABRICATION REQUIREMENTS, part (d)(3), is hereby modified by deleting the last sentence, which begins with “The Engineer reserves the right...” and replacing it with “The Structural Steel Fabrication Engineer reserves the right to reject inadequate office facilities and require suitable alternatives.”

506.03 GENERAL FABRICATION REQUIREMENTS, part (e), is hereby modified by adding the word “Execution” as the last word of the subsection.

506.04 DRAWINGS AND PROCEDURES, part (c), is hereby modified by being deleted in its entirety and replaced it with the following:

- (c) Welding Procedures. Detailed welding procedures shall be prepared in accordance with the provisions of the applicable AWS/ANSI/AASHTO code revisions and submitted in accordance with the following:
 - (1) All procedures shall be prequalified. Procedure qualification test records shall be submitted along with each procedure. Heat input values during welding shall be shown for each procedure.
 - (2) Welding procedure Specifications shall be presented in a format similar to *Form O-2* of *AWS D1.5*, Annex O (See Annex M for *AWS D1.1*). Procedure qualification test records shall be presented in a format similar to *Form O-3* and *Form O-4* of *AWS D1.5*, Appendix O (See Annex M for *AWS D1.1*).
 - (3) Details of welded joints not prequalified under *AWS D1.5*, Section 2.7 shall be qualified.

506.05 QUALITY ACCEPTANCE, part (b), is hereby modified by deleting the sentence “The QAI will have the authority to reject any material or work that does not conform to the Contract requirements.” in its entirety.

506.06 QUALITY CONTROL, part (b), is hereby modified by being deleted in its entirety and replaced it with the following:

(b) Qualifications of Inspectors. Inspectors shall meet the requirements of Subsection 506.03(c).

506.10 WELDING, part (d), is hereby modified by adding the word “VTrans” immediately before the phrase “prequalified welder list.” in the first paragraph, and by adding the word “VTrans” immediately before the phrase “*Field Welding Manual*” in the second paragraph.

506.10 WELDING, part (e)(1), is hereby modified by deleting the third and fourth paragraphs in their entirety. The deleted text begins with “Process and procedure qualification record tests...” and ends with “... similar to those provided in *AWS D1.5*.”

506.12 ASSEMBLY, part (d), is hereby modified by adding “,” (a comma) immediately following the phrase “All sharp corners”.

506.12 ASSEMBLY, part (d), is hereby further modified by adding the word “minimum” immediately before the phrase “1/16 inch radius”.

506.14 SURFACE PREPARATION is hereby modified by being deleted in its entirety and replaced it with the following:

506.14 SURFACE PREPARATION. All materials shall be blast-cleaned to the specified grade as defined by the *SSPC Painting Manual* and supplemented by reference to *SSPC-VIS 1*. Further preparation shall conform to the following:

- (a) Surfaces to Remain Uncoated. Surfaces shall be blast-cleaned at least equivalent to Preparation Grade *SSPC-SP 10*. This work may be performed either before or after fabrication. The final surface appearance after fabrication shall be clean and free from any contaminants or blemishes so as to allow the metal to weather uniformly.
- (b) Surfaces to be Coated. Prior to application of any coating, all material to be coated shall be cleaned and prepared in accordance with the appropriate Contract Specifications.

506.18 ERECTION, part (b), is hereby modified by deleting subparts (2) and (3) in their entirety and replacing them with the following:

- (2) Drift pins shall be used to align and center the connections of main and secondary members. Only light drifting will be permitted. Any member subjected to drifting that results in distortion of the member or elongation of the holes will be rejected. Cylindrical erection pins, the same size as the hole, shall be used at least in the extreme corners of all main member connections.

Main members shall be match marked by the Fabricator and should fit together easily.

Main members shall not be reamed larger than the hole size indicated on the approved Fabrication Drawings without written authorization from the Project Manager. Secondary members may be subjected to limited field reaming with the written approval of the Engineer. Assembled parts that have been approved for field drilling or reaming shall be disassembled to remove any burrs, shavings, oils, or lubricants.

Pins used for hinged connections and bearings shall be inserted with care and aligned so the members take full and even bearing. Nuts shall be adequately tightened and locked in position either by upsetting the threads or tack welding the nut to the bolt.

- (3) Errors in shop fabrication that prevent proper assembly shall be reported immediately to the Engineer. The Engineer shall approve any corrective action prior to it occurring.

506.19 BOLTING AND CONNECTIONS, part (a), is hereby modified by adding the phrase “Structural Steel Fabrication” immediately before the word “Engineer” in the last sentence of part (a).

506.19 BOLTING AND CONNECTIONS, part (b), is hereby modified by deleting the sentence which reads “Faying surfaces of bolted connections shall meet the Class B slip coefficient value of not less than 0.50 as specified by AASHTO.” and replacing it with “Unless otherwise specified in the Contract Documents, faying surfaces of bolted connections shall have a Class B slip coefficient value of not less than 0.50 as specified by AASHTO.”

506.19 BOLTING AND CONNECTIONS, part (c), is hereby modified by adding the sentence “Unless otherwise indicated on the plans, *ASTM F 3125/F 3125 M* Grade A 325 hex head bolts shall be used.” immediately following the sentence “Bolts shall be tightened to develop a tension not less than 5% more than the minimum bolt tension specified in Table 506.19A.”

506.19 BOLTING AND CONNECTIONS is hereby modified by relabeling part (d), “Acceptance of Bolt Tensioning.” as “(e) Acceptance of Bolt Tensioning.”

506.19 BOLTING AND CONNECTIONS is hereby further modified by adding a new part “(d) Bolt Tensioning Methods.” The new part (d) will be composed of text that is currently located in part (c). The new part (d) will begin with the phrase “Bolts shall be tensioned by the Contractor in the presence of the Engineer...” and will contain all text and tables up to and including Note 4 of Table 506.19B.

All references to “Column 3 of Table 506.19B” within the text identified above shall be replaced with the phrase “Column 4 of Table 506.19B”.

506.19 BOLTING AND CONNECTIONS, part (d)(1), is hereby modified by adding the sentence “This method shall only be used when required by the Contract.” immediately following the sentence “This method shall be employed when installing button-headed or dome-headed high-strength bolts.”

506.19 BOLTING AND CONNECTIONS, part (e), is hereby modified by deleting the phrase “or stick out not more than three threads” from the last sentence of the ninth paragraph.

506.23 UNCOATED STEEL is hereby modified by being deleted in its entirety and replaced with the following:

506.23 STEEL SURFACES AND COATINGS.

- (a) Uncoated Steel. Care must be taken to keep chemicals and oils from contacting the exposed surfaces of unpainted steel during storage, erection, and construction of the deck.
 - (1) Staining of Masonry. The Contractor shall protect all concrete and masonry from staining due to oxide formation on the steel.
 - (2) Cleaning of Steel. After all concrete has been placed, the outside surface of the fascia beams and bottom surface of their lower flanges shall be cleaned of all foreign material to a uniform appearance. The Engineer may require the exposed surfaces to be blast cleaned to Preparation Grade *SSPC-SP 10*. The use of acids for cleaning is prohibited.
- (b) Galvanized Steel. All steel surfaces to be galvanized per Contract Plans shall be coated in accordance with Subsection 726.08. Certifications as described in *ASTM A 123*, Section 10 for the completed products shall be furnished to the QA Inspector (or the Structural Steel Fabrication Engineer, if there is no QA Inspector assigned to the project) prior to shipment from the galvanizer's plant. Certifications shall include a report of all test results.
- (c) Metalized Steel. All steel surfaces to be metalized per Contract Plans shall be metalized and seal coated in accordance with Subsection 726.09.
- (d) Painted Steel. When the Contract Plans specify shop painted structural steel, the work shall be performed in accordance with the requirements of this Subsection.
 - (1) Materials. The fabricator shall provide a three coat paint system meeting the requirements of Subsection 708.03.

Shop applied systems may have isolated areas where the coatings were damaged during shipping or erection and will have areas around faying surfaces that may need field applied primer, intermediate, and top coatings. Thus, any coating system that is used in the shop shall be acceptable for the field conditions that are expected to be encountered.

(2) Submittals. The fabricator shall submit a complete package, in accordance with Subsection 105.03 for Construction Drawings, which includes the following information. The submittals shall be made sufficiently in advance of coating work to allow for review, resubmittals, and approval.

a. Surface Preparation/Painting Plan. The surface preparation/painting plan shall include the specified methods of surface preparation and type(s) of equipment to be utilized for removal of rust, mill scale, or foreign matter. The plan shall identify the solvents proposed for solvent cleaning, together with the solvent Safety Data Sheets (SDS). If any detergents, additives, or inhibitors are incorporated into the water used for any coating work operations, the plan shall include the names of the materials and their SDS.

The plan shall also include the methods of coating application, including any required stripe coats, and all equipment to be utilized.

The plan shall also identify all applicable QC/QA Hold Points. Specific inspection items throughout these specifications are designated as Hold Points. These Hold Points are for the QA Inspector to perform inspections. QA inspections will be performed only after a proper QC inspection by the fabricator. Permission to proceed beyond a Hold Point without a QA inspection will be granted solely at the discretion of the Structural Steel Fabrication Engineer, and only on a case-by-case basis. If re-work is necessary, as determined by a QA inspection, it shall be accomplished and a new Hold Point for the re-work shall be observed as defined above.

b. Abrasives. The fabricator shall submit the type of abrasives to be used for abrasive blast cleaning and their SDS. For expendable abrasives, the Contractor shall provide certification from the abrasive supplier that the abrasive meets the requirements of *SSPC-AB 1*. For steel grit abrasives, the certification shall indicate that the abrasive meets the requirements of *SSPC-AB 3*.

- c. Coating System Information. The fabricator shall submit the latest version of the product manufacturer's application and thinning instructions, SDS, and product data sheets for each and every coating, thinner, sealer, and grease rustproofing compound. Specific attention shall be drawn to storage temperatures and the temperatures of the material, surface, and ambient air at the time of application. Recommended minimum ambient weather conditions during curing shall also be included. A letter or written instructions from the coating manufacturer shall be provided indicating the length of time that each coat must be protected from cold or inclement weather (e.g. exposure to rain) during the drying/curing period.

When the Agency accepts the submittals, the fabricator will receive written notification. The fabricator shall not construe Agency acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the submittals does not relieve the fabricator from the responsibility to conduct the work according to the requirements of Federal, State, or local regulations, this Specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The fabricator remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

- (3) Quality Control (QC) Inspections. The fabricator shall perform first line, in progress QC inspections. The personnel performing any QC tests shall be trained in coatings inspection and the use of the testing instruments. Documentation of training shall be provided upon request. Painters shall perform wet film thickness measurements, with the Quality Control Inspector conducting random spot checks of the wet film. Reports for all quality control testing and observations shall be completed and provided to the QA Inspector on a daily basis.

- a. Fabricator QC inspections shall include, but are not limited to, the following:
1. Ambient conditions.
 2. Compressed air cleanliness.
 3. Surface preparation and surface profile (solvent cleaning, abrasive blast cleaning, etc.).
 4. Coating application (materials verification, mixing, thinning, induction/sweat-in time, and wet/dry film thickness).
 5. Recoat times and cleanliness between coats.

6. Coating continuity and coverage (freedom from runs, sags, overspray, dry spray, pinholes, shadow-through, skips, misses, etc.).
 7. Records of fabricator QC inspections shall document any applicable product batch numbers.
- b. The following equipment shall be provided by the fabricator as necessary to perform QC inspections:
1. Psychrometer or comparable equipment for the measurement of dew point and relative humidity, together with all necessary tables or psychrometric charts.
 2. Surface temperature Digital Spot Thermometer.
 3. *SSPC-VIS 1 - Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning* and *SSPC-VIS 3 - Visual Standard for Power and Hand-Tool Cleaned Steel*, as applicable.
 4. Commercially available putty knife of a minimum thickness of 40 mils and a width between 1 and 3 inches.
 5. Replica tape and spring micrometer.
 6. Wet film thickness gauge.
 7. Blotter paper for compressed air cleanliness checks.
 8. Type 2 electronic dry film thickness gauge per *SSPC-PA 2 Measurement of Dry Coating Thickness with Magnetic Gauges*.
 9. Calibration standards for dry film thickness gauge.
 10. Light meter for measuring light intensity during surface preparation, painting, and inspection activities.
 11. Printed copies of all applicable ASTM and SSPC Standards used for the work.
 12. *SSPC Manual of Good Painting Practice, Volume 1*.

The instruments shall be calibrated within 12 months of the date of Project usage or according to the equipment manufacturer's recommendations and the fabricator's QC Program if they require a shorter duration.

- (4) Quality Assurance (QA) Observations. The QA Inspector will conduct QA observations of any or all phases of the work. The presence or activity of QA Inspector observations in no way relieves the fabricator of the responsibility to provide all necessary daily QC inspections and to comply with all requirements of this specification.

The Structural Steel Fabrication Engineer has the right to reject any work that was performed without adequate provision for QA observations.

- (5) Inspection Access and Lighting. The fabricator shall provide artificial lighting in areas where natural light is inadequate, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 30 foot-candles.

- (6) Surface Preparation and Painting Equipment. All cleaning and painting equipment shall include gauges capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air, water, or paint as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

Hand tools, power tools, abrasive blast cleaning equipment, brushes, rollers, and spray equipment shall be of suitable size and capacity to perform the work required. All power tools shall be equipped with vacuums and High Efficiency Particulate Air (HEPA) filtration. Appropriate filters, traps, and dryers shall be provided for the compressed air used for abrasive blast cleaning and conventional spray application. Paint pots shall be equipped with air operated continuous agitation devices unless prohibited by the coating manufacturer. The air discharge from power tools and air motors shall be directed away from steel surfaces; if this is not possible a filtering device shall be appropriately placed.

- (7) Ambient Conditions. Surfaces to be painted after cleaning shall remain free of moisture and other contaminants. The fabricator shall control operations to ensure that dust, dirt, or moisture does not come in contact with surfaces cleaned or painted that day. The following ambient conditions shall be met:

- a. The surface and ambient temperatures shall be at least 5°F above the dew point during final surface preparation operations.
- b. The surface and ambient temperatures shall be a minimum of 40°F, at least 5°F above dew point, and the maximum relative humidity shall be less than or equal to 85% during the application and cure/dry time of each coat of the paint system. If the manufacturer's published literature is more restrictive it shall be followed for specific temperature, dew point, and humidity conditions during the application cure/dry of each coat. The cure/dry time shall be measured as the time following application when the ambient conditions are within the ranges above.

The fabricator shall monitor and document temperature, dew point, and relative humidity at the beginning of each Work Day and every 4 hours during surface preparation and coating application, in the specific areas where the work is being performed. The frequency of monitoring shall increase if weather conditions are changing. If the weather conditions are forecast to be borderline relative to the limits established by the manufacturer, monitoring shall continue at a minimum of 4 hour intervals throughout the curing/drying period. The Structural Steel Fabrication Engineer has the right to reject any work that was performed under unfavorable weather conditions. Rejected work shall be removed, re-cleaned, and repainted at the fabricator's expense.

- (8) Compressed Air Cleanliness. Prior to using compressed air for abrasive blast cleaning, blowing down the surfaces, and painting with conventional spray, the fabricator shall verify that the compressed air is free of moisture and oil contamination in accordance with the requirements of *ASTM D 4285*. The tests shall be conducted at least one time each shift for each compressor system in operation. If air contamination is evident, the fabricator shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air. The fabricator shall also examine the work performed since the last acceptable test for evidence of defects or contamination caused by the compressed air. Affected work shall be repaired at the fabricator's expense.
- (9) Surface Preparation and Profile (Hold Point).
- a. Surface Preparation. All steel surfaces to be painted shall be prepared by dry abrasive blast cleaning to meet the requirements of *SSPC-SP 10*.
 - b. Abrasives. Abrasive blast cleaning shall be performed using either expendable abrasives (other than silica sand), or recyclable steel grit abrasives. Expendable abrasives shall be used one time and disposed of. The fabricator shall verify that recycled abrasives are free of oil contamination by conducting oil content tests in accordance with *SSPC-AB 2* on a daily basis.
 - c. Surface Profile. The abrasives used for blast cleaning shall have a gradation such that the abrasive will produce a uniform surface profile of 1.5 to 3.5 mils. If the profile requirements of the coating manufacturer are more restrictive, the fabricator shall advise the Structural Steel Fabrication Engineer and comply with the more restrictive requirements. For recycled abrasives, an appropriate operating mix shall be maintained in order to control the profile within these limits.

The surface profile produced by the fabricator's surface preparation procedures shall be determined by replica tape and spring micrometer at the beginning of the work, and each day that the surface preparation is performed. Areas having unacceptable measurements shall be further tested to determine the limits of the deficient area. The replica tape shall be attached to the daily report.

When unacceptable profiles are produced, work shall be suspended. The fabricator shall make the necessary adjustments to ensure that the correct surface profile is achieved on all surfaces. The fabricator shall not resume work until the new profile is verified by the QA observations and he/she confirms that the profile is acceptable.

- d. Surface Condition Prior To Painting. Prepared surfaces shall meet the specified degrees of cleaning immediately prior to painting, and shall be painted before rusting appears on the surface. If rust appears or bare steel remains unpainted for more than 8 hours, the affected area shall be prepared again at the expense of the fabricator.

All surface preparation cleaning residue on steel surfaces shall be removed prior to painting.

The quality of surface preparation and cleaning of surface dust and debris must be accepted by the QA Inspector prior to painting. The Structural Steel Fabrication Engineer has the right to reject any work that was performed without adequate provision for QA observations to accept the degree of cleaning. Rejected coating work shall be removed and replaced at the fabricator's expense.

- (10) General Paint Requirements. Paint storage, mixing, and application shall be accomplished according to these Specifications and as specified in the paint manufacturer's written instructions and product data sheets for the paint system used. In the event of a conflict between these specifications and the coating manufacturer's instructions and data sheets, the fabricator shall advise the Structural Steel Fabrication Engineer and comply with the most restrictive requirements.

- a. Paint Storage and Mixing. All paint shall be stored according to the manufacturer's published instructions, including handling, minimum and maximum temperatures, and warming as required prior to mixing. All coatings shall be supplied in sealed containers bearing the manufacturer's name, product designation, batch number, and mixing/thinning instructions. Leaking containers shall not be used. The paint shall be stored in a secure fireproof location.

