BLUE EARTH COUNTY HIGHWAY DEPARTMENT
35 MAP DRIVE, MANKATO, MINNESOTA 56001

**********PROPOSAL**********

FOR HIGHWAY CONSTRUCTION
AND MAINTENANCE PROJECTS WITH
BIDS RECEIVED UNTIL 1:30 O'CLOCK P.M. ON MAY 25, 2012

PROPOSAL OF _____
(NAME OF FIRM)

_____
(ADDRESS)

_____
(AREA CODE) TELEPHONE NUMBER

TO FURNISH AND DELIVER ALL MATERIALS AND TO PERFORM ALL WORK IN ACCORDANCE WITH THE CONTRACT, THE PLANS AND THE APPROVED DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION", 2005 EDITION, EXCEPT AS STATED OTHERWISE IN THE SPECIAL PROVISIONS WHICH ARE PART OF THIS PROPOSAL, FOR

STATE PROJECT NO. **SP 07-612-11**

MINNESOTA PROJECT NO. **STP 0712 (129)**

LOCATION: Blue Earth County CSAH 12 from CSAH 17 to a point 200' South of CSAH. 3

TYPE OF WORK: Grading, Base, Concrete and Bituminous Paving, Roundabout, Signing, Striping, Lighting, and Bridge No. 07587

LENGTH: 1.105 Miles

STARTING DATE: See Special Provisions

COMPLETION DATE: See Special Provisions

NOTICE TO BIDDERS: In submitting a bid, you must return this complete proposal. You must initial changes made in the Schedule of Prices in the Proposal and acknowledge addenda on the back cover sheet.

I certify that this Proposal was prepared by me or under my direct supervision, and that I am a licensed professional engineer under the laws of the State of Minnesota.

_____

License Number 14720 Date: 20 April 12

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BID RIGGING IS A SERIOUS CRIME. IF YOU HAVE ANY INFORMATION CONCERNING COLLUSIVE BIDDING, EVEN A REQUEST TO SUBMIT A COMPLIMENTARY BID, PLEASE CALL THE MINNESOTA ATTORNEY GENERAL'S OFFICE AT TELE. NO. 651-296-1796

To Blue Earth County Board of Commissioners:

According to the advertisement of Blue Earth County inviting proposals for the improvement of the section of highway hereinbefore named, and in conformity with the Contract, Plans, Specifications and Special Provisions pertaining thereto, all on file in the office of the Auditor of Blue Earth County:

(I)(We) hereby certify that (I am)(we are) the only person(s) interested in this proposal as principal(s); that this proposal is made and submitted without fraud or collusion with any other person, firm or corporation at all; that an examination has been made of the site of the work and the Contract form, with the Plans, Specifications and Special Provisions for the improvement.

(I)(We) understand that the quantities of work shown herein are approximate only and are subject to increase or decrease; that all quantities of work, whether increased or decreased within the limits specified in Mn/DOT 1903, are to be done at the unit prices shown on the attached schedule; that, at the time of opening bids, totals only will be read, but that comparison of bids will be based on the correct summation of item totals obtained from the unit prices bid, as provided in Mn/DOT 1301.

(I)(We) propose to furnish all necessary machinery, equipment, tools, labor and other means of construction and to furnish all materials specified, in the manner and at the time prescribed, all according to the terms of the Contract and Plans, Specifications, and the Special Provisions forming a part of this.

(I)(We) further propose to do all Extra Work that may be required to complete the contemplated improvement, at unit prices or lump sums to be agreed upon in writing before starting such work, or if such prices or sums cannot be agreed upon, to do such work on a Force Account basis, as provided in Mn/DOT 1904.

(I)(We) further propose to execute the form of Contract within 10 days after receiving written notice of award, as provided in Mn/DOT 1306.

(I)(We) further propose to furnish a payment bond equal to the Contract amount, and a performance bond equal to the Contract amount, with the aggregate liability of the bond(s) equal to twice the full amount of the Contract if the contract is less than or equal to five million dollars ($5,000,000.00), or if the contract is in excess of five million dollars ($5,000,000.00) the aggregate liability shall be equal to the amount of the contract, as security for the construction and completion of the improvement according to the Plans, Specifications and Special Provisions as provided in Mn/DOT 1305.

(I)(We) further propose to do all work according to the Plans, Specifications and Special Provisions, and to renew or repair any work that may be rejected due to defective materials or workmanship, before completion and acceptance of the Project by Blue Earth County.

(I)(We) agree to all provisions of Minnesota Statutes, Section 181.59.

(I)(We) further propose to begin work and to prosecute and complete the same according to the time schedule set forth in the Special Provisions for the improvement.

(I)(We) assign to Blue Earth County all claims for overcharges as to goods and materials purchased in connection with this Project resulting from antitrust violations that arise under the antitrust laws of the United States and the antitrust laws of the State of Minnesota. This clause also applies to subcontractors and first tier suppliers under this Contract.

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

Office of Minnesota, Attorney General, Lori Swanson
(651) 296 3353 or 1-800-657-3787

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

LIMITATION ON USE OF CONTRACT FUNDS FOR LOBBYING
Appendix C to Part ___ - Contract Clause

NEW RESTRICTIONS ON LOBBYING

(a) Definitions. As used in this clause,

"Agency", as defined in 5 U.S.C. 552(f), includes Federal Executive departments and agencies as well as independent regulatory commissions and Government corporations, as defined in 31 U.S.C. 9101(1).

"Covered Federal action" means any of the following Federal actions:
(1) The awarding of any Federal contract;
(2) The making of any Federal grant;
(3) The making of any Federal loan;
(4) The entering into of any cooperative agreement; and,
(5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, load, or cooperative agreement.
Covered Federal action does not include receiving from an agency a commitment providing for the United States to insure or guarantee a loan.

"Indian tribe" and "tribal organization" have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B). Alaskan Natives are included under the definitions of Indian tribes in that Act.

"Influencing or attempting to influence" means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government" means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency" includes the following individuals who are employed by an agency:

(1) An individual who is appointed to a position in the Government under title 5, U.S. Code, including a position under a temporary appointment;
(2) A member of the uniformed services as defined in section 101(3). title 37, U.S. Code;
(3) A special Government employee as defined in section 202, title 18, U.S. Code; and,
(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, U.S. Code appendix 2.

"Person" means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation" means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment" means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient" includes all contractors and subcontractors at any tier in connection with a Federal contract. The term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed" means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State" means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and a multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibition.

(1) Section 1352 of title 31, U.S. Code provides in part that no appropriated funds may be expended by the recipient of a Federal contract, grant, loan, or cooperative agreement to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: 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) The prohibition does not apply as follows:

(i) Agency and legislative liaison by Own Employees.

(A) The prohibition on the use of appropriated funds, in paragraph (1) of this section, does not apply in the case of a payment of reasonable

compensation made to an officer or employee of a person requesting or receiving a Federal activities not directly related to a covered Federal action.

(B) For purposes of paragraph (A) of this section, providing any information specifically requested by an agency or Congress is allowable at any time.

(C) For purposes of paragraph (A) of this section, the following agency and legislative liaison activities are allowable at any time only where they are not related to a specific solicitation for any covered Federal action:
  (i) Discussing with an agency (including individual demonstrations) the qualities and characteristics of the person's products or services, conditions or terms of sale, and service capabilities; and,
  (ii) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) For purposes of paragraph (A) of this section, the following agency and legislative liaison activities are allowable only where they are prior to formal solicitation of any covered Federal action:
  (i) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;
  (ii) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and,
  (iii) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Public Law 95-507 and other subsequent amendments.

(E) Only those activities expressly authorized by paragraph (i) of this section are allowable under paragraph (i).

(ii) Professional and Technical Services by Own Employees.

(A) The prohibition on the use of appropriated funds, in paragraph (1) of this section, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a Federal contract or an extension, continuation, renewal, amendment, or modification of a Federal contract if payment is for professional of technical services rendered directly in the preparation submission, or negotiation of any bid, proposal, or application for that Federal contract or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal contract.

(B) For purposes of paragraph (A) of this section, "professional and technical services" shall be limited to advice and analysis directly

applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer), or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services, Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation, or reasonably expected to be required by law or regulation, and any other requirements in the actual award documents.

(D) Only those services expressly authorized by paragraph (ii) of this section are allowable under paragraph (ii).

(iii) Reporting for Own Employees.

No reporting is required with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(iv) Professional and technical services by Other than Own Employees.

(A) The prohibition on the use of appropriated funds, in paragraph (1) of this section, does not apply in the case of any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action, if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal contract or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal contract.

(B) For purposes of paragraph (A) of this section, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation, or reasonably expected to be required by law or regulation, and any other requirements in the actual award documents.

(D) Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(E) Only those services expressly authorized by paragraph (iv) of this section are allowable under paragraph (iv).

(c) Disclosure.

(1) Each person who requests or receives from an agency a Federal contract shall file with that agency a certification, set forth in ____, that the person has not made, and will not make, any payment prohibited by paragraph (b) of this clause.

(2) Each person who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, Standard Form-LLL, "Disclosure of Lobbying Activities," if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under paragraph (b) of this clause if paid for with appropriated funds.

(3) Each person shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under paragraph (2) of this section. An event that materially affects the accuracy of this information reported includes:

(i) A cumulative increase of $25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(ii) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,

(iii) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(4) Any person who requests or receives from a person referred to in paragraph (1) of this section a subcontract exceeding $100,000 at any tier under a Federal contract shall file a certification, and a disclosure form, if required, to the next tier above.

(5) All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the person referred to in paragraph (1) of this section. That person shall forward all disclosure forms to the agency.

(d) Agreement. In accepting any contract resulting from this solicitation, the person submitting the offer agrees not to make any payment prohibited by this clause.

(e) Penalties.

(1) Any person who makes an expenditure prohibited under paragraph (b) of this clause shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 of each such expenditure.

(2) Any person who fails to file or amend the disclosure form to be filed or amended if required by this clause, shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 or each such failure.

(3) Contractors may rely without liability on the representations made by their subcontractors in the certification and disclosure form.

(f) Cost allowability. Nothing in this clause is to be interpreted to make allowable or reasonable any costs which would be unallowable or unreasonable in accordance with Part 31 or the Federal Acquisition Regulation. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any of the provisions of Part 31 of the Federal Acquisition Regulation.

(End of Clause)

BILLING CODE 3110-01-M

NOTICE

By signing and submitting this proposal, the prospective primary bidder is providing the certification set out below. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why he/she cannot provide the certification set out below. Certification or explanation will be considered concerning Pennington County's determination whether to enter this transaction. Failure of the prospective primary participant to furnish a certification or a written explanation why he/she cannot provide the certification shall disqualify such people from participation in this transaction.

The certification in this clause is a material representation of fact upon which reliance was placed when Pennington County decided to enter this transaction. If it is later decided that the prospective primary participant knowingly rendered an erroneous certification, beyond other remedies available to the Federal Government, Pennington County may end this transaction for cause of default. The prospective primary participant shall provide immediate written notice to Pennington County if any time the prospective primary participant learns that his/her certification was erroneous when submitted or has become erroneous due to changed circumstances.

The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded as used in this clause have the meanings set out in the Definition and Coverage sections of the rules carrying out Federal Executive Order 12549 dated February 18, 1986. Bidders may contact Mn/DOT for assistance in obtaining a copy of these regulations.

The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered, he/she shall not knowingly enter any lower tier covered transaction with a person who is debarred, suspended, declared in-eligible, or voluntarily excluded from participation in this covered transaction unless authorized by Pennington County and Mn/DOT. Nothing contained in this shall be construed to require establishment of system of records to render in good faith the certification required by this clause. The knowledge and information of a participant are not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The prospective primary participant further agrees by submitting this proposal that he/she will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction" provided by Mn/DOT without modification in all solicitations for lower tier covered transactions. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that he/she and his/her principals are not de-barred, suspended, in-eligible, or voluntarily excluded, from the covered transaction by any Federal agency, unless he/she knows that the certification is erroneous. A participant may decide the method and frequency by which he/she decides the eligibility of his/her principals.

Except as authorized by Mn/DOT, if a participant in a covered transaction knowingly enters a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, beyond other remedies available to the Federal Government, Pennington County may end this transaction for cause or default.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters-Primary Covered Transactions

(I)(We) certify that the firm or any person associated with it in the capacity of owner, partner, director, officer, project director, manager auditor, or any position involving the administration of Federal funds:

- are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntary excluded from covered transactions by any Federal department or agency;

- have not within the three-year period preceding this proposal been convicted of or had a civil judgment rendered 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; or 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;

- are not presently indicted for or otherwise criminally or civilly charged by a governmental entity with commission of any of the above-enumerated offenses;

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

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

(I)(We) agree that (my)(our) signatures on this proposal form certification of "status" under penalty of perjury under the laws of the United States.

Rev. 11/29/99

NOTICE TO BIDDERS

TRAFFIC CONTROL
PREVAILING WAGE COVERAGE

The following defines the United States Department of Labor's interpretation of contract labor provision coverage for employees who work for traffic control companies and /or perform traffic control duties.

Non-covered Supplier Designated Duties:

Employees of bona fide "Material Persons/Suppliers" are not covered. A Material Person/Supplier is limited to supply, delivery, and routine maintenance (once a week) of barricades, cones, flashers, etc. to the job site.

The following functions, except as qualified in "6." below, do not come under the prevailing wage requirements of the contracts:

1. Supply and delivery of traffic control devices such as barricades, cones, barrels, flashers and signboards.

2. Routine and periodic maintenance service (usually once a week).

3. Removal of equipment from job site.

4. In connection with delivery, they may drop the equipment at a central stockpile location or at various locations along the project. Employees of company may set-up the equipment as long as such set-up is by dropping barrels and cones from the back of a moving truck.

5. Maintenance would consist of inspecting and cleaning the equipment, replacing broken or lost equipment, replacing barricades knocked down or out of line, and changing light bulbs and barricades.

6. If an employee spends more than 20% of their workweek performing the above duties on a Davis-Bacon (Federal-Aid) project or other Davis-Bacon (Federal-Aid) projects, prevailing wage rates would apply for the time so spent.

DEPARTMENT OF TRANSPORTATION

NOTICE OF DEBARMENT

NOTICE IS HEREBY GIVEN that the Department of Transportation ("MnDOT") has ordered that the following vendors be debarred for a period of two (2) years, effective January 4, 2010 until January 4, 2012:

- Riley Bros, Companies, Inc. and its affiliates, Morris, MN
- Riley Bros. Construction, Inc. and its affiliates, Morris, MN
- Riley Bros. Properties, LLC and its affiliates, Morris, MN
- Riley Bros. Utilities, Inc., d/b/a Chris Riley Utilities, Inc., and its affiliates, Morris, MN

NOTICE IS HEREBY GIVEN that MnDOT has ordered that the following vendors be debarred for a period of three (3) years, effective February 24, 2010 until February 24, 2013:

- Joseph Edward Riley, Morris, MN
- John Thomas Riley, Morris, MN

NOTICE IS HEREBY GIVEN that MnDOT has ordered that the following vendors be debarred for a period of three (3) years, effective March 25, 2011 until March 25, 2014:

- Philip Joseph Franklin, Leesburg, VA
- Franklin Drywall, Inc. and its affiliates, Little Canada, MN
- Master Drywall, Inc. and its affiliates, Little Canada, MN

NOTICE OF SUSPENSION

NOTICE IS HEREBY GIVEN that the Department of Transportation ("MnDOT") has ordered that the following vendors be suspended for a period of sixty (60) days, effective February 10, 2012 until April 10, 2012:

- Marlon Louis Danner and his affiliates, South St. Paul, MN
- Danner, Inc. and its affiliates, South St. Paul, MN
- Bull Dog Leasing, Inc. and its affiliates, Inver Grove Heights, MN
- Danner Family Limited Partnership and its affiliates, South St. Paul, MN
- Ell-Z Trucking, Inc. and its affiliates, South St. Paul, MN

Minnesota Statute section 161.315 prohibits the Commissioner, counties, towns, or home rule or statutory cities from awarding or approving the award of a contract for goods or services to a person who is suspended or debarred, including:

1) any contract under which a debarred or suspended person will serve as a subcontractor or material supplier,
2) any business or affiliate which the debarred or suspended person exercises substantial influence or control, and
3) any business or entity, which is sold or transferred by a debarred person to a relative or any other party over whose actions the debarred person exercises substantial influence or control, remains ineligible during the duration of the seller's or transfer's debarment.

DEPARTMENT OF ADMINISTRATION

As of the date of this notice and in accordance with Minnesota Rules 1230.1150, the Minnesota Department of Administration has debarred and disqualified the following persons and businesses from entering into or receiving a State of Minnesota contract:

NAME	DATE OF DEBARMENT
Alternative Counseling Clinic 337 97th Lane NE Minneapolis, MN 55434	Oct. 22, 2008 through Oct. 22, 2011 (eligible for reinstatement on Oct. 22, 2012)
Bull Dog Leasing, Inc. 7854 Danner Court Inver Grove Heights, MN 55076	Aug. 30, 2011 through Aug. 30, 2014 (eligible for reinstatement on Aug. 30, 2015)
Danner Family Ltd. Ptnship. 843 Hardman Ave. S. S. St. Paul, MN 55075	Aug. 30, 2011 through Aug. 30, 2014 (eligible for reinstatement on Aug. 30, 2015)
Danner, Inc. 843 Hardman Ave. S. S. St. Paul, MN 55075	Aug. 30, 2011 through Aug. 30, 2014 (eligible for reinstatement on Aug. 30, 2015)
Ell-Z Trucking, Inc. 843 Hardman Ave. S. S. St. Paul, MN 55075	Aug. 30, 2011 through Aug. 30, 2014 (eligible for reinstatement on Aug. 30, 2015)
Franklin Drywall, Inc. 43279 Fieldsview Crt. Leesburg, VA 20176	March 25, 2011 through March 25, 2014 (eligible for reinstatement on March 25, 2015)
Master Drywall, Inc. 43279 Fieldsview Crt. Leesburg, VA 20176	March 25, 2011 through March 25, 2014 (eligible for reinstatement on March 25, 2015)
Polyphase Electric Company 2515 West Superior Street Duluth, MN 55816-0151	May 5, 2010 through May 5, 2011 (eligible for reinstatement on May 5, 2012)
Riley Brothers Construction PO Box 535 Morris, MN 56267	Nov. 9, 2009 through Nov. 9, 2012

Minnesota Administrative Rule part 1230.1150, subpart 6 requires the Materials Management Division to maintain a master list of all suspensions and debarments. The master list must retain all information concerning suspensions and debarments as a public record for at least three (3) years following the end of a suspension or debarment. Refer to the following website for the master list: http://www.mmd.admin.state.mn.us/debarredreport.asp.

If the project is financed in whole or in part with federal funds, refer to the following website for vendors debarred by federal government agencies: https://www.epls.gov/.

FEDERALLY FUNDED CONSTRUCTION CONTRACTS
SPECIAL PROVISIONS DIVISION A - LABOR
February 1, 2006

I. PREAMBLE

It is in the public interest that public buildings and other public works projects be constructed and maintained by the best means and the highest quality of labor reasonably available and that persons working on public works projects be compensated according to the real value of the services they perform.[1]

Therefore, the department shall administer this contract pursuant to the **Federal Davis-Bacon and Related Acts, Required Contract Provisions Federal-Aid Construction Contracts, Form-1273, U.S. Department of Labor's Field Operations Handbook, State of Minnesota Statutes and Rules, MN/DOT's Standard Specifications for Construction, MN/DOT's Contract Administration Manual** and **MN/DOT's State Aid Manual.**

II. DEFINITIONS[2]

A. **Contract**: The written agreement between the contracting authority and the prime contractor setting forth their obligations, including, but not limited to, the performance of the work, the furnishing of labor and materials, the basis of payment, and other requirements contained in the contract documents.

B. **Contracting Authority**: The political subdivision, governmental body, board, department, commission, or officer making the award and execution of contract as the party of the first part.

C. **Contractor**: The term "contractor" in these provisions shall include the prime contractor, subcontractor, agent, or other person doing or contracting to do all or part of the work under this contract.[3]

D. **Department**: The Department of Transportation of the State of Minnesota, or the political subdivision, governmental body, board, commission, office, department, division, or agency constituted for administration of the contract work within its jurisdiction.

E. **First Tier Subcontractor**: An individual, firm, corporation, or other entity to which the prime contractor sublets part of the contract.

F. **Independent Truck Owner/Operator (ITO)**: An individual, partnership, or principal stockholder of a corporation who owns or holds a vehicle under lease and who contracts that vehicle and the owner's services to an entity that provides construction services to a public works project.[4]

G. **Laborer or Mechanic**: A worker in a construction industry labor class identified in or pursuant to Minnesota Rules 5200.1100, Master Job Classifications.[5]

H. **Plan**: The plan, profiles, typical cross-sections, and supplemental drawings that show the locations, character, dimensions, and details of the work to be done.

I. **Prime Contractor**: The individual, firm, corporation, or other entity contracting for and undertaking prosecution of the prescribed work; the party of the second part to the contract, acting directly or through a duly authorized representative.

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[1] Minnesota Statute 177.41
[2] MN/DOT Standard Specifications for Construction, Section 1103
[3] Minnesota Statute 177.44, Subdivision 1
[4] Minnesota Rules 5200.1106, Subpart 7(A)
[5] Minnesota Rules 5200.1106, Subpart 5(A)

J. **Project**: The specific section of the highway, the location, or the type of work together with all appurtenances and construction to be performed under the contract.

K. **Second Tier Subcontractor**: An individual, firm, corporation, or other entity to which a first tier subcontractor sublets part of the contract.

L. **Special Provisions**: Additions and revisions to the standard and supplemental specifications covering conditions peculiar to an individual project.

M. **Specifications**: A general term applied to all directions, provisions, and requirements pertaining to performance of the work.

N. **Subcontractor**: An individual, firm, corporation, or other entity to which the prime contractor or subcontractor sublets part of the contract.

O. **Substantially In Place**: Mineral aggregate is deposited on the project site directly or through spreaders where it can be spread from or compacted at the location where it was deposited.[6]

P. **Trucking Broker**: An individual or business entity, the activities of which include, but are not limited to: contracting to provide trucking services in the construction industry to users of such services, contracting to obtain such services from providers of trucking services, dispatching the providers of the services to do work as required by the users of the services, receiving payment from the users in consideration of the trucking services provided and making payment to the providers for the services.[7]

Q. **Trucking Firm/Multiple Truck Owner (MTO)**: Any business entity that owns more than one vehicle and hires the vehicles out for services to brokers or contractors on public works projects.[8]

R. **Work**: The furnishing of all labor, materials, equipment, and other incidentals necessary or convenient to the successful completion of the project and the carrying out of all the duties and obligations imposed by the contract upon the contractor. Also used to indicate the construction required or completed by the contractor.

III. SCOPE – SPECIAL PROVISIONS DIVISION A & CONTRACT

A. These provisions shall apply to this contract, which is funded in whole or in part with federal funds[9] and state funds.[10]

B. These provisions shall apply to the prime contractor and all subcontractors contracting to do all or part of the work under this contract.[11]

C. The provisions established in this document do not necessarily represent all federal, state, and local laws, ordinances, rules and regulations. It is the responsibility of the prime contractor to inform itself and all subcontractors about other regulations that may be applicable to this contract.

D. The prime contractor is responsible to ensure that each subcontractor performing work under this contract receives copies of all required contract provisions.[12] These provisions shall be incorporated into written subcontracts and must be displayed on the poster board.[13]

E. The department shall administer this contract in accordance with all applicable federal regulations, state statutes and rules[14], along with the plans, specifications and provisions, which are incorporated into and found elsewhere in this contract.

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[6] Minnesota Rules 5200.1106, Subpart 5(C)
[7] Minnesota Rules 5200.1106, Subpart 7(C)
[8] Minnesota Rules 5200.1106, Subpart 7(B)
[9] 29 CFR Part 5.5(a)
[10] Minnesota Statute 177.41
[11] Minnesota Statute 177.44, Subdivision 1
[12] 29 CFR Part 5.5(a)(6)
[13] Minnesota Statute 177.44, Subdivision 5

F. An unpublished decision from the Minnesota Court of Appeals affirms the authority of the Minnesota Commissioner of Transportation to enforce the Minnesota Prevailing Wage Law on a case-by-case basis.[15] Therefore, the department shall provide enforcement in a manner consistent with the decision notwithstanding any prior notices on the subject.

G. For additional information refer to: www.dot.state.mn.us/const/labor/.

IV. PAYROLLS AND STATEMENTS

A. Each week, in which work was performed under this contract, all contractors shall submit a payroll statement to the department.[16] Each statement shall be submitted within seven days after the regular payment date of the payroll period.[17] Each payroll submitted shall include all employees that performed work under this contract and provide at a minimum the following information:[18]

1. Contractor's name, address, and telephone number.
2. State project number.
3. Payroll report number.
4. Project location.
5. Workweek ending date.
6. Name, social security number, and home address for each employee.
7. Labor classification(s) and/or three-digit code for each employee.
8. Hourly straight time and overtime wage rates paid to each employee.
9. Daily and weekly hours worked in each labor classification, including overtime hours for each employee.
10. Authorized legal deductions for each employee.
11. Project gross amount, weekly gross amount and net wages paid to each employee.

B. Payroll records may be submitted in any form provided it includes all the information contained in **Subpart A (1 - 11)** of this section.[19] However, contractors needing a payroll form may utilize the "front side" of the **U.S. Department of Labor's, WH-347 - Payroll Form**. This form is available by visiting the Labor Compliance website.[20]

C. All payroll records must be accompanied with a completed and signed **MN/DOT, 21658 - Statement of Compliance Form.**[21]

D. The prime contractor is responsible for assuring that its payroll records and those of all subcontractors include all employees that performed work under this contract and accurately reflect the hours worked, regular and overtime rates of pay and classification of work performed.[22]

E. The prime contractor is responsible to maintain all certified payroll records, including those of all subcontractors, throughout the course of a construction project and retain all records for a period of three years after the final contract voucher has been issued.[23]

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[14] Minnesota Rules 8820.3000, Subpart 2
[15] Minnesota Court of Appeals Case Number: C6-97-1582
[16] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section V, Subpart 2(c)
[17] 29 CFR Part 3.4(a)
[18] Minnesota Rules 5200.1106, Subpart 10
[19] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section V, Subpart 2(c)
[20] www.dot.state.mn.us/const/labor/
[21] Minnesota Rules 5200.1106, Subpart 10
[22] 29 CFR Part 5.5(a)(6)
[23] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section V, Subpart 2(a)

F. At the end of each pay period, each contractor shall provide every employee, in writing, an accurate detailed earnings statement.[24]

G. Upon request from the U.S. Department of Labor (U.S. DOL), Federal Highway Administration (FHWA), Minnesota Department of Labor and Industry (MN/DLI) or the Department, the prime contractor shall promptly furnish copies of payroll records for its workers and those of all subcontractors, along with other records, deemed appropriate by the requesting agency to determine compliance with these contract provisions.[25]

H. At the department's discretion, the project engineer may administer the submission of payroll records according to MN/DOT's Payroll Maintenance Program. The guidelines for the implementation and administration of this program are outlined in the **MN/DOT Contract Administration Manual, Section A(4)(d)**. The program has not been approved for federal-aid contracts administered by local units of government and will not be allowed for such contracts. However, the program may be utilized for local state-aid contracts.

I. If, after written notice, the prime contractor fails to submit its payroll reports and certification forms and those of any subcontractor, the department may implement the actions prescribed in section **XVI (NON-COMPLIANCE AND ENFORCEMENT).**

V. WAGE RATES

A. The prime contractor is responsible to ensure that its workers and those of all subcontractors are compensated according to the U.S. DOL federal general decision(s) and the MN/DLI state prevailing wage determination(s) incorporated into and found elsewhere in this contract, **whichever is greater**. All contractors shall pay each worker the required minimum total hourly wage rate for all hours worked on the project and for the appropriate classification of labor.

1. Federal building, heavy and highway general decisions are specific to the county in which the construction work is being performed; a decision does not cross county or state lines.[26] If a project extends into more than one county or state, the applicable wage decision for each county or state shall be incorporated into and found elsewhere in this contract.

2. State highway and heavy wage determinations are specific to ten separate regions throughout the state of Minnesota. If a project extends into more than one region, the applicable wage decision for each region shall be incorporated into and found elsewhere in this contract.

   a. If this contract contains multiple highway and heavy wage determinations, there shall be only one standard of hours of labor and wage rates.[27]

3. State commercial wage determinations are specific to the county in which the construction work is being performed. If a project extends into more than one county, the applicable wage determination for each county shall be incorporated into and found elsewhere in this contract.

   a. If this contract contains multiple commercial wage determinations, there shall be only one standard of hours of labor and wage rates.[28]

B. Wage rates listed in the federal and/or state wage determination(s) contain two components: the hourly basic rate and the fringe rate; together they equal the total prevailing wage rate. A

[24] Minnesota Statute 181.032
[25] Minnesota Statute 177.44, Subdivision 7 and Minnesota Rules 5200.1106, Subpart 10
[26] 29 CFR Part 1.7(a)
[27] Minnesota Statute 177.44, Subdivision 4
[28] Minnesota Statute 177.44, Subdivision 4

contractor shall compensate a worker at a minimum, a combination of cash and fringe benefits equaling the total prevailing wage rate.[29]

C. The applicable certified wage decisions incorporated into and found elsewhere in this contract remain in effect for the life of this contract. The wage decisions do not necessarily represent the workforce that can be obtained at the rates certified by the U.S. DOL or MN/DLI. It is the responsibility of the prime contractor and any subcontractor to inform themselves about local labor conditions and prospective changes or adjustments to the wage rates. No increase in this contract price shall be allowed or authorized due to wage rates that exceed those incorporated into this contract.

D. A contractor shall not reduce a worker's private, regular rate of pay when the wage rate certified by the U.S. DOL or MN/DLI is less than the worker's normal hourly wage.[30]

E. From the time a worker is required to report for duty at the project site until the worker is allowed to leave the site, no deductions shall be made from the worker's hours for any delays of less than twenty consecutive minutes.[31]

   1. In situations where a delay may exceed twenty consecutive minutes and the contractor requires a worker to remain on the premises or so close to the premises that the worker cannot use the time effectively for the worker's own purposes, the worker is considered "on-call"[32] and shall be compensated in accordance with **Subpart B** of this section, unless the worker is allowed or required to leave the project site.

F. A contractor making payment to an employee, laborer, mechanic, worker, or truck owner-operator shall not accept a rebate for the purpose of reducing or otherwise decreasing the value of the compensation paid.[33]

G. Any employee who knowingly permits a contractor to pay less than the total prevailing wage or gives up any part of the compensation to which the employee is entitled may be subject to penalties.[34]

VI. BONA FIDE FRINGE BENEFITS

A. A "funded" fringe benefit plan is one that allows the contractor to make irrevocable contributions on behalf of an employee to a financially responsible trustee, third person, fund, plan or program, without prior approval from the U.S. Department of Labor. Types of "funded" fringe benefits may include, but are not limited to: pension, health and life insurance.[35]

B. An "unfunded" fringe benefit plan or program is one that allows the contractor to furnish an in-house benefit on behalf of an employee. The cost to provide the benefit is funded from the contractor's general assets rather than funded by contributions made to a trustee, third person, fund, plan or program. Types of "unfunded" fringe benefits may include, but are not limited to: holiday plans, vacation plans and sick plans.[36]

C. Credit toward the total prevailing wage rate shall be determined for each individual employee and is allowed for bona fide fringe benefits that:[37]

   1. include contributions irrevocably made by a contractor on behalf of an employee to a financially responsible trustee, third person, fund, plan, or program;

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[29] Minnesota Statute 177.42, Subdivision 6
[30] Minnesota Statute 181.03, Subdivision 1(2)
[31] Minnesota Rules 5200.0120,Subpart 1
[32] Minnesota Rules 5200.0120, Subpart 2
[33] Minnesota Rules 5200.1106, Subpart 6
[34] Minnesota Statute 177.44, Subdivision 6
[35] 29 CFR Parts 5.26 and 5.27
[36] 29 CFR Part 5.28
[37] 29 CFR Part 5.23

2. are legally enforceable;

3. have been communicated in writing to the employee; and

4. are made available to the employee once he/she has met all eligibility requirements.

D. No credit shall be allowed for benefits required by federal, state or local law, such as: worker's compensation, unemployment compensation, and social security contributions.[38]

E. Upon request from the Minnesota Department of Labor and Industry (MN/DLI) or the Department, the prime contractor shall promptly furnish copies of fringe benefit records for its workers and those of all subcontractors, along with other records, deemed appropriate by the requesting agency to determine compliance with these contract provisions.[39]

F. In addition to the requirements set forth in **Subpart C** of this section, it is the responsibility of the prime contractor and any subcontractor to inform themselves about other federal and state fringe benefit regulations that may be applicable to this contract.

G. Contractors shall submit a completed and signed **MN/DOT, 21658 - Statement of Compliance Form,** identifying any fringe contributions made on behalf of a worker.[40] The form must be submitted in accordance with section **IV (PAYROLLS AND STATEMENTS), Subparts A and C.**

H. Pursuant with ***Minnesota Statute 181.74, Subdivision 1***, a contractor that is obligated to deposit fringe benefit contributions on behalf of its employees into a financially responsible trustee, third person, fund, plan, or program and fails to make timely contributions may be guilty of a gross misdemeanor. A contractor found in violation of the above-mentioned statute shall compel the department to take such actions as prescribed in section **XVI, (NON-COMPLIANCE AND ENFORCEMENT).**

VII. OVERTIME

A. A contractor shall not permit or require a worker to work in excess of 40 hours per week unless the worker is compensated at a rate not less than 1-1/2 times the basic hourly rate as determined by the United States Secretary of Labor.[41]

B. A contractor shall not permit or require a worker to work longer than the prevailing hours of labor unless the worker is paid for all hours in excess of the prevailing hours at a rate of at least 1-1/2 times the hourly basic hourly rate of pay.[42] The prevailing hours of labor is defined as not more than 8 hours per day or more than 40 hours per week.[43]

C. In addition to the requirements set forth in **Subparts A and B** of this section, it is the responsibility of the prime contractor and any subcontractor to inform themselves about other federal and state overtime regulations that may be applicable to this contract.

VIII. LABOR CLASSIFICATIONS

A. All contractors shall refer to the federal general decision or the state wage determination incorporated into and found elsewhere in this contract to obtain an applicable job classification. Workers must be classified and compensated for the actual work performed regardless of the worker's skill level.[44] The prime contractor shall ensure that all contractors adhere to the following requirements:

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[38] 29 CFR Part 5.29(f)
[39] Minnesota Statute 177.44, Subdivision 7 and Minnesota Rules 5200.1106, Subpart 10
[40] Minnesota Rules 5200.1106, Subpart 10
[41] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 7
[42] Minnesota Statute 177.44, Subdivision 1
[43] Minnesota Statute 177.42, Subdivision 4
[44] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 1(a)

1. Prior to performing work under this contract, all contractors shall review the federal general decision and complete a **U.S. DOL, SF-1444 - Request for Authorization of Additional Classification and Wage Rate Form** for any labor classification missing from the decision and submit it to the MN/DOT Labor Compliance Unit for processing.[45]

2. If a contractor cannot determine an appropriate job classification, state law requires that the worker be assigned a job classification that is the "same or most similar".[46] Contractors should refer to the Master Job Classification List[47] to obtain an applicable labor classification. Clarification regarding labor classifications should be directed to the MN/DLI or the MN/DOT Labor Compliance Unit.

IX. INDEPENDENT CONTRACTORS, OWNERS, SUPERVISORS AND FOREMAN

A. An independent contractor performing work as a laborer or mechanic is subject to the contract prevailing wage requirements[48] for the classification of work performed and shall adhere to the requirements established in sections **IV (PAYROLLS AND STATEMENTS); V (WAGE RATES); VI (FRINGE BENEFITS); VII (OVERTIME) and VIII (LABOR CLASSIFICATIONS).** In order to ensure compliance, the department may examine the subcontract agreement to determine if the bid price submitted covers the applicable prevailing wage rate for the number of hours worked, along with other records, deemed appropriate by the department.[49]

B. Pursuant with state regulations, owners, supervisors and foreman performing work under the contract[50] shall be compensated in accordance with section **V (WAGE RATES).** Furthermore, the prime contractor and any subcontractor shall adhere to the requirements established in sections **IV (PAYROLLS AND STATEMENTS); VI (FRINGE BENEFITS); VII (OVERTIME) and VIII (LABOR CLASSIFICATIONS).**

C. Pursuant with federal regulations, the contract labor provisions do not apply to owners, supervisors or foreman whose duties are primarily associated with bona fide administrative, executive or clerical positions. These individuals are not deemed to be laborers or mechanics.[51]

1. However, working owners, supervisors and/or foreman who devote more than 20 percent of their time during a workweek to laborer or mechanic duties are considered laborers or mechanics for the time so spent and are subject to the requirements established in sections **IV (PAYROLLS AND STATEMENTS); V (WAGE RATES); VI (FRINGE BENEFITS); VII (OVERTIME) and VIII (LABOR CLASSIFICATIONS).**

X. APPRENTICES, TRAINEES AND HELPERS

A. An apprentice is not subject to the federal and/or state wage decisions incorporated into and found elsewhere in this contract, provided the contractor can demonstrate compliance with **Subparts (1 - 4)** of this section:[52]

1. The apprentice is performing the work of his/her trade.

2. The apprentice is registered with the U.S. DOL Bureau of Apprenticeship and Training or MN/DLI Division of Voluntary Apprenticeship.

3. The apprentice is compensated according to the rate specified in the program for the level of progress.

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[45] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 2
[46] Minnesota Statute 177.44, Subdivision 1
[47] Minnesota Rules 5200.1100
[48] 29 CFR Part 5.2(o) and Minnesota Statute 177.41
[49] Minnesota Statute 177.44, Subdivision 7 and Minnesota Rules 5200.1106, Subpart 10
[50] Minnesota Statute 177.44, Subdivision 1
[51] 29 CFR Part 5.2(m)
[52] Minnesota Rules 5200.1070

4. The ratio of apprentices to journeyman workers on the project is not greater than the ratio permitted for the contractor's entire work force under the registered program.[53]

B. A trainee is not subject to the federal general decision incorporated into and found elsewhere in this contract, provided the contractor can demonstrate compliance with **Subparts (1 - 4)** of this section: [54]

1. The trainee is performing the work of his/her trade.

2. The trainee is registered with the U.S. DOL Employment and Training Administration.

3. The trainee is compensated according to the rate specified in the program for the level of progress.

4. The ratio of trainees to journeyman workers on the project is not greater than the ratio permitted under the program.

5. All hours worked in excess of the prescribed hours allowed under the program and/or this contract shall be paid at the journeyman wage rate incorporated into and found elsewhere in this contract.

6. A trainee is not exempt under state law; the contractor shall assign the trainee a job classification that is the "same or most similar"[55] and compensate the trainee for the actual work performed regardless of the trainee's skill level, unless the trainee is:[56]

a. employed and registered in a bona-fide apprenticeship program; or

b. employed in the first 90 days of probationary employment as an apprentice, is not registered in the apprenticeship program, but has been certified by the proper government authorities to be eligible for probationary employment as an apprentice.

C. A helper may perform work only if the helper classification is specified and defined in the federal general decision incorporated into and found elsewhere in this contract or is approved pursuant to the federal conformance procedure:[57]

1. A helper is not exempt under state law; a contractor shall assign the helper a job classification that is the "same or most similar"[58] and compensate the helper for the actual work performed regardless of the helper's skill level.[59]

D. If a contractor fails to demonstrate compliance with the terms established in **Subparts A - C** of this section, the contractor shall compensate the worker not less than the applicable total prevailing wage rate for the actual work performed.[60]

XI. SUBCONTRACTING PART OF THIS CONTRACT[61]

A. If the prime contractor intends to sublet any portion of this contract, it shall complete and submit a **MN/DOT, TP-21834, Request To Sublet Form** to the project engineer 10 days prior to the first day of work for any subcontractor.

B. The prime contractor shall not subcontract any portion of this contract without prior written consent from the project engineer.

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[53] MN/DOLI Division of Apprenticeship – April 6, 1995 Memorandum from Jerry Briggs, Director
[54] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 4(b)
[55] Minnesota Statute 177.44, Subdivision 1
[56] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 1(a)
[57] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 4(c)
[58] Minnesota Statute 177.44, Subdivision 1
[59] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 1(a)
[60] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 4(a)(b)(c)
[61] MN/DOT Standard Specifications for Construction, Section 1801

C. The prime contractor's organization shall perform work amounting to not less than 40 percent of the total original contract cost. However, contracts with Disadvantaged Business Enterprise (DBE) or Targeted Group Business (TGB) established goals, or both, the contractor's organization shall perform work amounting to not less than 30 percent of the total original contract cost.

D. A first tier subcontractor shall not subcontract any portion of its work under this contract unless approved by the prime contractor and the project engineer. In addition, a first tier subcontractor may only subcontract up to 50% of its original subcontract.

E. A second tier subcontractor shall not subcontract any portion of its work under this contract.

F. Written consent to subcontract any portion of this contract does not relieve the prime contractor of liabilities and obligations under the contract and bonds.

G. Contractors shall not subcontract with or purchase materials or services from a debarred or suspended person.[62]

XII. POSTER BOARDS

A. The prime contractor shall construct and display a poster board, which contains all required posters, is legible and is accessible to all workers from the first day of work until the project is 100 percent complete.[63] The prime contractor is not allowed to place a poster board at an off-site location.

1. The prime contractor can obtain the required posters by contacting MN/DOT at (651) 366-3091. The prime contractor will need to furnish its name, mailing address, the type of posters (federal-aid) and the quantity needed.

XIII. EMPLOYEE INTERVIEWS

A. At any time the prime contractor shall permit representatives from the U.S. DOL, FHWA, MN/DLI, or the Department to interview its workers and those of any subcontractor during working hours on the project.[64]

XIV. TRUCKING / OFF-SITE FACILITIES

A. The prime contractor is responsible to ensure that its workers and those of all subcontractors are compensated in accordance with the federal wage decision incorporated into and found elsewhere in this contract for the following work duties:

1. The processing or manufacturing of material, including the hauling of material to and from an immediately adjacent, dedicated off-site facility.[65]

2. The hauling of any or all stockpiled or excavated materials on the project work site to other locations on the same project.[66]

B. The prime contractor is responsible to ensure that its workers and those of all subcontractors, are compensated in accordance with the state wage determination incorporated into and found elsewhere in this contract for the following work duties:

1. The processing or manufacturing of material, including the hauling of material to and from a prime contractor's material operation that is not a separate commercial establishment.[67]

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[62] Minnesota Statute 161.315, Subdivision 3(3)
[63] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 1(a)
[64] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section V, Subpart 2(g)
[65] 29 CFR Part 5.2(l)(2)
[66] 29 CFR Part 5.2(j)(1)
[67] ALJ Findings of Fact, Conclusions of Law, and Recommendation, Conclusions (7), Case #12-3000-11993-2

2. The processing or manufacturing of material, including the hauling of material to and from an off-site material operation that is not considered a commercial establishment.[68]

3. The hauling of any or all stockpiled or excavated materials on the project work site to other locations on the same project even if the truck leaves the work site at some point.[69]

4. The delivery of materials from a non-commercial establishment to the project and the return haul.[70]

5. The delivery of materials from another construction project site to the public works project and the return haul, either empty or loaded. Construction projects are not considered commercial establishments.[71]

6. The hauling required to remove any materials from the project to a location off the project site and the return haul, either empty or loaded from other than a commercial establishment.[72]

7. The delivery of mineral aggregate materials from a commercial establishment, which is deposited "substantially in place" and the return haul, either empty or loaded.[73]

C. The work duties prescribed in **Subpart A (1 - 2) and Subpart B (1 - 7)** of this section do not represent all possible hauling activities and/or other work duties that may be performed under this contract. It is the responsibility of the prime contractor to inform itself and all subcontractors about other applicable job duties that may be subject to this contract labor provisions.

D. A contractor acquiring trucking services from an ITO, MTO and/or Truck Broker to perform and/or provide "covered" hauling activities shall comply with the payment of the certified state truck rental rates,[74] which are incorporated into and found elsewhere in this contract.

1. Each month, in which hauling activities were performed under this contract, the prime contractor and all subcontractors shall submit a **MN/DOT, TP-90550 - Month-End Trucking Report and MN/DOT, TP-90551 - Statement of Compliance Form**, along with each ITOs, MTOs and/or Truck Brokers reports to the department.[75] The specifications regarding the dates for submission can be found near the bottom of the **MN/DOT, TP-90551 - Statement of Compliance Form.**

E. A Truck Broker contracting to provide trucking services in the construction industry may charge a reasonable broker fee to the provider of trucking services.[76] The prime contractor and any subcontractor contracting to receive trucking services shall not assess a broker fee.

F. A contractor with employee truck drivers shall adhere to the requirements established in **Sections IV (PAYROLLS AND STATEMENTS); V (WAGE RATES); VI (FRINGE BENEFITS); VII (OVERTIME) and VIII (LABOR CLASSIFICATIONS).**

G. If after written notice, the prime contractor fails to submit its month-end trucking reports and certification forms and those of any subcontractor, MTO and/or Truck Broker, the department may take such actions as prescribed in section **XVI, (NON-COMPLIANCE AND ENFORCEMENT).**

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[68] Minnesota Rules 5200.1106, Subpart 3B(2)
[69] Minnesota Rules 5200.1106, Subpart 3B(1)
[70] Minnesota Rules 5200.1106, Subpart 3B(2)
[71] Minnesota Rules 5200.1106, Subpart 3B(3)
[72] Minnesota Rules 5200.1106, Subpart 3B(4)
[73] Minnesota Rules 5200.1106, Subpart 3B(5)(6)
[74] Minnesota Rules 5200.1106, Subpart 1
[75] Minnesota Rules 5200.1106, Subpart 10
[76] Minnesota Rules 5200.1106, Subpart 7(C)

XV. CHILD LABOR

A. No worker under the age of 18 is allowed to perform work on construction projects.[77]

B. In accordance with state law, a worker under the age of 18, employed in a corporation totally owned by one or both parents that is supervised by the parent(s), may perform work on construction projects.[78] However, if this contractor is subject to the federal Fair Labor Standards Act, a worker under the age of 18 is not allowed to perform work in a hazardous occupation.[79]

C. To protect the interests of the department, the project engineer may remove a worker that appears to be under the age of 18 from the construction project until the contractor or worker can demonstrate proof of age[80] and compliance with all applicable federal and/or state regulations.[81]

XVI. NON-COMPLIANCE AND ENFORCEMENT

A. The prime contractor shall be liable for any unpaid wages to its workers or those of any subcontractor, ITO, MTO and/or Truck Broker.[82]

B. If it is determined that a contractor has violated federal and/or state prevailing wage laws, or any portion of this contract, the department may implement, after written notice, one or more of the following sanctions:

1. Withhold or cause to be withheld from the prime contractor under this contract, or any other federally funded contract with the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay workers employed by the prime contractor or any subcontractor the full amount of wages required by this contract.[83]

2. Withhold or cause to be withheld from the prime contractor such amounts in considerations or assessments against the prime contractor, whether arising from this contract or other contract with the department.[84]

3. The department may reject a bid from a prime contractor that has demonstrated continued or persistent noncompliance with the prevailing wage law on previous or current contracts with the department.[85]

4. The department may take the prosecution of the work out of the hands of the prime contractor, place the contractor in default and terminate this contract for failure to demonstrate compliance with these provisions.[86]

C. Any contractor who violates the state prevailing wage law is guilty of a misdemeanor and may be fined not more than $300 or imprisoned not more than 90 days or both. Each day that the violation continues is a separate offense.[87]

D. All required documents and certification reports are legal documents; willful falsification of the documents may result in civil action and/or criminal prosecution[88] and may be grounds for debarment proceedings.[89]

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[77] Minnesota Rules 5200.0910, Subpart F
[78] Minnesota Rules 5200.0930, Subpart 4
[79] 29 CFR Part 570.2(a)(ii)
[80] Minnesota Statute 181A.06, Subdivision 4
[81] MN/DOT Standard Specifications for Construction, Section 1701
[82] MN/DOT Standard Specifications for Construction, Section 1801
[83] Required Contract Provisions Federal-Aid Construction Contracts Form-1273, Section IV, Subpart 6
[84] MN/DOT Standard Specifications for Construction, Section 1906
[85] Minnesota Statute 161.32, Subdivision 1(d)
[86] MN/DOT Standard Specifications for Construction, Section 1808
[87] Minnesota Statute 177.44, Subdivision 6
[88] Minnesota Statutes 16B, 161.315, Subdivision 2, 177.43,Subdivision 5 177.44, Subdivision 6, 609.63
[89] Minnesota Statute 161.315

General Decision Number: MN120008 01/06/2012 MN8

Superseded General Decision Number: MN20100018

State: Minnesota

Construction Type: Highway

Counties: Blue Earth, Faribault, Le Sueur, Nicollet, Sibley and Waseca Counties in Minnesota.

HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012

* SUMN2010-007 05/01/2010

	Rates	Fringes
CARPENTER	$ 23.06	15.83
CEMENT MASON/CONCRETE FINISHER	$ 30.95	15.74
ELECTRICIAN		
Electrician	$ 31.08	15.59
Ground Person	$ 23.33	14.83
Lineman	$ 34.82	14.82
IRONWORKER	$ 34.05	20.37
LABORER		
Common or General	$ 23.66	14.13
Flag Person	$ 23.66	14.13
Landscape	$ 13.30	
Skilled	$ 23.66	14.13
Underground & Open Ditch (8 ft below grade)	$ 24.36	14.13
MILLWRIGHT	$ 30.75	19.47
OPERATOR:		
GROUP 2	$ 29.36	16.60
GROUP 3	$ 28.91	16.60
GROUP 4	$ 28.61	16.60
GROUP 5	$ 26.04	16.60
GROUP 6	$ 25.17	16.60
Speciality Equipment		
Articulated Hauler	$ 28.61	16.60
Boom Truck	$ 28.61	16.60
Landscaping Equipment	$ 19.50	
Off-Road Truck	$ 28.61	16.60

OPERATING ENGINEER CLASSIFICATIONS

GROUP 2: Helicopter Pilot; Concrete Pump; Cranes over 135 ft boom excluding jib; Dragline, Crawler, Hydraulic Backhoe and other similar equpment with shovel-type controls including attachments 3 cu yd & over; Grader or Motor Patrol; Pile Driving

GROUP 3: Asphalt Bituminous Stabilizer Plant; Cableway; Concrete Mixer, Stationary Plant; Derrick (guy or stiff leg)(power)(skids or stationary); Dragline, Crawler, Hydraulic

Backhoe and other similar equpment with shovel-type controls including attachments up to 3 cu yd; Dredge or Engineers Dredge (Power); Front end loader 5 cu yd & over including attachments; Locomotive Crane Operator; Mixer (paving) concrete paving, Road Mole including Mucking operations, Conway or similar type; Mechanic, Welder; Tractor, Boom type. Tandem Scraper; Truck Crane, Crawler Crane; Tugboat 100 H.P. & over.

GROUP 4: Air Track Rock Drill; Automatic Road Machine CMI or similar; Backfiller; Concrete Batch Plant; Bituminous Roller Rubber Tire or Steel Drum 8 tons & over; Bituminous Spreader & Finishing Machine (power), including pavers, Macro Surfacing & Micro Surfacing or similar types (Operator & Screed person); Brokk or RTC remote control or similar type with attachments; Cat Challenger Tractor or similar types pulling Rock Wagons; Bulldozer & Scraper; Chip Harvester & Tree Cutter; Concrete Distributor & Spreader Finishing Machine, Longitudinal Float, Joint Machine, Spray Machine; Concrete Mixer on jobsite; Concrete Mixer; Crusing Plant (gravel, stone) or Gravel Washing, Crushing & Screening Plant; Curb Machine; Directional Boring Machine; Drill Rigs, Heavy Rotary or Churn or Cable Drill; Dual Tractor; Elevating Grader; Fork Lift; Front End, Skid Steer 1 to 5 cu yd; GPS Remote Operating of equpment; Hoist Engineer (power); Hydraulic Tree Planter; Launcher Person; Locomotive; Milling, Grinding, Planing, Fine Grade, or Trimmer Machine; Multiple Machines such as Air Comressors, Welding Machines, Generators, Pumps; Pavement Breaker or Tamping Machine, Mighty Mite or similar type; Pickup Sweeper 1 cu yd & over hopper capacity; Horizontal Boring Machine power actuated over 6 inches; Pugmill; Pumpcrete; Rubber Tired Farm Tractor with Backhoe attachment; Scraper; Self-Propelled Soil Stabilizer; Slip Form (power driven) paving; Tractor, Bulldozer; Wheel type Tractor over 50 hp with PTO; Trenching Machine excludes walk behind Trencher; Tub Grinder, Morbark or similar type; Well Point installation or Dismantling.

GROUP 5: Air Compressor 600 cfm or over; Bituminous Roller under 8 tons; Concrete Saw multiple blade; Form Tench Digger (power); Front End Skid Steer up to 1 cu yd; Gunite Gunall; Hydraulic Log Splitter; Loader, Barber Greene or similar; Post Hole Driving Machine/Post Hole Auger; Power Actuated Auger & Boring Machine; Power Actuated Jack; Pump; Self-Propelled Chip Spreader (Flaherty or similar); Sheep Foot Compactor with blade 200 hp & over; Shouldering Machine (Power) APSCO or similar type including self-propelled Sand and Chip Spreader; Stump Chipper and Tree Chipper; Tree Farmer (Machine).

GROUP 6: Cat, Challenger or siliar tractor when pulling Disk or Roller; Conveyor; Dredge Deck Hand; Fire Person or Tank Car Heater; Gravel Screening Plant (portable, not crushing or washing); Greaser (tractor); Lever Person; Oiler (Power Shovel, Truck Crane, Dragline, Crusher and Milling Mazchine; Power Sweeper; Sheep Foot Roller & Rollers on Gravel Compaction including vibrating rollers; Wheel type Tractor over 50 hp.

PAINTER (Including Pavement Marking)	$ 29.70	14.06
PILEDRIVERMAN	$ 26.36	17.26
TRUCK DRIVER		
GROUP 1	$ 18.30	7.55

GROUP 2.....$ 20.24 0.63
GROUP 3.....$ 20.11 13.25
GROUP 4.....$ 20.11 13.25
TRUCK DRIVER CLASSIFICATIONS:

GROUP 1: Mechanic, Welder; Tractor Trailer; Truck hauling machinery including operation of hand and power operated winches.

GROUP 2: Four or more axle unit straight body truck.

GROUP 3: Bituminouos Distributor driver; Bituminous Distributor (one person operation); Three Axle units.

GROUP 4: Bituminous Distributor Spray operator (rear and oiler); Dump Person; Greaser; Pilot Car; Rubber Tire self-propelled Packer under 8 tons; Two Axle unit; Slurry Operator; Tank Truck Tender (gas, road oil, water); Tractor under 50 hp.

Tunnel Miner.....$ 23.86 13.63

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an

interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

NOTICE TO BIDDERS

Minnesota Statutes that require prompt payment to subcontractors:

471.425 Prompt payment of local government bills.

Subd. 1. Definitions. For the purposes of this section, the following terms have the meanings here given them.

(d) "Municipality" means any home rule charter or statutory city, county, town, school district, political subdivision or agency of local government. "Municipality" means the metropolitan council or any board or agency created under chapter 473.

Subd. 4a. Prompt payment to subcontractors.

Each contract of a municipality must require the prime contractor to pay any subcontractor within ten days of the prime contractor's receipt of payment from the municipality for undisputed services provided by the subcontractor. The contract must require the prime contractor to pay interest of 1-1/2 percent per month or any part of a month to the subcontractor on any undisputed amount not paid on time to the subcontractor. The minimum monthly interest penalty payment for an unpaid balance of $100 or more is $10. For an unpaid balance of less than $100, the prime contractor shall pay the actual penalty due to the subcontractor. A subcontractor who prevails in a civil action to collect interest penalties from a prime contractor must be awarded its costs and disbursements, including attorney's fees, incurred in bringing the action.

HIST: 1985 c 136 s 5; 1995 c 31 s 1

MINNESOTA DEPARTMENT OF LABOR AND INDUSTRY PREVAILING WAGES FOR STATE FUNDED CONSTRUCTION PROJECTS

THIS NOTICE MUST BE POSTED ON THE JOBSITE IN A CONSPICUOUS PLACE

Construction Type: Highway and Heavy

Region Number: 07

Counties within region:

- BLUE EARTH-07
- FARIBAULT-22
- LESUEUR-40
- NICOLLET-52
- SIBLEY-72
- WASECA-81

Effective: 2011-10-31

This project is covered by Minnesota prevailing wage statutes. Wage rates listed below are the minimum hourly rates to be paid on this project.

All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at a rate of one and one half (1 1/2) times the basic hourly rate.

Violations should be reported to:

Department of Transportation
Office of Construction
Transportation Building MS650
John Ireland Blvd
St. Paul, MN 55155
(651) 366-4209

Refer questions concerning the prevailing wage rates to:

Department of Labor and Industry
Prevailing Wage Section
443 Lafayette Road N
St Paul, MN 55155
(651) 284-5091
DLI.PrevWage@state.mn.us

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
101 LABORER, COMMON (GENERAL LABOR WORK)	2011-10-31	23.66	14.13	37.79
	2012-05-01	23.66	14.38	38.04
102 LABORER, SKILLED (ASSISTING SKILLED CRAFT JOURNEYMAN)	2011-10-31	23.66	14.13	37.79
	2012-05-01	23.66	14.38	38.04
103 LABORER, LANDSCAPING (GARDENER, SOD LAYER AND NURSERY OPERATOR)	2011-10-31	13.30	0.00	13.30
104 FLAG PERSON	2011-10-31	23.66	14.13	37.79

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
	2012-05-01	23.66	14.38	38.04
105 WATCH PERSON	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
106 BLASTER	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
107 PIPELAYER (WATER, SEWER AND GAS)	2011-10-31	25.66	14.13	39.79
	2012-05-01	25.66	14.38	40.04
108 TUNNEL MINER	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
109 UNDERGROUND AND OPEN DITCH LABORER (EIGHT FEET BELOW STARTING GRADE LEVEL)	2011-10-31	24.36	14.13	38.49
	2012-05-01	24.36	14.38	38.74
110 SURVEY FIELD TECHNICIAN (OPERATE TOTAL STATION, GPS RECEIVER, LEVEL, ROD OR RANGE POLES, STEEL TAPE MEASUREMENT; MARK AND DRIVE STAKES; HAND OR POWER DIGGING FOR AND IDENTIFICATION OF MARKERS OR MONUMENTS; PERFORM AND CHECK CALCULATIONS; REVIEW AND UNDERSTAND CONSTRUCTION PLANS AND LAND SURVEY MATERIALS). THIS CLASSIFICATION DOES NOT APPLY TO THE WORK PERFORMED ON A PREVAILING WAGE PROJECT BY A LAND SURVEYOR WHO IS LICENSED PURSUANT TO MINNESOTA STATUTES, SECTIONS 326.02 TO 326.15.	2011-10-31	27.00	14.32	41.32
111 TRAFFIC CONTROL PERSON (TEMPORARY SIGNAGE)	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
112 QUALITY CONTROL TESTER (FIELD AND COVERED OFF-SITE FACILITIES; TESTING OF AGGREGATE, ASPHALT, AND CONCRETE MATERIALS); LIMITED TO MN DOT HIGHWAY AND HEAVY CONSTRUCTION PROJECTS WHERE THE MN DOT HAS RETAINED QUALITY ASSURANCE PROFESSIONALS TO REVIEW AND INTERPRET THE RESULTS OF QUALITY CONTROL TESTERS. SERVICES PROVIDED BY THE CONTRACTOR.	2011-10-31	17.49	4.18	21.67
201 ARTICULATED HAULER	2011-10-31	28.61	16.60	45.21
	2012-05-01	28.66	16.70	45.36
202 BOOM TRUCK	2011-10-31	28.61	16.60	45.21
	2012-05-01	28.66	16.70	45.36
203 LANDSCAPING EQUIPMENT, INCLUDES HYDRO SEEDER OR MULCHER, SOD ROLLER, FARM TRACTOR WITH ATTACHMENT SPECIFICALLY SEEDING, SODDING, OR PLANT, AND TWO-FRAMED FORKLIFT (EXCLUDING FRONT, POSIT-TRACK, AND SKID STEER LOADERS), NO EARTHWORK OR GRADING FOR ELEVATIONS	2011-10-31	19.50	0.00	19.50
204 OFF-ROAD TRUCK	2011-10-31	28.61	16.60	45.21
	2012-05-01	28.66	16.70	45.36
GROUP 2	2011-10-31	29.36	16.60	45.96

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
	2012-05-01	29.41	16.70	46.11

302 HELICOPTER PILOT (HIGHWAY AND HEAVY ONLY)

303 CONCRETE PUMP (HIGHWAY AND HEAVY ONLY)

304 ALL CRANES WITH OVER 135-FOOT BOOM, EXCLUDING JIB (HIGHWAY AND HEAVY ONLY)

305 DRAGLINE, CRAWLER, HYDRAULIC BACKHOE (TRACK OR WHEEL MOUNTED) AND/OR OTHER SIMILAR EQUIPMENT WITH SHOVEL-TYPE CONTROLS THREE CUBIC YARDS AND OVER MANUFACTURER.S RATED CAPACITY INCLUDING ALL ATTACHMENTS. (HIGHWAY AND HEAVY ONLY)

306 GRADER OR MOTOR PATROL

307 PILE DRIVING (HIGHWAY AND HEAVY ONLY)

308 TUGBOAT 100 H.P. AND OVER WHEN LICENSE REQUIRED (HIGHWAY AND HEAVY ONLY)

GROUP 3				
	2011-10-31	28.91	16.60	45.51
	2012-05-01	28.96	16.70	45.66

309 ASPHALT BITUMINOUS STABILIZER PLANT

310 CABLEWAY

311 CONCRETE MIXER, STATIONARY PLANT (HIGHWAY AND HEAVY ONLY)

312 DERRICK (GUY OR STIFFLEG)(POWER)(SKIDS OR STATIONARY) (HIGHWAY AND HEAVY ONLY)

313 DRAGLINE, CRAWLER, HYDRAULIC BACKHOE (TRACK OR WHEEL MOUNTED) AND/OR SIMILAR EQUIPMENT WITH SHOVEL-TYPE CONTROLS, UP TO THREE CUBIC YARDS MANUFACTURER.S RATED CAPACITY INCLUDING ALL ATTACHMENTS (HIGHWAY AND HEAVY ONLY)