Mixing shall be performed according to the manufacturer's instructions. Thinning shall be performed using thinner provided by the manufacturer, and only to the extent allowed by the manufacturer's written instructions. In no case shall thinning be permitted that would cause the coating to exceed the local Volatile Organic Compound (VOC) emission restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers according to the manufacturer's instructions, in the original containers before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment, and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container.

Excessive skinning or partial hardening due to improper or prolonged storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted. Manufacturer recommended induction/sweat-in times and temperature of mixed coatings shall be observed.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, paint buckets, etc. overnight and shall be stored in a covered container and remixed before use.

- b. Paint Application. Unless prohibited by the coating manufacturer's written instructions, paint may be applied by spray methods, rollers, or brushes. If applied with conventional or airless spray methods, paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern.

The painters shall monitor the wet film thickness of each coat during application. The wet film thickness shall be calculated based on the specified dry film thickness using the solids by volume of the material and the amount of thinner added.

When brushes or rollers are used to apply the coating, additional applications may be required to achieve the specified thickness per layer.

- c. Re-coating and Film Continuity (Hold Point for Each Coat). Paint shall be considered dry for re-coating according to the re-coat time/temperature/humidity criteria provided in the manufacturer's instructions and when an additional coat can be applied without the development of film irregularities such as lifting, wrinkling, or loss of adhesion of the under coat.

- d. Stripe Coats. Unless indicated otherwise in the Contract, the Contractor shall apply an additional stripe coat to edges, crevices, welds, and similar surface irregularities for the prime coat and intermediate coat. The stripe coat shall be applied by brush or roller, as per manufacturer's recommendations, such that the coating is thoroughly worked into or on the irregular surfaces, and shall extend onto the surrounding steel a minimum of 1 inch in all directions. The purpose of the stripe coat is to build additional thickness and to assure complete coverage of these areas.

The stripe coat shall not be applied as part of the application of the full coat. The stripe coat shall be applied and dried separately according to the manufacturer's recommended drying times. Also, the color of the stripe coat shall contrast with the colors used for the full coats immediately preceding and succeeding the stripe coat.

- e. Coating Sequence. For locations painted under this specification, coatings shall be applied as follows:

1. Prime Coat. The full prime coat shall be applied first to protect the steel. Once the full prime coat has dried, the prime stripe coat shall be applied.
2. Intermediate Coat. After the prime stripe coat has dried, an intermediate stripe coat shall be applied and allowed to dry, followed by the full intermediate coat.
3. Top Coat. After the full intermediate coat has dried, the full top coat shall be applied.

- (11) Coating Thickness. The dry film thicknesses of the full coats shall be as follows, as measured in accordance with *SSPC-PA 2*. If the manufacturer's upper or lower thickness limit is more restrictive, it shall be followed instead.

1. The prime coat of organic zinc-rich primer shall be between 3.5 and 5.0 mils dry film thickness.
2. The intermediate coat of epoxy or urethane shall be between 3.0 and 6.0 mils dry film thickness.
3. The finish coat of aliphatic urethane shall be between 2.5 and 4.0 mils dry film thickness. Finish coat color shall be according to Contract Documents.

- (12) Amine Blush. Amine blush is a residue that can form on newly applied epoxy coating films under certain conditions. Amine blush often appears as a yellowish milky and/or a blotchy residue on the coating surface and is a deterrent to the adhesion of subsequently applied coating layers. If amine blush is detected, the Contractor shall provide the Engineer with written procedures from the coating manufacturer for complete removal prior to the application of additional coating layers.

Painting shall be done in a neat and workmanlike manner. Each coat of paint shall be applied as a continuous film of uniform thickness free of defects including, but not limited to, runs, sags, overspray, dry spray, pinholes, voids, skips, misses, and shadow-through. Defects such as runs and sags shall be brushed out immediately during application.

- (13) Repair of Damage to New Coating System. The Contractor shall repair all damage to the newly installed coating system, at no cost to the Agency. If the damage extends to the substrate, the damaged areas shall be prepared to meet *SSPC-SP 3*.

The surrounding coating at each repair location shall be feathered for a minimum distance of 1-1/2 inches to achieve a smooth transition between the prepared areas and the existing coating.

If the bare steel is exposed, all coats shall be applied to the prepared area. If only the intermediate and finish coats are damaged, the intermediate and finish coats shall be applied. If only the finish coat is damaged, the finish coat shall be applied.

All Hold Points and specifications are applicable to the repair of damaged areas and areas concealed by containment.

- (e) Grease Coating. When the Contract Plans specify that any steel surfaces are to be grease coated, all work shall be performed in accordance with Subsection 708.04.

Grease rustproofing compound shall be uniformly applied in a single coat by brush or spray at an approximate rate of 20 ft²/gal to the steel as specified. This shall occur after all concrete form work has been removed, and after the final coat of paint, including repairs, has fully cured. A fully cured condition has occurred when a thumbnail driven into the coating surface does not leave an impression and when a thumb firmly pushed against the surface and twisted does not disturb the coating.

Surfaces adjacent to areas being grease coated shall be protected against over-spray. Non-metallic and stainless steel surfaces shall not be coated.

506.25 BASIS OF PAYMENT is hereby modified by being deleted in its entirety and replaced with the following:

506.25 BASIS OF PAYMENT. The accepted quantity of Structural Steel will be paid for at the Contract Unit Price per pound for the items specified in the Contract. Payment will be full compensation for furnishing, detailing, handling, transporting, and placing the materials specified, including nondestructive testing of welds; for preparing the surface of new steel to be painted, galvanized, metalized, or to remain unpainted; for necessary field cleaning; and for painting, metalizing, sealing, galvanizing, or grease coating of surfaces, unless otherwise paid for. Payment will also be full compensation for furnishing and implementing the erection plan, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment for Structural Steel on a lump sum basis will be full compensation for performing all work specified and for furnishing all labor, materials, tools, equipment, erection plans, and incidentals necessary to complete the work.

The Engineer may authorize progress payments in the following manner:

- (a) A maximum of 15% of the estimated quantity may be paid when the Fabrication Drawings are approved for fabrication.
- (b) A maximum of 75% of the estimated quantity may be paid when the steel has been entirely completed and accepted per the approved Fabrication Drawings, stored in a location and manor accepted by the Structural Steel Fabrication Engineer, and all applicable material certifications have been approved.
- (c) A maximum of 90% of the estimated quantity may be paid when the steel has been erected, falsework removed, and painting of connections, and “touch-up” completed where required.
- (d) After completion and acceptance of all work under this Section, including extended weights being received and checked, 100% of the quantity will be paid.

All nondestructive testing and required quality control activities will be considered incidental to fabrication, and no separate payment will be made.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
506.50 Structural Steel, Rolled Beam.....	Pound
506.55 Structural Steel, Plate Girder	Pound
506.56 Structural Steel, Curved Plate Girder.....	Pound
506.57 Structural Steel, Truss.....	Pound
506.60 Structural Steel.....	Pound
506.75 Structural Steel.....	Lump Sum

SECTION 510 – PRESTRESSED CONCRETE

510.12 GROUT, part (b), is hereby modified by deleting the phrase “requirements of Subsection 707.03(c)(1) and Subsection 707.03(c)(3).” from the fifth paragraph and replacing it with the phrase “requirements of Subsection 707.03(a)(1) and Subsection 707.03(a)(3).”

SECTION 516 – EXPANSION DEVICES

516.02 MATERIALS is hereby modified by deleting the fourth entry, “Asphalt Plug Bridge Joint.....707.15”, from the Subsection listing and replacing it with the following:

Asphaltic Plug Joints for Bridges707.15

SECTION 519 – SHEET MEMBRANE WATERPROOFING

519.02 MATERIALS is hereby modified by being deleted in its entirety and replaced with the following:

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

Waterproofing Membrane System, Type I726.11(a)

Waterproofing Membrane System, Type II726.11(b)

Spray applied membranes shall be a Waterproofing Membrane System, Type I, and torch applied membranes shall be a Waterproofing Membrane System, Type II.

SECTION 524 – JOINT SEALER

524.02 MATERIALS is hereby modified by deleting the sixth entry, “Asphalt Plug Bridge Joint.....707.15”, from the Subsection listing and replacing it with the following:

Asphaltic Plug Joints for Bridges707.15

SECTION 540 – PRECAST CONCRETE

540.02 MATERIALS is hereby modified by deleting the twenty eighth material entry, “Sheet Membrane Waterproofing, Preformed Sheet.....726.11”, from the Subsection listing and replacing it with the following:

Waterproofing Membrane System, Type III.....726.11(c)

540.10 INSTALLATION, part (c), is hereby modified by deleting the phrase “requirements of Subsection 726.11.” from the fifth paragraph and replacing it with the phrase “requirements of Subsection 726.11(c).”

540.11 GROUT, part (b), is hereby modified by deleting the phrase “requirements of Subsection 707.03(c)(1) and Subsection 707.03(c)(3).” from the fifth paragraph and replacing it with the phrase “requirements of Subsection 707.03(a)(1) and Subsection 707.03(a)(3).”

540.12 POST-TENSIONING is hereby modified by deleting the phrase “requirements of Subsection 510.12(b).” from the second paragraph and replacing it with the phrase “requirements of Subsection 540.11(b).”

540.14 BASIS OF PAYMENT, part (b), is hereby modified by deleting the word “prestressed” and replacing it with the word “precast”.

SECTION 543 – CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE

543.04 SUBMITTALS is hereby modified by deleting the first paragraph, which begins with “As soon as practical after award...” and ends with “...submitted as separate submittals”, in its entirety and replacing it with the following:

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

SECTION 605 – UNDERDRAINS

605.02 MATERIALS is hereby modified by adding the following as the eighth entry in the Subsection listing:

Geotextile for Underdrain Trench Lining.....720.05

605.02 MATERIALS is hereby further modified by deleting the sentence “Geotextile shall meet the requirements of Table 720.01A for Geotextile for Underdrain Trench Lining.”

SECTION 625 – SLEEVES FOR UTILITIES

625.02 MATERIALS is hereby modified by deleting the eighth entry, “Asphalt Plug Bridge Joint.....707.15”, from the Subsection listing and replacing it with the following:

Asphaltic Plug Joints for Bridges707.15

625.02 MATERIALS is hereby further modified by deleting the fifteenth entry, “Well Casing.....741.01”, from the Subsection listing.

SECTION 630 – UNIFORMED TRAFFIC OFFICERS AND FLAGGERS

630.01 DESCRIPTION is hereby modified by deleting the last sentence, which begins with “Flaggers and UTOs shall conform to...” and replacing it with “Flaggers and UTOs shall conform to the requirements of the Contract Documents and the current edition of the *MUTCD* and its latest revisions.”

630.02 GENERAL, part (b), is hereby modified by being deleted in its entirety and replaced with the following:

- (b) Safety Apparel. Traffic control personnel shall wear safety apparel in accordance with the most current edition of the *MUTCD* and its latest revisions. Traffic control personnel deemed to have unsuitable safety apparel by the Engineer shall be considered ineffective and shall be removed.

When operating during nighttime hours, between sunset and sunrise, traffic control personnel shall wear safety apparel meeting or exceeding performance Class 3 requirements of *ANSI/ISEA 107*, including Class E pants or gaiters.

630.04 FLAGGERS is hereby modified by deleting part (a) in its entirety and replacing it with the following:

- (a) Requirements. The Contractor shall verify that Flaggers meet the following requirements. Flaggers shall have successfully completed a 4-hour training course taught by a certified instructor within the last 24 months and shall carry proof of training at all times when on the Project. Certified instructors shall have successfully completed one of the following courses:
 - (1) Associated General Contractors of VT Traffic Control Technician/Flagger Trainer Course
 - (2) American Traffic Safety Services Association Flagger Instructor Training Course
 - (3) National Safety Council Flagger Instructor Course

SECTION 631 – FIELD OFFICE

631.06 TESTING EQUIPMENT, BITUMINOUS is hereby modified by adding the following as the fourth and fifth entries in the list of equipment, immediately following “1 Shovel, round-pointed with D-handle”:

- 1 Metal shovel, square-head, 5.5 inch minimum width, with long handle
- 1 Metal spatula, of an appropriate size to clean shovels.

631.06 TESTING EQUIPMENT, BITUMINOUS is hereby further modified by adding the following two paragraphs, immediately following “1 Relative humidity pen”:

The Contractor shall provide a non-petroleum asphalt release agent for cleaning the bituminous testing equipment.

The Contractor shall provide 7.5 inch x 7.5 inch x 7.5 inch sampling containers meeting the requirements of *AASHTO R 97*. The number of containers provided shall be sufficient for the quantity of bituminous concrete material installed and the sampling frequency identified in the *Materials Sampling Manual*.

631.08 TESTING EQUIPMENT, GROUT is hereby modified by deleting “1 Set of specimen molds meeting the requirements of *AASHTO T 106 M/T 106*” and replacing it with the following:

Specimen molds meeting the requirements of *AASHTO T 106 M/T 106*. The number of molds shall be sufficient to perform both the acceptance testing required for the contract item and any necessary control of work testing. Each specimen mold shall be capable of producing 3 individual cubes.

631.09 METHOD OF MEASUREMENT is hereby modified by deleting the sentence “Upon entering the cost of the submitted bill into the next biweekly estimate, the Engineer will forward the original paid bill to the Construction Office to be retained with the Project records and will place a copy of the paid bill into the field office records.” in its entirety.

SECTION 641 – TRAFFIC CONTROL

641.02 GENERAL CONSTRUCTION REQUIREMENTS is hereby modified by deleting paragraphs four, five, six and seven in their entirety and replacing them with the following:

- (a) Traffic Control. When the Contract includes the Traffic Control Pay Item, the Plans will contain an Agency-designed traffic control plan. The Contractor may implement the Agency-designed plan or submit an alternate traffic control plan for the Project. When the Contractor will implement an Agency-designed traffic control plan, written certification shall be submitted to the Engineer indicating that traffic control will be performed in accordance with the Agency design. An alternate plan may be for the entire traffic control plan of the Project or for revisions to various phases of the Agency’s design in the Plans, including the specific location of the lanes where the traffic will be maintained. Any alternate plan submitted shall conform to the latest edition of the *MUTCD*.

For an alternate traffic control plan, Construction Drawings shall be submitted in accordance with Section 105. The submitted alternative plan shall include complete construction details, including all aspects of traffic control, to the same extent provided in the Agency design. The Contractor shall allow the Agency 30 Calendar Days to Review the proposed plan for Conformance before it is to be implemented.

- (b) Traffic Control, All-Inclusive. When the Contract includes the Traffic Control, All-Inclusive Pay Item, the Contractor shall design and submit a site-specific traffic control plan in accordance with Section 105. The submitted site-specific plan shall include, for each phase of construction requiring a significant change in temporary traffic control, a narrative description of the proposed temporary traffic control for each phase, including pedestrian accommodations where appropriate, and the major work activities to be completed in each phase.

The submitted site-specific plan shall also include a layout for each phase of construction showing existing lane configurations, existing traffic control devices (signs, signals, and pavement markings), driveways, ramps, and highway intersections, and the location of all proposed temporary traffic control devices, Flaggers, and UTOs. All pertinent dimensions, such as taper lengths, sign spacing, temporary lane widths, and distances from existing traffic control devices shall be labeled.

641.03 TRAFFIC CONTROL DEVICES is hereby modified by adding the following as the thirteenth paragraph, immediately following the phrase “each consisting of a maximum of three lines of eight characters.”:

Each PCMS unit shall be tamper-resistant. The control cabinet shall be locked when not in use. Each PCMS shall also have a security system that will only allow access if a code or password is entered. The default code or password shall be changed upon deployment of the PCMS by the Contractor. PCMS boards featuring remote access shall also be password protected.

641.07 BASIS OF PAYMENT is hereby modified by being deleted in its entirety and replaced with the following:

641.07 BASIS OF PAYMENT.

- (a) Traffic Control and Traffic Control, All-Inclusive. The accepted quantity of Traffic Control and Traffic Control, All-Inclusive will be paid for at the Contract lump sum price. Payment will be full compensation for designing, preparing, implementing, inspecting, maintaining, and removing the applicable traffic control plan and specified traffic control devices, and for furnishing all labor (including traffic patrol vehicle operators, if used by the Contractor), tools, materials, equipment, and incidentals necessary to complete the work.

Partial payments for Traffic Control and Traffic Control, All-Inclusive will be made as follows:

- (1) The first 15% of the Contract lump sum price will be paid upon receipt of written certification from the Contractor that traffic control will be performed in accordance with the Agency-designed traffic control plan, or upon approval of the Contractor’s traffic control plan.

- (2) The remaining 85% of quantity payments will be paid on a prorated basis for the estimated duration of the Contract work remaining.

- (b) Portable Changeable Message Sign and Portable Arrow Board. The accepted quantities of Portable Changeable Message Sign and Portable Arrow Board will be paid for at the Contract Unit Price for each. There will be no payment for any spare units, as they shall be considered incidental to the unit(s) being utilized and paid for through the Contract.

Partial payment for Portable Changeable Message Sign and Portable Arrow Board will be made as follows:

- (1) The first 50% of quantity payments will be made upon the erection of complete Portable Changeable Message Sign(s) and Portable Arrow Board(s) as specified in Subsection 641.06.

- (2) The remaining 50% of quantity payments will be paid on a prorated basis for the estimated duration of the Contract work remaining.

The accepted quantities of Portable Changeable Message Sign Rental and Portable Arrow Board Rental will be paid for at the Contract Unit Price per day. The minimum quantity for payment shall be five days.

Payment for the accepted quantities of Portable Changeable Message Sign, Portable Arrow Board, Portable Changeable Message Sign Rental, and Portable Arrow Board Rental shall be full compensation for furnishing, operating, maintaining, transporting, and installing the unit specified, for removing the unit when it is no longer needed, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

When both Pay Items are in the Contract, a Portable Changeable Message Sign used as a Portable Arrow Board will be paid for at the Contract price for a Portable Arrow Board.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
641.10 Traffic Control	Lump Sum
641.11 Traffic Control, All-Inclusive	Lump Sum
641.15 Portable Changeable Message Sign	Each
641.16 Portable Arrow Board	Each
641.17 Portable Changeable Message Sign Rental.....	Day
641.18 Portable Arrow Board Rental.....	Day

SECTION 646 – RETROREFLECTIVE PAVEMENT MARKINGS

646.02 MATERIALS is hereby modified by deleting the ninth through sixteenth entries in the Subsection listing and replacing them with the following:

Line Striping Targets	708.12(a)
Pavement Marking Mask	708.12(b)
Pavement Marking Tape, Type A.....	754.03(a)
Pavement Marking Tape, Type B.....	754.03(b)
Pavement Marking Tape, Type C	754.03(c)

646.04 APPLICATION OF MARKINGS, GENERAL, part (a), is hereby modified by deleting both instances of the phrase “cold planing” from the second sentence (which begins with “During paving and cold planing, work shall be...”) of the sixth paragraph, and replacing them with the word “milling”.