314 DREDGE OR ENGINEERS, DREDGE (POWER) AND ENGINEER

315 FRONT END LOADER, FIVE CUBIC YARDS AND OVER INCLUDING ATTACHMENTS. (HIGHWAY AND HEAVY ONLY)

316 LOCOMOTIVE CRANE OPERATOR

317 MIXER (PAVING) CONCRETE PAVING, ROAD MOLE, INCLUDING MUCKING OPERATIONS, CONWAY OR SIMILAR TYPE

318 MECHANIC . WELDER ON POWER EQUIPMENT (HIGHWAY AND HEAVY ONLY)

319 TRACTOR . BOOM TYPE (HIGHWAY AND HEAVY ONLY)

320 TANDEM SCRAPER

321 TRUCK CRANE . CRAWLER CRANE (HIGHWAY AND HEAVY ONLY)

322 TUGBOAT 100 H.P AND OVER (HIGHWAY AND HEAVY ONLY)

GROUP 4				
	2011-10-31	28.61	16.60	45.21
	2012-05-01	28.66	16.70	45.36

323 AIR TRACK ROCK DRILL

324 AUTOMATIC ROAD MACHINE (CMI OR SIMILAR) (HIGHWAY AND HEAVY ONLY)

325 BACKFILLER OPERATOR

326 CONCRETE BATCH PLANT OPERATOR (HIGHWAY AND HEAVY ONLY)

327 BITUMINOUS ROLLERS, RUBBER TIRED OR STEEL DRUMMED (EIGHT TONS AND OVER)

328 BITUMINOUS SPREADER AND FINISHING MACHINES (POWER), INCLUDING PAVERS, MACRO SURFACING AND MICRO SURFACING, OR SIMILAR TYPES (OPERATOR AND SCREED PERSON)

329 BROKK OR R.T.C. REMOTE CONTROL OR SIMILAR TYPE WITH ALL ATTACHMENTS

330 CAT CHALLENGER TRACTORS OR SIMILAR TYPES PULLING ROCK WAGONS, BULLDOZERS AND SCRAPERS

331 CHIP HARVESTER AND TREE CUTTER

332 CONCRETE DISTRIBUTOR AND SPREADER FINISHING MACHINE, LONGITUDINAL FLOAT, JOINT MACHINE, AND SPRAY MACHINE

333 CONCRETE MIXER ON JOBSITE (HIGHWAY AND HEAVY ONLY)

334 CONCRETE MOBIL (HIGHWAY AND HEAVY ONLY)

335 CRUSHING PLANT (GRAVEL AND STONE) OR GRAVEL WASHING, CRUSHING AND SCREENING PLANT

336 CURB MACHINE

337 DIRECTIONAL BORING MACHINE

338 DOPE MACHINE (PIPELINE)

339 DRILL RIGS, HEAVY ROTARY OR CHURN OR CABLE DRILL (HIGHWAY AND HEAVY ONLY)

340 DUAL TRACTOR

341 ELEVATING GRADER

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
342 FORK LIFT OR STRADDLE CARRIER (HIGHWAY AND HEAVY ONLY)				
343 FORK LIFT OR LUMBER STACKER (HIGHWAY AND HEAVY ONLY)				
344 FRONT END, SKID STEER OVER 1 TO 5 C YD				
345 GPS REMOTE OPERATING OF EQUIPMENT				
346 HOIST ENGINEER (POWER) (HIGHWAY AND HEAVY ONLY)				
347 HYDRAULIC TREE PLANTER				
348 LAUNCHER PERSON (TANKER PERSON OR PILOT LICENSE)				
349 LOCOMOTIVE (HIGHWAY AND HEAVY ONLY)				
350 MILLING, GRINDING, PLANNING, FINE GRADE, OR TRIMMER MACHINE				
351 MULTIPLE MACHINES, SUCH AS AIR COMPRESSORS, WELDING MACHINES, GENERATORS, PUMPS (HIGHWAY AND HEAVY ONLY)				
352 PAVEMENT BREAKER OR TAMPING MACHINE (POWER DRIVEN) MIGHTY MITE OR SIMILAR TYPE				
353 PICKUP SWEEPER, ONE CUBIC YARD AND OVER HOPPER CAPACITY(HIGHWAY AND HEAVY ONLY)				
354 PIPELINE WRAPPING, CLEANING OR BENDING MACHINE				
355 POWER PLANT ENGINEER, 100 KWH AND OVER (HIGHWAY AND HEAVY ONLY)				
356 POWER ACTUATED HORIZONTAL BORING MACHINE, OVER SIX INCHES				
357 PUGMILL				
358 PUMPCRETE (HIGHWAY AND HEAVY ONLY)				
359 RUBBER-TIRED FARM TRACTOR WITH BACKHOE INCLUDING ATTACHMENTS (HIGHWAY AND HEAVY ONLY)				
360 SCRAPER				
361 SELF-PROPELLED SOIL STABILIZER				
362 SLIP FORM (POWER DRIVEN) (PAVING)				
363 TIE TAMPER AND BALLAST MACHINE				
364 TRACTOR, BULLDOZER (HIGHWAY AND HEAVY ONLY)				
365 TRACTOR, WHEEL TYPE, OVER 50 H.P. WITH PTO UNRELATED TO LANDSCAPING (HIGHWAY AND HEAVY ONLY)				
366 TRENCHING MACHINE (SEWER, WATER, GAS) EXCLUDES WALK BEHIND TRENCHER (HIGHWAY AND HEAVY ONLY)				
367 TUB GRINDER, MORBARK, OR SIMILAR TYPE				
368 WELL POINT DISMANTLING OR INSTALLATION (HIGHWAY AND HEAVY ONLY)				
GROUP 5	2011-10-31	26.04	16.60	42.64
	2012-05-01	26.09	16.70	42.79
369 AIR COMPRESSOR, 600 CFM OR OVER (HIGHWAY AND HEAVY ONLY)				
370 BITUMINOUS ROLLER (UNDER EIGHT TONS)				
371 CONCRETE SAW (MULTIPLE BLADE) (POWER OPERATED)				
372 FORM TRENCH DIGGER (POWER)				
373 FRONT END, SKID STEER UP TO 1C YD				
374 GUNITE GUNALL (HIGHWAY AND HEAVY ONLY)				
375 HYDRAULIC LOG SPLITTER				
376 LOADER (BARBER GREENE OR SIMILAR TYPE)				
377 POST HOLE DRIVING MACHINE/POST HOLE AUGER				
378 POWER ACTUATED AUGER AND BORING MACHINE				
379 POWER ACTUATED JACK				
380 PUMP (HIGHWAY AND HEAVY ONLY)				
381 SELF-PROPELLED CHIP SPREADER (FLAHERTY OR SIMILAR)				
382 SHEEP FOOT COMPACTOR WITH BLADE . 200 H.P. AND OVER				
383 SHOULDERING MACHINE (POWER) APSCO OR SIMILAR TYPE INCLUDING SELF-PROPELLED SAND AND CHIP SPREADER				
384 STUMP CHIPPER AND TREE CHIPPER				
385 TREE FARMER (MACHINE)				
GROUP 6	2011-10-31	25.17	16.60	41.77
	2012-05-01	25.22	16.70	41.92
387 CAT, CHALLENGER, OR SIMILAR TYPE OF TRACTORS, WHEN PULLING DISK OR ROLLER				

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
388 CONVEYOR (HIGHWAY AND HEAVY ONLY)				
389 DREDGE DECK HAND				
390 FIRE PERSON OR TANK CAR HEATER (HIGHWAY AND HEAVY ONLY)				
391 GRAVEL SCREENING PLANT (PORTABLE NOT CRUSHING OR WASHING)				
392 GREASER (TRACTOR) (HIGHWAY AND HEAVY ONLY)				
393 LEVER PERSON				
394 OILER (POWER SHOVEL, CRANE, TRUCK CRANE, DRAGLINE, CRUSHERS, AND MILLING MACHINES, OR OTHER SIMILAR HEAVY EQUIPMENT) (HIGHWAY AND HEAVY ONLY)				
395 POWER SWEEPER				
396 SHEEP FOOT ROLLER AND ROLLERS ON GRAVEL COMPACTION, INCLUDING VIBRATING ROLLERS				
397 TRACTOR, WHEEL TYPE, OVER 50 H.P., UNRELATED TO LANDSCAPING				
GROUP 1	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
501 HELICOPTER PILOT (COMMERCIAL CONSTRUCTION ONLY)				
502 TOWER CRANE 250 FEET AND OVER (COMMERCIAL CONSTRUCTION ONLY)				
503 TRUCK CRAWLER CRANE WITH 200 FEET OF BOOM AND OVER, INCLUDING JIB (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 2	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
504 CONCRETE PUMP WITH 50 METERS/164 FEET OF BOOM AND OVER (COMMERCIAL CONSTRUCTION ONLY)				
505 PILE DRIVING WHEN THREE DRUMS IN USE (COMMERCIAL CONSTRUCTION ONLY)				
506 TOWER CRANE 200 FEET AND OVER (COMMERCIAL CONSTRUCTION ONLY)				
507 TRUCK OR CRAWLER CRANE WITH 150 FEET OF BOOM UP TO AND NOT INCLUDING 200 FEET, INCLUDING JIB (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 3	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
508 ALL-TERRAIN VEHICLE CRANES (COMMERCIAL CONSTRUCTION ONLY)				
509 CONCRETE PUMP 32-49 METERS/102-164 FEET (COMMERCIAL CONSTRUCTION ONLY)				
510 DERRICK (GUY & STIFFLEG) (COMMERCIAL CONSTRUCTION ONLY)				
511 STATIONARY TOWER CRANE 200 FEET AND OVER MEASURED FROM BOOM FOOT PIN (COMMERCIAL CONSTRUCTION ONLY)				
512 SELF-ERECTING TOWER CRANE 100 FEET AND OVER MEASURED FROM BOOM FOOT PIN (COMMERCIAL CONSTRUCTION ONLY)				
513 TRAVELING TOWER CRANE (COMMERCIAL CONSTRUCTION ONLY)				
514 TRUCK OR CRAWLER CRANE UP TO AND NOT INCLUDING 150 FEET OF BOOM, INCLUDING JIB (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 4	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
515 CRAWLER BACKHOE INCLUDING ATTACHMENTS (COMMERCIAL CONSTRUCTION ONLY)				
516 FIREPERSON, CHIEF BOILER LICENSE (COMMERCIAL CONSTRUCTION ONLY)				
517 HOIST ENGINEER (THREE DRUMS OR MORE) (COMMERCIAL CONSTRUCTION ONLY)				
518 LOCOMOTIVE (COMMERCIAL CONSTRUCTION ONLY)				
519 OVERHEAD CRANE (INSIDE BUILDING PERIMETER) (COMMERCIAL CONSTRUCTION ONLY)				
520 TRACTOR . BOOM TYPE (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 5	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
521 AIR COMPRESSOR 450 CFM OR OVER (TWO OR MORE MACHINES) (COMMERCIAL CONSTRUCTION ONLY)				
522 CONCRETE MIXER (COMMERCIAL CONSTRUCTION ONLY)				
523 CONCRETE PUMP UP TO 31 METERS/101 FEET OF BOOM				
524 DRILL RIGS, HEAVY ROTARY OR CHURN OR CABLE DRILL WHEN USED FOR CAISSON FOR ELEVATOR OR BUILDING CONSTRUCTION (COMMERCIAL CONSTRUCTION ONLY)				
525 FORKLIFT (COMMERCIAL CONSTRUCTION ONLY)				

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
526 FRONT END, SKID STEER 1 C YD AND OVER				
527 HOIST ENGINEER (ONE OR TWO DRUMS) (COMMERCIAL CONSTRUCTION ONLY)				
528 MECHANIC-WELDER (ON POWER EQUIPMENT) (COMMERCIAL CONSTRUCTION ONLY)				
529 POWER PLANT (100 KW AND OVER OR MULTIPLES EQUAL TO 100KW AND OVER) (COMMERCIAL CONSTRUCTION ONLY)				
530 PUMP OPERATOR AND/OR CONVEYOR (TWO OR MORE MACHINES) (COMMERCIAL CONSTRUCTION ONLY)				
531 SELF-ERECTING TOWER CRANE UNDER 100 FEET MEASURED FROM BOOM FOOT PIN (COMMERCIAL CONSTRUCTION ONLY)				
532 STRADDLE CARRIER (COMMERCIAL CONSTRUCTION ONLY)				
533 TRACTOR OVER D2 (COMMERCIAL CONSTRUCTION ONLY)				
534 WELL POINT PUMP (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 6	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
535 CONCRETE BATCH PLANT (COMMERCIAL CONSTRUCTION ONLY)				
536 FIREPERSON, FIRST CLASS BOILER LICENSE (COMMERCIAL CONSTRUCTION ONLY)				
537 FRONT END, SKID STEER UP TO 1 C YD				
538 GUNITE MACHINE (COMMERCIAL CONSTRUCTION ONLY)				
539 TRACTOR OPERATOR D2 OR SIMILAR SIZE (COMMERCIAL CONSTRUCTION ONLY)				
540 TRENCHING MACHINE (SEWER, WATER, GAS) EXCLUDES WALK BEHIND TRENCHER				
GROUP 7	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
541 AIR COMPRESSOR 600 CFM OR OVER (COMMERCIAL CONSTRUCTION ONLY)				
542 BRAKEPERSON (COMMERCIAL CONSTRUCTION ONLY)				
543 CONCRETE PUMP/PUMPCRETE OR COMPLACO TYPE (COMMERCIAL CONSTRUCTION ONLY)				
544 FIREPERSON, TEMPORARY HEAT SECOND CLASS BOILER LICENSE (COMMERCIAL CONSTRUCTION ONLY)				
545 OILER (POWER SHOVEL, CRANE, TRUCK CRANE, DRAGLINE, CRUSHERS AND MILLING MACHINES, OR OTHER SIMILAR POWER EQUIPMENT) (COMMERCIAL CONSTRUCTION ONLY)				
546 PICK UP SWEEPER (ONE CUBIC YARD HOPPER CAPACITY) (COMMERCIAL CONSTRUCTION ONLY)				
547 PUMP AND/OR CONVEYOR (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 8	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
548 ELEVATOR OPERATOR (COMMERCIAL CONSTRUCTION ONLY)				
549 GREASER (COMMERCIAL CONSTRUCTION ONLY)				
550 MECHANICAL SPACE HEATER (TEMPORARY HEAT NO BOILER LICENSE REQUIRED) (COMMERCIAL CONSTRUCTION ONLY)				
GROUP 1	2011-10-31	18.30	7.55	25.85
601 MECHANIC . WELDER				
602 TRACTOR TRAILER DRIVER				
603 TRUCK DRIVER (HAULING MACHINERY INCLUDING OPERATION OF HAND AND POWER OPERATED WINCHES)				
GROUP 2	2011-10-31	20.24	0.63	20.87
604 FOUR OR MORE AXLE UNIT, STRAIGHT BODY TRUCK				
GROUP 3	2011-10-31	20.11	13.25	33.36
	2012-05-01	20.51	13.25	33.76
605 BITUMINOUS DISTRIBUTOR DRIVER				
606 BITUMINOUS DISTRIBUTOR (ONE PERSON OPERATION)				
607 THREE AXLE UNITS				
GROUP 4	2011-10-31	20.11	13.25	33.36
	2012-05-01	20.51	13.25	33.76

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
608 BITUMINOUS DISTRIBUTOR SPRAY OPERATOR (REAR AND OILER)				
609 DUMP PERSON				
610 GREASER				
611 PILOT CAR DRIVER				
612 RUBBER-TIRED, SELF-PROPELLED PACKER UNDER 8 TONS				
613 TWO AXLE UNIT				
614 SLURRY OPERATOR				
615 TANK TRUCK HELPER (GAS, OIL, ROAD OIL, AND WATER)				
616 TRACTOR OPERATOR, UNDER 50 H.P.				
701 HEATING AND FROST INSULATORS	2011-10-31	18.00	1.23	19.23
702 BOILERMAKERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
703 BRICKLAYERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
704 CARPENTERS	2011-10-31	23.06	15.83	38.89
	2012-05-01	23.56	15.83	39.39
705 CARPET LAYERS (LINOLEUM)	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
706 CEMENT MASONS	2011-10-31	30.95	15.74	46.69
707 ELECTRICIANS	2011-10-31	31.08	15.59	46.67
708 ELEVATOR CONSTRUCTORS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
709 GLAZIERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
710 LATHERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
711 GROUND PERSON	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
712 IRONWORKERS	2011-10-31	34.05	20.37	54.42
713 LINEMAN	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
714 MILLWRIGHT	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
715 PAINTERS (INCLUDING HAND BRUSHED, HAND SPRAYED, AND THE TAPING OF PAVEMENT MARKINGS)	2011-10-31	29.70	14.06	43.76
716 PILEDRIVER (INCLUDING VIBRATORY DRIVER OR EXTRACTOR FOR PILING AND SHEETING OPERATIONS)	2011-10-31	26.36	17.26	43.62
	2012-05-01	26.86	17.26	44.12
717 PIPEFITTERS . STEAMFITTERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			

LABOR CODE AND CLASS	EFFECT DATE	BASIC RATE	FRINGE RATE	TOTAL RATE
718 PLASTERERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
719 PLUMBERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
720 ROOFER	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
721 SHEET METAL WORKERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
722 SPRINKLER FITTERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
723 TERRAZZO WORKERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
724 TILE SETTERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
725 TILE FINISHERS	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
726 DRYWALL TAPER	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
727 WIRING SYSTEM TECHNICIAN	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
728 WIRING SYSTEMS INSTALLER	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
729 ASBESTOS ABATEMENT WORKER	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			
730 SIGN ERECTOR	FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVWAGE@STATE.MN.US			

DEPARTMENT OF LABOR AND INDUSTRY **April 4, 2011**
LABOR STANDARDS UNIT

NOTICE OF CERTIFICATION OF TRUCK RENTAL RATES AND EFFECTIVE DATE PURSUANT TO MINNESOTA RULES, PART 5200.1105

On April 4, 2011, the Commissioner of the Department of Labor and Industry ("DLI") certified the minimum truck rental rates for highway projects in the state's ten highway and heavy construction areas for trucks and drivers operating "five or more axle units, straight body trucks," "four axle units, straight body trucks," "three axle units," "tractor only" and "tractor trailers." The certification followed publication of the Notice of Determination of Truck Rental Rates in the *State Register* on February 7, 2011 and the informal conference held pursuant to Minnesota Rules, part 5200.1105 on March 1, 2011.

According to Minnesota Rules, part 5200.1105, the purpose of the informal conference is for DLI to obtain further input regarding the proposed rates before the rates are certified. Approximately 50 individuals attended the informal conference. Many of the attendees voiced strong concerns regarding the inadequacy of the proposed rates. Among the concerns raised was the fact that the proposed rates were based on 2009 costs, including the 2009 price of fuel. Speakers indicated that because of the dramatic increase in the price of diesel in recent months, the published rates were far below the operators' current costs. As stated by one attendee:

> I might not even be able to survive until next year. If I have a bad season, there's no room left, you know. The price of oil and the price of fuel is going to kill all of us guys this summer.

Testimony of Mike McDonald, Transcript of Informal Conference, p. 63.

Following the informal conference, DLI staff obtained data from the United States Department of Energy ("DOE") regarding the price of diesel during 2009 as compared to current costs. That data, available at www.eia.doe.gov, show that the average price of diesel during 2009 was $2.463 per gallon. The average price of diesel during January and February 2011 was $3.497 per gallon. Consequently, the average price of diesel for the first two months of this year was 41.9% higher than the average cost of diesel during 2009.

The purpose of Minnesota Rules, part 5200.1105, as stated in its Statement of Need and Reasonableness, is to "provide equitable compensation" to independent truck operators. The commissioner finds that in order to carry out the purpose of the rule, it is appropriate to consider the concerns expressed at the informal conference[1] and to use average 2011 diesel costs in computing and certifying 2011 truck rental rates. Specifically, the commissioner finds that the extreme disparity between 2009 and current

[1] The DLI has historically used input from the informal conferences to establish certified rates. For example, truck rental rates certified in 2009 varied from the proposed rates based on information gathered at the informal conference.

fuel costs warrants this adjustment in order for truck operators to be equitably compensated. [2]

Construction truck operating costs were initially determined by survey on a statewide basis and were the subject of further input by interested parties attending the informal conference pursuant to Minnesota Rules, part 5200.1105 on March 1, 2011 and further data on fuel prices from the DOE for 2009 and 2011. In light of the discussion above, fuel costs stated in the surveys were adjusted upward by 41.9% to determine statewide operating costs. As a result of this adjustment, the operating cost for "five or more axle units, straight body trucks" is determined to be $49.10 per hour; the operating cost for "four axle units, straight body trucks" is determined to be $45.49 per hour; the operating cost for "three axle units" is determined to be $37.35 per hour; the operating cost for "tractor only" is determined to be $46.02 per hour; and the operating cost for "tractor trailers" is determined to be $57.48 per hour.

Adding the prevailing wage for drivers of these five types of trucks from each of the State's ten highway and heavy construction areas to the operating costs, the minimum hourly truck rental rate for the five types of trucks in each area is certified to be as follows:

	Tractor Trailer	Five or more axle	Four axle	Three Axle	Tractor only
Region 1	97.23	74.04	70.43	76.45	85.77
Region 2	90.90	82.01	78.40	67.41	79.44
Region 3	90.90	73.06	69.45	70.11	79.44
Region 4	81.03	72.65	69.04	70.11	69.57
Region 5	94.43	76.46	72.85	66.75	82.97
Region 6	77.48	79.23	75.62	67.15	66.02
Region 7	83.33	86.50	82.89	74.65	71.87
Region 8	84.99	76.46	72.85	70.11	73.53
Region 9	97.63	76.46	72.85	76.85	86.17
Region 10	90.90	82.01	78.40	70.11	79.44

[2] The commissioner notes that the Minnesota Department of Transportation incorporates a fuel adjustment clause in certain of its contracts to accommodate the fluctuating price of fuel. That clause generally provides for the adjustment of contract payments when the cost of fuel increases or decreases by more than 15% from an indexed rate during the term of the contract. By using 2011 fuel costs in certifying 2011 truck rental rates, the commissioner is not intending to adopt or establish a similar fuel adjustment mechanism. Rather, he is taking this action to effectuate the purpose of Part 5200.1105 in light of the concerns raised at the informal conference and the dramatic increase in the price of diesel between 2009 and effective date of 2011 truck rental rates.

The operating costs, including the average truck broker fees paid by those survey respondents who reported paying truck broker fees, and the truck rental rates may also be reviewed by accessing DLI's website at www.dli.mn.gov. Questions regarding the operational costs and truck rental rates can be answered by calling (651) 284-5091.

The minimum truck rental rates certified for these five types of trucks in the state's ten highway and heavy construction areas will be effective for all highway and heavy construction projects financed in whole or part with state funds advertised for bid on or after April 4, 2011.

KEN B. PETERSON
COMMISSIONER

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SPECIAL PROVISIONS
DIVISION S

S-1 INTENT OF CONTRACT

This Contract consists of Grading, Aggregate Base, Paving, Curb & Gutter, Drainage, Ponds, Singing, Striping, Lighting, Access Ramps, and Bridge #07587 Construction on the following:

CSAH 12 - SP 07-612-11

S-2 GOVERNING SPECIFICATIONS

The State of Minnesota, Department of Transportation "Standard Specifications for Construction" 2005 EDITION shall apply in this contract, except as modified or altered in the following Special Provisions.

S-3 CONTACT INFORMATION

Questions regarding this Project, including any questions prior to bidding, shall be directed to the Blue Earth County Public Works Department at 507-304-4025.

S-4 USE OF ADHESIVE ANCHORS

The use of adhesive anchors in sustained tension is prohibited. Other application utilizing adhesive anchors, such as metal rail attachment, in a non-direct tensile application is permitted.

S-5 (1103) DEFINITIONS

The provisions of MnDOT 1103 are supplemented and/or modified with the following:

S-5.1 The definition for **SPECIMEN TREE** is revised to read as follows:

A notable and valued tree in consideration of species, size, condition, age, longevity, durability, crown development, function, visual quality, and public or private prominence or benefit as indicated in the Contract documents or as determined by the Engineer.

S-6 (1206) PREPARATION OF PROPOSAL

The provisions of MnDOT 1206 are supplemented and/or modified with the following:

S-6.1 The first paragraph of MnDOT 1206.2 is hereby changed to read:

The bidder's attention is directed to MN Statute § 161.32 subd. 1c, which provides among other things, that a bid will be rejected if it contains any alterations or erasures that are not corrected as follows:

S-7 (1208) PROPOSAL GUARANTY

S-7.1 No proposal will be considered unless it is accompanied by a guaranty complying with the requirements of Specification 1208 and providing a penal sum at least equal to 5 percent of the total amount of the bid (under all circumstances and without exception) as provided in Specification 1208.

S-8 (1210) WITHDRAWAL OR REVISION OF PROPOSALS – MODIFIED

The provisions of MnDOT 1210 are hereby deleted and replaced with the following:

Any bidder may withdraw or revise its Proposal after it has been deposited with the Contracting Authority, provided the request for withdrawal or revision is received in writing before the time set for opening proposals.

The Department reserves the right to revise the Plans, Specifications, Special Provisions, and Proposal form for any Project at any time prior to the date set for opening the Proposals. Revisions will be made by Addendum, duly numbered and dated, subject to the following provisions:

(1) Each Addendum will be delivered by fax certified mail, courier service, or other electronic transmission to each prospective bidder who has received a Proposal form prior to the date of Addendum. The Addendum will be included with all Proposal forms issued to bidders after the date of the Addendum.

(2) Each Addendum will be posted to the Blue Earth County Egram website at https://egram.co.blue-earth.mn.us . Bidders are required to check the Egram website prior to submittal of their bid proposal to verify that any/all Addendum have been received and are acknowledged in their proposal packet on the 'TOTALS' page at the endo of the proposal.

(3) If revisions made by an Addendum require considerable change or reconsideration on the part of the bidder, the date set for opening the Proposals may be postponed, in which case the Addendum will include an announcement of the new date set for opening Proposals.

(4) Each bidder shall acknowledge receipt of each Addendum, either in the space provided on the Proposal form or by submitting a letter prior to the time set for opening Proposals.

S-9 (1212) PUBLIC OPENING OF PROPOSALS

The provisions of MnDOT 1212 are hereby deleted and replaced with the following:

S-9.1 Proposals will be opened at the time indicated in the Advertisement for Bids.

S-10 (1305) REQUIREMENT OF CONTRACT BOND

The provisions of MnDOT 1305 are hereby deleted and replaced with the following:

The successful bidder shall furnish a payment bond equal to the Contract amount and a performance bond equal to the Contract amount as required by Minnesota Statutes, section 574.26. The surety and form of the bonds shall be subject to the approval of the contracting authority.

The contracting authority shall require for all contracts less than or equal to five million dollars ($5,000,000.00), that the aggregate liability of the payment and performance bonds shall be twice the amount of the contract. All contracts in excess of five million dollars ($5,000,000.00) shall have an aggregate liability equal to the amount of the contract.

S-11 (1404) MAINTENANCE OF TRAFFIC AND (2563) TRAFFIC CONTROL

All traffic control devices shall conform and be installed in accordance to the "Minnesota Manual on Uniform Traffic Control Devices" (MN MUTCD) and Part 6, "Field Manual for Temporary Traffic Control Zone Layouts", the "Guide to Establishing Speed Limits in Highway Work Zones", the Minnesota Flagging Handbook, the provisions of Mn/DOT 1404 and 1710, the Minnesota Standard Signs Manual, the Traffic Engineering Manual, the Traffic Control Layouts/Typical Traffic Control Layouts in the Plans, and these Special Provisions.

The Contractor shall furnish, install, maintain, and remove all traffic control devices required to provide safe movement of vehicular traffic through the Project during the life of the Contract from the start of Contract operations to the final completion thereof. The Engineer will have the right to modify the requirements for traffic control as deemed necessary due to existing field conditions. The highways shall be kept open to traffic at all times, except as modified below.

Traffic control devices include, but are not limited to, barricades, warning signs, trailers, flashers, cones, and drums, as required and sufficient barricade weights to maintain barricade stability.

S-11.1 TRAFFIC CONTROL

(A) The Contractor shall be responsible for the immediate repair or replacement of all traffic control devices that become damaged, moved or destroyed, of all lights that cease to function properly, and of all barricade weights that are damaged, destroyed, or otherwise fail to stabilize the barricades. The Contractor shall further provide sufficient surveillance of all traffic control devices at least once every 24 hours.

The Contractor shall furnish names, addresses, and phone numbers of at least three (3) individuals responsible for the placement and maintenance of traffic control devices. These individuals shall be "on call" 24 hours per day, seven days per week during the times any traffic control devices, furnished and installed by the Contractor, are in place. The required information shall be submitted to the Engineer at the Pre-construction Conference.

(B) If traffic control layouts are not present in the Plan, or the Contractor modifies the layout or sequence from the Plan, the Contractor shall submit the proposed traffic control layout to the Engineer, for approval, at least fourteen (14) days prior to the start of construction. At least 24 hours prior to placement, all traffic control devices shall be available on the Project for inspection by the Engineer. The Contractor shall modify his/her proposed traffic control layout and/or devices as deemed necessary by the Engineer.

(C) The Contractor shall notify the Engineer in writing at least 72 hours prior to the start of any construction operation that will necessitate lane closure or internal traffic control signing.

(D) The Contractor shall inspect, on a daily basis, all traffic control devices, which the Contractor has furnished and installed, and verify that the devices are placed in accordance with **the Traffic Control Layouts,** these Special Provisions, and/or the MN MUTCD. Any discrepancy between the placement and the required placement shall be immediately corrected.

The Contractor shall be required to respond immediately to any call from the Engineer or his designated representative concerning any request for improving or correcting traffic control devices. **If the Contractor is negligent in correcting the deficiency within one hour of notification the Contractor shall be subject to an hourly charge assessed at a rate of $250.00 per hour for each hour or any portion thereof with which the Engineer determines that the Contractor has not complied.**

(E) The person performing the inspection in paragraph (D) above, shall be required to make a daily log. This log shall also include the date and time any changes in the stages, phases, or portions thereof go into effect. The log shall identify the location and verify that the devices are placed as directed or corrected in accordance with the Plan. All entries in the log shall include the date and time of the entry and be signed by the person making the inspection. The Engineer reserves the right to request copies of the logs as he deems necessary.

The Contractor shall be required to provide copies of the inspection logs, within the time frame agreed upon, when requested by the Engineer. **If the Contractor is negligent in providing the inspection logs within the time frame agreed upon, the Contractor shall be subject to an hourly charge assessed at a rate of $500.00 per hour for each hour or any portion thereof with which the Engineer determines that the Contractor has not complied.**

(F) The third sentence of paragraph 2 in Mn/DOT 1404.7 (Winter Suspension) is hereby revised as follows:

> "In the event that any Contractor-owned traffic control devices are damaged or destroyed making them ineffective for their intended use, the Contractor will receive payment in the amount of the value of the traffic control device as determined by the Engineer."

(G) If, at any time, the Contractor fails to, in a timely manner, properly furnish, install, maintain or remove any of the required traffic control devices, the Department reserves the right to properly correct the deficiency. **Each time the Department takes such corrective action, the costs thereof, including mobilization, plus $5,000 will be deducted from monies due or coming due the Contractor.**

(H) Measurement and Payment:

No measurement will be made of the various items that constitute Traffic Control, but all such work shall be construed to be included in the lump sum payment under Item 2563.601 (Traffic Control). The lump sum payment shall be compensation in full for all costs of furnishing, installing, maintaining and removing the individual traffic control devices.

S-11.2 VEHICLE WARNING LIGHT SPECIFICATION

All Contractors', subcontractors' and suppliers' mobile equipment, operating within the limits of the Project with potential exposure to passing traffic, shall be equipped with operable warning lights which meet the appropriate requirements of the SAE specifications. This would include closed roads that are open to local traffic only. This also includes any vehicle which enters the traveled roadway at any time. The SAE specification requirements are as follows:

360 Degree Rotating Lights - SAE Specification J845

Flashing Lights - SAE Specification J595

Flashing Strobe Lights - SAE Specification J1318

Lights shall be mounted so that at least one light is visible at all times when at eye level from a 18 m [**60 foot**] radius about the equipment. In order to meet the 360 degree at 18 m [60 foot] radius requirements supplemental lighting may be used in addition to the lights on the Approved Products List. All supplemental lights must be SAE Class 1 certified. This specification is to be used for both day and night time operations. All costs incurred to provide warning lights shall be at no cost to the Department. These warning lights shall also be operating and visible when a vehicle decelerates to enter a construction work zone and again when a vehicle leaves the work zone and enters the traveled traffic lane.