646.07 DURABLE PAVEMENT MARKINGS, parts (a) and (b), are hereby modified by being deleted in their entirety and replaced with the following:

- (a) Pavement Marking Tape, Type A. Pavement Marking Tape, Type A, when used as a final durable marking, shall be applied in a recess as defined in Subsection 646.09, and shall be applied in accordance with the manufacturer’s requirements.
- (b) Pavement Marking Tape, Type B. Pavement Marking Tape, Type B, when used as a final durable marking, shall be applied in a recess as defined in Subsection 646.09, and shall be applied in accordance with the manufacturer’s requirements.

646.07 DURABLE PAVEMENT MARKINGS, is hereby further modified by deleting part (c), “Pavement Marking Tape, Type C” and part (d), “Pavement Marking Tape, Type D”, in their entirety.

646.07 DURABLE PAVEMENT MARKINGS is hereby further modified by relabeling parts (e) and (f) as parts (c) and (d).

646.07 DURABLE PAVEMENT MARKINGS is hereby further modified by adding the following as the new part (e):

- (e) Preformed Thermoplastic. Preformed thermoplastic shall be one of the Thermoplastic Pavement Markings, Type B listed on the Agency’s *Approved Products List*.

646.07 DURABLE PAVEMENT MARKINGS is hereby further modified by relabeling part (g), “Polyurea Paint.” as “(f) Polyurea Paint.”

646.07 DURABLE PAVEMENT MARKINGS, parts (c)(1) and (f)(1), are both hereby modified by deleting the phrase “paver-placed pavement” from each part and replacing it with the phrase “bonded wearing course”.

646.08 TEMPORARY PAVEMENT MARKINGS is hereby modified by relabeling part (a), “Temporary Pavement Marking Tape.” as “(a) Pavement Marking Tape, Type C.”

646.09 OTHER RELATED MARKINGS, Table 646.09A, is hereby further modified by deleting the first row and replacing it with the following:

Marking Material	Recess Depth (mils)
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646.13 METHOD OF MEASUREMENT is hereby modified by deleting the seventh paragraph in its entirety. The deleted text begins with “The quantity of Raised Pavement Markers, Type II...” and ends with “... and removed when no longer needed.”

646.14 BASIS OF PAYMENT is hereby modified by deleting the phrase “raised pavement markers,” from the first sentence (which begins with “The Contract Unit Price for pavement marking items...”) of the eleventh paragraph.

646.14 BASIS OF PAYMENT is hereby further modified by deleting the twelfth and thirteenth paragraphs in their entirety. The deleted text begins with “The accepted quantity of Raised Pavement Markers, Type II...” and ends with “... will be considered incidental to the Contract Item Raised Pavement Markers, Type II.”

646.14 BASIS OF PAYMENT is hereby further modified by deleting the pay item “646.75 Raised Pavement Markers, Type II..... Each”.

SECTION 649 – GEOTEXTILE FABRIC

649.02 MATERIALS is hereby modified by being deleted in its entirety and replaced with the following:

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

Geotextile for Roadbed Separator.....	720.02
Geotextile Under Railroad Ballast.....	720.03
Geotextile Under Stone Fill	720.04
Geotextile for Underdrain Trench Lining.....	720.05
Geotextile for Filter Curtain.....	720.06

Geotextiles shall conform to the following:

- (a) Where sewn seams are used, the Contractor shall furnish the manufacturer’s wide strip tensile test results as part of the certification. The results must verify that the seam meets or exceeds the specified average minimum roll values for the grab tensile strength of the geotextiles, or wide strip tensile strength for reinforcement applications.
- (b) Field seams, where used, shall be in accordance with the manufacturer’s recommendations.

SECTION 653 – EROSION PREVENTION AND SEDIMENT CONTROL

653.02 MATERIALS is hereby modified by inserting the following as the fourth and fifth entries in the Subsection listing:

Geotextile Under Stone Fill720.04
Geotextile for Silt Fence720.07

653.02 MATERIALS is hereby further modified by deleting the phrase “Geotextile Under Stone Fill shall be in accordance with Section 720 and Table 720.01A. Geotextile for Silt Fence shall be in accordance with Section 720 and Table 720.01A.”

653.08 RUNOFF CONTROL MEASURES is hereby modified by deleting the first paragraph of Subsection 653.08(a)(1) in its entirety and replacing it with the following:

- (1) Check Dam, Type I. Check Dam, Type I shall be placed in channels and on Geotextile Under Stone Fill meeting the requirements of Subsection 720.04.

653.08 RUNOFF CONTROL MEASURES is hereby further modified by deleting Subsection 653.08(b)(1) and Subsection 653.08(b)(2) in their entirety and replacing them with the following:

- (1) Silt Fence, Type I. Silt Fence, Type I shall be constructed of posts and Geotextile for Silt Fence meeting the requirements of Subsection 720.07.
- (2) Silt Fence, Type II. Silt Fence, Type II shall be constructed of posts, Geotextile for Silt Fence meeting the requirements of Subsection 720.07, and woven wire reinforcement.

653.09 TREATMENT MEASURES is hereby modified by deleting the second paragraph of Subsection 653.09(a), beginning with “Stabilized Construction Entrances shall be constructed of stone...”, in its entirety and replacing it with the following:

Stabilized Construction Entrances shall be constructed of stone meeting the requirements of Subsection 704.17 and shall be placed on top of Geotextile Under Stone Fill meeting the requirements of Subsection 720.04.

653.09 TREATMENT MEASURES is hereby further modified by deleting the third paragraph of Subsection 653.09(b)(1), beginning with “Stake and fabric devices...”, in its entirety and replacing it with the following:

Stake and fabric devices shall be constructed of Geotextile for Silt Fence meeting the requirements of Subsection 720.07 and stakes approved by the Engineer.

653.09 TREATMENT MEASURES is hereby further modified by deleting the second paragraph of Subsection 653.09(b)(3), beginning with “Inlet Protection Device, Type III shall be constructed of Aggregate...”, in its entirety and replacing it with the following:

Inlet Protection Device, Type III shall be constructed of Aggregate for Erosion Prevention and Sediment Control and shall be placed on top of Geotextile Under Stone Fill meeting the requirements of Subsection 720.04.

SECTION 675 – TRAFFIC SIGNS

675.02 MATERIALS is hereby modified by deleting the first entry, “Paint for Traffic Signs.....708.06”, from the Subsection listing.

675.07 TRAFFIC SIGNS is hereby modified by deleting part (b)(2) in its entirety and replacing it with the following:

- (2) Flat Sheet Aluminum. Fabrication of the flat aluminum sheets, including cutting to size, shall be completed prior to degreasing, etching, or treating, and application of the retroreflective sheeting. Flat sheet aluminum may be sheared, blanked, sawed, or milled. No flame cutting will be permitted. Field drilling or punching of holes will be allowed as needed.

675.07 TRAFFIC SIGNS is hereby further modified by adding the following as the second and third sentences of part (d), immediately after the sentence beginning “Signs shall be mounted as tightly to the posts, frame, or...”:

For permanent installations of Type A signs to frames or posts, a nylon-insert locking nut and two washers shall be used. For all sign types, if bolts are used for mounting, the installed bolt shall be at least flush with the nut.

SECTION 677 – OVERHEAD TRAFFIC SIGN SUPPORTS

677.03 GENERAL is hereby modified by adding the sentence “Field verification testing for Direct Tension Indicators is not required.” immediately following the sentence “High-Strength Bolts, Nuts, and Washers shall be tensioned in accordance with Subsection 506.19.”

SECTION 678 – TRAFFIC CONTROL SIGNALS

678.09 ERECTION OF POSTS AND POLES is hereby modified by adding the sentence “Field verification testing for Direct Tension Indicators is not required.” immediately following the sentence “High-Strength Bolts, Nuts, and Washers shall be tensioned in accordance with Subsection 506.19.”

SECTION 679 – STREET LIGHTING

679.02 MATERIALS is hereby modified by deleting the fifth material entry, “Bracket Arms.....753.04”, from the Subsection listing.

679.02 MATERIALS is hereby further modified by inserting the following as the fifth and sixth entries in the Subsection listing:

- Bracket Arms, Aluminum.....753.04(a)
- Bracket Arms, Steel753.04(b)

679.05 BRACKET ARMS is hereby modified by deleting the first sentence of the Subsection and replacing it with the following:

Bracket arms shall be free of defects and burrs. Bracket arms shall be able to withstand a vertical load of 100 pounds and a horizontal load of 50 pounds without fracture or permanent deformation and shall be installed as shown in the Contract Documents.

Bracket arms installed on aluminum posts shall be in accordance with Subsection 753.04(a). Bracket arms installed on steel or wood posts shall be in accordance with Subsection 753.04(b).

SECTION 680 – TRAVEL INFORMATION SIGNS

680.02 MATERIALS is hereby modified by deleting the second entry, “Paint for Traffic Signs.....708.06”, from the Subsection listing.

SECTION 702 – BITUMINOUS MATERIALS

702.06 APPLICATION TEMPERATURE RANGES, is hereby modified by deleting Table 702.06A in its entirety and replacing it with the following:

TABLE 702.06A – EMULSIFIED ASPHALT APPLICATION TEMPERATURE RANGES

Emulsified Asphalt Type	Temperature Range (°F)		Temperature Range (°C)	
	Spray	Mix	Spray	Mix
	Min. – Max.	Min. – Max.	Min. – Max.	Min. – Max.
RS-1	70 – 170	--	21 – 77	--
RS-2, CRS-1	120 – 160	--	49 – 71	--
CRS-2	140 – 175	--	60 – 79	--
RS-1h, CRS-1h	70 – 170	--	21 – 77	--
SS-1h, CSS-1h	75 – 130	50 – 130	24 – 54	10 – 54
MS-2h, CMS-2h	--	75 – 140	--	24 – 60

SECTION 704 – AGGREGATES

704.01 FINE AGGREGATE FOR CONCRETE, part (b), is hereby modified by being deleted in its entirety and replaced with the following:

- (b) Organic Impurities. Fine aggregate for concrete shall have an Organic Plate Number of two or less as determined in accordance with *AASHTO T 21*.

704.10 AGGREGATE FOR BITUMINOUS CONCRETE PAVEMENT, part (a), is hereby modified by deleting the reference to “*ASTM C 295/C 295 M (Modified)*” from the end of the sentence that begins with “Manufactured sand may be substituted for...” and replacing it with “*AASHTO T 304*”.

704.10 AGGREGATE FOR BITUMINOUS CONCRETE PAVEMENT, part (a)(3), is hereby modified by deleting the reference to “*ASTM D 5821*” from the end of the sentence that begins with “When crushed gravel is used as coarse aggregate in Marshall bituminous...” and replacing it with “*AASHTO T 335*”.

704.10 AGGREGATE FOR BITUMINOUS CONCRETE PAVEMENT, part (a)(3)a., is hereby modified by deleting “Measurement is made using test method *ASTM D 5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.*” and replacing it with “Measurement is made using test method *AASHTO T 335.*”

SECTION 706 – STONE FOR MASONRY, RIPRAP, AND OTHER PURPOSES

706.06 ROCK FILL FOR GABIONS is hereby modified by being deleted in its entirety and replaced with the following:

706.06 THIS SUBSECTION RESERVED.

SECTION 707 – JOINT MATERIALS

707.14 PREFORMED JOINT FILLER, Table 707.14A, is hereby modified by deleting the reference to “*AASHTO T 42*” from the third column.

707.15 ASPHALTIC PLUG JOINTS FOR BRIDGES is hereby modified being deleted in its entirety and replaced with the following:

707.15 ASPHALTIC PLUG JOINTS FOR BRIDGES. Asphaltic Plug Joints for Bridges shall be single and/or multiple layer systems consisting of asphaltic binder, aggregate, closed cell foam expansion joint filler, and steel bridging plate, as applicable. Asphaltic Plug Joints shall be in accordance with *ASTM D 6297* and shall be one of the products listed on the Agency’s *Approved Products List*.

707.17 ASPHALTIC PLUG JOINT BINDER is hereby made a new subsection of the specifications as follows:

707.17 ASPHALTIC PLUG JOINT BINDER. Asphaltic Plug Joint Binder shall be a thermoplastic polymeric-modified asphalt in accordance with *ASTM D 6297* and shall be one of the products listed on the Agency’s *Approved Products List*.

SECTION 708 – PAINTS, STAINS, AND TRAFFIC MARKING MATERIALS

708.03 APPROVED STRUCTURAL COATING SYSTEMS is hereby modified by being deleted in its entirety and replaced with the following:

708.03 STRUCTURAL STEEL COATING SYSTEMS. Acceptable structural steel coating systems shall be one of the systems listed on the Agency’s *Approved Products List*, listed on the *NEPCOAT Qualified Products List B*, and shall meet the following requirements:

- (a) System. The structural steel coating system shall be a three-coat system with a prime, intermediate, and top coat. Components of different systems shall not be intermixed.
- (b) Color. Individual coats shall have contrasting colors. The finish color of the top coat shall be green, black, or brown as specified in the Contract Documents, and shall conform to *SAE AMS-STD 595* for the respective chip number as specified in Table 708.03A.

TABLE 708.03A – COLORS FOR STRUCTURAL COATING SYSTEMS

Color	Chip Number
Green	14062
Black	27038
Brown	20059

Damage to structural steel coating systems shall be repaired with a compatible structural steel coating system as specified herein.

708.06 PAINT FOR TRAFFIC SIGNS is hereby modified by being deleted in its entirety and replaced with the following:

708.06 THIS SUBSECTION RESERVED.

708.08 PAINT FOR PAVEMENT MARKINGS is hereby modified by adding the following two rows to Table 708.08C, immediately after the row for “Close cup flash point”.

Viscosity	<i>ASTM D 562</i>	78 Krebs min./ 95 Krebs max.	78 Krebs min./ 95 Krebs max.
Dry Time	<i>ASTM D 711</i>	10 minutes max	10 minutes max.

SUBSECTION 708.11 PAVEMENT MARKING TAPE is hereby modified by being deleted in its entirety and replaced with the following:

708.11 THIS SUBSECTION RESERVED

708.12 TEMPORARY DELINEATION SYSTEMS is hereby modified by being deleted in its entirety and replaced with the following:

708.12 TEMPORARY DELINEATION SYSTEMS.

- (a) Line Striping Targets. Acceptable Line Striping Targets shall be one of the Line Striping Targets on the Agency’s *Approved Products List*.
- (b) Pavement Marking Mask. Acceptable Pavement Marking Mask shall be one of the Masking Marking Tapes on the Agency’s *Approved Products List*.

SECTION 711 – CULVERTS, STORM DRAINS, AND SEWER PIPES, METAL

711.02 CORRUGATED ALUMINUM ALLOY PIPE, PIPE ARCHES, AND UNDERDRAINS, part (a)(2)c., is hereby modified by deleting the phrase “requirements of Subsection 711.01(a)(2)c.” and replacing it with the phrase “requirements of Subsection 711.01(a)(1)c.”

SECTION 712 – CRIBBING MATERIALS

712.04 GABION BASKETS is hereby modified by being deleted in its entirety and replaced with the following:

712.04 THIS SUBSECTION RESERVED.

SECTION 713 – REINFORCING STEEL, STRAND, AND WELDED WIRE REINFORCEMENT

713.04 COLD DRAWN STEEL WIRE is hereby modified by deleting the reference to “*AASHTO M 32 M/M 32*” and replacing it with “*AASHTO M 336 M/M 336*”.

713.05 WELDED WIRE REINFORCEMENT is hereby modified by deleting the phrase “*AASHTO M 55 M/M 55* or *AASHTO M 221 M/M 221*” and replacing it with “*AASHTO M 336 M/M 336*”.

SECTION 714 – STRUCTURAL STEEL

714.05 HIGH-STRENGTH BOLTS, NUTS, AND WASHERS is hereby modified by deleting the first sentence in its entirety and replacing it with the following:

High-strength bolts shall conform to the requirements of *ASTM F 3125/F 3125 M*, Grade A 325, including rotational capacity testing, for each lot of fasteners.

714.06 HEAT-TREATED STEEL STRUCTURAL BOLTS is hereby modified by deleting the first sentence in its entirety and replacing it with the following:

Heat-treated steel structural bolts shall conform to the requirements of *ASTM F 3125/F 3125 M*, Grade A 490, including rotational capacity testing, for each lot of fasteners.

SECTION 720 – GEOTEXTILES

SECTION 720 – GEOTEXTILES is hereby modified by being deleted in its entirety and replaced with the following:

SECTION 720 – GEOTEXTILES

720.01 GENERAL. Geotextiles shall be evaluated in accordance with the NTPEP geotextiles work plan and in compliance with the NTPEP audit program for geotextiles. Geotextiles shall be one of the products listed on the Agency’s *Approved Products List* for the respective material specification.

720.02 GEOTEXTILE FOR ROADBED SEPARATOR. Geotextile for Roadbed Separator shall conform to *AASHTO M 288*, Table 1, Class 1 for Geotextile Strength Property Requirements, and shall conform to *AASHTO M 288*, Table 3 for Separation Geotextile Property Requirements.

720.03 GEOTEXTILE UNDER RAILROAD BALLAST. Minimum Average Roll Values (MARV) for Geotextile Under Railroad Ballast shall be as required in Table 720.03A.