Contractor shall equip their vehicles with lights that are on the Approved Products List which can be found at: http://www.dot.state.mn.us/products/workzone/vehiclelights.html .

S-11.3 FLAGGER TRAINING

Any person acting as a flagger on this Project shall have attended a training session taught by a Contractor's qualified trainer. The Contractor's qualified trainer shall have completed a "Mn/DOT Flagger Train the Trainer Session" in the five years previous to the start date of this Contract and shall be on file as a qualified flagger trainer with the Department. The Flagger Trainer's name and Qualification Number shall be furnished by the Contractor at the pre-construction meeting. The Contractor shall provide all flaggers with the Mn/DOT Flagger Handbook and shall observe the rules and regulations contained therein. This handbook shall be in the possession of all flaggers while flagging on the Project. The Contractor shall obtain handbooks from the Department. Flaggers shall not be assigned other duties while working as authorized flaggers. The "Checklist for Flagger training" form shall be furnished to the Engineer any time a new flagger reports to work on the Project. The "Checklist for Flagger Training" form can be found at: http://www.dot.state.mn.us/const/wzs/documents/flaggertrainingchecklist.pdf.

The Engineer will have the right to waive the above requirements.

S-11.4 TEMPORARY LANE CLOSURE REQUIREMENTS:

(A) Unless otherwise approved by the Engineer, any temporary lane closure that is adjacent to traffic, and is extending to or beyond 300 m [**1000 feet**] shall have a minimum of one Type III barricade, or 3 drums, placed in the closed lane for every 300 m [**1000 feet**] of extension. Any lane closure that is adjacent to traffic and inplace 3 days or more, shall use the Type III barricade only.

(B) All temporary lane closures shall have Type B Channelizers (drums, Type I or Type II barricades, vertical panel or Direction Indicator Barricades) in the lane closure taper and also in any shifts in traffic alignment.

(C) Short Term Duration lane closures will not be permitted during inclement weather, nor any other time when, in the opinion of the Engineer, the lane closure will be a greater than normal hazard to traffic.

(D) Temporary lane closures or other restrictions by the Contractor, during work hours and consistent with the time restrictions, will be permitted during those hours and at those locations approved by the Engineer. Requests for temporary lane closures shall be made at least 24 hours prior to such closures. When a temporary lane closure is used by the Contractor, the closure shall be incidental work and no direct compensation will be made therefore.

(E) Temporary lane restrictions will not be permitted between the hours of 6:00 A.M. and 9:00A.M. and between the hours of 3:00P.M. and 6:00P.M. **Work which will restrict or interfere with traffic shall not be performed between 12:00 noon on the day preceding and 9:00 A.M. on the day following any consecutive combination of a Saturday, Sunday and legal holiday**. The Engineer will have the right to lengthen, shorten, or otherwise modify the foregoing periods of restrictions as actual traffic conditions may warrant. **If the Contractor is negligent in adhering to the established time schedules, he shall be subject to an hourly charge assessed at a rate of $500.00 per hour for each hour or any portion thereof with which the Engineer determines that the Contractor has not complied.**

(F) Temporary lane restrictions and/or closures for removing and/or erecting overhead structures will only be permitted between the hours of 1:30 A.M. and 5:00 A.M. as approved by the Engineer. If the Contractor requests to close the road and the Engineer approves that it is necessary to temporarily detour traffic in order to remove or set the structures, the Contractor shall furnish the detour as directed by the Engineer. The temporary detour shall be incidental work for which no direct compensation will be made. **If the Contractor is negligent in adhering to the established time schedules, he shall be subject to an hourly charge assessed at a rate of $500.00 per hour for each hour or any portion thereof with which the Engineer determines that the Contractor has not complied.**

The Contractor may stop all traffic on any road open to traffic to erect or remove overhead structures for periods of time not to exceed fifteen minutes only from 1:30 A.M. to 5:00 A.M. The Contractor shall allow sufficient clearance time between stopped periods so as to cause as little delay to traffic as possible. **If the Contractor is negligent in adhering to the established time schedules, he shall be subject to an hourly charge assessed at a rate of $500.00 per hour for each hour or any portion thereof with which the Engineer determines that the Contractor has not complied.**

(G) The Contractor shall provide one vehicle or trailer mounted flashing arrow panel for each lane of each work area where traffic is restricted. The arrow panel shall meet the requirements of the MN MUTCD, and be on the qualified products list for flashing arrow panels found at: http://www.dot.state.mn.us/products/workzone/electronic.html, and shall be equipped with a light that is visible to personnel in the work area to indicate that the unit is in operation. The flashing arrow panel shall be incidental to Traffic Control.

It is imperative that the Contractor continually operate each Flashing Arrow Panel at maximum legibility. Many factors, such as mechanical problems, insufficient charging, incorrect intensity settings, or other factors can degrade performance.

Except as approved by the Engineer, the Flashing Arrow Panel shall be stored off the shoulder when not in use. In the event the Engineer allows the arrow panel to remain on the shoulder, the arrow panel shall be delineated according to Layout 4 (Partial Shoulder Closure) in the field manual, as determined by the Engineer.

(H) The Contractor shall furnish flag persons as required to adequately control traffic. Flag persons shall conform to the requirements set forth in the MN MUTCD. All costs incurred to provide such flag persons shall be incidental to the lump sum traffic control.

(I) The Contractor shall provide two-way radios for flag persons.

Except as otherwise authorized by the Engineer, the maximum length of the flagging operation shall be no more than 1.6 km [**1 mile**].

The Contractor shall coordinate the flagging operations in a manner which causes as little delay to the traveling public as possible, and at no time shall the delay exceed 2 minutes. In the event that the Contractor is unable to meet the maximum delay requirements, operations shall shut down until such time a new traffic control plan is developed which does meet the maximum delay requirement.

If hauling operations create hazards for the traveling public, the Contractor will be required to provide additional flaggers, as directed by the Engineer. All costs incurred to provide the additional flaggers shall be incidental to the lump sum traffic control.

(J) The Contractor shall furnish off-duty police officers in uniform with cars and an orange reflectorized vest to direct traffic if deemed necessary and so ordered by the Engineer. "Police Officer" means every officer authorized to direct or regulate traffic or to make arrests for violations of traffic rules. No direct payment for police officers will be made, this work shall be incidental to the lump sum traffic control.

S-11.5 GENERAL REQUIREMENTS:

(A) All portable sign assemblies shall be perpendicular to the ground. No traffic control device (signs, channelizing devices, arrowboards, etc.) shall be weighted so they become hazardous to motorists and workers. The approved ballast system for devices mounted on temporary portable supports is sandbags, unless it is designed, crash tested, and approved for the specific device. During freezing conditions, the sand for bags shall be mixed with a de-icer to prevent the sand from freezing. The sandbags shall be placed and maintained at the base of the traffic control device to the satisfaction of the Engineer.

When signs will remain in the same location for more than 30 consecutive days the signs shall be post mounted. This would not include portable signs which are set up and taken down at the beginning and end of each work shift. The signs must be post mounted according to the Typical Temporary Sign Framing and Installation Detail Sheet found in the Plan or in these Special Provisions.

(B) When signs are installed, they shall be mounted on posts driven into the ground at the proper height and lateral offset as detailed in the MN MUTCD. **When signs are removed, the sign posts and stub posts shall also be removed from the Right of Way within two (2) weeks or the Contractor shall be subject to a daily charge assessed at a rate of $100.00 per day for each day or portion thereof with which the Engineer determines that the Contractor has not complied.**

(C) The Contractor shall be required to cover or remove all traffic control devices which may be inconsistent with traffic patterns during all traffic switches. See Maintenance and Staging of Traffic Control.

(D) Open excavation adjacent to the existing pavement will not be permitted on opposite sides of the roadway at the same time.

(E) The Contractor shall provide protective devices necessary to protect traffic from excavations, drop-offs, falling objects, splatter or other hazards that may exist during construction. Equipment will not be allowed to suspend over traffic. This work shall be an incidental cost to the Contractor.

(F) The Contractor will not be permitted to park vehicles or construction equipment so as to obstruct any traffic control device. The parking of workers' private vehicles will not be allowed within the Project limits unless so approved by the Engineer.

Note 1 of Layout 2 of the field manual is hereby deleted. The Contractor will not be allowed to load or unload material or equipment on the shoulders of the roadway without a full shoulder closure using appropriate signs, barricades and channelizing devices as directed by the Engineer.

(G) The Contractor will not be allowed to store materials or equipment within 10 m [**30 feet**] of through traffic unless approved by the Engineer. If materials or equipment must be stored within 10 m [**30 feet**] of through traffic, the Contractor shall provide Type B channelizers, barricades or barriers, placed near the object to warn and protect traffic.

(H) All workers within the road Right-of-Way who are exposed to either traffic or to construction equipment shall wear reflectorized high-visibility safety apparel.

High-visibility safety apparel means personal protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usage, and at a minimum meets performance Class 2 requirements of the ANSI/ISEA 107 – 2004 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear".

Additional Requirements: ANSI/ISEA 107-2004 Class 3 Requirements (Class 2 Vest with Class E Long Pants)

- Flag Persons – In addition to an ANSI Class 2 vest, shirt, or jacket, flaggers shall wear high visibility Class E long pants.
- Nighttime and Low Light Conditions – All workers working at night or in low light conditions shall wear high visibility Class E long pants in addition to an ANSI Class 2 vest, shirt, or jacket.

All high visibility apparel must be worn in the manner for which it is intended to be worn. All apparel worn on the torso must be closed in the front to provide contiguous 360 degree visibility. If a workers high-visibility apparel becomes faded, worn, torn, dirty, or defaced, reducing the conspicuity of the apparel, the apparel shall be removed from service and replaced with new apparel.

(I) At the beginning of the Project, the Contractor shall store at least 5 extra Type III barricades and 10 extra retroreflective drums, at a convenient location within the Project limits, to be used at the discretion of the Engineer. No direct compensation will be made to the Contractor for furnishing and erecting these traffic control devices.

If additional devices, beyond the quantity specified above, are ordered by the Engineer the Contractor will be compensated according to Section S-10.8 (ADDITIONAL TRAFFIC CONTROL DEVICES) of this Special Provision.

(J) When work will be performed between the official hours of sunset and sunrise, all appropriate practices for night work will apply.

The Contractor shall provide sufficient numbers of light plants to adequately illuminate the work area as determined by the Engineer. All costs incurred to provide such light plants shall be incidental to the lump sum traffic control.

All Contractor's personnel, except operators who will remain in their vehicles at all times, shall wear reflectively striped (approximately 10 m [**33 feet**] of striping), highly visible, short sleeved one or two piece coveralls (color and striping pattern to be determined by the District Traffic Engineer), at all times while working on the Project. These coveralls shall be considered an incidental expense for which no direct compensation will be made. Any Contractor's employee found on the Project not wearing the prescribed reflective coveralls will be immediately ordered off the Project by the Engineer.

The Contractor shall provide a sufficient amount of 50 mm [**2 inch**] wide highly reflective vehicle marking tape to be applied to Contractor vehicles and equipment, as directed by the Engineer, and as provided by the manufacturer's instructions. This tape shall be considered an incidental expense for which no direct compensation will be made and shall be on the qualified products list for conspicuity vehicle sign sheeting as found

at: http://www.dot.state.mn.us/trafficeng/qpl/Signing.pdf. Vehicle examples to be marked with tape are Contractor rollers, paver, millers and other equipment normally found in the lane closure.

(M) The Contractor shall provide a Traffic Control Supervisor. Payment and measurement will be made as provided in Section S-2563 (TRAFFIC CONTROL SUPERVISOR) of these Special Provisions.

(N) All temporary rigid signs shall be fabricated with an approved retroreflective sheeting material of the appropriate color, and be listed on the Qualified Product Listing (QPL) for either "Sheeting for Rigid Signs" or "High Performance Sheeting for Rigid Signs". Signs remaining inplace that still apply during temporary operations need no change in sign sheeting.

To visually identify approved retroreflective sign sheeting on temporary rigid signs in the field signs shall have an easily identifiable marking on the face. This marking verifies that the sign sheeting is Approved for Rigid Sign Use as found on the QPL. Although still required to meet sheeting standards, temporary rigid signs 4 sq. feet and under in size and all barricades and route markers will be exempt from this marking. The appropriate marking shall be used for each type of the approved sheeting types. Refer to the instructions for the marking of temporary signs which may be found on the APL or directly at the following link:
http://www.dot.state.mn.us/products/signing/common/typelabel.pdf

The retroreflective sheeting types and qualified products used for temporary signs and barricades can be found at: http://www.dot.state.mn.us/products/signing/sheeting.html.

S-11.6 MILLING, SEALCOATING, AND PAVING OPERATIONS

(A) Milling and paving operations on TH 14 shall be completed over the full width of all traffic carrying lanes, including turn lanes, bypass, etc., under construction on each day's run.

(B) The Contractor shall schedule construction operations so as to minimize traffic exposure to uneven lanes, milled edges, and edge drop-offs. Only after every attempt has been made to avoid these conditions and one or more of them are deemed necessary, the Contractor shall provide and maintain the appropriate traffic control in accordance with the "DROP OFF GUIDELINES" in the Field Manual.

S-11.7 MAINTENANCE AND STAGING OF TRAFFIC CONTROL

(A) The Contractor shall maintain, at all times, the existing traffic movements at the following intersections: CSAH 17 & future CSAH 12; and CSAH 3 & future CSAH 12.

The Contractor shall maintain at least one lane of traffic in each direction on TH 14 at all times.

Bridge median pier construction and ramp construction on TH 14 shall not be performed concurrently.

Eastbound and Westbound CSAH 17 construction shall not be performed concurrently.

(B) All signs installed on roads open to traffic that are not consistent with traffic operations shall be covered as directed by the Engineer. The cover should be a plate of solid material covering the entire legend or all of that part of the legend that is inappropriate. This cover shall be bolted to the sign and shall use a minimum of 3 mm [**1/8 inch**] plastic washers between the sign face and the cover. See Figures 8.2A, 8.2B and 8.3C of the Traffic Engineering Manual for details.

(C) As each road is completed, the Contractor shall install the final signing and pavement markings required to safely open that road to traffic. This work shall be completed on or before the date of opening as approved by the Engineer. Overhead signs may be temporarily ground mounted at the Contractor's expense.

(D) The Contractor shall at all times maintain a lane width of not less than **11 feet** in each direction.

(E) Street identification signage shall be maintained at all times. Where the only existing signs are small city or county signs located at the intersection, street names and address numbers shall be maintained by temporary installations as required by the Engineer. This is necessary to maintain the 911 emergency system.

S-11.8 ADDITIONAL TRAFFIC CONTROL DEVICES

In addition to the traffic control devices shown on the Traffic Control Layouts, and/or Field Manual, the Engineer may require more traffic control as traffic conditions may warrant. These items are not intended for temporary lane closures.

NOTE: These provisions will apply ONLY when the Plan contains Item(s) for 2563.601 (Traffic Control) and/or if "Traffic Control Layouts" are included in the Plan or attached to this Proposal.

(A) General Requirements:

The Contractor shall furnish the additional traffic control devices as ordered by the Engineer.

The devices shall be installed and maintained in a functional and/or legible condition, at all times, to the satisfaction of the Engineer.

(B) Measurement:

Flashers, barricades, reflectorized drums, portable changeable message signs, 1220 x 1220 mm [**48 x 48 inch**] signs, and flashing arrow boards will be measured by the number of individual units of each type multiplied by the number of Calendar Days each unit is in service.

Standard signs of each type, other than 1220 x 1220 mm [**48 x 48 inch**] signs will be measured by the face area of signs furnished multiplied by the number of Calendar Days each square meter [**square foot**] of sign is in service.

Special construction signs will be measured by the face area thereof furnished and installed as specified.

Flag Persons and Police Officers will be measured by the length of time each is in service on the job. Police Officers shall be equipped with a car at all times on the job and the car shall be incidental in the payment for the Police Officer.

(C) Payment:

Payment for additional traffic control devices of each type, at the appropriate pre-determined Unit Day price set forth below, shall be compensation in full for all costs of furnishing, installing, maintaining, and subsequently removing and disposing of the device.

Payment for standard signs of each type, other than 1220 x 1220 mm [**48 x 48 inch**] signs, will be made at the appropriate pre-determined Square Meter/Day [**Square Foot/Day**] price which shall be payment in full for all costs of furnishing, installing, maintaining and subsequently removing and disposing of the signs.

The pre-determined Square Meter [**Square Foot**] price for "Construction Signs - Special" shall be payment in full to furnish, install, maintain and remove such signs. All materials required to furnish and install these signs will remain the property of the Contractor.

Payment for Flag Persons and Police Officers will be by the Unit Hour for each hour or portion thereof that each is in service on the Project.

Payment for all additional traffic control devices, as ordered by the Engineer, will be made in accordance with the following schedule:

ADDITIONAL TRAFFIC CONTROL DEVICES

Item No.	Item	Unit	Predetermined Price
2563.610	Flag Person	Hour	*
2563.610	Police Officer	Hour	**
2563.613	Type I Barricade w/Steady Burn Light	Unit Day	$1.05
2563.613	Type III Barricade	Unit Day	2.75
2563.613	Direction Indicator Barricade	Unit Day	1.25
2563.613	Reflectorized Plastic Safety Drum	Unit Day	0.85
2563.613	Reflectorized Plastic Safety Drum w/Down Arrow	Unit Day	0.95
2563.613	Weighted Traffic Channelizer	Unit Day	0.40
2563.613	Flasher Type A (Low Intensity)	Unit Day	0.50
2563.613	Flasher Type B (High Intensity)	Unit Day	1.75
2563.613	Flasher Type C (Steady Burn)	Unit Day	0.90
2563.613	1220 x 1220 mm [**48 x 48 inch**] Standard Sign	Unit Day	1.75
2563.613	1220 x 1220 mm [**48 x 48 inch**] Standard Sign w/Support	Unit Day	2.20
2563.613***	Portable Changeable Message Sign	Unit Day	225.00
2563.613****	Flashing Arrow Board (one shift)	Unit Day	33.00
2563.613****	Flashing Arrow Board (24 hour day)	Unit Day	45.00
2563.617*****	Standard Signs	m^2/Day	1.08
2563.617*****	Standard Signs	**SQ.FT./Day**	**0.10**
2563.617*****	Standard Signs w/support	m^2/Day	1.72
2563.617*****	Standard Signs w/support	**SQ.FT./Day**	**0.16**
2563.604	Construction Signs - Special	m^2	270.00
2563.618	Construction Signs - Special	**SQ.FT.**	**25.00**

* Shall be paid at the Contract Flagger Classification Total Rate, which is the Basic Rate plus the Fringe Rate.

** Shall be paid at the invoice price plus 10%

*** (PCMS) Type C Trailer Mounted Message Signs will be permitted. It is imperative that the Contractor continually operate each PCMS at maximum legibility. Many factors, such as mechanical problems, insufficient charging, incorrect intensity settings, or other factors can degrade performance. If at any time the Contractor fails to operate a Portable Changeable Message Sign at maximum legibility, as determined by the Engineer, no payment will be made for each day that the Message Sign is deemed inadequate.

**** It is imperative that the Contractor continually operate each Flashing Arrow Board at maximum legibility. Many factors, such as mechanical problems, insufficient charging, incorrect intensity settings, or other factors can degrade performance. If at any time the Contractor fails to operate the Flashing Arrow Board at maximum legibility, as determined by the Engineer, no payment will be made for each day that the Flashing Arrow Board is deemed inadequate.

***** Other than 1220 X 1220 mm [**48 X 48 inch**] Signs, with or without support.

NOTE: These predetermined unit prices apply only if not listed as separate bid items.

Barricades, drums and signs by the Unit Day shall be paid for up to 90 days per device. After 90 days, payment per Unit Day will continue at a reduced price of 40% of the Unit price.

S-12 (1506) SUPERVISION BY CONTRACTOR

SP2005-15

The provisions of MnDOT 1506 are supplemented as follows:

At the Preconstruction Conference the Contractor shall designate in writing who the competent superintendent and competent individual (if different) will be for this Project. These persons can only be changed throughout the duration of the Project by submission of written authorization to the Engineer by the Contractor. The submittal of these persons shall be done before any work is performed on this Project.

The Contractor will be subject to an hourly charge for failure to comply with the requirements of MnDOT 1506. Non-Compliance charges, for each incident, will be **assessed at a rate of $100 per hour**, for each hour or portion thereof, during which the Engineer determines that the Contractor has not complied. No charge will be made if the deficiency is corrected within one (1) hour of notification.

An incident of Non-Compliance will be defined as the receipt of a written work order by the Contractor with instructions to correct a deficiency.

S-13 (1507) UTILITY PROPERTY AND SERVICE

Construction operations in the proximity of utility properties shall be performed in accordance with the provisions of MnDOT 1507, except as modified below:

S-13.1 The provisions of MnDOT 1507.1 B are hereby deleted and the following substituted therefore:

B Gopher State One Call
The Contractor shall:

(1) Mark the proposed excavation in accordance with the Minnesota State Statute 216D color code before contacting "Gopher State One Call." The Contractor shall mark proposed excavation area with white paint and white flags or in lieu of white flags, white stakes may be used. The Contractor must adhere to all requirements of Gopher State One Call in addition to the following:

The white markings must delineate the **actual excavation area** where the locating of underground facilities is required. All flags and stakes shall display the name, and phone number of the Contractor. All areas of proposed excavation shall be considered "practical" for the use of white markings, pursuant to Minnesota Statutes §216D.05 (2).

(2) Call "Gopher State One Call" at least 48 hours (excluding Saturdays, Sundays, and holidays) before starting excavation operations.

(3) The Contractor shall acquire a Positive Response confirmation from MnDOT for all proposed excavations when the Gopher State One Call has indicated MnDOT utilities may be affected. The Contractor may call MnDOT Electrical Services Section (ESS) Dispatch Locating to confirm the status of Utility infrastructure owned by MnDOT. MnDOT Electrical Services Section (ESS) Dispatch Locating can be contacted at the following phone numbers; (651) 366 -5750 or (651) 366-5751. The Contractor shall be responsible for all damage to MnDOT owned Utility infrastructure if a Positive Response confirmation has not been acquired from MnDOT. The Contractor is required to comply with the provisions of Minnesota Statutes chapter 216D when performing Excavation as defined in Minnesota Statutes §216D.01 (subdivision 5), and will be responsible for damages to facilities in accordance with Minnesota Statutes §216D.06.

S-13.2 If the Contractor is negligent in adhering to MnDOT 1507.1 B, he will be subject to a daily charge assessed at a rate of **$500.00** per excavation area per day for each day or any portion thereof with which the Engineer determines that the Contractor has not complied.

S-13.3 All utilities that relate to this Project are classified as "Level D," unless the Plans specifically state otherwise. This utility quality level was determined according to the guidelines of CI/ASCE 38-02, entitled "Standard Guidelines for the Collection and depiction of existing subsurface utility data."

S-13.4 By bidding on this Contract, the bidder agrees that it shall use the Plan to identify the location of MnDOT drainage facilities as satisfying the requirements of Minnesota Statutes Ch. 216D and Minnesota Rules 7560.0250 with respect to MnDOT's storm water drainage facilities.

S-13.5 The following utility owners have existing facilities that may be affected by the work under this Contract, all of which they intend where necessary to relocate or adjust in advance of or concurrently with the Contractor's operations as detailed in the project plan set.

Hickory Tech	507-386-3553
Greater MN Gas	507-934-3411
Verizon	
MNDOT District 7	507-304-6100
Blue Earth County	507-304-4025

S-13.6 The following utility owners have existing facilities in the area of construction. These utilities will not be affected by work under this Contract. The utilities are detailed in the project plan set and are listed below are for informational purposes only.

Kinder Morgan Cochin Pipeline	641-228-3021
Charter Communications	507-469-0256
Xcel Energy	507-387-9674
Alliance Pipeline	507-381-3891

See http://www.dot.state.mn.us/utility for utility operators contact list.

S-13.7 The State's Contractor shall coordinate his/her work and cooperate with the foregoing utility owners and their forces in a manner consistent with the provisions of MnDOT 1507 and the applicable provisions of MnDOT 1505.

S-14 (1508) CONSTRUCTION STAKES, LINES AND GRADES

SP2005-17 The provisions of MnDOT 1508 are hereby modified and supplemented as follows:

The Contractor shall give the Engineer 48 hour notice of request for construction stakes.

S-15 (1513) RESTRICTIONS ON MOVEMENT AND STORAGE OF HEAVY LOADS AND EQUIPMENT

The provisions of MnDOT 1513 are hereby deleted and replaced with the following:

The hauling or storage of materials and/or the movement and storage of equipment to and from the Project and over completed structures, base courses, and pavements within the Project that are open for use by traffic and are to remain a part of the permanent improvement, shall comply with the regulations governing the operation of vehicles on the highways of Minnesota, as prescribed in the Highway Traffic Regulation Act.

The Contractor shall comply with legal load restrictions, and with any special restrictions imposed by the Contract, in hauling or storing materials, moving or storing equipment on structures, completed subgrades, base courses, and pavements within the Project that are under construction, or have been completed but have not been accepted and opened for use by traffic.

The Contractor shall have a completed Weight Information Card in each vehicle used for hauling bituminous mixture, aggregate, batch concrete, and grading material (including borrow and excess) prior to starting work. This card shall identify the truck or tractor and trailer by Minnesota or prorated license number and shall contain the tare, maximum allowable legal gross mass, supporting information, and the signature of the owner. The card shall be available to the Engineer upon request. All Contractor-related costs in providing, verifying, and spot checking the cab card information (including weighing trucks on certified commercial scales, both empty and loaded) will be incidental, and no compensation other than for Plan pay items will be made.

Equipment mounted on crawler tracks or steel-tired wheels shall not be operated on or across concrete or bituminous surfaces without specific authorization from the Engineer. Special restrictions may be imposed by the Contract with respect to speed, load distribution, surface protection, and other precautions considered necessary.

Should construction operations necessitate the crossing of an existing pavement, bridges or completed portions of the pavement structure with equipment or loads that would otherwise be prohibited, approved methods of load distribution or bridging shall be provided by the Contractor at no expense to the Department.

Neither by issuance of a special permit, nor by adherence to any other restrictions imposed, shall the Contractor be relieved of liability for damages resulting from the operation and movement of construction equipment.

Unless specifically allowed in the Contract, or approved by the Engineer, all construction material and/or equipment which might be temporarily stored or parked on a bridge deck while the bridge is under construction will be limited by this specification. These requirements are intended to limit construction loads to levels commensurate with the typical design live load. The storage of materials and equipment as a whole will be limited to all of the following:

- Stockpiles of material are limited to a maximum weight of 31,702 kg/100 m^2 (**65,000 lbs./1000 ft^2**).
- Individual material stockpiles (including but not limited to pallets of products, reinforcing bar bundles, aggregate piles) are limited to a maximum weight of 12,200 kg/10 m^2 (**25,000 lbs./100 ft^2**).
- Combinations of vehicles, materials, and other equipment are limited to a maximum weight of 90,700 kg (**200,000 lbs.**) per span providing span lengths are over 40 feet long.

The Contractor may submit alternate loadings to the Project Engineer 30 Calendar days prior to placement. Any submittals will require the calculations be certified by a Professional Engineer.

S-16 (1514) MAINTENANCE DURING CONSTRUCTION

The provisions of MnDOT 1514 are supplemented with the following:

In addition to the Contractor's requirements for sweeping as required under MnDOT 2051 (Maintenance and Restoration of Haul Roads), the Engineer may require additional sweeping of roads adjacent to the construction site to provide safe conditions for the traveling public, environmental reasons, local regulatory requirements or as otherwise directed by the Engineer.

Payment for additional sweeping ordered by the Engineer will be made as specified below. (This price represents a shared cost.)

Pick Up Broom W/Operator .....$55.00 per hour

Self Propelled Pavement Broom W/Operator .....$30.00 per hour

S-17 (1517) CLAIMS FOR COMPENSATION ADJUSTMENT

The provisions of MnDOT 1517 are hereby supplemented with the following:

S-17.1 NOTICE OF CLAIM:

At the time the Contractor gives written notice of the claim, the Contractor and the Department shall immediately begin to keep and maintain complete and specific records to the extent possible. The records shall consist of, but are not limited to, cost and schedule records concerning the details of the perceived claim.

Unless otherwise agreed to in writing, the Contractor shall continue with and carry on the work and progress during the pendency of any claim, dispute, decision or determination by the Engineer, and any arbitration proceedings.

S-17.2 SUBMISSION OF CLAIMS:

The Contractor shall submit the claim to the Engineer no later than 60 Calendar Days after receiving written notice from the Engineer that direct damages (money or time due) resulting from the claim has occurred in the opinion of the Engineer. If, in the opinion of the Contractor, the direct damages have not fully occurred, the Contractor shall provide written justification detailing why the direct damages have not fully occurred. This written justification shall be submitted to the Engineer no later than 30 Calendar Days from receiving the notice from the Engineer. If proper justification is not given as required within the 30 Calendar Day requirement or the claim is not submitted to the Engineer within 60 Calendar Days after receiving notice from the Engineer that the direct damages have occurred, the Contractor waives all claims for additional compensation in connection with the work already performed.

The contents of the claim shall be in accordance with MnDOT 1517 and shall also include all scheduling documentation related to the claim

The Engineer shall have access to the Contractors records involved in the claim and, when so requested, shall furnish the Engineer copies of claim documentation.

The Contractor shall promptly furnish any clarification and additional information or data requested in writing by the Engineer.

All claims shall be submitted through the Contractor. Submission of claims directly from subcontractors shall constitute a waiver of that portion of the claim.

S-17.3 DECISION ON CLAIMS:

The Department intends to resolve claims at the lowest possible administrative level. Upon receipt of the claim, the Engineer will make a written decision in relation to any claim presented by the Contractor within the following time frames:

(A) For an adjustment in compensation, or other contractual dispute between the parties where the amount in controversy is $75,000.00 or less, 60 Calendar Days from the receipt of the Contractor's claim;

(B) For an adjustment in compensation, or other contractual dispute between the parties where the amount in controversy is more than $75,000.00, 90 Calendar Days from the receipt of the Contractor's claim.

Unless the Contractor and the Engineer otherwise stipulate in writing to a later time, if the Engineer does not make a decision or determination within these time frames, the claim shall be deemed denied.

When the Contract has established a dispute resolution process, that moves the dispute through various levels of both organizations, this process shall also be completed within the above time period.

S-17.4 MEDIATION

Notwithstanding the formal claims procedures set forth in this Special Provision, the parties may at any time enter into nonbinding mediation by mutual agreement. If the parties agree to mediation, then the time requirements set forth above in Section S-15.3 (A) and (B) are suspended until the mediation is completed. The time and place for mediation, as well as selection of the mediator, shall be established by mutual agreement. The mediator's costs shall be divided equally between the Contractor and the Department. This payment shall be accomplished by the Contractor paying in full all costs and fees for the mediator and then submit the bill to the Engineer for 50 percent reimbursement. Either party may terminate mediation at any time.

S-17.5 RIGHTS OF ARBITRATION:

The decision of the Engineer in relation to the Contractor's claim shall be deemed final unless the Contractor commences a legal action within the time prescribed by law or unless the Contractor invokes arbitration as prescribed hereafter in these Special Provisions. Nothing herein contained shall be so construed as to preclude the Contractor from commencing a legal action in relation to claims for a single issue in excess of $75,000.00 but the Contractor's sole legal remedy in relation to claims of $75,000.00 or less shall be arbitration as prescribed hereafter in these Special Provisions. If the claim amount is in excess of $75,000, the Contractor and MnDOT may mutually agree to arbitration.

If the Contractor seeks to arbitrate a claim of $75,000 or less, the Contractor shall submit a written request for arbitration to the Department's Claims Engineer in MnDOT's Central Office within 30 Calendar Days after the Contractor's receipt of the Engineer's decision. Failure to reasonably conform with this time requirement waives the right to arbitration. The scope of the arbitration proceeding shall be limited to the claim(s) that the Contractor previously presented to the Engineer for decision

S-17.6 ARBITRATION OF CLAIMS AND DISPUTES:

(A) For purposes of this section, a claim for adjustment in compensation shall mean an aggregate of operative facts which give rise to the rights which the Contractor seeks to enforce. Stated another way, a claim is the event, transaction, or set of facts that give rise to a claim for compensation. Any Contractor having a claim in excess of $75,000.00 may waive or abandon the dollar amount in excess of $75,000.00 so as to bring the claim within the scope of this section. However, the arbitration award shall not exceed $75,000.00. Various damages claimed by the Contractor for a single claim may not be divided into separate proceedings to create claims within the $75,000.00 limit.

(B) More than one separate claim may be presented at each arbitration hearing if agreed to by the Department, the Contractor, and the Arbitrator.

(C) Selection of the Arbitrator/ Optional Use of the American Arbitration Association:

a. Selection of the arbitrator shall be conducted by one representative of the Department and one representative of the Contractor. A single person shall represent the prime and all subcontractors involved in the claim. Separate representation for subcontractors during the selection of the arbitrator is not allowed.

b. The parties may mutually agree to have the arbitration process administered by the American Arbitration Association ("AAA").

c. The arbitration shall be administered by a single arbitrator.

d. The parties shall select an arbitrator by mutual agreement, or, if the parties have agreed to use the AAA to administer the process, shall select an arbitrator from a list of arbitrators provided by the Association in accordance with the Association's procedures.

(D) Arbitration Proceedings and Decision

a. All arbitration of claims shall be conducted in Minneapolis, Minnesota, or another mutually agreed upon location.

b. Regardless of whether the parties have agreed to use AAA to administer the process, the arbitration proceeding shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then in effect and in accordance with the requirements below. The arbitration procedures set-forth in this Special Provision shall take precedence over conflicting American Arbitration Association requirements.

c. If mutually agreed to by both parties, the arbitration proceeding shall follow the Fast Track rules of the American Arbitration Association.

d. Unless otherwise agreed to by the parties, the arbitration hearing shall be bifurcated into a liability phase and, if needed, a valuation phase. No evidence or testimony regarding the value of the claim shall be presented during the liability phase.

e. The Contractor shall first present evidence to support the claim. The Department will then present evidence supporting its defense. Witnesses shall submit to questions or examinations. The arbitrator has the discretion to vary this procedure and shall afford a full and equal opportunity to all parties to be heard. Exhibits, when offered by either party, may be received in evidence by the arbitrator.

f. The arbitrator shall entertain motions, including motions that dispose of all or part of a claim or that may expedite the proceedings.

g. There shall be no ex parte communication between any party and an arbitrator.

h. When satisfied that the presentation of the parties is complete, the arbitrator shall declare the liability phase of the arbitration hearing closed. The arbitrator shall then determine whether MnDOT is liable.

i. If the Department is found to be liable, the arbitration proceeding shall continue before the same arbitrator to resolve all damages issues. The proceedings for this portion of the arbitration shall follow the procedures outlined in Section S-15.6(D)e of this Special Provision.

j. Within three Calendar Days after the close of the damages portion of the hearing, each party shall submit to the arbitrator their last best offers. The arbitrator shall be limited to awarding only one of the two figures submitted. In no event shall a claim award in arbitration exceed $75,000.

k. The decision or award of the arbitrator shall be:

i. In writing showing the basis for the decision or award. The arbitrator shall use the Contract and Minnesota law, or, in the absence of Minnesota law on the issue(s), other persuasive authority, as the basis for the decision.
ii. Final and binding on both the Department and the Contractor.

The award shall have the same finality as is accorded awards under the Uniform Arbitration Act, Minnesota Statutes Chapter 572.

(E) Arbitration Costs

a. Each party to the arbitration shall bear its own costs and fees assessed by the American Arbitration Association or independent arbitrator which shall be divided equally between the parties to the arbitration. This payment will be accomplished by the Contractor paying in full all costs and fees for the arbitrator and then submit the bill to the Engineer for 50 percent reimbursement.

b. Each party shall bear its own preparation costs.

S-18 (1601) SOURCE OF SUPPLY AND QUALITY - MODIFIED

The provision of MnDOT 1601 are supplemented as follows:

The Contractor will furnish and use only steel and iron materials that have been melted and manufactured in the United States in executing the work under this Contract, in conformance with the provisions of the U.S. Code of Federal Regulations 23CFR635.410. Domestic products taken out of the United States for any process (e.g. change of chemical content, permanent shape or size, or final finish of product) shall be considered foreign source materials.

All bids must be based on furnishing domestic iron and steel, which includes the application of the coating, except where the cost of iron and steel materials incorporated in the work does not exceed one-tenth of one percent of the total Contract cost or $2,500.00, whichever is greater. The state may approve the use of foreign iron and steel materials for particular Contract items, provided the bidder submits, a stipulation identifying the foreign source iron and/or steel product(s) and the estimated invoice cost of the product(s), for one or more of the Contract bid items. Each stipulation shall be made on the "Stipulation for Foreign Iron or Steel Materials" form which shall be submitted with the Contractor's proposal. **If the Contractor chooses to use ANY non-domestic iron or steel, the Contractor must submit a stipulation with the proposal.**

The "Stipulation for Foreign Iron or Steel Materials" form is attached or can be found on the MnDOT Web site: http://www.dot.state.mn.us/bidlet/forms.html.

Prior to completing work the Contractor shall submit to the Engineer a certification stating that all iron and steel items supplied are of domestic origin, except for non-domestic iron and steel specifically stipulated and permitted in accordance with the paragraph above.

Source of Supply and Quality: MnDOT 1604 is supplemented as follows: All costs of shop inspection at plants outside the United States shall be borne by the Contractor. Such costs shall be deducted from monies due or to become due the Contractor.

Partial Payment: All provisions for partial payments shall apply to domestic materials only. No payments shall be made to the Contractor for materials manufactured outside of the United States until such materials have been delivered to the job site.

S-19 (1701) LAWS TO BE OBSERVED (DATA PRACTICES)

The provisions of MnDOT 1701 are supplemented with the following:

S-19.1 Bidders are advised that all data created, collected, received, maintained, or disseminated by the Contractor and any subcontractors in performing the work contained in this Contract are subject to the requirements of MN Statute Chapter 13, the Minnesota Government Data Practices Act (MGDPA). The Contractor shall comply with the requirements of the MGDPA in the same manner as the Department. The Contractor does not have a duty to provide access to public data to the public if the public data are available from the Department, except as required by the terms of the Contract.

S-20 (1701) LAWS TO BE OBSERVED (WET LANDS)

SP2005-27.2

The provisions of MnDOT 1701 are modified and/or supplemented with the following :

S-20.1 If the Contractor operations involve the excavation and/or disposal of material off MnDOT Right of Way, the Contractor is advised of the following:

MN Statutes Sections 103G.2212 and 103G.241 stipulate that an agent or employee of another may not:

1) drain, excavate, or fill a wetland, wholly or partially; or
2) construct, reconstruct, remove, or make any change in any reservoir, dam, or the course, current, or cross-section of any public water;

unless the agent or employee has obtained a signed statement from the property owner stating that any permit or wetland replacement plan required for the work has been obtained, or that a permit or replacement plan is not required; **AND** this statement is mailed to the appropriate office with jurisdiction over the wetland or public water prior to initiating the work.

The "Landowner Statement and Contractor Responsibility For Work in Wetlands or Public Waters" can be found at: http://www.bwsr.state.mn.us/wetlands/forms/Contractor_Responsibility.doc . The Contractor shall provide the Engineer with a copy of the completed "Landowner Statement and Contractor Responsibility for Work in Wetlands or Public Waters" for the excavation and/or disposal site prior to initiating the work.

S-21 (1706) EMPLOYEE HEALTH AND WELFARE

The provisions of MnDOT 1706 are supplemented with the following:

S-21.1 All construction operations shall be conducted in compliance with applicable laws, regulations and industry standards as described in MnDOT 1706. The Contractor shall be considered to be **fully responsible** for the development, implementation and enforcement of all safety requirements on the Project, notwithstanding any actions MnDOT may take to help ensure compliance with those requirements.

S-21.2 The Contractor shall submit a written safety program to the Engineer at the pre-construction conference addressing safety issues for all Project activities. This program shall contain name(s) of person(s) responsible for all safety requirements and this Contractor's Designee(s) shall be available at all times that work is being performed. The Contractor's designee(s) shall be responsible for correcting violations on the Project as observed by the Engineer or his/her representative.

S-21.3 The Contractor shall not use any motor vehicle equipment on this Project having an obstructed view to the rear unless:

(A) The vehicle has a reverse signal alarm which is audible above the surrounding noise level; or

(B) The vehicle is backed up only when an observer signals that it is safe to do so.

S-21.4 **A $500.00 monetary deduction (per incident) will be assessed by MnDOT for violations of safety standards and requirements that have the potential for loss of life and/or limb of Project personnel or the public.** The areas of special concern include, but are not limited to excavation stability protection, fall protection, protection from overhead hazards, vehicle backup protection (see S-18.3 above), confined space safety, blasting operations, and personal safety devices.

S-21.5 None of the monetary deductions listed above shall be considered by the Contractor as allowance of noncompliance incidents of these safety requirements on this Project.

S-22 (1707) PUBLIC CONVENIENCE AND SAFETY - MODIFIED

Section 1707 is hereby supplemented to include the following:

S-22.1 The Contractor shall remove, store and replace all mailboxes, etc., that may interfere with the installation of utilities and grading. The Contractor shall contact and receive permission from the property owner before removing or relocating any mailboxes. Such work shall be considered incidental to the contract with no direct compensation made therefore. Damage to mailboxes, etc., during removal, storage shall be corrected and/or repaired by the Contractor.

S-22.2 Mailboxes shall not be disturbed until actual construction warrants removal. No such removal shall take place until the Engineer is on-site, has approved of and is witness to the work. Removed mailboxes shall

be relocated to a temporary location subject to the approval of the Engineer, the homeowner and the U.S. Postal Service. Removed mailboxes shall be relocated promptly so as to prevent any interruption in postal service.

S-23 (1710) TRAFFIC CONTROL DEVICES

All traffic control devices and methods shall conform to the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD), Minnesota Standard Signs Manual, the Traffic Engineering Manual, and the following:

S-23.1 On any roadway having a 45 mph or higher speed limit prior to construction, all Category I and II temporary traffic control devices used after July 1, 2006 shall meet NCHRP 350 crash testing criteria. This includes all new and used Category I and Category II devices. Category I devices include tube markers, plastic drums and cones, etc. Category II devices include portable sign supports, Type I ,II and III barricades, etc.

S-23.2 The Contractor shall provide the Project Engineer a Letter of Compliance stating that all of the Contractors Category I and II Devices are NCHRP 350 approved as of July 1, 2006. The Letter of Compliance must also include approved drawings of the different signs and devices and shall be provided to the Project Engineer at the Pre-construction meeting.

S-24 (1712) PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE - MODIFIED

Protection and restoration of property and landscape shall be done in accordance with the requirements of 1712, except as modified below:

Any signs that interfere with construction and are adjusted or removed by authorization of the Engineer shall be reset in their original location, by the Contractor, prior to leaving the project each day. Said signs shall be set in a temporary location, in a manner approved by the Engineer, during construction hours. Permanent replacement of traffic control devices, upon completion of all work, shall be by the County.

S-25 (1714) RESPONSIBILITY FOR DAMAGE CLAIMS; INSURANCE

The provisions of MnDOT 1714 are hereby deleted and replaced with the following:

The Contractor shall indemnify, defend, and save harmless the Department, its officers, and its employees from all suits, actions, and claims of any character brought because of injuries or damages received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of the Contractor; or because of any claims arising or amounts recovered from infringements of patent, trademark, or copyright; or because of any claims arising or amounts recovered under the Workers' Compensation Act, or under any other law, ordinance, order, or decree.

The Department may retain for its use money that is due the Contractor under this or any other contract with the Department, as the Department deems necessary to protect its interests with respect to any suits, actions, or claims arising on account of the Contractor's operations or in consequence of any act, neglect, omission, or misconduct of the Contractor; or, in case no money is due, the Contractor's Sureties may be held liable until those suits, actions, or claims have been settled and suitable evidence to that effect has been furnished to the Department.

The Contractor shall identify a contact person for damage complaints from the public, and shall maintain a log of such complaints and any action taken by the Contractor. This log shall be available to the Engineer at his request.

A Workers' Compensation Insurance

Contractor shall provide workers' compensation insurance for all employees and shall require any subcontractors to provide workers' compensation insurance in accordance with the statutory requirements of the State of MN and must include:

a. Part 2, Employers' Liability including Stop Gap Liability for monopolistic states. Minimum limits:
   $100,000 – Bodily Injury by disease per employee
   $500,000 – Bodily Injury by disease aggregate
   $100,000 – Bodily Injury by accident
b. Coverage C: All States Coverage
c. If applicable, USL&H, Maritime, Voluntary and Foreign Coverage
d. Waiver of subrogation in favor of the Department

If Contractor is self-insured for its obligation under the Workers' Compensation Statutes in the jurisdiction where the project is located, a Certification of the Authority to Self-Insure such obligations shall be provided.

The Contractor must require Subcontractors to file evidence of insurance with the Contractor

B Commercial General Liability Insurance

The Contractor shall maintain insurance to cover liability from operations under the contract, whether such operations are by the Contractor, subcontractor or by anyone directly or indirectly employed under the Contract.

Minimum Limits of Liability
$2,000,000 – **Per** Occurrence
$2,000,000 – **Annual** Aggregate
$2,000,000 - **Annual** Aggregate applying to Products and Completed Operations
$50,000 – Fire **Damage**
$5,000 – Medical **Expense** (any one person per occurrence)

Coverages
- Premises and Operations Bodily Injury and Property Damage
- Personal and Advertising Injury
- Products and Completed Operations Liability
- Contractual Liability as provided in ISO form CG 00 01 12 04 or its equivalent
- Pollution exclusion with standard exception as per ISO Commercial General Liability Coverage Form – CG 00 01 12 04 or equivalent
- Explosion, Collapse and Underground (XCU) perils
- Broad Form PD
- Independent Contractors – Let or Sublet work
- Waiver of subrogation in favor of the Department
- Department named as an Additional Insured, by endorsement, ISO Forms CG 2010 and CG 20 37 or their equivalent for claims arising out of the Contractor's negligence or the negligence of those for whom the Contractor is responsible.

C Automobile Liability Insurance

Contractor shall maintain insurance to cover liability arising out of the operations, use, or maintenance of all owned, non-owned, and hired automobiles.

Coverages
- Owned Automobiles
- Non-owned Automobiles
- Hired Automobiles
- Waiver of subrogation in favor of the Department

Minimum Limit of Liability
$2,000,000 – Per Occurrence Combined Single Limit for Bodily Injury and Property Damage

Umbrella or Excess Liability Insurance
An Umbrella or Excess Liability insurance policy may be used to supplement the Contractor's policy limits to satisfy the full policy limits required by the Contract.

D Additional Conditions

Contractors' policy(ies) shall be primary and non-contributory insurance to any other valid and collectible insurance available to the Department with respect to any claim arising out of the Contract.

Evidence of subcontractor insurance shall be filed with the Contractor.

The Contractor is responsible for payment of Contract related insurance premiums and deductibles.

Insurance companies must have an AM Best rating of A- (minus) and a Financial Size Category of VII or better, and be authorized to do business in the State of Minnesota.

Certificates of Insurance acceptable to the Department shall be submitted prior to commencement of work under the Contract. Such Certificates and the required insurance policies shall contain a provision that coverage afforded under these policies shall not be cancelled without at least thirty (30) days advance written notice to the Department.

E Notice to the Contractor

The failure of the Department to obtain Certificate(s) of Insurance for the policies or renewals thereof or failure of the insurance company to notify the State of the cancellation of policies required under this Contract shall not constitute a waiver by the Department to the Contractor to provide such insurance.

The Department will reserve the right to terminate the Contract in accordance with 1808 if the Contractor is not in compliance with the insurance requirements and the Department retains all rights to pursue any legal remedies against the Contractor. In the event of a claims dispute, all insurance policies must be open to inspection by the Department, and copies of policies must be submitted to Department's authorized agent upon written request.

S-26 (1717) AIR, LAND AND WATER POLLUTION

The provisions of MnDOT 1717 are supplemented and/or modified with the following:

S-26.1 **DISCOVERY OF CONTAMINATED MATERIALS AND REGULATED WASTES**

If during the course of the Project, the Contractor unexpectedly encounters any of the following conditions indicating the possible presence of contaminated soil, contaminated water, or regulated waste, the Contractor shall immediately stop work in the vicinity, notify the Engineer, and request suspension of work in the vicinity of the discovery area, in accordance with MnDOT 1803.4.

A documented inspection and evaluation will be conducted prior to the resumption of work. The Contractor shall not resume work in the suspected area without authorization by the Engineer.

(A) Indicators of contaminated soil, ground water or surface water include, but are not limited to the following:

(1) Odor including gasoline, diesel, creosote (odor of railroad ties), mothballs, or other chemical odor.

(2) Soil stained green or black (but not because of organic content), or with a dark, oily appearance, or any unusual soil color or texture.

(3) A rainbow color (sheen) on surface water or soil.

(B) Indicators of regulated wastes include, but are not limited to the following:

(1) Cans, bottles, glass, scrap metal, wood (indicators of solid waste and a possible dump)
(2) Concrete and asphalt rubble (indicators of demolition waste).
(3) Roofing materials, shingles, siding, vermiculite, floor tiles, transite or any fibrous material (indicators of demolition waste that could contain asbestos, lead or other chemicals).
(4) Culverts or other pipes with tar-like coating, insulation or transite (indicators of asbestos).
(5) Ash (ash from burning of regulated materials may contain lead, asbestos or other chemicals).
(6) Sandblast residue (could contain lead).
(7) Treated wood including, but not limited to products referred to as green treat, brown treat and creosote (treated wood disposal is regulated).
(8) Chemical containers such as storage tanks, drums, filters and other containers (possible sources of chemical contaminants).
(9) Old basements with intact floor tiles or insulation (could contain asbestos), sumps (could contain chemical waste), waste traps (could contain oily wastes) and cesspools (could contain chemical or oily wastes).

S-26.2 MnDOT 1717.2 A2 is hereby deleted and replaced with the following:

A2 During Construction

The Contractor shall implement the Project's Storm Water Pollution Prevention Plan. The Contractor shall schedule and install temporary and permanent sediment and erosion control measures, construct ponds and drainage facilities, finish earth work operations, place topsoil, establish turf, and conduct other Contract work in a timely manner to minimize erosion and sedimentation.

All exposed soil areas with continuous positive slopes that are within 60 m (**200 feet**) of a public water shall have temporary or permanent erosion protection within 24 hours after the construction activity in that portion of the site has temporarily or permanently ceased and connection is established to the public water. All other positive slopes to constructed surface waters, such as permanent storm water treatment ponds, curb and gutter systems, storm sewer inlets, temporary or permanent drainage ditches, or other storm water conveyance systems, shall have temporary erosion protection or permanent cover for the exposed soil areas as soon as practicable but no later than 14 days after construction activity has temporarily or permanently ceased in that area. For those drainage areas that have a discharge point within 1 mile and flows to an impaired or Special Waters shall have temporary erosion protection or permanent cover for the exposed soil areas as soon as practicable but no later than 7 days after construction activity has temporarily or permanently ceased in that area. Impaired and Special Waters are defined as those listed and referenced in the NPDES Permit.

Positive slopes adjacent to public waters and wetlands will be stabilized at the close of each day when weather forecasts for rain that evening, and/or overnight including weekends. Once work is completed it will be stabilized permanently as soon as practical but no later than seven days.

Exposed soil areas do not include; stockpiles or surcharge areas of sand, gravel, aggregate, concrete, bituminous, or road bed and surfacing material. A perimeter sediment barrier may be necessary to minimize loss when these are within the 60 m (**200 feet**) of existing surface waters or the property edge.

The bottom of temporary or permanent drainage ditches or swales constructed to drain water from a construction site must be stabilized with erosion control measures for the last 60 m (**200 feet),** or more when conditions warrant, from the property edge or from the point of discharge to any existing surface water. Stabilization shall be completed within 24 hours after the construction activity in that portion of the

ditch has temporarily or permanently ceased. Ditch stabilization will continue concurrently with construction activities but no later than 14 days after construction activities have permanently or temporarily ceased. Any, culvert pipe or storm sewer pipe that is within the cumulative distance is not part of this distance. Ditch checks may be provided where necessary to slow water flow and capture sediment.

Temporary or permanent ditches used as treatment systems will not need to be stabilized but must provide the proper Best Management Practices for the treatment system.

Pipe outlets shall be provided with temporary or permanent energy dissipation within 24 hours of connecting the pipe to any constructed or existing surface waters.

The Contractor shall limit the surface area of erodible soil that can be exposed to possible erosion at any one time when the permanent erosion control features are not completed and operative.

All liquid and solid wastes generated by concrete washout operations must be contained and not have the opportunity to come in contact with the surface waters or ground water. This includes the ditches, slopes to ditches, curb and gutter/stormsewer systems, and ponds. Areas where there are sandy soils, karsts, and high ground water the washout facility must have an impermeable liner. Liquid and solid wastes must be disposed of properly. A concrete washout sign must be installed adjacent to each washout facility to notify personnel.

S-26.3 MnDOT 1717.2E is hereby deleted and replaced with the following:

E Site Plans

The Engineer may require the Contractor to submit a site plan, in writing, detailing proposed erosion control and sediment control measures and a schedule indicating starting and completion times for construction operations working in water bodies and/or in direct proximity to waters of the state.

Contractor shall not start work in the affected areas until the schedule and site plan have been accepted by the Engineer and all materials and equipment for the activity are on site.

S-27 (1717) AIR, LAND AND WATER POLLUTION (CONCRETE GRINDING)

The provisions of MnDOT 1717 are supplemented and/or modified with the following:

S-27.1 All slurry material shall become property of the Contractor and must be disposed of as per MnDOT 2104.3C3 as approved by the Engineer, and as described below.

All concrete residue and water (slurry) resulting from concrete grinding operations must be continuously vacuumed from the surface, captured, and containerized for further handling or processing. The slurry must not be permitted to flow across lanes occupied by traffic, flow into drainage facilities or discharge anywhere within the highway Right of Way. The Contractor must submit a slurry disposal or reuse plan at the preconstruction conference for approval by the Engineer.

The method to manage the slurry may require separation of the solids from the liquids. This separation may be achieved mechanically by centrifuging or passively by allowing settlement of the fines to occur in a temporary impermeable lined containment area. If a temporary containment area is used within the highway Right of Way, a Site Plan as per 1717 will be required for the Engineer's approval. The minimum Site Plan shall include methods for storm water protection at the temporary containment area, a description of the proposed separation method, and the process for final removal and restoration of the disturbed containment area. For any method used to separate the liquid from the solids, the Contractor shall identify the name and location of the publicly owned treatment works facility (POTW) that the liquids will be deposited in, or how the processed water will be reused by the Contractor.

As part of the slurry disposal or reuse plan, the Contractor must be able to provide, upon request, documentation that identifies the name and location of the MPCA permitted lined mixed municipal solid waste

(MMSW) or industrial landfill that the solids will be deposited in, or identifies any alternative methods of disposal or reuse that meet environmental requirements of regulated industrial waste.

The Contractor shall hold MnDOT harmless for any fines or sanctions caused by the Contractor's actions or inactions regarding compliance with concrete slurry management and disposal. All materials and labor for installation of storm water protection practices, maintenance, control, removal and disposal for the management of concrete slurry is incidental to the concrete grinding operation.

S-28 (1717) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT - MODIFIED

Pollution of natural resources of air, land and water by operations under this Contract shall be prevented, controlled, and abated in accordance with the rules, regulations, and standards adopted and established by the Minnesota Pollution Control Agency (M.P.C.A.), and in accordance with the provisions of MnDOT 1717, 1803.5, these Special Provisions, and the following:

S-28.1 By signing the Proposal and completing the NPDES permit application, the Contractor is a co-permitee with the Department to ensure compliance with the terms and conditions of the General Storm Water Permit (MN R100001) and is responsible for those portions of the permit where the operator is referenced. This Permit establishes conditions for discharging storm water to waters of the State from construction activities that disturb 0.4 hectares [**1 acre**] or more of total land area. A copy of the "General Permit Authorization to Discharge Storm Water Associated with a Construction Activity Under the National Pollutant Discharge Elimination System (NPDES)/State Disposal System Permit Program" is available at http://www.pca.state.mn.us/water/stormwater/stormwater-c.html or by calling 651-296-3890.

(A) **The Contractor shall apply and pay for the NPDES Permit on this Project**. Payment for the application shall be incidental to the Contract and no direct compensation will be made. The Department will provide the Contractor with the application form with Sections 1 thru 3 and 5 thru 14 completed, as part of the Contract document package. The Contractor shall fill out the Contractor's portion (Section 4 and Section 15), complete the application process, and post the Permit and MPCA's letter of coverage onsite.

A NPDES Permit Declaration form will be sent to the Contractor with the Contract award packet. A copy of the signed permit application and a signed Permit Declaration form must be returned with the Contract and Bond. Submittal of the copy of the signed permit application and Permit Declaration is mandatory for Contract approval. No work which disturbs soil and/or work in waters of the state will be allowed on this Project until the NPDES Permit is in effect and the Department has received the required documentation.

S-28.2 The Contractor shall be solely responsible for complying with the requirements listed in Part II.B and Part IV of the General Permit.

The Contractor shall be responsible for providing all inspections, documentation, record keeping, maintenance, remedial actions, and repairs required by the permit. All inspections, maintenance, and records required in the General Permit Paragraphs IV.E, shall be the sole responsibility of the Contractor. The word "Permitee" in these referenced paragraphs shall mean "Contractor". Standard forms for logging all required inspection and maintenance activities shall be used by the Contractor. All inspection and maintenance forms used on this Project shall be turned over to the Engineer every two weeks for retention in accordance with the permit.

The Contractor shall have all logs, documentation, inspection reports on site for the Engineer's review and shall post the permit and MPCA's letter of coverage on site. The Contractor shall immediately rectify any shortcomings noted by the Engineer. All meetings with the MPCA, Watershed District, WMO, or any local authority shall be attended by both the Engineer and the Contractor or their representatives. No work required by said entities, and for which the Contractor would request additional compensation from MnDOT, shall be started without approval from the Engineer. No work required by said entities and for which the changes will impact the design or requirements of the Contract documents or impact traffic shall be started without approval from the Engineer.

The Contractor shall immediately notify the Engineer of any site visits by Local Permitting Authorities performed in accordance with Part V.H.

S-28.3 Emergency Best Management Practices must be enacted to help minimize turbidity of surface waters and relieve runoff from extreme weather events. It is required to notify the MPCA Regional Contact Person within 2 days of an uncontrolled storm water release. The names and phone numbers of the MPCA Regional Contract personnel can be found at: http://www.pca.state.mn.us/water/stormwater/stormwater-c.html. The Contractor is reminded that during emergency situations involving uncontrolled storm water releases that the State Duty Officer must be contacted immediately at 1-800-422-0798 or 1-651-649-5451.

S-28.4 The Contractor shall review and abide by the instructions contained in the permit package. The Contractor shall hold MnDOT harmless for any fines or sanctions caused by the Contractor's actions or inactions regarding compliance with the permit or erosion control provisions of the Contract Documents.

S-28.5 The Contractor is advised that Section 1 of the NPDES application form makes reference to a Storm Water Pollution Prevention Plan (SWPPP). This Projects' SWPPP is addressed throughout MnDOT's Standard Specifications for Construction, as well as this Project's Plan and these Special Provisions. The following table identifies NPDES permit requirements and cross-references where this Contract addresses each requirement.

NPDES Permit Requirements	Cross-Reference within this Contract
Obtain NPDES Permit; Permit Compliance; Submit Notice of Termination	MnDOT 1701, 1702; and 1717 Special Provisions: 1717 (Air, Land & Water Pollution), 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Certified Personnel in Erosion / Sediment Control Site Management Develop a Chain of Command	MnDOT 1506, 1717, and 2573; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Project / Weekly Schedule (for Erosion / Sediment Control) Completing Inspection / Maintenance Log / Records	MnDOT 1717 and 2573; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit); and
Project Specific Construction Staging	The Plans; MnDOT 1717; Special Provisions: 1717 (Air, Land & Water Pollution), 1717 (National Pollutant Discharge Elimination System (NPDES) Permit); and 1806 (Determination and Extension of Contract Time)
Temporary Erosion / Sediment Control	The Plans; MnDOT 2573 and 2575
Maintenance of Devices / Sediment removal Removal or Tracked Sediment Removal of Devices	The Plans; MnDOT 1717 and 2573; Special Provisions: 1514 (Maintenance During Construction), 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Dewatering	MnDOT 2105.3B and 2451.3C; May also require DNR Permit
Temporary work not shown in the Plans Grading areas (unfinished acres exposed to erosion)	MnDOT 1717, 2573, and 2575; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Permanent Erosion / Sediment Control and Turf Establishment	The Plans; MnDOT 1717, 2573, and 2575; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)

S-29 IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

By signing this bid form, the bidder will be deemed to have stipulated as follows:

(1) That any facility to be utilized in the performance of this Contract, unless such Contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub. L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub. L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 C.F.R. Part 15), is not listed on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 C.F.R. 15.20.

(2) That the state transportation department shall be promptly notified prior to Contract award of the receipt by the bidder of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility to be utilized for the Contract is under consideration to be listed on the EPA List of Violating Facilities.

S-30 (1802) TRAINING FOR CONSTRUCTION TRUCK OPERATORS

Operators of construction trucks hauling construction materials such as borrow, aggregate base, asphalt mixtures and concrete paving mixtures are encouraged to become certified as a Level I Construction Truck Operators (CTO).

This one-day session taught in various MnDOT Districts features classroom and hands-on educational experiences. The objective of the CTO Training is to make the driver aware of the Federal and State requirements and regulations regarding the construction truck and driver, and the safe driving techniques that will result in the safe operation of the construction truck. Presenters include Minnesota State Patrol, Minnesota Department of Transportation and the Minnesota Safety Center.

This training is co-sponsored by the Minnesota State Patrol, the Minnesota Highway Safety Center, the Minnesota Trucking Association, the Minnesota Asphalt Pavement Association and the Minnesota Department of Transportation.

Additional information about this certification program can be obtained by contacting any of the following:

	PHONE #	FAX #
Minnesota Asphalt Pavement Association: E-mail: info@mnapa.org	651-636-4666	651-636-4790
Minnesota Department of Transportation: E-mail: motorcarrier@state.mn.us Website: http://www.dot.state.mn.us/cvo/index.html	Toll Free: 1-888-472-3389 651-405-6060	651-405-6082
Minnesota Highway Safety Center: E-mail: tjsakry@stcloudstate.edu Website: http://mnsafetycenter.org	Toll Free: 1-888-234-1294 320-255-4732	320-255-3942
Minnesota State Patrol: Website: http://www.dps.state.mn.us/patrol/comveh/index.htm	Toll Free: 1-888-472-3389 651-405-6171	651-405-6082
Minnesota Trucking Association: E-mail: john@mntruck.org Website: http://www.mntruck.org	651-646-7351	651-641-8995

S-31 (1803) PROSECUTION OF WORK

The provisions of MnDOT 1803 are supplemented and/or modified with the following:

S-31.1 The Contractor will be subject to an hourly charge for failure to furnish, install and/or maintain the proper Portable Concrete Barrier attenuation required on this Project. Non-compliance charges, for each incident, will be **assessed at a rate of $250.00 per hour**, for each or any portion thereof, which the Engineer determines that the Contractor has not complied.