TABLE 720.03A – MARV FOR GEOTEXTILE UNDER RAILROAD BALLAST

Geotextile Property	Test Method	MARV
Elongation Criteria at Failure ¹	<i>ASTM D 4632/ D4632 M</i>	≥ 50%
Grab Strength (lbs)	<i>ASTM D 4632/ D4632 M</i>	225
Tear Strength (lbs)	<i>ASTM D 4533/ D 4533 M</i>	115
Puncture Strength (lbs)	<i>ASTM D 6241</i>	850
Permittivity (s ⁻¹)	<i>ASTM D 4491/ D 4491 M</i>	0.70
Apparent Opening Size (mm)	<i>ASTM D 4751</i>	0.212 max. (No. 70 Sieve)
UV Resistance (% Strength Retained)	<i>ASTM D 4355/ D 4355 M</i>	70% at 500 hours of exposure
Structure	--	Nonwoven only

¹ Elongation corresponds to Maximum Grab Tensile Strength as measured in accordance with the requirements of *ASTM D 4632/D 4632 M*.

720.04 GEOTEXTILE UNDER STONE FILL. Geotextile Under Stone Fill shall conform to *AASHTO M 288*, Table 1, Class 1 for Geotextile Strength Property Requirements, and shall conform to *AASHTO M 288*, Table 5 for Stabilization Geotextile Property Requirements. Geotextile structure shall not be slit film.

720.05 GEOTEXTILE FOR UNDERDRAIN TRENCH LINING. Geotextile for Underdrain Trench Lining shall conform to *AASHTO M 288*, Table 1, Class 3 for Geotextile Strength Property Requirements, with a minimum elongation of 20%. Geotextile for Underdrain Trench Lining shall conform to *AASHTO M 288*, Table 2 (> 50% of in situ soil passing the No. 200 (0.075 mm) sieve) for Subsurface Drainage Geotextile Requirements. Geotextile structure shall be nonwoven and shall not be slit film.

720.06 GEOTEXTILE FOR FILTER CURTAIN. Minimum Average Roll Values (MARV) for Geotextile for Filter Curtain shall be as required in Table 720.06A.

TABLE 720.06A – MARV FOR GEOTEXTILE FOR FILTER CURTAIN

Geotextile Property	Test Method	MARV
Elongation Criteria at Failure ¹	<i>ASTM D 4632/D 4632 M</i>	20% max.
Grab Strength (lbs)	<i>ASTM D 4632/D 4632 M</i>	200
Tear Strength (lbs)	<i>ASTM D 4533/D 4533 M</i>	50
Puncture Strength (lbs)	<i>ASTM D 6241</i>	430
Permittivity (s ⁻¹)	<i>ASTM D 4491/D 4491 M</i>	0.28
Apparent Opening Size (mm)	<i>ASTM D 4751</i>	0.212 max. (No. 70 Sieve)
UV Resistance (% Strength Retained)	<i>ASTM D 4355/D 4355 M</i>	70% at 500 hours of exposure
Structure	--	Woven only

¹ Elongation corresponds to Maximum Grab Tensile Strength as measured in accordance with the requirements of *ASTM D 4632/D 4632 M*.

720.07 GEOTEXTILE FOR SILT FENCE. Geotextile for Silt Fence shall conform to *AASHTO M 288*, Table 8 for Temporary Silt Fence Property Requirements. Geotextile structure shall be woven.

SECTION 725 – CONCRETE CURING MATERIALS AND ADMIXTURES

725.01 CONCRETE CURING MATERIALS, part (d) is hereby modified by being deleted in its entirety and replaced with the following:

- (d) **Liquid Membrane-Forming Compounds.** Liquid membrane-forming compounds shall be one of the products listed on the Agency's *Approved Products List* and shall meet the following requirements:
- (1) Liquid membrane-forming compounds shall be evaluated in accordance with the NTPEP concrete curing compounds work plan.
 - (2) Liquid membrane-forming compounds shall conform to the requirements of *ASTM C 309*, Type 1-D or Type 2, Class B.
 - (3) Liquid membrane-forming compounds shall not be allowed to freeze.

725.02 CHEMICAL ADMIXTURES, part (a) is hereby modified by being deleted in its entirety and replaced with the following:

- (a) General Requirements. Non-bulk quantities of chemical admixtures shall be delivered in the manufacturer's original containers marked with the manufacturer's name and product name. Bulk quantities shall be accompanied by a delivery slip indicating both the manufacturer's name and the product name. Chemical admixtures shall be one of the products listed on the Agency's *Approved Products List* for the respective material specification, shall be evaluated in accordance with the NTPEP concrete admixtures work plan, and shall meet the requirements of the respective material specification below.

SECTION 726 – PROTECTIVE COATINGS AND WATERPROOFING MATERIALS

726.09 METALIZING is hereby modified by being deleted in its entirety and replaced with the following:

726.09 METALIZING. Surfaces to be metalized shall be prepared and coated in accordance with the requirements of *AASHTO/NSBA S8.2/SSPC-PA 18, Specification for Application of Thermal Spray Coating Systems to Steel Bridges*, and the following:

- (a) The coating shall be zinc with a minimum purity of 99.9%.
- (b) All surfaces to be thermal sprayed shall be blast-cleaned to white metal immediately prior to metalizing. The final surface appearance shall be equivalent to Preparation Grade *SSPC-SP 5* supplemented by *SSPC VIS-1*. All surfaces shall also have a uniform surface profile of 3.5 to 5.5 mils. If the profile requirements of the coating manufacturer are more restrictive, the Fabricator shall advise the Structural Steel Fabrication Engineer and comply with the more restrictive requirements.

The surface profile produced by the Fabricator's surface preparation procedures shall be determined by replica tape and spring micrometer at the beginning of the work, and each day that the surface preparation is performed. The replica tape shall be attached to the daily inspection records. Areas having unacceptable measurements shall be further tested to determine the limits of the deficient area and subsequently corrected to meet specification requirements.

- (c) Thermal Spray Coating (TSC) shall be applied within six hours of completing blast cleaning. If this time is exceeded, or rust appears on the surface, the steel surface shall be properly prepared again. TSC shall be applied in the thickness range of 8 to 12 mils to all exterior surfaces. Internal surface (e.g. pot bearings) shall have a coating with a minimum thickness of 2 mils.

- (d) Exterior surfaces (except faying surfaces) shall be sealed with an approved sealant conforming to the sealant manufacturer's recommendations for the TSC applied. The sealant name, manufacturer, and product data sheets shall be included with the submittal for the metalizing procedure. Unless otherwise specified in the Contract, a top coat will not be applied over the seal coat, and therefore the seal coat shall be UV-resistant. The dry film thickness of the sealant shall be 1 to 2 mils. The sealant shall be applied within 8 hours of completing the TSC application.
- (e) In addition to the requirements above, the following shall also apply:
 - (1) QA witnessing of Job Reference Standard(s) is required, when applicable
 - (2) Companion coupons shall be used in lieu of destructive testing on the work piece, except when a test failure occurs.
 - (3) Bend tests shall be performed. The tests shall meet the requirements of *AWS C2.23*.
- (f) Metalizing that has been damaged shall be repaired in accordance with the requirements of Subsection 726.08.

726.11 WATERPROOFING MEMBRANE SYSTEMS is hereby modified by being deleted in its entirety and replaced with the following:

726.11 WATERPROOFING MEMBRANE SYSTEMS. Waterproofing Membrane Systems shall conform the requirements of *ASTM D 6153*, be one of the products listed on the Agency's *Approved Products List*, and meet the following requirements for the respective material specification.

- (a) Waterproofing Membrane System, Type I. Waterproofing Membrane System, Type I shall be a Type I cold applied elastomeric system in accordance with *ASTM D 6153*.
- (b) Waterproofing Membrane System, Type II. Waterproofing Membrane System, Type II shall be a Type II hot applied elastomeric system in accordance with *ASTM D 6153*.
- (c) Waterproofing Membrane System, Type III. Waterproofing Membrane System, Type III shall be a Type III preformed sheet membrane system in accordance with *ASTM D 6153*.

SECTION 753 – HIGHWAY ILLUMINATION

753.04 BRACKET ARMS is hereby modified by being deleted in its entirety and replaced with the following:

753.04 BRACKET ARMS.

- (a) Bracket Arms, Aluminum. Single member bracket arms and the main member of truss-type arms shall be fabricated from seamless aluminum tube conforming to the requirements of *ASTM B 221/B 221 M*, Alloy 6063-T6 or Alloy 6061-T6. Other members of truss-type arms shall conform to the requirements of *ASTM B 221/B 221 M*, Alloy 6063-T6. All screws, nuts, bolts and other hardware for mounting bracket arms to the light pole shall be stainless steel, unless otherwise specified.
- (b) Bracket Arms, Steel. Components of single member and truss-type bracket arms shall be fabricated from standard steel pipe meeting the requirements of *ASTM A 53/A 53 M* or *ASTM A 501/A 501 M*.

SECTION 754 – PAVEMENT MARKING MATERIALS

SECTION 754 – PAVEMENT MARKING MATERIALS is hereby made a new Section of the Specifications as follows:

SECTION 754 – PAVEMENT MARKING MATERIALS

754.01 THIS SUBSECTION RESERVED.

754.02 THIS SUBSECTION RESERVED.

754.03 PAVEMENT MARKING TAPE. Pavement marking tape is a white or yellow preformed retroreflective tape. Pavement marking tape shall be evaluated in accordance with the applicable NTPEP pavement marking materials work plan, with a minimum of one year of data for permanent tape and a full data set for temporary tape, listed on the Agency's *Approved Product List* for the respective material specification, and meet the following requirements.

- (a) Pavement Marking Tape, Type A. Pavement Marking Tape, Type A shall be a high performance and extended service life pavement marking tape in accordance with *ASTM D 4505*. The tape shall have continuous wetting properties and meet the following requirements.
 - (1) Skid Resistance. Skid resistance shall be Skid Resistance Level A in accordance with *ASTM D 4505*.
 - (2) Adhesive. Adhesive shall be Class I, II, or III in accordance with *ASTM D 4505*.

- (3) Durability. Initial durability shall be 10 and three-year durability shall be a minimum of 7 as determined in accordance with *ASTM D 913*.
- (4) Retroreflectivity.
 - a. Dry. Initial dry retroreflectivity shall be Reflectivity Level I in accordance with *ASTM D4505*. Three-year retroreflectivity shall be a minimum of 150 mcd/m²/lx for white and 100 mcd/m²/lx for yellow as determined in accordance with *ASTM E 1710*.
 - b. Wet. Initial wet retroreflectivity shall be a minimum of 250 mcd/m²/lx for white and 200 mcd/m²/lx for yellow. Three-year wetness retroreflectivity shall be a minimum of 150 mcd/m²/lx for white and 75 mcd/m²/lx for yellow as determined in accordance with *ASTM E 2177*.
 - c. Wet Continuous. Wet continuous retroreflectivity shall be a minimum of 150 mcd/m²/lx for white and 100 mcd/m²/lx for yellow in accordance with *ASTM E 2832*.
- (b) Pavement Marking Tape, Type B. Pavement Marking Tape, Type B shall be a standard performance pavement marking tape in accordance with *ASTM D 4505*.
 - (1) Skid Resistance. Skid resistance shall be Skid Resistance Level A in accordance with *ASTM D4505*.
 - (2) Adhesive. Adhesive shall be Class I, II, or III in accordance with *ASTM D 4505*.
 - (3) Durability. Initial durability shall be 10 and three-year durability shall be a minimum of 7 as determined in accordance with *ASTM D 913*.
 - (4) Retroreflectivity. Initial dry retroreflectivity shall be Level II in accordance with *ASTM D 4505*.
- (c) Pavement Marking Tape, Type C. Pavement Marking Tape, Type C shall be a temporary pavement marking tape in accordance with *ASTM D 4592* and the following requirements.
 - (1) Retroreflectivity. Initial wet retroreflectivity shall be a minimum of 250 mcd/m²/lx for white and 200 mcd/m²/lx for yellow.

ALPHABETICAL INDEX OF PAY ITEMS

The index entry “406.38 Hand-Placed Bituminous Concrete Pavement, Drives..... Square Yard” is hereby modified by deleting the word “Pavement” and replacing it with the word “Material”.

The index is hereby modified by adding an entry for “418.10 Asphaltic Approach Material..... Square Foot”.

The index entry for “646.75 Raised Pavement Markers, Type II..... Each” is hereby modified by being deleted in its entirety.

Appendix J

COMPLIANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal,

(Corporation, Partnership or Individual)

and _____

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

(Name of Owner)

(Address of Owner)

hereinafter called Owner, in the penal sum of _____ Dollars, \$(_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

Appendix J

The condition of this obligation is such that whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20__, a copy of which is hereto attached and made a part hereof for the construction of:

Now, therefore, if the principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if they shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

Provided, further, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any wise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications.

Provided, further, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

Appendix J

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, (No.)
each one of which shall be deemed an original, this the _____ day of
_____, 20_.

ATTEST:

Principal

(Principal Secretary)

(SEAL)

By: _____(s)

Address: _____

Witness as to Principal

Address

Surety

ATTEST:

By: _____
Attorney-in-Fact

Witness as to Surety

Address

Appendix J

Address

NOTE: Date of Bond must not be prior to date of Contract.

If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570) as amended and be authorized to transact business in the State where the Project is located.

Appendix J

LABOR & MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal,
(Corporation, Partnership or Individual)

and

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

(Name of Owner)

(Address of Owner)

Hereinafter called Owner, in the penal sum of _____ Dollars, \$(_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

Appendix J

The Condition of this obligation is such that whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20_, a copy of which is hereto attached and made a part hereof for the construction of:

Now, Therefore, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such Work and all insurance premiums on said Work, and for all labor performed in such Work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in force and effect.

Provided, further, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications.

Provided, further, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

Appendix J

In Witness Whereof, this instrument is executed in ____ count (No.)
each one of which shall be deemed an original, this the ____ day of
_____, 20__.

ATTEST:

Principal

(Principal Secretary)

By: _____(s)

(SEAL)

Address: _____

Witness as to Principal

Address

Surety

ATTEST: By: _____

Attorney-in-Fact

Witness as to Surety Address

Address

Appendix J

NOTE: Date of Bond must not be prior to date of Contract.

If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bond must appear on the Treasury Department's most current list (Circular 570) as amended and be authorized to transact business in the State where the Project is located.

APPENDIX K

CHANGE ORDER

Date: _____

Change Order No: _____

Name of Project: _____

Municipality: _____

Contractor: _____

The following changes are hereby made to the Contract:

Justifications:

Change to Contract Price: \$ _____

Original Contract Price: \$ _____

Current Contract Price adjusted by previous Change Order: \$ _____

The Contract Price due to this Change Order will be (increased) decreased by: \$ _____

New Adjusted Contract Price: \$ _____

Change to Contract Time: _____

The Contract Time will be (increased) decreased by _____ Calendar days

The date for completion of all work will be _____

APPROVALS

Contractor: _____

Construction Inspector: _____

Municipality: _____

APPENDIX L –

Work Zone Safety and Mobility

Guidance Document

May 2011

WORK ZONE SAFETY & MOBILITY GUIDANCE DOCUMENT APPENDIX A TEMPORARY TRAFFIC CONTROL DEVICES

May 2011



Prepared by:

Vermont Agency of Transportation



Work Zone Safety and Mobility Guidance Document Appendix A Temporary Traffic Control Devices

Overview –

The following Appendix was drafted in response to updates made to the work zone regulations in 23 CFR 630, Subpart K, published by the Federal Highway Administration. This document applies to all federal aid projects that have a pre-contract/step submittal date after July, 1, 2011.

The purpose of the Appendix is to provide guidance on the use of temporary traffic control devices, flaggers and uniformed traffic officers to control and minimize worker exposure to traffic hazards and to increase road user safety. Additional guidance for preparing site specific traffic control plans can be found in Chapter 6 of the Manual on Uniformed Traffic Control Devices (MUTCD).

The primary users of this Appendix will be project managers, project design engineers and technicians and construction resident engineers.

Framework:

Procedures –procedures, and guidance established under the WZ Safety & Mobility Rule for the systematic consideration and management of WZ impacts **shall** include consideration and management of road user and worker safety by Exposure addressing:

- Use of positive protection devices to prevent intrusions;
- control measures to avoid or minimize exposure;
- Other traffic control measures to minimize crashes; and
- Safe entry/exit of work vehicles onto/from the travel lanes.

Positive Protection Devices – use **shall** be based on an engineering study.

An engineering study **may** be used to develop positive protection guidelines for the agency, or to determine the measures to be applied on an individual project; (See MUTCD Section 1A.13.65 FOR DEFINITION OF Engineering Study);

Use of positive protection **shall** be considered in work zone situations that place workers at increased risk from motorized traffic and where positive protection devices offer the highest potential for increased safety for workers and road users.

Exposure Control Measures – **should** be considered to avoid or minimize exposure for workers and road users.

Other Traffic Control Measures – **should** be considered to reduce work zone

crashes, and risks and consequences of intrusions into the work space.

Uniformed Law Enforcement – includes guidance for the use of uniformed law enforcement on Federal-aid highway projects.

Work Vehicles and Equipment – Safe means for work vehicles and equipment to enter and exit traffic lanes and for delivery of construction materials to the work space **should** be addressed at the project level.

Payment for Traffic Control Features and Operations – **shall** not be incidental to the contract, or included in payment for other items of work not related to traffic control and safety.

Separate pay items **shall** be provided for major categories of traffic control devices, safety features, and work zone safety activities. For minor projects, the major category may be 641.10 Traffic Control, Lump Sum.

Quality Guidelines – **shall** be implemented to help maintain the quality and adequacy of the temporary traffic control devices for the duration of the project.

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1.0 DESIGN GUIDELINES FOR POSITIVE PROTECTION IN WORK ZONES

Positive protection is an essential part of numerous works zones where workers are exposed to nearby traffic for an extended period of time or where errant vehicles would be in significant jeopardy by entering the work area. The proposed use of positive protection should be considered based on one or a combination of the following site characteristics.

1.1 Project Characteristics (When to consider using positive protection)

Site Operating Speed – Work zones where the non-work zone posted speed limit or 85th percentile speed is equal to or greater than 45 mph.

Volumes – On roadways where the AADT is 15,000 or greater.

Project Duration - Projects greater than **two weeks** in length where workers are in close proximity to traffic thereby increasing the risk of a vehicle intrusion in the work area.

Longitudinal Drop-offs - Project construction characteristics and phasing should be evaluated on the basis of Standards T-35 and T-36 (E-108 and E-108A).

Fixed Objects - Equipment, materials or other fixed objects that remain in the work area overnight.