S-31.2 SPECIAL PROJECT ADA REQUIREMENTS

All pedestrian facilities and shared trails on this Project must be constructed according to Public Rights-of-Way Accessibility Guidelines (PROWAG) which can be found at: http://www.access-

board.gov/prowac/draft.htm. The appropriate pedestrian ramp details for each quadrant are included in the Plan. The Engineer may provide additional details to those provided in the Plan that meet the PROWAG guidelines as the need arises and field conditions dictate.

(A) The Contractor must designate a responsible person familiar with PROWAG to assess proposed sidewalk layouts at each site before work begins. Any time work the Contractor is performing concerns pedestrian facilities, the Contractor's representative shall be on site.

(B) Pedestrian facilities must be constructed to meet the following criteria:

(1) Pedestrian Access Routes (PAR) must be constructed to meet the following:
- Minimum 4 feet width.
- A maximum cross slope of 2.0%.
- Vertical discontinuities must be less than 0.25 inches.
- Must provide positive drainage without allowing any ponding.

(2) Landings are part of the PAR and must be constructed to meet the following:
- 4 feet by 4 feet minimum width.
- Maximum slope of 2.0% in all directions.
- Required at all locations where the PAR changes directions.
- Must be connected to the PAR.

(3) Ramps are part of the PAR and must be constructed to meet either of the following criteria:
- Longitudinal slopes less than 5% in the direction of travel requires no landing at the top of the ramp (unless the PAR changes direction).
- Longitudinal slopes between 5 - 8.3% in the direction of travel require a landing at the top of the ramp.

(C) If the Contractor constructs any pedestrian or shared-use trail facilities that are not per Plan, do not meet the above requirements, or do not follow the agreed upon resolution, the Contractor shall be responsible for correcting the deficient facilities with no compensation paid for the corrective work. To ensure that the pedestrian facilities are constructed in compliance with PROWAG, the Contractor shall follow the following three steps:

(1) The Contractor shall use the appropriate ramp details in the Plan and identify the removal limits for the sidewalk and curb and gutter. If Contractor determines the removal limits are not adequate to meet PROWAG, the Contractor shall stop work immediately and consult the Engineer to determine the best solution. Once the Engineer and the Contractor reach agreement on how to proceed, the Contractor may finish the removals.

(2) Prior to pouring each curb and gutter segment, the Contractor must verify the zero height curb and curb transitions will be located as shown in the Plans and will provide an adequate detectable edge as described in Section S-2531 (CONCRETE CURBING) of these Special Provisions. The Contractor shall also verify the proposed curb flow lines will provide positive drainage as well as maintain existing gutter inflows/outflows. The curb and gutter shall be constructed as detailed in the Plan with a defined flowline and no vertical discontinuities. The Contractor shall consult with the Engineer to determine a resolution if any of these conditions cannot be met. Once the Engineer and the Contractor reach agreement on how to proceed, the Contractor may proceed with pouring the curb and gutter.

(3) After the curb has been correctly poured, the Contractor has set the sidewalk forms, and prior to placing the concrete curb ramps/sidewalks, the Contractor shall verify the requirements in Section S-28.2B will be achieved. If any of these requirements cannot be

met the Contractor shall meet with the Engineer to determine the best solution. Once the Engineer and the Contractor reach agreement on how to proceed, the Contractor may proceed with the curb ramp/sidewalk pour.

(D) It shall be the responsibility of the Contractor, or Contractor's Surveyor if applicable, to layout all proposed work at each intersection in accordance with the Plan and requirements listed in this Special Provision. The Contractor may confer with the Engineer for guidance in laying out the proposed work, but it will be the Contractor's responsibility to ensure the proposed work meets all the requirements of this Special Provision. This layout includes, but is not limited to placement of grade breaks, curb transitions, gutter flow lines, truncated dome placement, crosswalk marking placement, flares, landing limits, and ramp limits. It is important that the Contractor layout this work properly to achieve the construction of a compliant pedestrian facility. This layout work shall be incidental with no extra compensation paid.

(E) The Contractor shall utilize measures and methods when working near existing buildings that will avoid damaging the building's face or structure. The contractor will be responsible for any damage to the building's face or structure, both below and above ground. Any damage resulting from Contractor operations will be repaired at the Contractor's expense to the satisfaction of the Engineer.

(F) The Contractor shall round all joints and edges of the walk with a ¼ inch radius edging tool, contraction joints shall extend to at least 30 percent of walk thickness and shall be approximately 1/8 inch wide as per MnDOT 2521. The Contractor shall also have the option of providing saw cuts to construct the sidewalk joints. This work shall be considered incidental and no extra compensation paid.

S-32 (1803) CRITICAL PATH METHOD (CPM) SCHEDULE - MODIFIED

The provisions of 1803 are modified to the extent that the "Progress Schedule" (bar chart or critical path diagram) referenced in 1803.1 and elsewhere will not be required on this Project. This shall, however, in no way lessen the Contractor's responsibility for (1) providing the Engineer with the notifications required by the provisions of 1803.2; and (2) prosecuting the work diligently, as required therein, so as to assure satisfactory progress towards a timely completion of the Project. No work shall be performed during the hours of darkness as determined by the Engineer.

S-33 (1806) DETERMINATION AND EXTENSION OF CONTRACT TIME - MODIFIED

The Contract Time will be determined in accordance with the provisions of MnDOT 1806 and the following:

S-33.1 Construction operations shall be started on June 18, 2012 or within eight (8) Calendar Days after the date of Notice of Contract Approval, whichever is later. Construction operations shall not commence prior to Contract Approval.

S-33.2 All work required under this Contract, except maintenance work and Final Clean Up shall be completed on or before November 15, 2012.

S-33.3 No work which will restrict or interfere with traffic shall be performed between 12:00 noon on the day preceding and 9:00 A.M. on the day following any consecutive combination of a Saturday, Sunday, and legal holiday without written permission from the Engineer.

S-33.4 The Contractor is advised that the Contract Time (Completion Date) is based on an accelerated schedule with overtime and may likely require working six (6) day work weeks, Monday through Saturday.

S-33.5 When, in the opinion of the Engineer, work on the Project cannot be performed due to failure of material delivery beyond the control of the Contractor, the Engineer will agree to a Suspension of Work in conformance with MnDOT 1803.4 and/or will cease the charging of working days, whichever the Engineer deems applicable.

A Resumption of Work Order will be issued by the Engineer after the Contractor has received delivery of the required material, and/or the Engineer will resume the charging of working days.

S-34 (1807) FAILURE TO COMPLETE THE WORK ON TIME

The provisions of MnDOT 1807 are supplemented as follows:

S-34.1 Liquidated Damages will be assessed in accordance with the provisions of MNDOT 1807.

S-34.2 The Department may reduce the daily liquidated damages to$500 when the only remaining items are maintenance or Final Cleanup.

S-34.3 For informational purposes only, bidders are advised that in addition to the requirements of MnDOT 1807, other Sections of these Special Provisions, as shown below, contain requirements for assessment of monetary deductions to this Contract:

1404	MAINTENANCE OF TRAFFIC AND (2563) TRAFFIC CONTROL
1506	SUPERVISION BY CONTRACTOR
1507	UTILITY PROPERTY AND SERVICE
1706	EMPLOYEE HEALTH AND WELFARE
1803	PROSECUTION OF WORK
2533	PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337
2563	TRAFFIC CONTROL SUPERVISOR

S-34.4 The liquidated damages set forth in MnDOT 1807 and any monetary deductions as set forth above may apply equally, separately, and may be assessed concurrently.

S-35 (1901) MEASUREMENT OF QUANTITIES - MODIFIED

SP2005-46 The provisions of MnDOT 1901 are supplemented by the following:

S-35.1 During each days production, loads will be selected at random by the Engineer for spot checks of total tons being hauled from the producing plant. These spot checks will be taken two or more times each day, to ensure that the actual load is equal to or exceeds the established uniform load weight. The results of these tests shall be recorded and the spot-check tickets given to the County as documentation of uniform loads. The loads selected for scale check shall be weighed by the Contractor on a platform scale which is large enough to weigh the entire hauling vehicle in one operation and which is accurate to within one percent (1%) of the net load weighed. If a commercial platform scale is used for the scale check, it shall have currently been tested and approved by the Division of Weight and Measures of the Minnesota Department of Public Service. Other scales may be tested by the Contractor in the presence of the Engineer or by the Divisions of Weight and Measures, Minnesota Department of Public Service. This will be considered incidental work and no direct compensation will be made therefore.

S-35.2 If a belt scale is used, it shall have automatic shutoff controls that can be calibrated for more than one net weight. Manual control of shutoff controls will not be permitted. All costs that the Contractor may incur as a result of this work will be considered to be incidental to the type of aggregate being weighed and no direct compensation will be made therefore.

S-36 (1904) EXTRA AND FORCE ACCOUNT WORK

The provisions of MnDOT 1904 are supplemented and/or modified with the following:

S-36.1 The Contractor is required to submit force account work itemized statements of costs in accordance with MnDOT 1904 to the Engineer on MnDOT form TP-21659 (Summary of Daily Force Account). Copies of this form can be obtained from the Engineer.

S-36.2 The following sentence shall be added to the second paragraph of MnDOT 1904:

"Under no circumstance will the negotiated unit price for Extra Work which is performed by a subcontractor include a Prime Contractor allowance which exceeds that provided for in 1904(4), Paragraph 3."

S-37 (1906) PARTIAL PAYMENTS - MODIFIED

Partial payments shall be made in accordance with the requirements of 1906, except as modified below:

The first line of the third paragraph is modified to read: From the amounts ascertained as payable on each partial estimate, five (5) percent will be retained until final payment is made, unless reduced by authorization of the Engineer, on the last partial payment.

S-38 (1910) FUEL ESCALATION CLAUSE - MODIFIED

The provisions of MnDOT 1910 are hereby deleted. There will be no cost adjustment for Fuel Escalation.

S-39 (2021) MOBILIZATION

The provisions of MnDOT 2021 are hereby deleted and replaced with the following:

2021.1 DESCRIPTION

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the Project site; for the establishment of all Contractor's offices and buildings or other facilities necessary for work on the Project. Mobilization may include bonding, permit, and demobilization costs. When the proposal does not have a lump sum item for Mobilization, all costs incurred by the Contractor for Mobilization shall be incidental to other work.

2021.2 BLANK

2021.3 BLANK

2021.4 BLANK

2021.5 BASIS OF PAYMENT

Based on the lump sum Contract price for mobilization, partial payments will be made as follows:

Mobilization Partial Payments		
	Pay Lesser of the Two	
% of Original Contract Amount Completed[1]	% of Mobilization	% of Original Contract Amount
5	50	3
15	75	5
25	100	5
95	100	N/A

[1] The Percent of Original Contract Amount Completed = the amount earned by the Contractor, excluding money earned for mobilization and material on hand, divided by the total value of the original contract (all bid items).

The total sum of all payments shall not exceed the original Contract amount bid for the mobilization item, regardless of the fact that the Contractor may have, for any reason, shut down work on the Project or moved equipment away from the Project and then back again.

Nothing herein shall be construed to limit or preclude partial payments otherwise provided by the Contract.

Item No.	Item	Unit
2021.501	Mobilization	Lump Sum

S-40 (2041) ON-THE-JOB-TRAINING PROGRAM - MODIFIED

Section II. 6.b of the "Required Contract Provisions-Federal-Aid Contracts" set forth elsewhere in this Proposal is deleted and the following substituted therefore:

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade involved. **THE NUMBER OF HOURS OF TRAINING TO BE FULFILLED UNDER THIS CONTRACT WILL BE 1600; UTILIZING AT LEAST 2 TRAINEES**. In the event the Contractor subcontracts a portion of the Contract work, he/she shall determine how much of the training requirement will be fulfilled by the subcontractor, provided, however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. This Contractor shall insure that these provisions are made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on (1) the basis of the Contractor's needs and (2) the availability of journeymen in the various classifications within a reasonable area of recruitment. The contractor must complete all sections of the "On-the-Job Training (OJT) Program Approval Form" The form should be submitted to Mn/DOT's Office of Civil Rights within ten (10) days of Contract Award and must be received no later than at the time of the pre-construction conference to the Project Engineer. The Form can be found in the attached Equal Employment Opportunity (EEO) Special Provisions on EEO Page 25, and on the Mn/DOT Office of Civil Rights website - http://www.dot.state.mn.us/civilrights/documents/OJTPre-ConstructionForm.pdf. The Contractor will be credited for each trainee who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

THE COMPLETED FORM MUST BE SUBMITTED TO MN/DOT NO LATER THAN AT THE TIME OF THE PRE-CONSTRUCTION CONFERENCE. The Contractor may use one of the following means to submit their completed On-the-Job Training (OJT) Program Approval Form.

a) Mail the form to Mn/DOT Office of Civil Rights 395 John Ireland Blvd. MS 170 Saint Paul, MN 55155
b) The form may be faxed to Christian Guerrero at 651-366-3129.

A CONTRACTOR WHO IS APPROVED AND ACCEPTED INTO MN/DOT'S ON-THE-JOB TRAINING (OJT) ALTERNATIVE PROGRAM WILL SUBMIT THEIR TRAINING PLAN WITHIN THE TIMEFRAMES SPECIFIED BY THAT PROGRAM AND THEREFORE WILL NOT BE REQUIRED TO SUBMIT THE "ON-THE-JOB TRAINING (OJT) PROGRAM APPROVAL FORM" WITHIN TEN (10) DAYS OF CONTRACT AWARD OR AT THE TIME OF THE PRE-CONSTRUCTION CONFERENCE. The trainees

that have been approved as part of their Contractor – based assignment of positions, must be utilized in accordance with the following provisions set forth here.

Training and upgrading of minorities and women toward journeyman status is a primary objective of these requirements. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he/she has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with these requirements. This training commitment is not intended and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employees shall be employed as a trainee in any classification in which he/she has successfully (1) completed a training course leading to journeyman status or (2) in which he/she has been employed as a journeyman. The Contractor shall satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records shall document the findings in each case.

The Contractor should also note the following in regards to qualification of candidates to meet the OJT requirements:

1. All apprentices that are officially registered in one of the approved training programs listed below are eligible to be accepted as a OJT candidates as long as they have not worked more hours than the stated number of hours of their crafts apprenticeship program.
2. Movement of approved trainees from project to project or from contractor to contractor is allowed for OJT credit, if that practice is not determined to constitute a practice of "bicycling" and/or result in a disproportionate adverse effect upon minority and women apprentice members or trainees. Bicycling – is the transfer of minority or female employees or trainees from contractor to contractor and/or from project to project for the sole purpose of meeting the Contractor's goals. "Bicycling" shall be a violation of this Special Provision and the regulations in 41 CFR Part 60-4.

The minimum length and type of training for each classification will be as established on the "On-the-Job Training (OJT) Program Approval Form" submitted by the Contractor and approved by the State Transportation Department and the Federal Highway Administration. The State Transportation Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and will qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts.

Examples of approved training programs are not limited to but include the following:

- MN Construction Laborers Apprenticeship Program
- Local 49 Operating Engineers Apprenticeship Training Program
- North Central States Regional Council of Carpenters Training Program
- Iron Workers Apprenticeship Program
- MN Teamsters Construction Apprenticeship Training Program
- MN Cement Masons Apprenticeship Training Program
- Painters and Allied Trades District Council 82 Finishing Trades Apprenticeship Program
- MN Electricians Union Apprenticeship Programs.

Any training program proposed by a contractor to meet the obligations set forth in this Provision which is not included in the list of approved programs cited above will be subject to approval by Mn/DOT's Office of Civil Rights, and must include a minimum of 500 training hours but shall not to exceed 2,000 hours. If a

contractor proposes to utilize an approved apprenticeship program from one of the examples cited above, the contractor must provide the Apprenticeship Form or Indenture Number when submitting for approval. The Contractor shall also furnish to Mn/DOT's Office of Civil Rights a list of currently employed apprentices in each trade they wish to utilize. The list must include: Name, Gender, Ethnicity and current year of apprenticeship. The number of hours an approved trainee who is enrolled in a certified apprenticeship program can retain eligibility for trainee status will be consistent with the amount of hours that have been established as the minimum requirement necessary to be completed prior to achieving journey level status.

Approval or acceptance of a training program shall be obtained from Mn/DOT's Office of Civil Rights prior to any work by the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Any and all training provided by a contractor to meet the obligations in this Provision must provide a significant and meaningful training experience for the trainee candidate. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as noted below, the Contractor will be reimbursed at the appropriate Contract price per hour for each employee that is trained in accordance with, and for at least the minimum period specified in the approved training program. As approved by the Engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he/she does one or more of the following and the trainees are concurrently employed on a Federal-aid project; (1) contributes to the cost of the training, (2) provides the instruction to the trainee or (3) pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Special Provision. It is normally expected that a trainee will begin his/her training on the Project as soon as feasible after start of work utilizing the skill involved, and remain on the Project as long as training opportunities exist in his/her work classification or until he/she has completed his/her training program. It is not required that all trainees be on board for the entire length of the Contract. If a contractor lays off or terminates a trainee for any reason, that contractor must complete and submit the "Trainee Termination Form" which can be found in the EEO Special Provisions. A Contractor will have fulfilled his/her responsibilities under this special provision if he/she has provided a significant, meaningful training experience and/or acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the Contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the Contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this Project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Special Provision.

The Contractor shall furnish the trainee a copy of the program he/she will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor shall provide for the maintenance of records and furnish periodic reports documenting his/her performance under these Special Provisions. Any trainee that has been approved by the Office of Civil Rights and employed by the Contractor, and subsequently terminated must be documented on the "On-the-Job Training Trainee Termination Form" located in the EEO Special Provisions of this Contract on EEO Page 26. All required forms needed to satisfy the requirements of these Special Provisions can be found in the attached EEO

Special Provisions, pages 23-26 or on the Mn/DOT Office of Civil Rights website - http://www.dot.state.mn.us/civilrights/.

Compliance with the foregoing requirements for timely filing of the reports may be a condition precedent to the processing and payment of partial and final payments. If it is determined that a contractor has not acted in "Good Faith" with efforts to comply with this provision or engages in willful violations, a contractor may be subject to sanctions including but not limited to: monetary deductions associated with the trainee line item in the contract, withholding of partial and/or final payment.

The trainee period will be measured by time in hours as specified hereinbefore, and payment will be made under Item 2041.610 (Trainees). This item will be paid as a Backsheet Item on the Contract at the fixed rate amount of $1.00 per hour.

With appropriate documentation, an additional $4.00 per hour (maximum total of $5.00 per hour) will be paid to the Contractor for hours worked on the project by employees recruited from Mn/DOT's OJT Supportive Services Programs. In conjunction with any employees recruited from Mn/DOT's OJT Supportive Services Programs, an additional $5.00 per hour (maximum total of $10.00 per hour) will be paid to the Contractor for hours worked on the project by employees recruited from Mn/DOT's OJT Supportive Services Programs, if the Contractor provides a mentor for the trainee(s) while the trainee(s) is working on the project. Approval for payments to be made under Item 2041.610 (Trainees) for any amount which exceeds the fixed rate amount of $1.00 must be received in writing from the Mn/DOT Office of Civil Rights. The ratio of trainee to mentor may not exceed 3 to 1. A listing of Mn/DOT's OJT Supportive Services Programs can be found on the Office of Civil Rights website cited above.

S-41 (2051) MAINTENANCE & RESTORATION OF HAUL ROADS - MODIFIED

Maintenance and restoration of haul roads shall be done in accordance with the provisions of 2051 except as modified below:

S-41.1 Prior to hauling of any materials on this project, Contractor shall submit a list of proposed haul roads to the Engineer for his approval. The Contractor shall also submit a list of all township roads that are proposed to be used as haul roads to the township official for their approval.

S-41.2 Contractor will be required to maintain and restore haul roads as per Specification No. 2051.4 Any costs that the Contractor may incur during this operation will be considered incidental and no direct compensation will be made therefore.

S-42 (2104) REMOVING PAVEMENT AND MISCELLANEOUS STRUCTURES - MODIFIED

Abandoned structures and other obstructions shall be removed from the Right of Way and disposed of in accordance with the provisions of MnDOT 2104, except as modified below:

S-42.1 The bituminous pavement to be left in place shall be marked in the field by the Engineer and the Contractor shall saw the pavement in a manner that will not damage the surface left in place. The Contractor shall use a concrete or similar type saw. The use of jack-hammers or similar type equipment will not be permitted.

S-42.2 The bituminous pavement and miscellaneous structures shall be removed and disposed as per requirements of 2104 and shall become the property of the Contractor.

S-42.3 Measurement and payment for the removal and disposal of materials will be made only for those Items of removal work specifically included for payment as such in the Proposal and as listed in the Plans. The removal of any unforeseen obstruction requiring in the opinion of the Engineer equipment or handling substantially different from that employed in excavation operations, will be paid for as Extra Work as provided in MnDOT 1403.

S-42.4 All removals shall be disposed of by the Contractor outside the Right of Way in accordance with MnDOT 2104.3C3 to the satisfaction of the Engineer.

S-43 (2105) EXCAVATION AND EMBANKMENT - MODIFIED

Roadway excavation and embankment construction shall be performed in accordance with the provisions of MnDOT 2105, except as modified below:

S-43.1 MnDOT 2105.2A2 Rock Excavation is revised to read as follows:

Rock excavation shall consist of all materials that cannot, in the Engineer's opinion, be excavated without drilling and blasting or without the use of rippers, together with all boulders and other detached rock each having a volume of 1 cubic meter (**1 cubic yard**) or more, but exclusive of those quantities that are to be paid for separately under the item of rock channel excavation.

S-43.2 The last paragraph in MnDOT 2105.3B Preparation of Embankment Foundation, is revised to read as follows:

Before backfilling depressions within the roadway caused by the removal of foundations, basements, and other structures, the Contractor shall enlarge the depressions as directed by the Engineer.

S-43.3 The first and second sentences in the second paragraph in MnDOT 2105.3D Disposition of Excavated Material, are revised to read as follows:

When the soils are so varied that selection and placement of uniform soils is not practical, the Contractor shall use disks, plows, graders or other equipment to blend and mix suitable soils to produce a uniform soil texture, moisture content and density; except that, all soils that contain 20 percent or more particles passing the 75 *u*m (**#200**) sieve shall be blended, mixed and dried with a disk, within the entire upper 2 meters (**6 feet**) of embankment. The disk shall meet the requirements of 2123 N, Disk Harrow. A disk is also to be used below the upper 2 meters (**6 feet**) of the embankment fill area, if in the opinion of the Engineer, the Contractor is not producing a uniform soil texture.

S-43.4 The fifth paragraph in MnDOT 2105.3D Disposition of Excavated Material, is revised to read as follows:

Peat, muskeg, and other unstable materials that are not to be used in the roadbed embankments shall be deposited in the areas indicated in the Plans or elsewhere as approved by the Engineer. All other material that is considered unsuitable for use in the upper portion of the roadbed shall be placed outside of a 1:1 slope down and outward from the shoulder lines on fills under 10 m (**30 feet**) in height or outside of a 1 vertical to 1.5 horizontal slope down and outward from shoulder lines on fills over 10 m (**30 feet**) in height, or used to flatten the embankment slopes, or disposed of elsewhere as approved by the Engineer.

S-43.5 The second sentence in the eighth paragraph of MnDOT 2105.3D Disposition of Excavated Material, is revised to read as follows:

No stones exceeding 150 mm (**6 inches**) in greatest dimension will be permitted in the upper 1 m (**3 feet**) of the roadbed embankment.

S-43.6 The fourth to last paragraph in MnDOT 2105.3D Disposition of Excavated Material, which begins with "All combustible debris materials (stumps, roots, logs, brush, etc.) together with all…" is hereby deleted and replaced with the following:

All noncombustible materials other than soils (oversized rock, broken concrete, metals, plastic pipe, etc.) shall be disposed of in accordance with 2104.3C.

S-43.7 The ninth paragraph of MnDOT 2105.5 is hereby deleted and replaced with the following:

If the Proposal fails to include a bid item for rock excavation or rock channel excavation, and material is uncovered that is so classified, excavation of the rock will be paid for separately at the Contract price for common excavation or common channel excavation, plus an additional $26.00 per cubic meter (**$20.00 per cubic yard**) . If no bid item is provided for common channel excavation, excavation of materials classified as rock channel excavation will be paid for at the Contract price for common excavation plus an additional $28.00 per cubic meter (**$21.50 per cubic yard**). Such stipulated prices for rock excavation will apply up to a maximum of 200 m3 (**260 cubic yards**) of excavation per item or to such quantity as may be performed by mutual consent prior to execution of an Extra Work agreement.

S-43.8 The eleventh paragraph of MnDOT 2105.5 is hereby deleted and replaced with the following:

(a) That portion of the additional excavation that is removed from below a plane parallel to and 5 m (**15 feet**) below the natural ground surface will be measured in 2 m (**5 foot**) depth zone increments and paid for separately at adjusted unit prices. The adjusted unit price will be equal to the Contract bid price for muck excavation plus $0.39 per cubic meter (**$0.30 per cubic yard**) for the additional excavation within the 5-7 m (**15-20 foot**) depth zone and an additional $0.26 per cubic meter (**$0.20 per cubic yard**) for each additional 2 m (**5 foot**) increment of depth beyond 7 m (**20 feet**).

S-43.9 Compaction of all embankment construction, including culvert backfills, shall be obtained by the "Specified Density Compaction" method described in MnDOT 2105.3F.

S-43.10 No compensation will be made for the construction of the impervious soil seals.

S-43.11 Excess soils and rock not used on the Project shall become the property of the Contractor and shall be disposed of outside of the Right of Way. No direct compensation will be paid for the preparation of an acceptable Disposal Plan or for Off-Project disposal of excess materials. Disposal sites shall be left in a well graded condition with all solid wastes and boulders adequately covered.

S-43.12 No disposal shall occur in those areas defined below as "environmentally sensitive" unless the Contractor can document that: 1) non-sensitive areas are not available; or that 2) the material can be used to benefit an "environmentally sensitive" area. All necessary permits for the disposal operations shall be obtained by the Contractor and approval from the appropriate State and Federal Agencies shall be included in the Contractor's Disposal Plan.

(A) No disposal shall occur in the following "environmentally sensitive" area:

(1) Wetlands, as described in "Wetlands of the United States", Circular 39, published by the U.S. Department of Interior, Fish and Wildlife Service;
(2) 100-year frequency flood plains;
(3) Archaeological or historic sites – See Section S-1701 (LAWS TO BE OBSERVED (CULTURAL RESOURCES)) of these Special Provisions for specific requirements;
(4) Areas with stability or settlement problems;
(5) Areas with artesian conditions;
(6) Unique animal or plant communities;
(7) Landscapes or geologic formations with exemplary, unique, rare or threatened/endangered characteristics.

(B) Any environmentally sensitive areas shown in the Plan are approximate only. If it is anticipated that said areas may be affected by disposal site usage and/or any of the Contractor's operations, the Engineer will determine exact limits on an "as needed basis".

(C) Prior to the disposal of any excess grading materials, concrete rubble, bituminous materials, or any other materials requiring disposal, the Contractor shall have on file a written Disposal Plan with written approval by the Engineer. The written Disposal Plan must reflect not only the above requirements, but also the following points:

(1) That legal permission from the property owner has been obtained;
(2) That all required local and county disposal permits have been obtained;
(3) That the MPCA has reviewed and granted permits as necessary for solid waste disposal;
(4) That the disposal area and Plan meet with requirements of the U.S. Fish and Wildlife Service as noted in Executive Order 11990 and Circular 39, as verified by field review. In this regard, the Contractor shall give notice sufficient to permit the Engineer and a representative from the MnDOT Office of Environmental Services to conduct a site review; and
(5) That the limits of the disposal area will be staked by the Contractor so as to accommodate the site review and aid the Contractor in limiting disposal operations so that encroachments do not inadvertently occur.

The Contractor is required to present his/her Disposal Plan in detail at the Pre-construction Conference.

S-43.13 At the preconstruction meeting, the Contractor shall present to the Engineer his proposed plan for construction, including as a minimum, his hauling operation and the amount, size, and type of equipment he will use for the project.

S-43.14 Material which is excavated and determined by the Engineer or the Engineer's representative to be suitable material shall be used for embankment construction or backfill. The suitable materials shall not be mixed with or contaminated with unsuitable soil in any amounts. Selection of suitable materials shall be considered to be incidental to the contract, with no direct compensation therefore. Any stockpiling or re-handling of these materials shall be considered incidental to the contract with no direct compensation therefore.

S-43.15 No topsoil shall be placed on the in-slopes until the slopes are approved by the Engineer.

S-43.16 The rate of depositing material on the embankment shall not exceed the capacity of the leveling and compaction equipment as determined necessary by the Engineer. Compaction of this material should not be delayed after being placed.

S-43.17 Any Excess Salvaged Aggregate not incorporated into the project shall be stockpiled for removal by Blue Earth County maintenance staff and become property of Blue Earth County.

S-43.18 A skidloader will be required for finish work and final shaping around pipe aprons, driveways and other miscellaneous smaller areas not adequately shaped by larger equipment as determined acceptable as determined by the Engineer.

S-44 (2105) SELECT GRANULAR BORROW - MODIFIED 10%

The Contractor shall furnish and install MNDOT 3149.2b Select Granular Borrow – Modified to contain a maximum of 10% by dry weight passing the No. 200 Sieve.

S-45 (2112) SUBGRADE PREPARATION & STRINGLINE CONTROL

The shaping and compacting of the subgrade shall be in accordance with the provisions of 2112, except as modified below:

S-45.1 STRINGLINE CONTROL

The Contractor shall finish the surface of the aggregate base course on the roadway sections as shown on the plan using a string line and equipment with an approved automatic blade control system capable of grade reference and transverse slope control.

The County will set the control reference points at 50-foot intervals prior to the placement of the final lift of aggregate base. The Contractor shall set his won string line and equipment based on these elevations. The elevations of the finished surface of the aggregate base course shall not vary by more than 0.05 feet from the prescribed elevation at any point where measurement is made.

String line grade control shall consist of a tightly stretched wire or string, offset from and parallel to the centerline of the road. The County will establish alignment and grade by placing nails or hubs set on centerline at the aggregate base grade. Erecting the string line control shall be set up by the Contractor and the lines hall be supported at intervals as close as necessary to maintain the established grade and alignment. The control aggregate base course shall not vary by more than 0.012 feet from the prescribed elevation at any point where measurement is made.

Payment will be made under Item 2112.619 Aggregate Base Preparation (Stringline) at the contract bid price per RD STA which shall be compensation in full for all costs incidental to subgrade preparation and stringline grading.

S-46 (2123) EQUIPMENT RENTAL

The provisions of MnDOT 2123 are modified and/or supplemented with the following:

S-46.1 The following is added to MnDOT 2123.3 SPECIFIC REQUIREMENTS:

N Disk Harrow

The disk harrow shall be of sufficient size and mass to manipulate the soils to a depth of approximately 300 mm [**12 inches**] and shall meet the approval of the Engineer.