Interstate or divided limited access facilities - Bypasses for bridge construction or roadway reconstruction. Longer bypasses 1 mile or greater may use positive protection devices for shifts and approaches, and use surface mounted vertical delineation devices (tubular markers) on tangents based on an economic analysis

1.2 Positive Barrier Use guidelines

When positive barrier is utilized in projects, the following guidelines should be considered:

- Positive barrier should be installed tangentially with a desired minimum 2 ft offset from the traveled lane to the face of the barrier at its widest point. The lateral offset should not be less than 1 ft. On higher speed facilities, the lateral offsets should be maximized to the extent possible.
- If there is no tolerance for deflection within the work area, consider anchoring barrier to roadway surface or bridge deck.
- Tapers for positive barrier are based on operating or 85th percentile speed of the facility as seen in the chart on Standard T-22 (E- 106)
- Unprotected ends of the barrier on US and State Routes should be tapered at least 10 ft. outside the edge of the traveled lane. If the positive barrier cannot be tapered outside the minimum clear zone of 10ft, then an appropriate crash attenuator shall be provided to protect the end of the barrier. Truck mounted attenuators should

not protect the ends of barrier but may be used to close off or protect the work area if adequate roll distance is available.

- Unprotected ends of the barrier on interstates and other limited access multi-lane facilities should be tapered to the clear zone as defined in the latest edition of the AASHTO Roadside Design Guide. If the positive barrier cannot be tapered outside the minimum clear zone, then an appropriate crash attenuator shall be provided to protect the end of the barrier.
- Consider and plan for how construction materials will be delivered to the job site. Positive barrier may need to be opened temporarily.
- Access to businesses and residences must be delineated and proper treatment of the blunt ends of the barrier.

1.3 Exceptions

For moving operations such as paving projects where barrier is not practical but exposure is still long duration, other methods should be incorporated to protect workers and motorists, see “Exposure Control Measures” section for alternate methods of reducing worker exposure. Limited access facility projects employing long crossovers and two lane two way operations may use surface mounted vertical delineation devices (tubular markers) instead of concrete barrier on tangents based on an economic analysis and engineering judgment. Consider tubular markers when the risk to motorists and workers of placing a large length of temporary barrier along with the high overall cost of placing the barrier offsets the advantages of providing positive separation.

1.4 Truck Mounted Attenuators

Truck Mounted Attenuators (TMA's) have proven to be an effective piece of equipment for improving safety in work zone traffic control areas. This effectiveness is dependent on the proper use of the device.

When to use TMA's:

- At the leading end of the Work Activity Area (after the buffer space) where errant vehicles could enter the Work Activity Area causing a danger to the workers and/or the vehicle operators themselves. Be sure to add sufficient length to the work area to allow for TMA forward roll if struck. The chart below, taken from Michigan DOT's TMA guidelines, provides some guidance for designers to consider when employing TMA's in work zones.
- Where access is maintained for construction materials and equipment. The TMA's prevent errant vehicles from impacting construction equipment, workers or from areas of significant hazard to the motorists. (ie. Bridge out, deep excavation, etc.)
- On shadow vehicles for moving operations.

When to NOT use TMA's:

- For crash attenuation at the terminal ends of temporary traffic barrier
- Without a channelizing taper in a static work zone.

MDOT Chart Test Level 3 – Guidelines for Roll-ahead Distance for TMA Vehicles

Weight of TMA Vehicle	Prevailing Speed (mph) (Posted Speed Prior to Work Zone)	Roll-Ahead Distance* (Distance from front of TMA Vehicle to Work Area)
5 Tons	60-70	175 ft
	50-55	150 ft
	45	100 ft
12 Tons	60-70	50 ft
	50-55	25 ft
	45	25 ft

* Roll-ahead distances are calculated using a 10,000 pound impact vehicle weight.

2.0 EXPOSURE CONTROL MEASURES

Exposure Control Measures should be considered where appropriate to avoid or minimize worker exposure to motorized traffic and exposure of road users to work activities, while also providing adequate consideration to the potential impacts on mobility. A wide range of measures may be appropriate for use on individual projects, such as:

2.1 Full road closures;

When and What to consider:

- When viable alternate routes exist and full road closure will accelerate construction,
- When construction is only feasible with the roadway closed.
- When Emergency vehicle access can be accommodated in another manner.
- Public relations campaign is essential for off-site detours. See Section 2.4 for detour information.

2.2 Ramp closures;

When and What to consider:

- When construction on ramp will not allow adequate width (15 ft) to be maintained, (Temporary ramp widening may be a feasible alternative to ramp closure. For short durations, lesser widths may be acceptable; notice of the roadway restriction must be sent to DMV.)
- When mainline lane closures are close to ramps and adequate distances for safe merging cannot be obtained,
- Night work when ramp volumes are very low,
- Traffic impact to alternate routes must be considered. See Section 2.4,
- Public relations campaign is essential.

2.3 Median crossovers;

When and What to consider:

- When construction could adversely affect adjacent travel lane, such as ledge blasting, or slow heavy construction vehicle traffic moving in and out of work area.
- When construction can be accelerated or work quality can be improved by closing one barrel
- Capacity of remaining barrel must be considered. AADT should be less than 25,000 (DHV < 3000) unless an engineering study shows that capacity is sufficient.
- Crossovers should avoid interchange areas, to the extent possible
- Crossovers should be located so as to maximize sight distance for merging.
- Crossovers must be designed carefully to minimize rollover potential for large trucks. See Standard T-19 (E-104).

2.4 Full or partial detours or diversions;

Consider when traffic volumes exceed tables below:

For work zones on two lane highways with one lane open for traffic

Length of Closure	Max. DHV	Max. ADT
2500 ft	500	4000
1500 ft	1000	7500
1000 ft	1500	11500

The above values are based on:

Two phase operation (no intervening intersections)

50-50 directional split

25 mph avg. speed through work zone

$v/c \leq 1.0$

ADT's may be exceeded if flagging operations cease during peak hours of traffic (work during hours below DHV volumes)

Definitions:

Partial detour – one direction of traffic is maintained on alignment, but the other is detoured. Or, a particular type of traffic is detoured (i.e. trucks) while other traffic is maintained.

Full detour – full road closure with traffic maintained off-alignment. Detour may consist of temporary roadway or signed detour on existing highways.

Diversions – two way traffic is maintained on alignment but because of real or perceived capacity constraints, substantial numbers of drivers can be expected to seek alternate routes not officially signed as detours.

When and What to consider:

- Capacity, condition and safety of detours/alternate routes must be considered.
- Off-site improvements, especially at intersections, may be necessary to accommodate additional traffic. This may include temporary signalization, changes in signal timings, paving or temporary widening, signing/pavement markings improvements, brush cutting to improve sight distance at intersections.
- Truck traffic and truck turning characteristics must be considered.
- Legal load restrictions on town highways or bridges may be lower than state highway limits. Town highways may require upgrades to accommodate increased truck traffic if detour is allowed by town.
- Separate truck detours may be considered.

- Bicycle and pedestrian access must be considered.
 - Long detours are not acceptable for these modes of traffic.
 - Bicycles and pedestrians shall not be detoured onto limited access highways.
 - Detour route for these modes does not have to be the same as for vehicular traffic, if signed separately.
 - Road surface conditions may need to be upgraded.
- Access to businesses (including directional signing) and residences must be considered.
- Emergency vehicle access must be considered.
- Detour route shall be adequately signed
- For town highway bridge projects, town should designate detour route prior to ROW process commencing, and the designated detour route should be included in the project plans.

2.5 Road work during nighttime or off-peak periods when traffic volumes are lower;

When to consider:

- When capacity is constrained but detours are not a viable option.
- Consider night work for high volume non-residential roads, especially with substantial day-time business traffic.
- Consider imposing seasonal constraints near schools or high volume seasonal traffic generators such as fairgrounds or fall tourist destination areas.

Pros:

- May be able to avoid use of detours,
- May increase worker safety due to reduced exposure to high volume traffic,
- May be able to complete work faster by closing off more of the roadway,
- May reduce affect on adjacent traffic generators

Cons (Night Work):

- Reduced ability to get materials, inspectors, upper level decision making,
- Higher costs,
- Lower temperatures, especially at either end of construction season; may be difficult to meet materials specifications,
- Work quality may suffer due to lighting conditions and worker fatigue,
- Unexpected condition for drivers; higher speeds,
- Local ordinances may limit type of work (such as noise ordinances),

Cons (Daytime off-peak work):

- Additional time/cost of setting up/removing traffic control to avoid am/pm peak periods; increased worker exposure to adjust traffic control devices,
- Shortened work periods may increase duration of project

Cons (Seasonal off-peak work):

- May be difficult to predict/control when project will be constructed.

2.6 Rolling road blocks;

When to consider:

- Activities taking less than one hour affecting both lanes of an interstate barrel, such as ledge blasting, crossover bridge launching, utility line pulls, major material deliveries,
- Should be done at low volume daylight period,
- Should be warned at least one week in advance using PCMS,
- Requires UTO's.

2.7 Accelerated construction techniques;

- Consider cost/benefit of accelerated construction vs. normal construction practices; longer detours may be palatable for shorter construction periods.
- Accelerated construction may include full roadway closures, round the clock work, or off site prefabrication.
- Inconvenience to the travelling public and businesses should be balanced by shorter overall durations and reduced worker exposure to traffic.

3.0 TRAFFIC CONTROL MEASURES

Listed Below are Traffic Control Measures that may be used in the Temporary Traffic Control Plan (TCP). Designers, Resident Engineers and Contractors should consider these when developing, reviewing, proposing changes or implementing traffic control plans. These have been arranged starting with the most commonly used at the top of the list. The arrangement of this list should not stop the designer, resident engineer or contractor from considering any of these measures when preparing traffic control plans or resolving traffic control issues.

From 23 CFR 630.1108 (c) "Other Traffic Control Measures should be given appropriate consideration for use in work zones to reduce work zone crashes and risks and consequences of motorized traffic intrusion into the work space. These measures, which are not mutually exclusive and should be considered in

combination as appropriate, include a wide range of other traffic control measures such as:"

3.1 Effective, credible signing:

When to consider:

- This is used on every project. Guidance on work zone signing can be found in MUTCD (Manual on Uniform Traffic Control Devices) and the VTrans T – Standards. The MUTCD can be found online at <http://mutcd.fhwa.dot.gov/> and signing for work zones can be found in chapter 6.

What to consider:

- What is the message that needs to be provided to the driver?
- Are there any permanent traffic control devices that conflict with the work zone signing? (conflict can either be visual – blocking, screening etc or the conflict can be with message on the permanent sign.)

3.2 Changeable message signs:

When to consider PCMS / VMS:

- To give drivers notice of the date or time of upcoming construction activities or traffic pattern changes which might lead to seeking alternate routes or changing travel plans.
- When long term work zones change traffic control phases, and traffic pattern has changed (i.e., left lane was closed for a long period, now right lane is closed.)
- When additional directional guidance is required (i.e., use exit 10 for Montpelier)

What to consider:

- PCMS shall not take the place of static signs, and should not display the same message for more than 2 weeks. If message is required for longer than 2 weeks static signs should be used.
- Each message shall consist of no more than two phases. A phase shall consist of no more than three lines of text and eight characters per line. Each phase shall be understood by itself regardless of the sequence in which it is read. More detailed guidance for this can be found in the MUTCD. The provisions in Chapter 2L apply to both permanent and portable changeable message signs with electronic displays. Additional provisions that only apply to portable changeable message signs can be found in Section 6F.60.
- Consider pay item by day instead of each when traffic flow through project area will not change over time

3.3 Arrow panels:

Shall only be used for lane drops (merging conditions), and not for shifting traffic within a lane. Refer to Section 6F.61 of the 2009 MUTCD

3.4 Longitudinal and lateral buffer space:

When to consider:

- All projects.
- The buffer space is a lateral and/or longitudinal area that separates road user flow from the work space or roadside hazards, and might provide some recovery space for an errant vehicle.
- Neither work activity nor storage of equipment, vehicles, or material should occur within a buffer space. The width of a lateral buffer space should be determined by engineering judgment.

What to consider:

- Will the site allow for longitudinal buffer? (capacity needs on one lane/two way traffic space, driveways, side roads, curve/grade sight distance restrictions could lead to longer or shorter buffer spaces)
- What is the speed limit approaching the workzone ? (Stopping sight distance SSD is baseline for longitudinal buffer – see MUTCD Table 6C-2)
- What are the traffic volumes. (high volumes = increased worker exposure)
- Are there going to be drop offs (even if no devices required by Standard T-35/T-36 (E-108/E-108A), lateral buffer may increase safety)
- Curves and grades – longitudinal buffer may be increased to provide better sight distance to approach on curves (vertical/horizontal), longitudinal buffer may be increased for downhill grades especially with high truck volumes.
- Is there enough room for traffic to safely pass when the buffer space is provided? (i.e.. what are the lane widths for traffic through the work zone) For one lane – two way traffic, 15 feet of travel space is ideal, with 1-2 feet of lateral buffer space.
- Can I use a temporary lane closure to provide lateral buffer space? (lane closure next to shoulder work)
- Are pedestrian and bicycle accommodations needed ? (may require wider travel space, therefore reducing available space to use for lateral buffer.) Bicycle accommodation where cyclists cannot keep up with speed of traffic in longer work zones can be another issue to consider.
- Will the site allow for lateral buffer without barrier? (Refer to positive barrier Section 1.2)

- Will positive protection be used? If positive protection is used the longitudinal buffer area buffer may be shorter than what is shown in Table 6C-2 of 2009 MUTCD.

3.5 Trained flaggers and spotters:

For reference please refer to VTrans Standard Specifications for Construction (latest edition) Section 630 and Section 6E.01 of the 2009 MUTCD:

Flaggers are only allowed to stop and release traffic. A UTO is required for intersection traffic direction.

When to consider flaggers:

- When maintaining two way traffic in a single travel lane
- When side roads enter into a flagger controlled travel space
- When haul roads require stopping one direction of traffic to allow construction vehicles to enter and exit.

When to consider using flaggers as spotters:

- When high speed traffic near workers (slow paddle only) for example, long paving operations, spotter may be used next to paver where there is less lateral buffer space
- When the lane closure is long and the flaggers may not be visible to each other

3.6 Automated Flagger Assistance Devices

Automated Flagger Assistance Devices (AFADs) enable a flagger(s) to be positioned out of the lane of traffic and are used to control road users through temporary traffic control zones. These devices are designed to be remotely operated either by a single flagger at one end of the TTC zone or at a central location, or by separate flaggers near each device's location.

There are two types of AFADs:

- Remotely controlled STOP/SLOW sign on either a trailer or a movable cart system to alternately control right-of-way.
- Remotely controlled red and yellow lenses and a gate arm to alternately control right-of-way.

When to consider:

- Bridge maintenance;
- Haul road crossings; and
- Pavement patching.
- Night work, because AFAD using red and yellow lenses and gate may be more visible than flagger, and will lead to less worker exposure by moving flagger out of roadway.

What to consider:

- Must be operated manually so not for use on long term closures
- AFAD's take additional time to set up and remove, so not for very short or mobile operations.

3.7 High quality work zone pavement markings and removal of misleading markings;

When to consider:

- When new traffic pattern will be in place for greater than 3 days

What to consider when specifying materials to be used for pavement markings:

- Time of year for placement may affect type of marking suitable for application,
- If pavement markings to be in place for greater than 1-2 months, consider normal paint pay items rather than temporary paint,
- If temporary markings are on final pavement layer, removable tape should be considered rather than any type of paint, which will have to be ground off when no longer valid.

Line Striping Targets (LST) or Raised Pavement Markers (RPM) can also be used instead of temporary tape or paint.

- LST's should not be used for over 14 days, nor where heavy traffic is expected to drive over the line (such as passing maneuvers)
- See MUTCD for appropriate device spacing to mimic solid and dashed lines
- Adjacent to barriers, RPM's shall be used in addition to solid edgeline.

Refer to current edition of VTrans Standard Specifications for Construction section 646.08 for more guidance on Temporary Pavement Markings.

3.8 Channelizing device spacing reduction;

When to consider:

- when high volume traffic near workers,
- when cones are at risk of blowing over,
- on curves,
- where additional guidance is needed for drivers to safely negotiate work zone
- when using channelizing devices for pedestrian pathways

What to consider:

- Where multiple channelizing devices are aligned to form a continuous pedestrian channelizer, connection points should be smooth to optimize long-cane and hand railing.

- The maximum allowable spacing between cones, tubular markers, vertical panels, drums, and barricades is a distance in feet equal to 1.0 times the speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the speed limit in mph when used for tangent channelization. Spacing should be reduced as needed.
- When channelizing devices have the potential of leading vehicular traffic out of the intended vehicular traffic space the channelizing devices should be extended a distance in feet of 2.0 times the speed limit in mph beyond the downstream end of the transition area. *(At the end of a taper, it might be helpful to the driver to continue the line of cones/barrels on tangent to get them straightened out again.)*
SEE Section 6F.63 of the 2009 MUTCD

3.9 Work zone speed management (including changes to the regulatory speed and/or variable speed limits); Speed reductions Taken from section 6C.01 of the 2009 MUTCD.

When to consider:

- Reduced speed limits should be used only in the specific portion of the (temporary traffic control) TTC zone where conditions or restrictive features are present. However, frequent changes in the speed limit should be avoided. A TTC plan should be designed so that vehicles can travel through the TTC zone with a speed limit reduction of no more than 10 mph.
- Reduced speed zoning (lowering the regulatory speed limit) should be avoided as much as practical because drivers will reduce their speeds only if they clearly perceive a need to do so.
- A reduction of more than 10 mph in the speed limit should be used only when required by restrictive features in the TTC zone. Where restrictive features justify a speed reduction of more than 10 mph, additional driver notification should be provided. The speed limit should be stepped down in advance of the location requiring the lowest speed, and additional TTC warning devices should be used.

3.10 Law enforcement; See Section 4.0 of this document

3.11 Worker and work vehicle/equipment visibility;

From the 2009 edition of the MUTCD.

“Standard: All workers, including emergency responders, within the right-of-way (ROW) who are exposed either to traffic (vehicles using the highway for purposes of travel) or to work vehicles and construction equipment within the TTC zone shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107–2004 publication entitled “American National Standard for High-Visibility Safety Apparel and Headwear” (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure, except as provided in Paragraph 5. A person designated by the employer to be responsible for worker safety shall make the selection of the appropriate class of garment.”