S-46.2 The following is added to MnDOT 2123.5 BASIS OF PAYMENT:

2123.610 Disk Harrow .....hour

S-47 (2123) TRACTOR MOUNTED BACKHOE

This work shall consist of furnishing and operating a tractor mounted backhoe in accordance with the provisions of MnDOT 2123 and the following:

S-47.1 The backhoe shall be tractor mounted and power operated, and of sufficient size and operating depth for the purpose intended and to the satisfaction of the Engineer.

S-47.2 Measurement will be made in accordance with the provisions of MnDOT 2123.4A and payment will be made under Item 2123.610 (Tractor Mounted Backhoe) at the Contract bid price per hour, which shall be compensation in full for all costs relative thereto.

S-48 (2123) DOZER

This work shall consist of furnishing and operating a dozer in accordance with the provisions of MnDOT 2123 and the following:

S-48.1 The Dozer shall be power operated, and of sufficient size (D6 or equivalent as approved by the Engineer) and operating power for the purpose intended of shaping ditches and embankment grading and to the satisfaction of the Engineer.

S-49 (2130) APPLICATION OF WATER

The provisions of MnDOT 2130 are modified as follows:

S-49.1 The third paragraph of MnDOT 2130.5 is hereby deleted and the following substituted therefore:

Water applied by order or approval of the Engineer for dust control will be paid for at a unit price of $5.45 per cubic meter (**$20 per 1000 gallons**) in the absence of the Contract bid Item 2130.501.

S-50 (2211) AGGREGATE BASE - MODIFIED

Aggregate base courses shall be constructed in accordance with the provisions of MnDOT 2211 except as modified below:

S-50.1 Compaction shall be achieved by the "Specified Density Compaction Method" described in MnDOT 2211.3C.

S-50.2 The second sentence in MnDOT 2211.1 Description, is revised to read as follows:

The aggregate base shall be produced and placed under the Contractor's quality control program in accordance with the MnDOT Grading and Base Manual.

S-50.3 The first sentence in MnDOT 2211.3F1 Gradation Control, is revised to read as follows:

The Contractor and/or aggregate producer shall be responsible for maintaining a gradation control program in accordance with the random sampling acceptance method described in the MnDOT Grading and Base Manual.

S-50.4 MnDOT 2211.3F2(d) under Acceptance Testing is hereby deleted and replaced with the following:

(d) Samples for gradation testing will be taken randomly by the Engineer prior to compaction, in accordance with the random sampling method described in the Grading and Base Manual. All gradation tests will be reported to the nearest whole number, except the 75µ [**#200**] sieve will be reported to the nearest one tenth of one percent (0.1%).

S-50.5 MnDOT 2211.3F2(j) under Acceptance Testing, is revised to read as follows:

(j) One gradation sample will be taken from each sublot and tested. Payment will be based on the average results from the four sublot samples for each specified sieve.

S-50.6 The third paragraph after MnDOT 2211.3F2(k) under Acceptance Testing, is revised to read as follows:

A 5% price reduction will be assessed to both individual or averaged test lots for each test result that fails to meet specified gradations for sieve sizes not listed in Tables 2211-B and 2211-C by more than 2%. These price reductions are cumulative and shall be analyzed both separately and averaged by lot when applicable.

S-50.7 Table 2211-B in MnDOT 2211.3F2 Acceptance Testing, is hereby deleted and replaced with the following:

Table 2211-B
AGGREGATE BASE PAYMENT SCHEDULE
(4 Sublots/4 Samples)

% Passing Outside Specified Limits*		
4.75 mm (**#4**), 2.00 mm (**#10**), and 425 µm (**# 40**) Sieves	75 µm (**#200**) Sieve	Acceptance Schedule (Price Reduction)
1	0.1	5%
----------	0.2	6%
----------	0.3	9%
----------	0.4	11%
----------	0.5	14%
2	0.6	15%
> 2	> 0.6	Corrective Action

*Based on average of 4 tests

Price reductions for more than one failing sieve size shall be cumulative. The compensation due to the Contractor for the quantity of material represented by the failing test results shall be reduced by the sum of the respective percentages.

The Contractor does not have the option of taking a price reduction in lieu of complying with the Specifications.

S-50.8 The following is added to Table 2211-C in MnDOT 2211.3F2 Acceptance Testing:

Substantial compliance will be applied to no more than one test failure. Substantial compliance will be eliminated when two or more test failures occur and test failures meeting substantial compliance will be subject to the next higher price reduction. One sieve failure = one test failure. Test failures for each material type will be treated separately.

S-50.9 The following is added to Table 2211-D in MnDOT 2211.3F2 Acceptance Testing:

Substantial compliance will be applied to no more than one test failure. Substantial compliance will be eliminated when two or more test failures occur and test failures meeting substantial compliance will be subject to the next higher price reduction. Test failures for each material type will be treated separately.

S-50.10 The Class 5 base material shall be placed, compacted, and cut to final grade at least seven (7) days in advance of the start of the bituminous surfacing. Class 7 material may be allowed for aggregate base as approved by the Engineer.

S-50.11 Each aggregate source (Add-Rock) will meet the Aggregate (Quality Tests), Specification 3138 requirements as its own product sample, not as a combined/composite sample with other aggregates.

S-50.12 The Schedule of Materials Control section I. Grading and Base Construction Items; Item No. 7 'Moisture Content'; Minimum Required Agency Acceptance Testing (Field Testing Rate) shall be revised to: As determined necessary by the Engineer.

S-51 (2221) AGGREGATE SHOULDERING

Aggregate shouldering courses shall be constructed in accordance with the provisions of MnDOT 2221 except as modified below:

S-51.1 Compaction shall be achieved by the "Quality Compaction Method" described in MnDOT 2211.3C.

S-51.2 The second sentence in MnDOT 2221.1 Description, is revised to read as follows:

The aggregate shouldering shall be produced and placed under the Contractor's quality control program in accordance with the MnDOT Grading and Base Manual.

S-51.3 The following is hereby inserted after the first paragraph of MnDOT 2221.3C Spreading and Compacting:

Water shall be applied to the shouldering material during the mixing and spreading operations so that at the time of compaction the moisture content is not less than 5 percent of the dry weight.

S-52 (2301) CONCRETE PAVEMENT

(2012 version (Rev. 1/20/12))

MnDOT 2301 shall be deleted and replaced with the following:

2301.1 DESCRIPTION

This work consists of constructing portland cement concrete pavement on a prepared base.

The Department defines paving concrete to include concrete mainline, ramps, loops, integrant curb, shoulders, and curb and gutter placed adjacent to the concrete mainline with the same mixture used in the paving. Integrant curb is a curb constructed monolithically with the pavement.

For the purposes of concrete pavement, the Department defines a concrete plant as the following:

(1) A paving plant using dump or agitator trucks to haul concrete, or
(2) A certified ready-mix plant using truck mixers to haul concrete.

For concrete pavement incentives and disincentives, the Department defines a concrete plant as the following:

(1) A primary concrete plant providing the majority of the concrete to a paving project, and
(2) A secondary concrete plant providing any minor work or fill-ins not provided by the primary concrete plant.

Only one primary concrete plant per project is allowed unless otherwise approved by the Engineer. The Contractor may use a paving plant or a certified ready-mix plant as the primary concrete plant.

2301.2 MATERIALS

A Concrete 2461

A.1 Slipform Placement ..... Mix No. 3A21

A.2 Fixed Form Placement ..... Mix No. 3A41

B Coarse and Fine Aggregate Requirements

Test each aggregate fraction proposed for use in accordance with Table 2301-1:

Table 2301-1 Aggregate Testing Requirements	
Aggregate	**Testing Required**
Tested by Department in the last 3 years	No additional testing *
Not tested by the Department in the last 3 years	Preliminary aggregate testing in accordance with 2301.3.B.1
New source	New source concrete aggregate testing in accordance with 3126 and 3137
* Perform additional testing as required by the Engineer in conjunction with the Concrete Engineer.	

B.1 Required Preliminary Aggregate Testing

After the Department awards the Contract and as soon as coarse and fine aggregates are available for testing, contact the Engineer to coordinate preliminary sampling of aggregate for concrete paving. The Engineer in conjunction with the Concrete Engineer will sample and test the aggregate to verify specific gravity, absorption data, and aggregate quality. The Department will perform other tests as determined necessary by the Engineer in conjunction with the Concrete Engineer.

B.2 Aggregate Alkali Silica Reactivity (ASR) Requirements for Concrete Mixes

The Department will test the designated fine aggregate for alkali silica reactivity (ASR) with Holcim, St. Genevieve, Type I/II portland cement and Lafarge, Davenport, Type I/II portland cement in accordance with ASTM C 1260 MnDOT Modified. If the fine aggregate contains an intermediate size aggregate such as "buckshot" or "pearock" as determined by the Concrete Engineer, the Department will perform testing in accordance with ASTM C 1260.

The Concrete Engineer, in coordination with the Engineer, will review the 14-day fine aggregate expansion test results to determine the acceptability of the proposed fine aggregate and cement combination in accordance with the 14-day fine aggregate expansion limits in Table 2301-2.

Table 2301-2 Fine Aggregate ASR Mitigation Requirements	
14-day Fine Aggregate Expansion Limits	
≤ 0.150	The Department will accept the fine aggregate with or without a mitigator
$> 0.150 - 0.250$	Mitigate the fine aggregate with 35 percent ground granulated blast furnace slag or at least 20 percent fly ash
$> 0.250 - 0.300$	Mitigate the fine aggregate with 35 percent ground granulated blast furnace slag or 30 percent fly ash in accordance with 3115, modified with at least 66.0 percent $SiO_2 + Fe_2O_3 + Al_2O_3$ on a dry weight basis and at least 38.0 percent SiO_2
> 0.300	The Department will reject the fine aggregate

For fine aggregate and cement combinations previously tested by the Department, the Concrete Engineer will use the previous test results to determine necessary mitigation. The Contractor may contact the Department to access the list of previously tested fine aggregate sources.

If the fine aggregate and cement combination were not previously tested, the Concrete Engineer will use the higher expansion result of the two fine aggregate and cement combinations to determine necessary mitigation.

Add "buckshot" or "pea rock as a separate aggregate in accordance with the quality requirements of 3137, except the Department will determine the shale content in accordance with AASHTO T 113 MnDOT Modified, "Lightweight Pieces in Aggregate" fine aggregate procedure. If this aggregate is from the same source as the ¾ in+ [19 mm+] or ¾ in– [19 mm–] aggregate, the Concrete Engineer will waive the

requirements specified in 3137.2D3(c), "Carbonate in Class C aggregate by weight.". If this aggregate is from sources other than the ¾ in+ [19 mm+] or ¾ in– [19 mm–] aggregate, approval is at the discretion of the Concrete Engineer.

The Concrete Engineer may reject the fine aggregate if mortar bar specimens exhibit an indication of external or internal distress not represented by the expansion results. The Concrete Engineer will make the final acceptance of the aggregate.

C Cementitious Materials

Design the concrete paving mixes in accordance with the following requirements for cementitious material:

(1) Total alkalis no greater than 0.60 percent in the portland cement ($Na_2O + 0.658\ K_2O$)
(2) Total alkalis no greater than 5.0 lb per cu. yd [3.0 kg per cu.m] in the combined cementitious material
(3) At least 530 lb per cu. yd [315 kg per cu. m] minimum cementitious,
(4) At least 400 lb per cu. yd [237 kg per cu. m] of portland cement when using fly ash or at least 385 lb per cu. yd [228 kg per cu. m] when using slag as a portland cement replacement,
(5) Provide additional cementitious material to meet requirements in accordance with this section at no additional cost to the Department,
(6) Total cementitious material no greater than 600 lb per cu. yd [356 kg per cu. m] except for high-early strength mixes.

The Department defines high-early strength concrete as concrete with a cementitious content of greater than 600 lb per cu. yd [356 kg per cu. m].

The Contractor may use 100 percent portland cement for the cementitious material for high-early mixes, except if using quartzite or gneiss coarse aggregate provide high-early mixes in accordance with 2301.2.C.1.

C.1 Special Cementitious Requirements for Quartzite and Gneiss

If providing coarse aggregate from sources identified by the Department as quartzite or gneiss and if the coarse aggregate does not meet the 0.04 percent expansion limit when tested in accordance with ASTM C 1293, replace the portland cement with the following:

(1) 30 percent of a MnDOT certified fly ash from the Approved Products list in accordance with 3115, except provide fly ash in the concrete mixture with at least 66 percent $Si0_2 + Fe_2O_3 + Al_2O_3$ on a dry weight basis for at least 12 consecutive months and at least 38 percent $Si0_2$ content, or
(2) 35 percent of a MnDOT certified ground granulated blast furnace slag from the Approved Products list.

D Concrete Mix Design Requirements

Design the concrete mix based on an absolute volume of 27.00 cu. ft ± 0.10 cu. ft [1.000 cu. m ± 0.003 cu. m] in accordance with the following:

(1) Fine aggregates complying with the requirements of Specification 3126 for aggregate quality.
(2) Coarse aggregates complying with the requirements of Specification 3137 for aggregate quality.
(3) Air content of 7.0 percent plus or minus 1.5 percent at the point of placement.

(4) High-early concrete placed at a water-cementitious ratio not greater than 0.38.

Submit the concrete mixes utilizing the MnDOT Contractor Mix Design Submittal Worksheet available on the Department's website at least 21 calendar days before the initial placement of concrete using the concrete mix design. For mix design calculations, the Engineer, in conjunction with the Concrete Engineer, will provide specific gravity and absorption data.

The Concrete Engineer, in coordination with the Engineer, will review the mix design submittal and approve the materials and mix design for compliance with the Contract.

The Contractor assumes full responsibility for the mix design and performance of the concrete.

The Engineer determines final acceptance of concrete for payment based on satisfactory field placement and performance.

D.1 Concrete Pavement < 3,500 cu. yd. [2,900 cu. m]

If the estimated quantity of concrete pavement in the Contract is less than 3,500 cu. yd. (2,900 cu. m.), calculated by multiplying the planned pavement area by the planned pavement thickness, provide a mix design meeting the following requirements:

(1) Grade A paving concrete placed at a water/cement ratio not greater than 0.42.
(2) Provide a fine aggregate gradation complying with Table 3126-3.
(3) Provide either a CA-15, CA-35, or CA-50 coarse aggregate gradation complying with the requirements of Table 3137-4.
(4) In lieu of (2) and (3) above, provide a Job Mix Formula in accordance with 2301.2.D.3.
(5) Specification 2301.2.D.4 incentive/disincentives for aggregate quality, well-graded aggregate and w/c ratio shall not apply.

D.2 Concrete Pavement ≥ 3,500 cu. yd. [2,900 cu. m]

If the estimated quantity of concrete pavement in the Contract is at least 3,500 cu. yd. [2,900 cu. m], calculated by multiplying the planned pavement area by the planned pavement thickness, provide a mix design meeting the following requirements:

(1) Grade A paving concrete placed at a water/cement ratio not greater than 0.40.
(2) Submit a Job Mix Formula in accordance with 2301.2.D.3.
(3) For concrete produced at a secondary concrete plant or as otherwise allowed by the Engineer, the Contractor has the option to design a mix in accordance with 2301.2.D.1.
(4) Specification 2301.2.D.4 incentive/disincentives for aggregate quality, well-graded aggregate and w/c ratio apply.

D.3 Job Mix Formula

Use at least two fractions of coarse aggregate that include the ¾ in+ [19 mm+] and ¾ in– [19 mm–] fractions.

A Job Mix Formula (JMF) contains proportions of materials and individual gradations of each material plus a composite gradation. The Engineer will base the JMF on the combination of coarse and fine aggregate in accordance with Table 2301-3. The Department will waive the gradation requirements of 3126 and 3137.

Table 2301-3 Job Mix Formula Working Range	
Sieve Sizes	**Working Range, %***
2 in [50 mm]	±5
1½ in [37.5 mm]	±5
1 in [25 mm]	±5
¾ in [19 mm]	±5
½ in [12.5 mm]	±5
⅜ in [9.5 mm]	±5
No.4 [4.75 mm]	±5
No.8 [2.36 mm]	±4
No.16 [1.18 mm]	±4
No.30 [600 µm]	±4
No.50 [300 µm]	±3
No.100 [150 µm]	±2
No.200 [75 µm]	≤ 1.6
* Working range limits of the composite gradation based on a moving average of 4 tests (N=4).	

Add fill-in sieves as needed during the testing process to prevent overloading. Provide combined aggregates with 100 percent passing the 2 in [50 mm] sieve and no greater than 1.6 percent passing the No. 200 [75 µm] sieve. In addition, each coarse aggregate fraction must comply with the Material Passing the No. 200 [75 µm] sieve requirement in 3137.2.D.1.i.

Include working ranges based on the composite gradation of the sieves specified in Table 2301-3 with the JMF submittal.

Take samples at the belt leading to the weigh hopper or other locations close to the incorporation of the work as approved by the Engineer. The Engineer will determine the sampling location by using a random number chart and multiplying the random number by the sampling rate as defined in the Schedule of Materials Control. Test, and record the individual results.

The Engineer will randomly verify Contractor combined aggregate gradation results as defined in the Schedule of Materials Control.

If the quantities of concrete produced results in no gradation testing for any given day, include the untested quantity of concrete into the next day's production and include that quantity of concrete in the sampling rate. If the untested quantity is on the last day of production, add that quantity to the previous day's production.

D.3.a JMF Adjustments

If, during production, the moving average of QC aggregate gradation tests falls outside the allowable JMF working range, make adjustments within the limits specified in Table 2301-4 without submitting a new mix design as approved by the Engineer.

Table 2301-4 Allowable JMF Adjustments	
Sieve Size	**Allowable Adjustment, %**
≥ No. 4 [4.75 mm]	±5
No. 8 [2.36 mm] – No.30 [600 µm]	±4
No. 50 [300 µm]	±3
No. 100 [150 µm]	±2

The Contractor may continue paving after submitting a new JMF with working range and aggregate volume adjustments to the Engineer. Submit all JMF adjustments on the MnDOT JMF Adjustments Worksheet available from the Department's website.

If the moving average of four tests falls outside of the adjusted allowable working range, stop production and provide a new mix design including JMF as directed by the Engineer in conjunction with the Concrete Engineer.

D.4 Concrete Pavement Incentives and Disincentives

The Department shall apply concrete mix incentives and disincentives for Contracts using at least 3,500 cu. yd [2,900 cu. m] of concrete, calculated by multiplying the planned pavement area by the planned pavement thickness, of paving concrete.

The Department will only apply coarse aggregate quality incentives or disincentives for materials provided or produced by the Contractor's primary concrete plant.

The Department will not provide water/cement ratio incentive payments for high-early mixes. The Department will only apply water/cement incentives or disincentives for concrete hauled in dump trucks, agitator trucks, or both.

If the Contractor adds water to the pavement surface without approval by the Engineer, the Department will not pay water/cement or ride incentives on sections where the water is added and the Engineer may reject the pavement in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work."

D.4.a Coarse Aggregate Quality Incentive/Disincentive

The Engineer will accept the coarse aggregate for paving concrete by statistical methods and in accordance with all other aggregate quality requirements of 2301, 2461, and 3137.

The **Coarse Aggregate Quality Incentive/Disincentive** for CLASS B and CLASS C Aggregates will comply with the following:

The Engineer will take samples at the belt leading to the weigh hopper or other locations close to the incorporation of the work as approved by the Engineer. The Engineer will take samples in accordance with Table 2301-5:

Table 2301-5
Coarse Aggregate Quality Incentive/Disincentive Sampling Rates

Plan Concrete, cu. yd [cu. m]	Samples per Fraction (n)
3,500 – 7,500 [2,900 – 6,250]	3
7,501 – 10,000 [6,251 – 8,500]	5
10,001 – 25,000 [8,501 – 21,000]	10
25,001 – 50,000 [21,001 – 42,000]	15
50,001+ [42,001+]	20

The Engineer will consider the entire Project as a single lot for each of the two fractions containing the highest percentage by weight. If the Project is planned for construction over multiple years and prior to placing any concrete pavement, the Contractor shall request the Engineer calculate the incentive/disincentive payment on a yearly basis. The Engineer, in conjunction with the Concrete Engineer, will modify the sampling and testing rates as necessary.

The Engineer will establish a new statistical family for each change in aggregate source, fraction, or both.

The Engineer will randomly choose the acceptance samples.

The Engineer will divide a lot representing the Plan cubic yards [cubic meters] of concrete by the number of samples to form sublots. The Engineer will multiply the number of cubic yards [cubic meters] in a sublot by a random number to obtain the position in the sublot for the sample. The Engineer will split the samples and leave half of the sample for the Contractor. The Engineer's laboratory will test the samples and report the individual results. The Engineer will calculate a Quality Index (QI) for each fraction in accordance with the following:

$$QI = X + k(s)$$

Where:

$$X = \text{mean} = \sum \frac{X_i}{n}$$

X_i = individual test results

$$s = \text{standard deviation} = \sqrt{\sum \frac{(x_i - x)^2}{(n-1)}}$$

k = Adjustment Factor based on the number of tests as shown in Table 2301-6:

Table 2301-6
Adjustment Factor "k"

k	No. of Tests
1.09	3
1.23	5
1.26	10
1.27	≥ 15

If Class A, Class B, and Class C aggregates meet the requirements as determined by the Engineer, the Department will provide payment based on a per fraction incentive in accordance with Table 2301-7.

Table 2301-7 Coarse Aggregate Quality Incentive/Disincentive		
Aggregate Class	**QI for Fraction, %**	**Structural Concrete per cu. yd [cu. m] Payment Change per Fraction**
Class A (including quartzite and gneiss)	—	$1.00 [$1.30]
Class B (based on % absorption)	≤1.00	$1.00 [$1.30]
	1.01 – 1.45	$0.50 [$0.65]
	1.46 – 1.76	$0.00
	1.77 – 1.85	-$1.00 [$1.30]
	≥ 1.86	As recommended by the Concrete Engineer, with coordination of the Engineer
Class C (based on % carbonate)	≤ 15.0	$1.00 [$1.30]
	15.1 – 24.0	$0.50 [$0.65]
	24.1 – 31.0	$0.00
	31.1 – 35.0	-$1.00 [$1.30]
	≥ 35.1	As recommended by the Concrete Engineer, with coordination of the Engineer

The Department will not pay incentives or disincentives for Class R aggregates.

If the concrete mixture contains at least three fractions of coarse aggregate, the Engineer will consider only the two containing the highest percentage by weight as eligible for incentive. The Contractor may combine at least two sub-fractions to form the ¾ in – [19 mm –] fraction for either the coarse or fine fraction of the coarse aggregate. Blend the sub-fractions by weight. The Engineer will base the maximum incentive for aggregate quality on the two largest fractions by weight.

The Department will pay for Coarse Aggregate Quality Incentive/Disincentive for all paving concrete, including water/cement ratio concrete, and high-early concrete provided by the Contractor's primary paving plant.

D.4.b Water/Cement (w/c) Ratio

Provide and place concrete with a water/cement ratio not to exceed 0.40. Make any adjustments immediately when the water/cement ratio exceeds 0.40.

The Department will not make incentive payments for water/cement ratio on high-early mixes.

Do not add water to the surface of the concrete to aid in finishing without the approval of the Engineer. Supply sufficient trucks to ensure a steady forward progress of the paver.

The Department will determine the water/cement ratio for concrete hauled in dump or agitator trucks (concrete hauled in truck mixers are not eligible for w/c ratio incentives) in accordance with the following:

D.4.b(1) Water Content Determination

For a concrete paving batch plant, use an electronic meter approved by the Engineer to record the water, including temper water, added to the mix that is capable of printing the amount of total water on each batch ticket.

For a ready-mix plant, record the total water added to the mix, including temper water, on the computerized Certificate of Compliance.

The Engineer will determine the water content for calculating the water/cement ratio using the average water calculated from 10 batch tickets or Certificates of Compliances surrounding the randomly selected batch ticket sample (four previous tickets, ticket representing the random sample, and the five following tickets).

D.4.b(2) Water Content Verification

The Engineer will use plastic concrete taken at the plant site to verify the water content in the mix as determined in accordance with 2301.2.D.4.b.(1), "Water Content Determination." The Contractor will sample the plastic concrete as directed by the Engineer.

The Engineer will verify the water content in the plastic concrete mixture using the test procedure specified in AASHTO T 318-02, "Standard Test Method for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying." The Engineer will begin the test within 45 min after the water has contacted the cement. Provide the microwave oven and the ancillary equipment as required by the Engineer to perform this test.

D.4.b(3) Cementitious Content Determination

The Engineer will determine the cementitious content for calculating the water/cement ratio using the average total cementitious calculated from 10 batch tickets or Certificates of Compliances surrounding the randomly selected batch ticket sample (four previous tickets, ticket representing the random sample, and the five following tickets).

D.4.b(4) W/C Ratio Incentive/Disincentive

The Engineer will base the statistical analysis of acceptance for water/cement ratio in accordance with with 2301.2.D.4.b(1), "Water Content Determination," and 2301.3.D.4.b(3), "Cementitious Content Determination," at a rate defined in the Schedule of Materials Control.

The Engineer will randomly choose acceptance samples. The Engineer will determine the sampling location by using a random number chart and multiplying the random number by the sampling rate as defined in the Schedule of Materials Control.

The Engineer will sample, test, and record the individual results.

If the quantities of concrete produced results in no Agency moisture testing for any given day, include the untested quantity of concrete into the next day's production and include that quantity of concrete in the sampling rate. If the untested quantity is on the last day of production, add that quantity to the previous day's production.

Do not place concrete mix not meeting the 0.40 water/cement ratio requirement in the work. The Engineer may accept material not meeting the Contract requirements and the Department will pay for the work in accordance with Table 2301-8.

Table 2301-8 W/C Ratio Incentive/Disincentive	
W/C Ratio Test Result	**Payment incentive/disincentive per cu. yard [cu. m]**
≤ 0.37	+$3.00 [$3.90]
0.38	+$1.75 [$2.25]
0.39	$0.50 [$0.65]
0.40	$0.00
0.41	-$0.50 [$0.65]
0.42	-$1.75 [-$2.25]
0.43	-$3.00 [-$3.90]
≥ 0.44	Determined by the Concrete Engineer

The Contractor may remove and replace concrete represented by water/cement ratios greater than 0.40. For concrete left in place with water/cement ratios greater than 0.40, if the level of payment is not defined in the table, the Engineer in conjunction with the Concrete Engineer, will evaluate the material based on the adequacy of the material for the use intended. Remove and replace unsatisfactory concrete as determined by the Engineer at no additional cost to the Department.

D.4.c Well-Graded Aggregate Optional Incentive

The Engineer will use the Contractor's combined aggregate gradation test results, as verified by Department testing, to determine eligibility for the incentive.

The Contractor has two well-graded aggregate optional incentives available as follows:

(1) Percent Retained Gradation Band in accordance with Table 2301-9.

TABLE 2301-9 8-18 or 7-18 Percent Retained Gradation Band		
Sieve Sizes	**8-18 % Retained**	**7-18 % Retained**
2 inch **[50 mm]**	0%	0%
1 ½ inch **[37.5 mm]**	≤9%	≤9%
1 inch **[25 mm]**	8% to 18%	7% to 18%
¾ inch **[19 mm**	8% to 18%	7% to 18%
½ inch **[12.5 mm]**	8% to 18%	7% to 18%
3/8 inch **[9.5 mm]**	8% to 18%	7% to 18%
#4 **[4.75 mm]**	8% to 18%	7% to 18%
#8 **[2.36 mm]**	8% to 18%	7% to 18%
#16 **[1.18 mm]**	8% to 18%	7% to 18%
#30 **[600 µm]**	8% to 18%	7% to 18%
#50 **[300 µm]**	≤ 13%	≤ 13%
#100 **[150 µm]**	≤8%	≤8%
#200 **[75 µm]**	≤8%	≤8%

(2) Gradation Zone II-A of the Coarseness Factor Chart in accordance with Table 2301-10.

TABLE 2301-10 **Coarseness Factor Boundaries – Zone II-A**	
Coarseness Factor (CF)	**Workability Factor (WF)**
52	34 - 38
68	32 - 36
The Coarseness Factor (CF) is defined as follows: $CF = \frac{\text{Combined \% retained above 3/8 in [9.5 mm] sieve}}{\text{Combined \% retained above No.8 [2.36 mm] sieve}} \times 100$	The Workability Factor (WF) is defined as follows: $\text{WF} = \text{Combined \% passing No. 8 [2.36 mm] sieve}$

The Engineer will use statistical analysis of the Contractor's combined aggregate gradation samples for well-graded aggregate on a lot basis representing one day's paving. The lot will represent the cumulative average of the sublot values on each sieve for the gradation band or the cumulative average of the sublot values of the coarseness factor and workability factor for the coarseness factor chart.

An optional incentive is available to the Contractor provided a concrete mixture is designed and produced with a well-graded aggregate gradation that meets one of the following in accordance with Table 2301-11. The Contractor may achieve only one of the optional incentives for any single lot.

TABLE 2301-11 **Well-Graded Aggregate Optional Incentive**	
Gradation Options	**Payment incentive/disincentive per cu. yard [cu. m]**
8-18 Retained	\$2.00 per cubic yard (\$2.60 per m^3)
7-18 Retained	\$0.50 per cubic yard (\$0.65/m^3)
Gradation Zone II-A	\$2.00 per cubic yard (\$2.60 per m^3)

The Engineer will use the Contractor's combined aggregate gradation test results, as verified by Department testing, to determine compliance.

E Reinforcement Bars 3301

F Dowel Bars 3302

G Concrete Joint Sealers

G.1 Preformed Type 3721

G.2 Hot-poured, Elastic Type 3725

G.3 Silicone Type 3722

H Preformed Joint Filler 3702

I Curing Materials

I.1 Burlap Curing Blankets 3751

I.2 Poly-Alpha Methylstyrene (AMS) Membrane Curing Compound 3754

I.3 Linseed Oil Membrane Curing Compound 3755

I.4 Plastic Curing Blankets **3756**

J Form Coating Material **3902**

2301.3 CONSTRUCTION REQUIREMENTS

Use "slipform" as the standard construction method for concrete paving, unless otherwise specified in the Contract or allowed by the Engineer.

A.1 High-Early Strength Sections

For early use of the pavement as required by the Engineer, construct a section of pavement of high-early strength concrete in accordance with 2301.2.D, "Concrete Mix Design Requirements" at important road crossings, intersections, driveway entrances, or other locations as shown on the Plans or directed by the Engineer. Take precautions to satisfactorily finish, cure, and protect high-early strength concrete pavements.

A.2 Operation and Supervision

Notify the Engineer at least 24 h before placing concrete to allow for inspection. Do not place concrete until the Engineer approves preparations for concrete placement. If the Contractor fails to notify the Engineer at least 24 h before concrete placement, the Engineer may not allow concrete placement in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work."

Provide paving operations supervision in accordance with 1506, "Supervision by Contractor." Provide an organizational chart listing names and phone numbers of individuals and alternates responsible for mix design, quality control administration, and inspection to the Engineer. Post the organizational chart in the Contractor's on-site facility.

Provide a manufacturer's manual explaining the operation and adjustments of the major pieces of power operated equipment used.

A.3 Plant Certification

Provide notice 16 hrs in advance of concrete paving production and in conjunction with the Engineer, perform a thorough on-site inspection of the concrete plant and complete MnDOT Form 2164, "Concrete Paving Plant Contact Report." Sign the report to certify compliance with the paving requirements and to certify review of the continual maintenance of the plant.

Calibrate and correlate the testing equipment in accordance with 2461.

A.3.a Combination Plant Lab – Office Requirements

The Concrete Paving Contractor QC technicians and the Department QA technicians will equally share a combination plant lab – office during concrete paving.