What this means: Everyone in the ROW needs to have the appropriate vest.

In addition to high visibility garments for workers, an internal work zone traffic control plan should be developed for projects with traffic management plans. For short term projects all workers on site should have an understanding of how equipment will access and exit the work zone.

3.12 Temporary traffic signals.

When to consider:

- One lane – two way traffic is maintained 24 hours per day. (Otherwise flaggers or AFADs are typically used.)
- Often used on bridge projects that maintain traffic on a portion of the existing bridge. When significant traffic is diverted or detoured to an unsignalized intersection, creating capacity or safety issues.

3.13 Public relations and traveler information;

When to consider:

- All projects need some form of public outreach,
- The extent required should be determined based on the project category,
- A minor project may only need property owner visits during the design phase, and notification of local officials during construction,
- A significant project may have a Public Relations Officer (PRO), project website, weekly bulletins, etc.
- Designated Public Relations Officers are typically used for longer term projects affecting large volumes of traffic, especially projects with multiple phases where traffic patterns change and potential for significant congestion exists.

What to consider:

- The needs of all road users should be assessed such that appropriate advance notice is given and clearly defined alternative paths are provided,
- The cooperation of the various news media should be sought in publicizing the existence of and reasons for TTC zones because news releases can assist in keeping the road users well informed,
- The needs of abutting property owners, residents, and businesses should be assessed and appropriate accommodations made,
- The needs of emergency service providers (law enforcement, fire, and medical) should be assessed and appropriate coordination and accommodations made,
- Special provision are required when utilizing PROs,
- The needs of railroads and transit should be assessed and appropriate coordination and accommodations made,
- The needs of operators of commercial vehicles such as buses and large trucks should be assessed and appropriate accommodations made.

3.14 Warning flags and lights on signs;

When to consider:

- Where changes to the intersection or roadway may not be expected to driver and consequences of not obeying traffic control devices are severe,
- Converting an intersection to 4 way stop during construction,
- Adding a temporary signal during construction,
- Adding a permanent signal,
- Converting an intersection to a roundabout,
- Traffic is not responding to signs (stop, yield, speed limit),
- Traffic pattern/intersection control has been altered (new signal or stop sign).

What to consider:

- Will the flags block another traffic control device,
- Will the flags hang over the travel way and be hit by large trucks.

3.15 Pace or pilot vehicle:

When to consider:

- When traffic is routed through an extended work zone with multiple activity areas. These work zones many times have a serpentine travel path for motorists which is not intuitively obvious thus requiring a pilot car,

- When traffic may need to come to a stop on the interstate (rolling road block).

3.16 Longitudinal channelizing barricades

These are not barriers – this refers to lightweight barricades used for channelization only (plastic “jersey barrier”)

When to consider:

- Lower speed roadways (Speed limit 40 mph or less),
- Projects where there is no lighting provided during nighttime hours,
- Drivers need extra visual cues to get through work zone at night (more retroreflectivity than a barrel),
- Work zones with limited lateral buffer space. In such cases other channelizing devices would require constant resetting.

What to consider:

- Existing speed limit of the roadway prior to the work zone,
- Is there recovery area behind the barricade for an errant vehicle,
- Barricade should not replace barriers,
- Is worker protection needed behind the barricade. If impacted by a vehicle is there sufficient lateral deflection distance before entering the work area.

3.17 Worker training

When to consider:

- On all projects, all workers need to have sufficient training for their safety,
- Additional training may be required if project is unique and or has one unique element that is not normally seen in Vermont.

What to consider:

- What is unique about the project and what are the risks to workers
- Who needs to be trained, and at what level, based on their risk exposure.

3.18 Enhanced flagger station setups

When to consider:

- When flagger is in a less than ideal environment (such as shadow, low light, visually congested area with high driver attention load)

What to consider:

- Additional device(s), typically a flag tree, to enhance the visibility of the flagger.
- A high-level warning device shall consist of a minimum of two flags with or without a Type B high intensity flashing warning light.
- The distance from the roadway: to the bottom of the lens of the flashing light and/or to the lowest point of the flag material shall be not less than 8 feet.
- The flag shall be 16 inches square or larger and shall be orange or fluorescent orange in color.

3.19 Intrusion alarms

When to consider:

- Daily lane closures in high volume/high speed areas where positive barrier is not in use.

3.20 Transverse Rumble strips

When to consider:

- Where longitudinal and lateral buffer is limited and it is important that the driver see and understand the next traffic control device after rumble strips,
- In long lane closures, to reduce the speed of traffic (traffic calming),
- At the beginning of speed reduction zones,
- Not for use in mobile operations.

What to consider:

- If the color of a transverse rumble strip used within a travel lane is not the color of the pavement, the color of the rumble strip shall be white, black, or orange.
- Transverse rumble strips should be placed perpendicular to vehicular traffic movement. They should not adversely affect overall pavement skid resistance under wet or dry conditions.
- Transverse rumble strips should not be placed on sharp horizontal or vertical curves.
- Rumble strips should not be placed through pedestrian crossings or on bicycle routes.
- Transverse rumble strips should not be placed on roadways used by bicyclists unless a minimum clear path of 4 feet is provided at each edge of the roadway or on each paved shoulder
- These are placed 150 to 300' feet in advance (WZ speed dependent) of the next traffic control feature you want the driver to see (merge, speed limit etc)
- Proximity to residences and noise sensitive businesses
- No signing is required

3.21 Drone radar and Radar Speed Feedback Signs (RSFS);

When to consider:

- Work zone speeding is a problem
- Enforcement cannot be on the project everyday
- RSFS may be used instead of UTO presence

What to consider:

- Drone radar only affects drivers with radar detectors
- Use Drone Radar with spot enforcement so drivers do not ignore drone
- Typically use only when workers are present
- Some PCMSs have drone radar

3.22 Automated speed enforcement (where permitted by State/local laws);

Vermont State Statutes currently do not allow this

3.23 Consecutive Work Zone Spacing

For short term interstate lane closures, work zone length should be based on contractor's capacity to conduct work within the closure that day. Lanes should only be closed if work is imminent, so that drivers can perceive the need for the closure and obey temporary traffic control. In most cases, lane closures should not exceed 3 miles, and consecutive closures should be spaced at least 1 mile apart. This will allow queues to dissipate and traffic to develop appropriate gaps.

4.0 UNIFORMED TRAFFIC OFFICERS

4.1 General Guidance:

The goal of these guidelines is to reduce the likelihood of injuries and fatalities to workers and road users in Work Zones, while maintaining a fiscally responsible approach in the use of flaggers and uniformed traffic officers. These guidelines provide parameters to identify the appropriate need and consistent use of flaggers and uniformed traffic officers addressed by the following categories:

Traffic control (guiding and directing traffic in, through, and around a work zone).

Presence (deter speeding and aggressive driving, encourage drivers to cautiously proceed through the work zone)

Enforcement (actively enforce traffic laws within the work zone on an as needed basis to gain driver awareness rather than as a full-time operation).

Emergency assistance (assist and coordinate activities at accident sites within the work zone, report accidents)

4.2 Traffic Control Operations

Flaggers shall be used to the greatest extent possible for “dynamic” traffic control operations. However, the use of uniformed traffic officers may be necessary in some instances.

Examples of dynamic traffic control operations where **flaggers** should be used include:

- Alternating 1-way traffic (stop/slow paddles must be used).
- Controlling traffic at low volume intersections (one flagger per approach).
- Assisting trucks and equipment in and out of work areas.
- Controlling traffic at side roads and driveways during mobile operations (i.e. paving, striping, etc.).
- Directing pedestrians and bicyclists through the work zone.
- Providing detour guidance beyond work zone limits, if needed.

Examples of dynamic traffic control operations where **uniformed traffic officers** may be used include:

- Directing traffic through complex intersections, especially where signal indications are being countermanded (signal shall be placed in flashing mode).

- Assisting construction vehicles and equipment in and out of work areas on high speed, high volume facilities. Note: If an access area is anticipated to be in place for an extended period of time and it is determined that assistance is required for the safe exit and entry of construction vehicles, then a cost analysis should be completed to determine if stationary measures (i.e. signals) would be more cost effective than officers or flaggers.
- Rolling roadblock operations on interstates and other multi-lane limited access highways.
- If a uniformed officer is already on site for other needs (**enforcement or presence**), then the officer may be asked to supplement these duties by providing limited duration traffic control that would otherwise be covered by a flagger. However, the officer must be adequately trained for the flagger operation to be performed and must use appropriate equipment and techniques (which may include the use of stop/slow paddles).

4.3 Presence

The use of flaggers or uniformed traffic officers for **presence** should only be used when there is an added safety risk to the workers and road users due to speeding, other aggressive driving behaviors, and/or high traffic crash/incident rates attributed to other features such as poor highway geometrics.

Flaggers may be used for **presence** to alert and slow traffic with the use of hand signals and “slow” face of stop/slow paddles as described in Part 6 of the MUTCD.

Uniformed traffic officers should be used for **presence** on high-speed facilities when workers are not behind barrier and are in close proximity to high volume traffic for extended periods of time (long term or intermediate term stationary projects lasting more than one daylight period, or at night) or where unique work zone conditions require a higher level of driver awareness to ensure safety. Facilities where this application may be appropriate include, but are not necessarily limited to:

Interstate facilities

Roads with a posted speed of 45 mph or higher **and** an average daily traffic (ADT) volume of 10,000 vpd or greater.

If all work is behind positive barrier, neither officers nor flaggers are typically necessary.

The use of police vehicles should be considered for nighttime operations in most instances, as the use of flashing blue lights, visible from 360

degrees, has been proven to deter aggressive driving behavior. However, the manner of their use during nighttime operations should be carefully considered as police vehicle lights provide no positive direction to motorists traveling through the work zone and are often overpowering and distracting. Excessive use of police vehicles with lights at night, or the inappropriate positioning of these vehicles, may actually detract from the positive guidance the work zone traffic control devices (TCDs) provide. When used for nighttime work, flashing blue lights shall be dimmed if capable.

Though typically not necessary, **uniformed traffic officers** may also be used for **presence** on roads with posted speeds of less than 45 mph or ADT volumes less than 10,000 vpd if the resident engineer determines that a **police presence** is needed to address a specific safety issue.

Examples of traffic control safety issues where a uniformed officer may be needed include:

- A work zone with a high rate of crashes.
- A work zone with vehicles traveling at excessive speeds.
- A work zone with poor highway geometrics.
- A work zone with excessive East-West sun glare.

NOTE: Using the flashing blue lights from a police vehicle to slow traffic approaching a work zone with poor visibility (i.e. East-West sun glare) or poor sight distance due to geometric features should be considered only after other measures have been determined to be ineffective.

4.4 Enforcement

The following guidelines are recommended to reduce the likelihood of injuries and fatalities to workers and road users by enforcing traffic laws within work zones. **Enforcement** can only be performed by uniformed traffic officers.

Enforcement may be used during work zone operations where excessive speed and/or other aggressive driving behaviors are likely to jeopardize the safety of the workers and other road users.

Enforcement may be used on an as needed basis within a work zone either by itself or where another officer is being used for **presence** to improve that officer's effectiveness.

Uniformed traffic officers being used for **presence** should typically not be used for **enforcement** except for flagrant violations of traffic law.

If an arrest is necessary, the work-zone detail uniformed officer shall either:

- call in, and turn the arrest over to, an on-duty officer,
- call in a replacement UTO to cover work zone duties.

4.5 Emergency Assistance

While on site, work-zone detail uniformed traffic officers may offer immediate assistance in emergency situations, such as a motor vehicle crash within the limits of the work-zone. The detail officer may investigate minor property damage crashes that occur within the work-zone if the time required to complete the investigation is minimal and the detail officer is not actively engaged in directing traffic. The detail officer should limit investigation of minor property damage crashes to assurance that no injuries are involved. Crashes involving injury should be investigated by the appropriate personnel once other emergency personnel arrive at the scene, not the detail officer.

5.0 WORK VEHICLES AND EQUIPMENT

FROM 23 CFR 630.1108 (e) *Work Vehicles and Equipment*. In addition to addressing risks to workers and road users from motorized traffic, the agency processes, procedures, and/or guidance established in accordance with 23 CFR 630.1006 should also address safe means for work vehicles and equipment to enter and exit traffic lanes and for delivery of construction materials to the work space, based on individual project characteristics and factors.

5.1 Introduction

Wherever possible, construction, maintenance and utility work zones shall be designed to allow for safe access from or entrance to travel lanes by work vehicles or equipment and for delivery of construction materials.

The project designer should address the access of work vehicles and equipment in the traffic control plans for significant projects. The contractor has the option of proposing alternative traffic control plans and entry and exit of work and delivery vehicles should be addressed. Anything below a significant project shall be addressed by the contractor prior to starting construction even if the contractor is using standard plans for TTC.

When to consider:

- Significant projects in the design phase
- All other projects need to be developed by the contractor and reviewed by the RE before construction starts

What to consider:

- What is the classification and speed limit of the roadway? (limited access vs a local road. i.e. traffic would expect to be stopped on a local road but not on a limited access facility)
- How will the work be phased?
- What type of work is being performed? Will work vehicles be exiting/entering the project once a day or many times through out the day? (i.e. a concrete pour versus a steel beam delivery)
- Will the project have many visitors or does the project have environmental concerns that may require monitoring from other agencies besides Vtrans?

5.2 Strategies for Enhancing Safety at Work Zone Access Points

Strategies which may aid in this objective include, but are not limited to:

- flaggers stationed and signed appropriately,
- advance warning signs for driveway locations,
- advance warning using “TRUCKS ENTERING” signs,
- advance warning using portable changeable message signs,
- temporary turn lanes or shoulder lanes approaching access points.

Used to slow approaching traffic:

- temporary transverse rumble strips,
- radar feedback signs,
- uniformed law enforcement officers in marked vehicles.

6.0 MAINTENANCE OF TEMPORARY TRAFFIC CONTROL DEVICES

When project construction begins all TTC devices should be new or like new. In the course of the project, TTC devices should be maintained to meet the ATSSA “acceptable” level

¹ The American Traffic Safety Services Association's (ATSSA) Quality Guidelines for Work Zone Traffic Control Devices uses photos and written descriptions to help judge when a traffic control device has outlived its usefulness. These guidelines are available for purchase from ATSSA through the following URL:

http://www.atssa.com/store/bc_item_detail.jsp?productId=1.

7.0 PAYMENT GUIDELINES FOR WORK ZONE TRAFFIC CONTROL

Another critical piece of the traffic control puzzle is specifying the proper pay items to include in the traffic control plan. The contract documents must provide sufficient detail and information to give contractors the ability to develop reasonable bids for the work required. In addition to the contractor's requirements, items must be specific enough to develop useable bid histories with time. These allow the contracting agency to determine reasonable estimates for budgeting purposes.

7.1 Item Categories

Traffic Control Devices

608.45	Truck Mounted Attenuator	Hour
621.56-59	Energy Absorption Attenuator	Each
621.90	Temporary Traffic Barrier	Linear Foot
621.95	Remove and Reset Temporary Traffic Barrier	Linear Foot
641.10	Traffic Control	Lump Sum
641.12	Public Relations Officer	Lump Sum
641.15	Portable Changeable Message Sign	Each
641.16	Portable Arrow Board	Each
641.17	Portable Changeable Message Sign	Day
641.18	Portable Arrow Board	Day
646.600 to 646.715	Temporary Pavement Marking Items	Linear Foot
646.75	Temporary Raised Pavement Markers, Type II	Each
646.76	Line Striping Targets	Each
646.85	Removal of Existing Pavement Markings	Square Foot
646.86	Pavement Marking Mask	Square Foot
678.40	Temporary Signal Item	Each
678.41	Temporary Flashing Beacon	Each
678.42	Temporary Detector	Each

Safety Features

900.XX	Various traffic control Specialty items	Each
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For items not currently listed, such as PIO, AFAD, Smart Work Zone, I-Cones, etc

Work Zone Activities

630.10	Uniformed Traffic Officers *	Hour
630.15	Flaggers	Hour

* UTO's for law enforcement are not paid under item 630.10. Designers can request law enforcement by adding a estimated dollar amount on the Contract Plan Submittal form under the line, "Worksite Traffic Control \$\$." This is not a bid item but is paid under a statewide contract between the Agency and Vermont State Police and is used at the discretion of the Resident Engineer. Resident engineers can also access this contract during construction via a change order.

7.2 Plan Development

Temporary traffic control plans should be developed to allow a contractor the ability to determine the quantities of the various channelizing devices, pavement markings and signs needed to maintain traffic during the project.

The plans should provide the contractor with a feasible means of controlling traffic while maintaining adequate capacity during the various phases of the project. Every traffic control plan should address the four main sections of a work zone traffic control plan as defined in the MUTCD: the Advance Warning Area, the Transition Area, the Work Activity Area, and the Termination Area. Given a good traffic control plan with sufficient detail and the appropriate pay items, contractors should be able to develop a reasonable bid for the work required. Over time the Agency's bid histories should improve and provide a better tool for designers.

7.3 Specifications

The Standard Specifications for Construction , 2011 edition, provide the explanation dealing with payment for the installation, interim movement and removal of all traffic control items.

For Lump sum items, the scope of work should be well defined. If that scope changes due to unforeseen field conditions, the contractor can submit a claim or the resident engineer can submit a change order to address the additional effort required.

Unit pay items allow the resident engineer and the contractor more flexibility to address changing conditions. However, this also requires additional book keeping.

7.4 Selecting Appropriate Items and Pricing

621.56-59	Energy Absorption Attenuators	Each
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When blunt end of temporary barrier warrant attenuation add this item and specify what type of attenuator is desired. This will depend on the available space at the site. If sufficient space is available in front of the

blunt barrier end, use the plastic barrel type of attenuation. If adequate space is not available, specify a temporary attenuator similar to the Quad-guard.

One spare attenuator should be included in the quantities in order to have a spare on site in case of a vehicle impact.

621.90 Temporary Traffic Barrier Lineal Foot

Estimate the total length of barrier needed to be brought to the construction site for any work zone traffic control phase necessary during construction of the project. This item also pays for the final removal of barrier from the site.

621.95 Remove and Reset Temporary Traffic Barrier Lineal Foot

Add this item if more than one traffic control phase is needed which requires moving temporary traffic barrier to different locations on the construction site. This item pays the contractor only for moving barrier a few feet on site and excludes trucking costs. Estimate the lineal feet of barrier needed for all traffic control phases beyond the initial traffic control phase.

630.10 Uniformed Traffic Officers Hour
630.15 Flaggers Hour

See Section 4 for guidance on the use of flaggers and UTOs.

641.10 Traffic Control Lump Sum

Add this item to all projects to cover the site specific traffic control plan for the project. The item covers all items needed for the successful implementation for the plan other than those items which have their own separate pay items, such as signs, barricades, cones and barrels.

This item will include all necessary traffic control phases during construction.

641.15/641.17 Portable Changeable Message Sign(PCMS) Each/Day

PCMS should be used to inform motorist of changing conditions in the work zone when temporary static signs do not convey the same message. In most cases they should be paid for by the unit day item. This item pays for the signs and only for the days that they are in use.

641.16/641. 18 Portable Arrow Board Each/Day

Arrow boards are to be used only when vehicles are to merge from one lane into another. Arrow boards are not to be used when vehicles are being redirected to follow a detour or a bypass.

Similar to the PCMS signs in most situations, the unit day item should be used. Using the unit day item helps the Agency build a bid history for this item and also only pays for the item when it is in use.

646.6-646.715 Temporary markings Lineal foot

These items should be used only for projects or traffic control phases which are proposed to last one to two months. If traffic control phases are estimated to last more than two months, then the regular paint items should be used.

646.75 Raised Pavement Markers, Type II Each

Raised Pavement markers, Type II should be used where the temporary pavement markings need to be supplemented, such as next to barrier, or may be used in lieu of temporary paint or LST's where temporary markings are required for more than two weeks

RPMs should be placed at maximum 20 ft spacing to mimic solid lines. Double lines (centerlines) should have side by side RPMs. Dashes consist of 3 RPMs per dash at 5 ft spacing.

646.76 Line Striping Targets Each

On projects where temporary or permanent markings cannot be placed for up to 14 days. They should not be used if permanent markings are not expected to be installed within two weeks due to their lack of long term durability. LST's should be placed at maximum 20 ft spacing to mimic solid lines. Double lines (centerlines) should have side by side LSTs. Dashes consist of 3 LSTs per dash at 5 ft spacing.

646.85 Removal of Existing Pavement Markings Square Foot

This item should be used when existing pavement markings may confuse motorists as to the proper travel path through a work zone. This removal is usually accomplished via a mechanical means. Consideration should be given to whether the permanent pavement will be scarred by the pavement marking removal process. Sometimes scarred pavement can confuse motorists.

646.86	Pavement Marking Mask	Square Foot
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This item should be used if scarring the pavement surface is not desirable. In some areas the existing pavement marking material can remain by just covering the lines however, the MUTCD does not allow markings to be covered over with a black paint.

678.40	Temporary Traffic Signal	Lump Sum
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For temporary bridge or roadway projects that can only maintain one direction of traffic at a time and for projects where rerouted traffic causes unacceptable congestion at existing non-signalized intersections, this item can be used. If it is used for intersections the traffic signal warrants should be met. This item includes all signal equipment, signs, markings and various accessories to create an operating temporary signal per plan (see Section 678.12 Standard Specifications for Construction, 2011 ed.)

678.41	Temporary Flashing Beacons	Each
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Temporary flashing beacons should be used when motorists have limited sight distance in advance of the upcoming traffic control. Also flashing beacons can be incorporated into a traffic control scheme when additional emphasis is needed.

900.xxx	Specialty Items	Varies
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Specialty items are those items that are infrequently used on projects or are items that have just been developed and have not made it into the Vermont Standard Specifications for Construction. These items include: Public Relations Officers (PRO), Smart work zones, I-cones, AFADs, etc. Check with Contract Administration to ensure that the proper item descriptions are called for in the special provisions.

8.0 TRAFFIC MANAGEMENT PLAN CHECKLIST

Project Design – Traffic Management Plan Checklist

Project Name and Number: _____

Project Manager: _____

Conceptual Design Phase

1. Classify Project:

___ Significant (Major reconstruction; high impacts on traffic both inside and outside project limits. Projects that on their own might be moderate could be significant in combination with concurrent projects in the vicinity.)

___ Moderate (most projects; most traffic impact is localized within project limits)

___ Minor (mobile and short term operations; minimal impact to the traveling public)

2. Identify necessary Traffic Management Plan Components:

___ Temporary Traffic Control Plan (required for all projects)

___ Transportation Operations Component (strategies to mitigate off-site impacts; required for significant projects, may be needed for moderate projects)

___ Public Information Component (communications with public and property owners before and during construction; required for significant projects, may be beneficial for any project.)

Preliminary Design Phase:

1. Temporary Traffic Control Plan:

___ Identify features which will require adjustments to E-standards or MUTCD Typical Applications (curves and other geometric constraints, commercial and residential driveways, intersecting roads, adjacent/concurrent projects, special road users)

___ Determine feasible phasing for construction with regard to where and how traffic will be maintained.

___ Identify potential ROW or Environmental permitting needs associated with maintenance of traffic. (Specific limits will be needed for ROW plans)

2. Transportation Operations Component:

___ Identify off-project impacts and determine whether off-project improvements are required to maintain traffic mobility. (This may include signalization improvements, pedestrian upgrades, paving, widening. Improvements may be needed on official detour routes and also on major expected diversion routes if project is open to traffic but cannot handle ADT.)

___ Can impacts be mitigated by adjusting timing of project? (This could include night work, avoiding school terms, opening project to traffic during known high traffic events, or full road closure to expedite work.)

___ Consider whether special accommodations need to be made for emergency service access (Ambulance, Fire, Police)

3. Public Information Component

___ Identify stakeholders (emergency responders, municipalities, businesses, schools, property owners, etc.)

___ Can stakeholders be kept informed by Resident Engineer and Project Manager, or will there be enough information flow required to justify a public relations officer?

Final Design Phase:

1. Temporary Traffic Control Plan:

___ Can all anticipated users safely get from one side of the project to the other in a reasonable amount of time? (Bike/Ped, Cars, Trucks, emergency vehicles)

___ Is access to side roads, commercial drives, and residences accounted for?

___ Are workers adequately protected from traffic?

___ All projects: include traffic control notes specific to project needs, and applicable T-Standards (E-standards). (For example, paving projects usually include a list of side roads requiring road work ahead/end road work signs)

___ Project where T-Standards (E-Standards) or MUTCD typical applications do not account for site specific conditions: include TCP layout sheets detailing sign placement and placement of other traffic control devices.

___ Project requiring phased construction: provide enough detail in TCP layout sheets to demonstrate constructability, that sufficient space exists to maintain traffic, and to develop quantities. (As defined at the Preliminary Plans Stage) Provide traffic control notes specifying time/space constraints and other project specific requirements.

___ Project requiring detour: provide detailed detour sign locations, including affected existing signs that need to be covered or removed; consider whether different detours are applicable to trucks, cars, and bike/peds. Cars may be able to use local routes not legal for trucks, bike/peds can't be sent on miles of detour or on limited access roadways. (If ROW is required, these details should be addressed at Preliminary Plans stage)

___ Project requiring night work: require contractor to submit site specific lighting plan.

___ Include necessary pay items in quantity sheet (temporary markings, pavement marking removal/replacement, RPMs and/or LST's, barriers and attenuators, TMA's, arrow boards, PCMS, flaggers, UTO's, etc.)

2. Transportation Operations Component:

___ Include plan sheets detailing off-site improvements.

___ Document other mitigation strategies as appropriate (as traffic control plan notes, special provisions, agreements with municipalities, etc.)

3. Public Relations Component:

___ include PRO in Quantities if needed. Document expectations in special provisions.

9.0 SITE SPECIFIC TRAFFIC CONTROL PLAN GUIDANCE

Purpose: To ensure that all roadway users can get through the project area safely without undue delay.

Site specific traffic control plans are needed when project conditions do not closely resemble E-standards or MUTCD Typical applications, or there are project specific issues that must be addressed.

If needed, site specific control plans may be included in the project plans, or may be required of the contractor, or both. In some cases, project plans may contain phased construction traffic control plans in order to demonstrate constructability and determine ROW requirements, but still require additional information from the contractor based on methods and means.

Site specific traffic control plans should include:

- Layouts showing existing site conditions (may be based on CADD layouts, aerial photo, map, or hand drawn)
 - Location of pertinent features such as sidewalks, utility poles, ramps, drives, and side roads
 - Lane configurations
 - Existing traffic control devices such as signs, signals, and pavement markings
 - Location of pertinent traffic generators, such as shopping centers, schools, large businesses
 - Pertinent dimensions should be labeled
 - Layout may need to include features which are outside the project limits if they affect traffic control considerations, such as nearby intersections or ramps
- Proposed Temporary Traffic Control on layouts
 - Location of devices such as cones, temporary signals, barriers, temporary markings
 - Location of flagger stations if used
 - Taper lengths and device spacing
 - Pedestrian accommodations where appropriate
 - Pertinent dimensions should be labeled
- Narrative describing work activities and how materials and equipment will be transported to and from the work area and stored, as they relate to temporary traffic control. Narrative may also address emergency vehicle accommodations.

APPENDIX M

VERMONT AGENCY OF TRANSPORTATION

MATERIAL SAMPLING MANUAL

LEVEL 3

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures	
										Sampling	Testing ⁽¹⁾
Embankments	203.30	Earth Borrow	703.02	Earth Borrow	Moisture-Density	< 300 CY	1/Soil type	Stockpile	50	R 90	T 99
					Moisture	< 300 CY	1/2000 CY	In place	2		T 255 or T 310
					Density	< 300 CY	1/2000 CY	In place			T 191 or T 310
					Gradation	< 300 CY	1 per project	In place	22	R 90	T 27, T 11
	203.31	Sand Borrow	703.03	Sand Borrow and Cushion	Moisture	< 300 CY	1 per project	In place	20		T 255 or T 310
					Density	< 300 CY	1 per project	In place			T 191 or T 310
					Gradation	< 300 CY	1 per project	In place	22	R 90	T 27, T 11
					Moisture	< 300 CY	1 per project	In place	2		T 255 or T 310
	203.32	Granular Borrow	703.04	Granular Borrow	Density	< 300 CY	1 per project	In place			T 191 or T 310
					Gradation	< 300 CY	1 per project	In place	see note 2	R 90	T 27, T 11
					Moisture	< 300 CY	1 per project	In place	20		T 255 or T 310
					Density	< 300 CY	1 per project	In place			T 191 or T 310
Excavation for Structures	204.30	Granular Backfill for Structures	704.07	Granular Backfill for Slope Stabilization	Moisture	< 300 CY	1 per project	In place	20		T 255 or T 310
					Density	< 300 CY	1 per project	In place			T 191 or T 310
					Gradation	< 300 CY	1 per project	In place	see note 2	R 90	T 27, T 11
Subbase	204.30	Granular Backfill for Structures	704.08	Granular Backfill for Structures	Moisture	< 300 CY	1/500 CY	In place	30		T 255 or T 310
					Density	< 300 CY	1/500 CY	In place			T 191 or T 310
			704.05B	Crushed Gravel for Subbase, Fine Graded	Gradation	< 300 CY	1/3000 CY	In place	see note 2	R 90	T 27, T 11
	301.15	Subbase of Gravel	704.04	Gravel for Subbase	Gradation	< 300 CY	1 per project	Stockpile on project	see note 2	R 90	T 27, T 11
					Moisture	< 300 CY	1 per project	In place			AOT-MRD 55
					Density	< 300 CY	1 per project	In place			AOT-MRD 55
	301.25	Subbase of Crushed Gravel, Coarse Graded	704.05A	Crushed Gravel for Subbase, Coarse Graded	Gradation	< 300 CY	1 per project	Stockpile on project	see note 2	R 90	T 27, T 11
					Moisture	< 300 CY	1 per project	In place			AOT-MRD 55
					Density	< 300 CY	1 per project	In place			AOT-MRD 55
	301.26	Subbase of Crushed Gravel, Fine Graded	704.05B	Crushed Gravel for Subbase, Fine Graded	Gradation	< 300 CY	1 per project	Stockpile on project	see note 2	R 90	T 27, T 11
	301.28	Subbase of Crushed Gravel, Fine Graded	704.05B	Crushed Gravel for Subbase, Fine Graded	Moisture	< 300 CY	1 per project	In place			AOT-MRD 55
					Density	< 300 CY	1 per project	In place			AOT-MRD 55
	301.35	Subbase of Dense Graded Crushed Stone	704.06	Dense Graded Crushed Stone for Subbase	Gradation	< 300 CY	1 per project	Stockpile on project	see note 2	R 90	T 27, T 11
					Moisture	< 300 CY	1 per project	In place			AOT-MRD 55
					Density	< 300 CY	1 per project	In place			AOT-MRD 55
	301.40	Subbase, RAP	301.02	Subbase, RAP	Gradation	< 400 TONS	1 per project	In place	see note 2	R 90	T 27, T 11
RSB	310.20	Full Depth Reclamation (FDR)	310.02	Reclaimed Base (2011) Full Depth Reclamation (2018)	Gradation		1/2500 sy for first 10,000 sy 1/10,000 sy thereafter	In place	165	R 90	T 27
					Moisture		1/4000 sy for first 10,000 sy 1/10,000 sy thereafter	In place			T 310
					Density		1/4000 sy for first 10,000 sy 1/10,000 sy thereafter	In place			T 310
Aggregate Surface Course	401.10	Aggregate Surface Course	704.12 (2011) 704.12 (a) (2018)	Aggregate for Surface Course and Shoulders (2011) Aggregate Surface Course (2018)	Gradation	< 300 CY	1 per project	In place	100	R 90	T 27, T 11
					Moisture	< 300 CY	1 per project	In place			T 255 or T 310
					Density	< 300 CY	1 per project	In place			T 191 or T 310
Aggregate Shoulders	402.12	Aggregate Shoulders	704.12 (2011) 704.12 (b) (2018)	Aggregate for Surface Course and Shoulders (2011) Aggregate for Shoulders (2018)	Gradation	< 300 CY	1 per project	In place	100	R 90	T 27, T 11
	402.13	Aggregate Shoulders, RAP	402.02 (2011) 704.12 (b) (2018)	Aggregate for Shoulders (2018)	Gradation	< 300 CY	1 per project	In place	100	R 90	T 27, T 11
	403.12	Aggregate Shoulders, RAP with RAS (2018)	704.12 (b) (2018)	Aggregate for Shoulders (2018)	Gradation	< 300 CY	1 per project	In place	100	R 90	T 27, T 11
Surface Treatment Materials	404.65	Emulsified Asphalt	702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/project/production lot	Distributor Truck on Project	1 Quart	R 66	T 49, T 59
In-Place Recycling	415.20	Cold Mixed Recycled Bituminous Pavement	415.02	Cold Mixed Recycled Bituminous Pavement	Density		1/2000ft/lane/lift	In place			T 310 or ASTM D7830
	415.25	Emulsified Asphalt, Cold Mixed	415.02	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/day/production lot	Distributor Truck on Project	1 Quart	R66	T 49, T 59

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures			
										Sampling	Testing ⁽¹⁾		
Bituminous Concrete Pavement Mainline Paving and Shoulders (Method Spec Acceptance)	406.25 406.27	Marshall Bituminous Concrete Pavement (Method Spec) Medium Duty Marshall Bituminous Concrete Pavement	406.03	Bituminous Concrete Pavement	Slip AC Content	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck Batch Slip	Dependent on mix type - see note 9	Truck Slip Calculation			
					Gradation	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project ¹¹		R 97	T 308, T 30		
					Air voids, VMA	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project ¹¹		R 97	T 166, T 209, T 269, PP 19		
					Marshall Flow & Stability	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project ¹¹		R 97	T 245		
					Mixing Temperature	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project ¹¹					
	406.25 406.27	Marshall Bituminous Concrete Pavement (Method Spec) Medium Duty Marshall Bituminous Concrete Pavement	406.03	Bituminous Concrete Pavement	Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .6 miles, minimum of 6 cores per day.	In place	6" ID Core	T 168	T 166		
					Density-joint		See specifications	In place	6" ID core	T 168	T 166		
					Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A	ASTM E1926 or straightedge			
					702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/project/production lot	Distributor Truck on Project	1 Quart	R 66	T 49, T 59
	490.30 (2011) 406.35 406.36 (2018)	Superpave Bituminous Concrete Pavement (Method Spec) Superpave Bituminous Concrete Pavement (Method Spec) Superpave Bituminous Concrete Pavement, Type IVB (2018)	490.03	Superpave Bituminous Concrete Pavement	Slip AC Content	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck Batch Slip	Dependent on mix type - see note 9	Truck Slip Calculation			
					Gradation	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or Hopper on Project		R 97	T 308, T 30		
					Air voids, VMA	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or Hopper on Project		R 97	T 312, T 166, T 209, T 269, R 35		
					Mixing Temperature	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or Hopper on Project					
					Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .6 miles, minimum of 6 cores per day.	In place		6" ID core	T 168	T 166	
	490.30 (2011) 406.35 406.36 (2018)	Superpave Bituminous Concrete Pavement (Method Spec) Superpave Bituminous Concrete Pavement (Method Spec) Superpave Bituminous Concrete Pavement, Type IVB (2018)	490.03	Superpave Bituminous Concrete Pavement	Density-joint		See specifications	In-place	6" ID core	T 168	T 166		
					Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A	ASTM E1926 or straightedge			
					702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ project/production lot	Distributor Truck on Project	1 Quart	R 66	T 49, T 59
					407.15	Bonded Wearing Course	407.03	Bonded Wearing Course	Slip AC Content	< 100 TONS	1/500 TONS	Truck Batch Slip	Dependent on mix type - see note 9
	Gradation	< 100 TONS	1/500 TONS	Truck @ Plant or on Project ¹¹					R 97	T 308, T 30			
	Mixing Temperature	< 100 TONS	1/500 TONS	Truck @ Plant or on Project ¹¹									
407.16	Polymer-modified Emulsified Asphalt	702.04 (c)	Polymer-modified Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/day/production lot	Distributor Truck on Project	1 Quart	R 66	T 49, T 59			

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures		
										Sampling	Testing ⁽¹⁾	
Bituminous Concrete Pavement Mainline Paving and Shoulders (QA Acceptance)	406.25 406.27	Marshall Bituminous Concrete Pavement (QA) Medium Duty Marshall Bituminous Concrete Pavement (QA)	406.03	Bituminous Concrete Pavement	Slip AC Content	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck Batch Slip	Dependent on mix type - see note 9	Truck Slip Calculation		
					Gradation	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹		R 97	T 308, T 30	
	Air voids, VMA	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹	R 97	T 166, T 209, T 269, PP 19						
	Marshall Flow & Stability	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹	R 97	T 245						
	Mixing Temperature	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹								
					Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .6 miles, minimum of 6 cores per day.	In place	6" ID Core		T 166	
					Density-joint		See specifications	In place	6" ID core	T 168	T 166	
					Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		ASTM E1926 or straightedge	
			702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ project	Distributor Truck on Project	1 Quart	R 66	T 49, T 59	
	Bituminous Concrete Pavement Mainline Paving and Shoulders (QA Acceptance)	490.30 406.35 406.36 (2018)	Superpave Bituminous Concrete Pavement (QA) Superpave Bituminous Concrete Pavement (QA) Superpave Bituminous Concrete Pavement, Type IVB (QA) (2018)	490.03	Superpave Bituminous Concrete Pavement	Slip AC Content	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck Batch Slip	Dependent on mix type - see note 9	Truck Slip Calculation	
						Gradation	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹		R 97	T 308, T 30
		Air voids, VMA	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹	R 97	T 312, T 166, T 209, T 269, R 35					
		Mixing Temperature	< 100 TONS	Stratified Random Sampling, 1/500 TON subplot per mix design.	Truck @ Plant or on Project ¹¹							
		Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .6 miles, minimum of 6 cores per day.	In place	6" ID core	T 168	T 166				
					Density-joint		See specifications	In-place	6" ID core	T 168	T 166	
					Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		ASTM E1926 or straightedge	
			702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ project	Distributor Truck on Project	1 Quart	R 66	T 49, T 59	
Non Mainline Paving: Side Roads, Traffic Islands, Handwork, Drives & Aprons	406.25 (2011) 406.38 (2018)	Marshall Bituminous Concrete Pavement (2011) Hand Placed Bituminous Concrete Drives (2018)	406.03	Bituminous Concrete Pavement	Slip AC Content	< 200 TONS of Mix	1/500 TONS of Mix/Day	Truck Batch Slip	Dependent on mix type - see note 9	Truck Slip Calculation		
					Gradation	< 200 TONS of Mix	1/500 TONS of Mix/Day	Truck @ Plant or on Project ¹¹		R 97	T 308, T 30	
			702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C		1 per project	Distributor Truck on Project	1 Quart	R 66	T 49, T 59	
	490.30 (2011) 406.35 406.36 406.38 (2018)	Superpave Bituminous Concrete Pavement Hand Placed Bituminous Concrete Drives (2018)	490.03	Superpave Bituminous Concrete Pavement	Slip AC Content	< 200 TONS of Mix	1/500 TONS of Mix/Day	Truck Batch Slip	Dependent on mix type - see note 9	Truck Slip Calculation		
					Gradation	< 200 TONS of Mix	1/500 TONS of Mix/Day	Truck @ Plant or on Project ¹¹		R 97	T 308, T 30	
			702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C		1 per project	Distributor Truck on Project	1 Quart	R 66	T 49, T 59	

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures	
										Sampling	Testing ⁽¹⁾
HPC Structural Concrete	501.32 (2011)	Concrete, High Performance Class AA (2011) Concrete, High Performance Class A (2011) Concrete, High Performance Class B (2011) Prefabricated Bridge Unit Superstructure	501.03	HPC Structural Concrete	Air Temperature	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231 ASTM C1064
	501.33 (2011)				Compressive Strength					T 23	T 22
	501.34 (2011)										
	544.10										
HPC Structural Concrete	501.35	Concrete, High Performance Class SCC	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 T 23	ASTM C231 ASTM C1064 T 22
	501.36	Concrete, High Performance Class LW	501.03	HPC Structural Concrete	Air Temperature Compressive Strength		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 T 23	ASTM C231 ASTM C1064 T 22
					Unit weight (for lightweight aggregate only)						
704.14	Lightweight Coarse Aggregate for Structural Concrete	Gradation Density	< 80 CY	1 per project 1 per placement	Stockpile at plant Stockpile at plant	see note 8 0.5 to 2 ft ³	R 90 R 90	T 27 T 19			
Performance-Based Structural Concrete	501.37 501.38 501.39 544.10	High Performance Concrete, Class PCD High Performance Concrete, Class PCS High Performance Concrete, SCC Prefabricated Bridge Unit Superstructure	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Slump	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 T 23 R 60	ASTM C231 ASTM C1064 T 22 T 119
Structural Steel	506.50	Structural Steel, Rolled Beam	714.04	Carbon Steel Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension Control Assembly Bolt production lot if used) to be incorporated into the project for main member connections as designated in the Contract or as defined in 714.01, or other connections as deemed necessary by the Resident Engineer.	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A		ASTM F606
	506.55	Structural Steel, Plate Girder	714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness					N/A	ASTM F606
	506.56	Structural Steel, Curved Plate Girder									
	506.57	Structural Steel, Truss									
506.60	Structural Steel	714.06	Heat Treated Structural Bolts	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness						ASTM F606	
506.75	Structural Steel (LS)										
Precast/Prestressed Concrete	510.21	Prestressed Concrete Box Beams	501.03	HPC Structural Concrete	Air Temperature Compressive Strength		1 per project (note 5) 1 per project (note 6)	At plant, as close to point of deposit as possible	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231 ASTM C1064
	510.22	Prestressed Concrete Voided Slabs			Spread (SCC)	1 per project (note 6)	T 23			T 22	
	510.23	Prestressed Concrete Girders	704.14	Lightweight Coarse Aggregate for Concrete	Density (lightweight only)	1 per project	Stockpile at plant			0.5 to 2 ft ³	ASTM C172 R 90
	510.25	Prestressed Concrete Solid Slabs									
	510.26	Prestressed Concrete NEXT D Beams	713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile at plant/Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	N/A	T 244
	540.10	Precast Concrete Structure	707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109
	543.10	Contractor-Fabricated Precast Concrete Structure									
510.24	Grouting Shear Keys	707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109	

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures	
										Sampling	Testing ⁽¹⁾
Prefabricated Bridge Unit	544.10	Bridge Unit Superstructure	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)		1 per project (note 5) 1 per project (note 6) 1 per project (note 6)	At plant, as close to point of deposit as possible	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 T 23 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
			704.14	Lightweight Coarse Aggregate for Concrete	Density (lightweight only)		1 per project	Stockpile at plant	0.5 to 2 ft ³	R 90	T 19
			707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109
			713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	at plant	6 ft	N/A	T 244
			713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile at plant/Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	N/A	T 244
			714.04	Carbon Steel Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension Control Assembly Bolt production lot if used) to be incorporated into the project for main member connections as designated in the Contract or as defined in 714.01, or other connections as deemed necessary by the Resident Engineer.	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
			714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness	N/A					ASTM F606
			714.06	Heat Treated Structural Bolts	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness	N/A					ASTM F606
			714.12	Direct Tension Indicators	Rockwell Hardness	N/A					ASTM F606
					714.13	Tension Control Assemblies	Rotational Capacity Test				
Bridge Railing	525.11 525.33 525.335 525.34 525.41 525.44	Reset Existing Bridge Railing Bridge Railing, Galvanized 2 Rail Box Beam Bridge Railing, Galvanized 3 Rail Box Beam Bridge Railing, Galvanized 4 Rail Box Beam Bridge Railing, Galvanized HD Steel Beam/Fascia Mounted Bridge Railing, Galvanized, HDSB/Fascia Mounted/Steel Tubing	714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC) Unit weight (for lightweight aggregate only)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 T 23 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611 ASTM C173
			704.14	Lightweight Coarse Aggregate for Concrete	Density (for lightweight aggregate only)		1 per placement	Stockpile at plant	0.5 to 2 ft ³	R 90	T 19
			713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile on Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	N/A	T 244
			714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC) Unit weight (for lightweight aggregate only)		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 T 23 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611 ASTM C173
			704.14	Lightweight Coarse Aggregate for Concrete	Density (for lightweight aggregate only)		1 per placement	at plant	0.5 to 2 ft ³	R 90	T 19
			713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile on Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	N/A	T 244

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures			
										Sampling	Testing ⁽¹⁾		
Structural Concrete	541.21	Concrete, Class AA	541.03	Structural Concrete	Air Temperature	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231		
	541.22	Concrete, Class A			Compressive Strength					T 23	ASTM C1064		
	541.25	Concrete, Class B			Unit weight (for lightweight aggregate only)					ASTM C172	ASTM C173		
	541.30	Concrete, Class C											
	541.31	Concrete, Class D											
	541.40	Concrete, Class LW	704.14	Lightweight Coarse Aggregate for Structural Concrete	Density (for lightweight aggregate only)	1 per placement	Stockpile at plant	0.5 to 2 ft ³	R 90	T 19			
	541.45	Controlled Density (Flowable) Fill	541.03	Structural Concrete	Air Temperature Compression Strength of cubes (Flowable Fill)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or 3 cubes cast on project	ASTM C172	ASTM C231 ASTM C1064		
Structural Concrete Repair	580.10	Repair of Concrete Superstructure, Class I	541.03	Structural Concrete	Air Temperature	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231		
	580.11	Repair of Concrete Superstructure, Class II	501.03	High Performance Structural Concrete (2011)	Compressive Strength					T 23	ASTM C1064		
	580.12	Repair of Concrete Superstructure, Class III	501.03	Performance Based Structural Concrete (2018)						T 22			
	580.13	Repair of Concrete Substructure, Class I	780.02	Overhead and Vertical Concrete Repair Material	Compressive Strength		1 per first 25 units, then 1 per 100 units (bags) after	on project, as close to point of deposit as practical	3 cubes cast on project	R 64	ASTM C109		
	580.14	Repair of Concrete Substructure, Class II	780.03	Rapid Setting Concrete Repair Material									
	580.15	Repair of Concrete Substructure, Class III	780.05	Polymer Concrete Repair Material (2018)									
580.19	Concrete, Class AA Overlay	780.04	Rapid Setting Concrete Repair Material with Coarse Aggregate	Compressive Strength		1 per first 25 units, then 1 per 100 units (bags) after	on project, as close to point of deposit as practical	1 ft ³ for Compressive Strength Cylinders	ASTM C172	ASTM C231			
Underdrains	605.10 to 605.23	Underdrain pipe Underdrain Carrier pipe	704.16	Drainage Aggregate	Gradation	< 600 CY	1 per project	Stockpile on Project	55	R 90	T 27		
	Curbs, Gutters, and Sidewalks	616.27	Cast-in-place Concrete Curb, Type A	541.03	Structural Concrete	Air Temperature	< 10 CY	1 per project	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231	
616.28		Cast-in-place Concrete Curb, Type B	Compressive Strength			T 23					ASTM C1064		
616.45		Portland Cement Concrete Gutter (2011) Portland Cement Sidewalk, 5 inch											
618.10		Portland Cement Sidewalk, 8 inch											
618.11		Concrete Median Barrier (2011)											
621.45		Concrete Median Barrier (2011)											
616.300		Bituminous Concrete Pavement	406.03a	Bituminous Concrete Pavement	Slip AC Content	< 200 TONS of Mix	1/500 TONS of Mix/Day	Box Sample on Project or Truck at Plant	Dependent on mix type - see note 9		Truck Slip Calculation		
616.305		Bituminous Concrete Curb Type A (ton) (2011)	702.02	PG Binder	Gradation	< 200 TONS of Mix	1/500 TONS of Mix/Day	Box Sample on Project or Truck at Plant	Dependent on mix type - see note 9	T 168	T 164 or T 308, T 30		
616.31		Concrete Curb Type A (ft) Bituminous Concrete Curb Type B (ton) (2011) Bituminous Concrete Curb Type B (ft)			Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/2,000 TONS of Mix	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316		
616.315					702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 200 TONS of Mix	1 per project	Distributor Truck on Project	1 Quart	R 66	T 49, T 59
					616.13	Bituminous Concrete Gutters and Traffic Islands	Slip AC Content	< 200 TONS of Mix	1/500 TONS of Mix/Day	Box Sample on Project or Truck at Plant	Dependent on mix type - see note 9	T 168	T 164 or T 308, T 30
			406.03a	Bituminous Concrete Pavement	Gradation	< 200 TONS of Mix	1/500 TONS of Mix/Day	Box Sample on Project or Truck at Plant	Dependent on mix type - see note 9	T 168	T 164 or T 308, T 30		
616.47	Bituminous Concrete Gutters and Traffic Islands	702.02	PG Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/2,000 TONS of Mix	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316			
		702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 200 TONS of Mix	1 per project	Distributor Truck on Project	1 Quart	R 66	T 49, T 59			
		490.03a	Superpave Bituminous Concrete Pavement (2011)	Slip AC Content	< 200 TONS of Mix	1/500 TONS of Mix/Day	Box Sample on Project or Truck at Plant	Dependent on mix type - see note 9	T 168	Truck Slip Calculation			
		(2011)	Bituminous Concrete Pavement (2018)	Gradation	< 200 TONS of Mix	1/500 TONS of Mix/Day	Box Sample on Project or Truck at Plant	Dependent on mix type - see note 9	T 168	T 164 or T 308, T 30			

Table 2: Material Sampling Manual Project Level 3

Type of Construction	Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size ⁽²⁾	Procedures		
										Sampling	Testing ⁽¹⁾	
Sign Foundations, Over Head Traffic Sign Supports, Traffic Control Signals & Street Lighting	675.40 (2011)	Foundation for W-Shape Steel Post (18 (2011), 24, 30 inch diameter)	541.03	Structural Concrete	Air Temperature	< 10 CY	1 per project	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231 ASTM C1064	
	675.41	Foundation for Tubular Steel Post			Compressive Strength					T 23	T 22	
	675.42											
	675.43											
	677.12	Overhead Traffic Sign Support, Cantilever	541.03	Structural Concrete	Air Temperature	< 10 CY	1 per 75 CY (See Note 4)	on project, as close to point of deposit as possible (see note 7)	1 ft ³ for Compressive Strength or wheelbarrow needed	ASTM C172	ASTM C231 ASTM C1064	
	677.21	Overhead Traffic Sign Support, Multi-Support			Compressive Strength					T 23	T 22	
	677.22	Overhead Traffic Sign Support, Cantilever with Lighting	714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Strength			Original Manufacturer Shipping Container at the project or at fabrication facility	N/A		ASTM F606	
	677.23	Overhead Traffic Sign Support, Multi-support with Lighting			Rockwell Hardness					N/A	N/A	
	677.25	Remove and Reset Overhead Traffic Sign Support	714.06	Heat Treated Structural Bolts	Ultimate Tensile Strength							ASTM F606
	678.15	Support			Rockwell Hardness							
679.46	Traffic Control Signal System, Intersection Street Light Assembly	714.09	Anchor Bolts, Traffic Signals, Lighting, and Overhead Sign Structures (see note 10)	Ultimate Tensile Strength		1 - Each anchor bolt production lot to be incorporated into the project. Include washer and nut with sample.	Original Manufacturer Shipping Container at the project or at fabrication facility	1 bolt, including threads (at least 18" long)	N/A	ASTM F606		

- Notes:**
- (1) Testing procedures are AASHTO procedures unless otherwise noted.
 - (2) Sample size is in pounds unless otherwise noted. The sample size should be selected based on the maximum nominal aggregate size (See AASHTO T27, Section 7.1). For example, if the material visually passes a 2", 1.5", or 1" sieve then the sample size is 220 lbs, 165 lbs, and 110 lbs, respectively.
 - (3) Total placement for day split into equal sublots not to exceed 50 CY, test yardage chosen randomly. The test yardage is used to determine which load to test with proper sample collection techniques followed. Check first load for temperature, and air content. **This will not be counted as the acceptance test for the first sublot.** If the first load is determined to be out-of-specification then the Contractor must test each consecutive load until 3 consecutive passing loads are tested. VTrans will check 4th consecutive load to verify. Deck pours shall have no less than 3 acceptance tests, regardless of total CY placed. Acceptance tests shall be standard cured in accordance with applicable test method.
 - (4) Check first load for temperature and air content as an initial check. Acceptance sampling will be done every 75 CY, including the first load in the yardage count. If the first load, or any acceptance test, does not comply with VTrans' specifications then the Contractor must test each load until 3 consecutive passing loads are achieved. VTrans will check 4th consecutive load or last load, which ever happens first, to verify compliance.
 - (5) Acceptance tests are to be performed by Owner representative at the frequency indicated, per project. However, all QC tests are to be witnessed by Owner representative. Minimum of six Compressive Strength for determining detensioning, to be cured with the piece. Four specimens to determine 28 day and shipping strengths and are to be cured with the piece until it is stripped and then standard cured.
 - (6) Acceptance tests are to be performed by Owner representative at the frequency indicated, per project. However, all QC tests are to be witnessed by Owner representative. As a minimum, the first load as well as the load that the Compressive Strength are fabricated from should be tested by QC.
 - (7) If the sample cannot be safely obtained from the end of pump truck hose at the point of placement (i.e. without retracting the hose from within formwork), the sample should be obtained from the mixer truck.
 - (8) Depends upon the mix type. For mixes with 3/4", 1/2", and 3/8" stone the sample size is 165 lbs, 55 lbs, and 22 lbs respectively.
 - (9) The sample size for HMA depends upon the nominal maximum aggregate in the mix, see following table. Minimum sample sizes are in accordance with AASHTO T168 and are suitable for routine testing. However, actual sample size is dependent upon the type and number of tests to which the material is to be subjected. AC Content is determined from the mass (weight) or percentage printed on the weight slip or demand ticket.
 - (10) Acceptance testing is not required for anchor bolts for traffic signal controllers and cabinets or pedestal poles.
 - (11) Bituminous mixtures sampled on project shall be sampled from the paver or material transfer vehicle hopper or the paver auger in accordance with AASHTO R 97.

Mix Type:	MS	I / IS	II / IIS	III / IIIS	IV / IVS	VS	VI / VIS
Maximum Nominal Aggregate Size, in:	1 1/2"	1"	3/4"	1/2"	3/8"	3/16"	3/16"
Minimum Sample Size, lbs:	25	20	16	12	8	4	4