For concrete paving projects in accordance with 2301.2.D.2, provide a separate combination plant lab – office in accordance with 1604, "Plant Inspection – Commercial Facility," except as modified by the following characteristics and requirements:

(1) Located at the plant site within 100 yd [91 m] from the batch plant or other location, as approved by the Engineer,
(2) Plant lab and plant office areas separated and isolated by a wall,

(3) Total plant lab-office floor area, based on exterior dimensions, of at least 224 sq. ft [21 sq. m],
(4) Plant lab floor area, based on exterior dimensions, of at least 144 sq. ft [13.5 sq. m],
(5) Plant office floor area, based on exterior dimensions, of at least 80 sq. ft [7.5 sq. m],
(6) Heating and cooling system capable of maintaining a uniform temperature between 72° and 85° F [22° and 29° C],
(7) Drinking water container or cooler with adequate supply of potable water,
(8) Detached portable toilet conveniently located,
(9) Electrical power supply that provides adequate amperage for all electrical needs,
(10) Water supply (storage tank with a capacity of 50 gal or more, or pressurized water supply) connected to the sink faucet,
(11) Provide a sample storage area to prevent contamination of the samples,
(12) Plant lab furnished in accordance with the following:
  (12.1) One sturdily built workbench or countertop at least 30 in × 144 in [0.75 m × 3.65 m],
  (12.2) One service sink located near one end of the workbench with a water supply, faucet and an outside drain,
  (12.3) Shelf space above workbench or countertop or at other convenient locations, totaling at least 8 linear ft [2.5 m] × 8 in [0.2 m],
  (12.4) Electronic scales of sufficient size to weigh the samples for all required materials testing, and
  (12.5) A four burner 30" standard electric stove top or stove and at least two additional electric burners to perform required aggregate testing per the Schedule of Materials Control.
  (12.6) Microwave oven with turntable or wave deflection fan (900 Watt), heat resistant glass pan (approx. 9"x9"x2"), plain weave fiberglass cloth (10 oz/yd^2 and 14 mills thick), metal scrapper and grinding pestle,
  (12.7) Metal bowls of sufficient size to perform all required material testing,
(13) Plant office furnished in accordance with the following:
  (13.1) Two desks, one for the Department and one for the Contractor, with total exterior dimensions of at least 30 in × 60 in [¾ m × 1.50 m],
  (13.2) At least four (4) chairs,
  (13.3 A telephone capable of providing email, and
  (13.4) A printer with scanning and copying capabilities.

For concrete paving projects supplied by a Certified Ready-Mix Plant, the separate Combination Plant - Lab Office requirements of 2301.2.A.3.a do not apply with the exception of the following:

(1) Electrical power supply that provides adequate amperage for all electrical needs,
(2) Water supply (storage tank with a capacity of 50 gal or more, or pressurized water supply) connected to the sink faucet,
(3) Electronic scales of sufficient size to weigh the samples for all required materials testing, and
(4) At least six (6) electric burners to perform required aggregate testing per the Schedule of Materials Control.
(5) Metal bowls of sufficient size to perform all required material testing,
(6) If w/c incentives apply, provide a microwave oven with turntable or wave deflection fan (900 Watt), heat resistant glass pan (approx. 9"x9"x2"), plain weave fiberglass cloth (10 oz/yd^2 and 14 mills thick), metal scrapper and grinding pestle,

Do not begin concrete paving operations until the Engineer approves the combination plant lab–office. The Contract square yard [square meter] price for *Concrete Pavement* includes the cost of the plant lab-office.

A.4 Sampling and Testing

Provide a MnDOT Certified Concrete Plant Level 2 Technician to oversee testing and plant operations and to remain on-site during concrete production or have cellular phone availability.

Provide technicians with certification at least meeting MnDOT Concrete Plant Level 1 to perform all of the duties in accordance with the MnDOT Concrete Manual. The Engineer will provide technicians with certification at least meeting MnDOT Concrete Plant Level 1 to perform all of the duties in accordance with the MnDOT Concrete Manual.

Performs testing in accordance with the MnDOT Concrete Manual and determines testing rates meeting the requirements of the Schedule of Materials Control. The Engineer performs testing in accordance with the MnDOT Concrete Manual and determines testing rates meeting the requirements of the Schedule of Materials Control.

Take samples randomly using ASTM D 3665, Section 5.

Take samples in accordance with the 2011 Schedule of Materials Control except as modified in the following tables below:

<table>
<tr><th colspan="7">Concrete Pavement - Concrete Plant Production</th></tr>
<tr><th>Pay Item No.</th><th>Test Type</th><th>Spec. No.</th><th colspan="2">Producer/Contractor Testing</th><th colspan="2">Agency Testing</th><th>Form No.</th></tr>
<tr><td rowspan="3">2301</td><td rowspan="3">Gradation Testing (QC/QA) (5-694.145 and 5-694.148)</td><td rowspan="3">3126
3137</td><td colspan="2"><u>For a concrete paving batch plant:</u>

1 per 1200 m^3 (1500 yd^3) or completed 1 per ½ day, whichever results in the highest sampling rate.</td><td colspan="2">Test the first 4 QA samples of production each time the Contractor mobilizes the plant or changes aggregate sources.</td><td rowspan="3">21764 Concrete Aggregate Worksheet JMF

Well-graded Concrete Aggregate Worksheet</td></tr>
<tr><td colspan="2"><u>For a certified ready-mix plant:</u>

1 per 400 m^3 (yd^3) or completed every 4 hours, whichever results in the highest sampling rate.</td><td><u>For a concrete paving batch plant:</u>

1 per day on randomly selected samples thereafter.</td><td><u>For a certified ready-mix plant:</u>

1 per 1000 m^3 (1000 yd^3) or 1 per week, whichever results in highest sampling rate on randomly selected samples thereafter.</td></tr>
<tr><td colspan="2">Performing testing on representative material at the end of the most recent day of production is allowed.

If well-graded aggregate incentives apply: Use the Contractor's gradation results for well-graded aggregate incentive calculations as verified by Agency testing</td><td colspan="2">Identify the gradation samples with "QA Gradation" on the Sample ID Card and include the JMF Number and the QC Gradation results.

If Coarse Aggregate Quality Incentive/Disincentives apply: The Agency may also use the QA gradation sample for the Coarse Aggregate Quality incentive/disincentive testing. In this case, notify the Producer/Contractor to double the QC/QA gradation sample size.</td></tr>
</table>

Concrete Pavement - Concrete Plant Production							
Pay Item No.	**Test Type**	**Spec. No.**	**Producer/Contractor Testing**		**Agency Testing**		**Form No.**
2301	Coarse Aggregate Testing on -75 µm (#200) (QC/QA) (5-694.146)	3137	Starting on the first day of production and each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question: test the first sample and then at least 1 of the next 3 samples. 1 test per day thereafter **Test these samples at the plant.**		1 randomly selected sample on the first day of production and each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question. **Test these samples at the plant.**		21764 Concrete Aggregate Worksheet JMF
					For a concrete paving batch plant: 1 test per week thereafter	**For a certified ready-mix plant:** 1 per 1000 m^3 (1000 yd^3) or 1 per week, whichever results in highest sampling rate on randomly selected samples thereafter.	
	Aggregate Moisture Testing (QC/Verification) **(5-694.142)**		**For a concrete paving batch plant:** **If w/c incentives do not apply:** 1 per 750 m^3 (1000 yd^3) or completed every 4 hours, whichever results in the highest sampling rate.	**For a certified ready-mix plant:** **If w/c incentives do not apply:** 1 per 200 m^3 (200 yd^3) or completed every 4 hours, whichever results in the highest sampling rate	**For a concrete paving batch plant:** **If w/c incentives apply:** 1 per 750 m^3 (1000 yd^3) or completed every 4 hours, whichever results in the highest sampling rate. Take initial samples for aggregate moisture testing within the first 175 m^3 (250 yd^3).	**For a certified ready-mix plant:** **If w/c incentives apply:** 1 per 200 m^3 (200 yd^3) or completed every 4 hours, whichever results in the highest sampling rate. Take initial samples for aggregate moisture testing within the first 75 m^3 (100 yd^3).	Concrete W/C Ratio Calculation Worksheet

Concrete Pavement - Concrete Plant Production						
Pay Item No.	**Test Type**	**Spec. No.**	**Producer/Contractor Testing**	**Agency Testing**		**Form No.**
	Aggregate Moisture Testing (QC/Verification) **(5-694.142)** **CONTINUED FROM PREVIOUS PAGE**		Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed.	**If w/c incentives apply:** Use aggregate moisture results for determining the water content to calculate the w/c ratio incentive/disincentive. **Do not leave samples unattended.**		
2301	Water Content Verification Testing **(Microwave Oven Verification) (5-694.532)**	2301	Obtain the plastic concrete sample at the plant.	**If w/c incentives apply:** Microwave oven verification testing to verify the w/c ratio is completed in conjunction with Agency aggregate moisture testing. **Do not leave samples unattended.**		Concrete W/C Ratio Calculation Worksheet
				<u>For a concrete paving batch plant:</u> Take initial sample for microwave oven verification testing within the first 175 m^3 (250 yd^3). At least one additional verification test should be taken if more than 750 m^3 (1000 yd^3) is produced in a day.	**<u>For a certified ready-mix plant:</u>** Take initial sample for microwave oven verification testing within the first 75 m^3 (100 yd^3). At least one additional verification test should be taken if more than 400 m^3 (400 yd^3) is produced in a day.	

A.5 Contractor Charting

Maintain and keep control charts current. Provide and display easily readable sized charts on the testing facility wall or store in a 3-ring binder. Plot the following information on control charts using a method approved by the Engineer:

(1) Composite gradation,
(2) Air content (QC and QA),
(3) Moisture content of aggregates, and
(4) Water/cement ratio.

Also include the following information on the charts:

(1) Date,
(2) Time,
(3) Lot and sublot,
(4) Admixture dosage adjustments, and
(5) Other data necessary to facilitate control of the process.

Provide all reports, records, and diaries developed during the progress of construction activities to the Engineer. Provide all batch tickets and test results to the Engineer on a daily basis. The Engineer may suspend plant operations if the Contractor fails to provide daily test results.

A.6 MIT-SCAN T2 Non-Destructive Testing Device

The Contractor shall furnish a MIT-SCAN T2 non-destructive testing device having the ability to measure the location of concrete reinforcement, dowel bars and concrete pavement thickness in a single device. Agency and Contractor personnel shall mutually use this non-destructive testing device several times a day during concrete pavement construction. Agency observations do not relieve the Contractor of the requirement to properly place the concrete reinforcement and dowel bars as shown in the plans. In addition, the Department reserves the right to reject the pavement in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work."

The Engineer will not provide additional payment for furnishing the above equipment for the Department's use.

B Subgrade and Aggregate Base Preparations

Prepare the subgrade and aggregate base in accordance with 2112 and 2211 and the following:

Fine grade the aggregate base to the required shape and grade as shown in the plans, allowing construction of the pavement to the specified thickness and cross section as shown in the plans. Use an approved fine grading machine mounted on crawler tracks.

Shape and maintain the shoulders to allow surface water to drain away from the pavement and off the shoulders.

C Setting Forms

Provide forms meeting the following requirements and characteristics:

(1) Steel, straight edge sides,
(2) Depth equal to the specified pavement thickness,
(3) Smooth and free of localized indentations and deformities,
(4) Top face with deviations no greater than ⅛ in [3 mm] in any 10 ft [3 m] section,
(5) Faces of straight forms with deviations no greater than ¼ in [13 mm] in any 10 ft [3 m] section,
(6) Side forms containing no bends or damaged sides,
(7) Forms containing no damaged joint locks or pin pockets, and
(8) Form lengths at least 10 ft [3 m] long with horizontal joint and base width equal to the depth of the forms.

For pavements with radii no greater than 100 ft [30 m], use flexible or curved forms approved by the Engineer. Provide devices to securely set forms and withstand operation of the paving equipment without springing, settlement, or lateral displacement. Provide forms with joint locks to tightly join ends of

abutting form sections together. Connect individual form sections using methods creating a continuous form.

Set the forms to the proper alignment and grade as shown in the Plans for a distance equal to at least 3 h ahead of concrete placement.

Compact the foundation before placing the forms in accordance with 2301.3.B. Ensure the forms have a firm and uniform bearing over the entire base area, are tightly joined and securely staked, and are clean and free of accumulations of hardened concrete. Coat the contact faces of the forms with an approved form coating material in accordance with 3902 before placing the concrete.

During a rain event, remove and reset the forms as necessary to allow drainage.

D Concrete Equipment and Paving Operations

Provide self-propelled spreading and finishing machines capable of consolidating and finishing the concrete, and producing a finished surface meeting the requirements specified.

D.1 Slipform Construction

Place concrete using a slipform paver or combination of pavers designed to spread, consolidate, screed, and float-finish the freshly placed concrete with minimum hand finishing. Provide a slipform paver with a non-oscillating extrusion plate with an adjustable angle of entry.

Place the concrete pavement prior to placing curb and gutter. If the sequence of operations includes placing the curb and gutter prior to the concrete pavement, submit a jointing plan to the Engineer for approval prior to placing the curb and gutter.

Consolidate the full width and depth of concrete pavement placed by a single pass of a series of internal vibrators. Operate full-width vibrators from 3,600 VPM [60 Hz] to 7,000 VPM [117 Hz] in concrete and from 4,150 VPM [70 Hz] to 8,000 VPM [133 Hz] when checked in air. Deliver the vibrator impulses directly to the concrete and operate at an intensity to consolidate the concrete uniformly throughout the entire depth and width of the concrete. The Contractor may increase the vibrator frequency as approved by the Engineer. Perform additional testing as required by the Engineer at no additional cost to the Department. If the vibrator fails, suspend operations and remove unconsolidated concrete.

Regulate the rate of progress of the vibratory equipment and the duration of the application to fully, but not excessively, vibrate the concrete. Suspend the operation of vibrators if the forward progress of the paver stops.

Attach vibrators to spreading or finishing equipment. Do not allow vibrators to come in contact with preset dowel basket assemblies, the grade, pavement reinforcement, or side forms. Do not allow the operation of vibrators to cause separation or segregation of the mix ingredients, including the downward displacement of large aggregate or the accumulation of laitance on the concrete surface. The Contractor may reduce the vibration frequency within the specified range if reducing the forward progress of the paver to avoid segregation of the concrete mix. Connect the power to all vibrators so that they cease when the machine motion is stopped. Stop paving operations if a vibrator fails to operate within the specified range.

Provide an electronic monitoring device meeting the following characteristics and requirements to display the operating frequency of each individual internal vibrator for concrete pavement placed by the slipform method:

(1) Contains a readout display near the operator's controls; visible to the paver operator and to the Engineer,
(2) Operates continuously as the paving machine operates,

(3) Displays all the vibrator frequencies with manual and automatic sequencing for each of the individual vibrators, and

(4) Records the following at least every 25 ft [7.62 m] of paving or at least every 5 min of time:

(4.1) Clock time,

(4.2) Station location,

(4.3) Paver track speed, and

(4.4) Operating frequency of individual vibrators.

Provide an electronic copy containing the record of data after the completion of the concrete paving operation. Provide vibration data daily as directed by the Engineer.

Operate the slipform paver with a continuous forward movement, and coordinate all operations of mixing, delivering, and spreading concrete to provide uniform progress with minimal stopping and starting of the paver.

Equip the paver with automatic grade control capable of maintaining both elevation and longitudinal line as shown in the Plans at both sides of the paver, by controlling the elevation of one side and controlling the crown, or by controlling the elevation of each side independently. Achieve the grade reference by means of an erected string line.

Tightly stretch a wire or string line set parallel to the established grade for the pavement surface to achieve the grade reference. Set the control reference and support the line at intervals to maintain the established grade and alignment.

D.2 Fixed Form Construction

Place concrete using one or more machines to spread, screed and consolidate between previously set side forms. Accomplish vibration of these areas using hand held or machine mounted internal vibrators.

If not using an electronic monitoring device, use a tachometer or similar device to demonstrate to the Engineer that the paving equipment vibration meets the requirements in this section.

Use hand held vibrators to consolidate concrete adjacent to side forms and fixed structures. Operate the hand held vibrators at a speed of at least 3,600 VPM [60 Hz]. Do not allow the vibrator head to contact the joints, load transfer devices, reinforcement, grade, or side forms. If the vibrator fails, suspend operations and remove unconsolidated concrete.

Continue vibration to achieve adequate consolidation, without segregation, for the full depth and width of the area placed.

Furnish an adequate number and capacity of machines to perform the work at a rate equal to the concrete delivery rate.

Strike-off concrete with a clary screed unless otherwise allowed by the Engineer. Finish small or irregular areas that are inaccessible to finishing equipment using other methods as approved by the Engineer.

Discontinue any operation that causes displacement of the side forms from the line or grade or causes undue delay, as determined by the Engineer, due to mechanical difficulties.

E Batching and Mixing

Batch and mix the concrete in accordance with 2461 and the following:

E.1 Batching Requirements

Perform the initial spot check of the measuring equipment in accordance with the MnDOT Concrete Manual for accuracy and sensitivity before starting production operations. Provide a copy of the inspection certificate to the Engineer.

Provide to the Engineer a computerized batch ticket that includes the following:

(1) Date,
(2) State project number (SP) or (SAP),
(3) Time concrete was batched,
(4) Quantity of concrete in this load,
(5) Running total of each type of concrete, each day for each project,
(6) Mix number,
(7) Labels identifying each material that correlates with the Contractor mix design, including cementitious and admixture abbreviations or MnDOT 5 digit pit numbers),
(8) Target weight of materials,
(9) Actual batched weights of materials,
(10) Temper water, and
(11) Total water weight.

Suspend batching and mixing operations if satisfactory finishing and curing of the pavement does not occur as determined by the Engineer..

E.2 Cement Cutoff and Yield

Submit the cement records to the Engineer. Make positive cement cutoffs, except if providing cement proportioned in a certified ready-mix plant, and delivering the batch to the construction site in truck mixers, in accordance with the following:

(1) Perform individual cement cutoffs at the following intervals:
  (1.1) After using 500,000 lb [250 tonne] of cement,
  (1.2) Before using 2,000,000 lb [1,000 tonne] of cement,
  (1.3) Using at least every 3,000,000 lb [1,500 tonne] or once a week, whichever provides the longer time interval between cutoffs.
(2) If delivering bulk cement directly to the concrete batching plant in railroad cars or sealed transport trucks, submit copies of the freight bills to the Engineer on the same day received from the transporting company.
(3) Advise the Engineer of the method and schedule of cement unloading. Do not unload cement until the Engineer approves the operation.

The Engineer will verify the following:

(1) Individual cutoffs do not show an underrun in cement usage greater than 1.5 percent of the quantity specified, and
(2) The final cutoff does not show an overall underrun greater than 1.0 percent.
(3) If either one or both of these limitations are exceeded, the Engineer will not pay for the concrete represented at the Contract unit bid prices.

The Engineer may reject defective concrete in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work," or the Department may pay for the defective concrete at an adjusted unit price at the same ratio to the Contract unit price as the quantity of cement used to the quantity of cement required less the allowable underrun. If the cement exceeds the limitations for individual cutoff and final cutoff, the Department may apply the price adjustment to the cutoff value that produces the greatest monetary deduction.

F Placing Concrete

Dump or discharge concrete without causing grade displacement or damage to the existing asphalt or bond breaker layer. Repair damage to the grade, existing asphalt, or bond breaker layer as approved by the Engineer, at no cost to the Department. Provide protection for turning concrete trucks.

Maintain the grade in a moist condition until placement of concrete.

Construct mainline pavement in a single layer of concrete. Place the concrete pavement in one complete pass of the paving machine to minimize the need for hand finishing.

Coordinate paving operations for mixing, delivering, spreading, and extruding the concrete to provide uniform progress of the paver. Use sufficient trucks to ensure a steady forward progress of the paver. If the forward movement of the paver stops for a period long enough to create a cold joint or honeycombing, construct a header joint in accordance with 2301.3.H.3.

Do not add water to the surface of the concrete to aid in finishing without the approval of the Engineer.

When placing concrete on asphalt or asphalt bond breakers comply with the following:

(1) Do not place concrete on an asphalt surface with an asphalt surface temperature greater than 120° F [50° C].
(2) Maintain the asphalt surface in a moist condition as necessary and at a surface temperature not greater than 120° F [50° C] before placing the concrete.
(3) The Engineer will allow the Contractor to apply water and/or a whitewash of hydrated lime and water to cool the asphalt surface or other methods allowed by the Engineer.
(4) Before placing concrete on a milled asphalt surface, clean the milled surface by sweeping, and patch as shown in the Plans in accordance with 2231or as required by the Engineer.

When placing concrete adjacent to in-place concrete pavement, protect the following:

(1) All ends of transverse joints 3/16 in [5 mm] or wider to the satisfaction of the Engineer. The Engineer will allow sawing through the existing joint when sawing the newly placed concrete, and
(2) The in-place pavement to prevent damage.

Do not allow the edges of the pavement, including longitudinal joints, to deviate from the line shown on the Plans by greater than ½ in [13 mm] at any point.

Set manhole and catch basin frames or rings to the required elevation during the paving operations.

F.1 Consistency

For slipform concrete pavement placement, place the concrete with a slump value that optimizes placement, except ensure the concrete does not slough or slump and is adequately consolidated and meets all other requirements. Maintain the concrete at a uniform consistency. The Engineer will not allow an edge slump greater than ⅛ in [3 mm] or irregular edge alignment.

For fixed form placement, place the concrete with a slump no greater than the maximum allowable slump in accordance with 2461.4A4a.

F.2 Air Content

Maintain the air content of Type 3 paving concrete at the specified target of 7.0 percent ±1.5 percent of the measured volume of the plastic concrete in accordance 1503.

Make any adjustments immediately to maintain the desired air content.

Measure the air content after placement on the grade but before consolidation.

If using the slipform paving method, establish an air loss correction factor (ACF) to determine the air content after consolidation once per half day of paving. Apply the ACF to tests taken before consolidation to estimate the air content after consolidation. Place concrete with an air content of at least 5.0 percent after consolidation.

Take the following actions for the following air content test results with the ACF applied or a test taken after consolidation:

(1) A single test (QC or QA) from 5.0 percent to 5.5 percent, adjust the mix design to obtain an air content greater than 5.5 percent without stopping production,

(2) Two consecutive tests (QC or QA) from 5.0 percent to 5.5 percent, make immediate adjustments to obtain an air content greater than 5.5 percent or stop production. Test every truck until the air content test results meet the requirements. Test at least three additional trucks after obtaining the correct air content.

(3) Any test (QC or QA) less than 5.0 percent, make immediate adjustments to obtain an air content greater than 5.5 percent or stop production. Test every truck until the air content meets the requirements. Test at least three additional trucks to ensure the concrete remains within compliance. Perform additional testing on the hardened concrete as required by the Engineer in conjunction with the Concrete Engineer.

F.2.a Non-Conforming Material

Only place Type 3 concrete meeting the air content requirements in the work. If the Contractor places Type 3 concrete not meeting the air content requirements into the work, the Engineer will not accept nonconforming concrete at the Contract unit price. For concrete not meeting the required air content, the Engineer will make determinations regarding the disposition, payment, or removal. The Department will adjust the Contract unit price for the Contract pay item of the concrete in accordance with Table 2301-12. When there is not a separate Structural Concrete bid price for an item of work, the Department will reduce payment based on a concrete price of $60.00 per cu. yd [$78.00 per cu. m] or the Contractor-provided invoice amount for the concrete in question, whichever is less.

Table 2301-12 Paving Concrete	
Air Content Before Consolidation, %	**Adjusted Contract Unit Price**
>10.5	The Department will pay 75 percent of the Contract unit price for the concrete represented and placed as approved by the Engineer.
>8.5 – ≤10.5	The Department will pay 95 percent of the Contract unit price for the concrete represented and placed as approved by the Engineer
5.5 – 8.5	The Department will pay 100 percent of the Contract unit price for the concrete represented and placed as approved by the Engineer
>4.5 – <5.5	The Department will pay 75 percent of the Contract unit price for the concrete represented and placed as approved by the Engineer
>4.0 – ≤4.5	The Department will pay 25 percent of the Contract unit price for the concrete represented and placed as approved by the Engineer. If the Engineer, in conjunction with the Concrete Engineer, determines the surface is exposed to freeze-thaw cycling, coat the concrete with an approved epoxy penetrant sealer from the MnDOT Approved Products list.
≤ 4.0	Remove and replace concrete in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work" as directed by the Engineer. If the Engineer, in conjunction with the Concrete Engineer, determines the concrete can remain place, the Engineer will not pay for the concrete and if the Engineer determines the surface is exposed to salt-brine freeze-thaw cycling, coat with an approved epoxy penetrant sealer from the MnDOT Approved Products list.

G Placing Reinforcement

Provide and place reinforcement meeting the following requirements and characteristics:

(1) Provide epoxy coated reinforcement in accordance with 2472.
(2) Provide and place reinforcement bars including keyway bars, tie bars, taper steel, and stopper bars.
(3) Place keyways as shown on the plans.
(4) Provide and place supplemental pavement reinforcement as shown on the plans.
(5) Provide and place reinforcement bars on chairs, in stakes, utilizing tie bar basket assemblies or by appropriate equipment for depressing the bars to the specified location.
(6) For slipform paving, stake the tie bar steel to the roadbed, or use a mechanical device attached to the spreader or paver to place tie bar steel required for L1T joints as shown on the plans. Space and depress the tie bar steel to the desired depth and location as shown on the plans. Do not place tie bars over a dowel bar assembly.

H Joint Construction

Unless otherwise shown on the plans, construct all joints perpendicular to the grade. Place dowel bars parallel to the grade and parallel to the centerline of the pavement.

H.1 Dowel Bar Placement

Provide dowel bar assemblies manufactured in single units for the lane widths as shown on the plans, unless otherwise approved by the Engineer. Do not use more than two assembled sections in any one joint for ramps, loops, and tapered sections.

Secure the dowel bar assemblies to prevent movement during concrete placement in accordance with MnDOT Standard Plate 1103 and the following:

(1) If placing dowel bar assemblies on asphalt or asphalt bond breaker layers, secure the assemblies with at least seven anchorage points. Place four of the anchorage points on the assembly side facing the front of the paver. Fasten the assemblies in accordance with the following:
   (1.1) Place pins or fasteners of sufficient length and shank diameter of at least 0.177 in [0.45 cm] to penetrate through the asphalt bond breaker layer and into the concrete at least 1 in [25 mm] or at least 2 in [50 mm] into the in-place asphalt layer,
   (1.2) Before paving, demonstrate the fastening method to the Engineer for approval.

Within 1 h before covering with concrete, coat the dowel bars with a thin uniform coating of an approved form coating material in accordance with 3902 and listed on the MnDOT Approved Products List.

Before placing the concrete, mark the location on both sides of each transverse joint as approved by the Engineer. Transfer the markings to the fresh concrete immediately after completing the final finishing operations.

The Contractor may use a mechanical dowel bar inserter to place dowel bars in the pavement as approved by the Engineer, in conjunction with the Concrete Engineer. Immediately before inserting the dowels, coat the dowels with a thin uniform coating of an approved form coating material in accordance with 3902 and listed on the MnDOT Approved Products List. If using a dowel bar inserter, initially and on each production day, demonstrate to the Engineer that the inserted dowel bars in the completed concrete pavement are parallel to the surface and centerline slab and are located at mid depth of the slab thickness.

H.1.a Quality Control Plan for Dowel Basket Assemblies

Provide a Quality Control Plan in writing to the Engineer for acceptance that provides a method for keeping the dowel basket assemblies anchored to the existing asphalt or bond breaker layer and into the underlying concrete. The Quality Control Plan shall include the following at a minimum:

(1) Proposed type and number of fasteners
(2) Dowel basket assembly anchoring plan (ie. Anchored all basket assemblies prior to concrete placement, one lane at a time, anchor all basket assemblies during the concrete placement operation, etc.)
(3) Procedure if assemblies do not hold with the proposed method
(4) Sampling rate for locating basket assemblies with the MIT-SCAN T2

H.2 Joint Establishment

Space contraction joints at the intervals shown on the plans, except shorten the spacing at the following to provide panel lengths at least 5 ft [1.5 m]:

(1) Adjacent to header joints,
(2) Reinforced panels,
(3) Railroad grade crossings, and
(4) Free ends of pavement.

Provide either wet-cut saws referred to as "conventional concrete saws" or lighter weight dry-cut saws referred to as "early-entry concrete saws" capable of establishing joints sooner than the conventional saws.

Provide initial joint sawing as shown on the plans. Perform the initial sawing as soon as the concrete will support the joint sawing operation without raveling and before random cracking occurs.

Immediately after completing the joint sawing, use water under nozzle pressure to remove the sawing residue from each joint and the pavement surface.

If widening is necessary, do not widen the joints to full width until the concrete is at least 24 h old or longer if the sawing causes raveling of the concrete.

Stake preformed joint filler material for expansion joints in place to maintain proper position as shown on the Plans during concrete placement.

Extend transverse joints constructed in the pavement through the integrant curb.

H.3 Constructing Headers

Construct construction headers, temporary headers, and permanent headers as shown on the plans.

The Engineer will not allow incorporating any concrete accumulated in the grout box of the paver into the pavement. Construct all headers such that the concrete contained in the grout box is removed from the Project. Use any approved construction header method as shown in the Standard Details.

Use internal vibration to consolidate the concrete along header joints before final finishing.

I Surface Finishing

Use a ⅜ in [10 mm] radius edging tool to finish edges of the pavement.

After consolidating, screeding, and floating the concrete, give the pavement surface a final finish texture in accordance with 2301.3.I.1, "Pavement Texture" unless 2301.3.I.2, "Pavement Tining" is required in the Contract.

I.1 Pavement Texture

Test the adequacy of the pavement skid resistance meeting the requirements of ASTM E 965-87, "Test Method for Measuring Surface Macrotexture Depth Using a Sand Volumetric Technique." Provide a texture depth of at least $^{1}/_{25}$ in [1.00 mm].

The Department defines a lot as pavement of a single lane. Establish a separate lot for each lane on the Project.

The Department defines a sublot as the rate at which an individual measurement is taken over a given length. The Department considers a sublot as one lane wide, measured in accordance with the following:

(1) From the pavement edge to the adjacent longitudinal joint,
(2) From one longitudinal joint to the next, or
(3) In the absence of a longitudinal joint, between pavement edges.
(4) Each ramp and loop 18' (5.5 m) wide or less is considered a single lane.

The Engineer will break lots into sublots representing 1,000 linear ft [300 m] of pavement. Test the pavement surface at a point located transversely in the outside wheel path as determined by the Engineer. Test adjoining driving lanes at the same location. The Engineer will determine the locations using a random number multiplied by length of the sublot. If the Project or individual lane results in less

than three sublots, the Engineer will divide the Project or individual lane lot into three sublots of equal length.

Complete surface texture testing no later than 24 hours after pavement placement unless otherwise approved by the Engineer. Refer to Table 2301-13for the acceptance criteria of texture depths below the specification limits.

Table 2301-13
Pavement Texture Depth

Texture Depth Test Results for Individual Tests	Acceptance Criteria
< $^{1}/_{25}$ in to ≥ $^{1}/_{32}$ in [< 1.00 mm to ≥ 0.80 mm]	The Engineer will accept the work if the Contractor amends the operation to achieve the required depth of at least $^{1}/_{25}$ in [1.00 mm] as approved by the Engineer. If the Contractor fails to correct the operation, the Engineer will suspend the paving operation until corrections produce the required results.
< $^{1}/_{32}$ in [< 0.80 mm]	Perform concrete grinding of the pavement represented by this test to attain the necessary texture of $^{1}/_{25}$ in [1.00 mm] as required by the Engineer.

Run additional tests at 100 ft [30 m] intervals before and after the failing test location to determine the limits of any individual failing test.

I.2 Pavement Tining

Pull a carpet drag longitudinally along the pavement before the concrete attains its initial set to obtain the final finish. Mount the drag on a bridge. Provide a drag with the following dimensions:

(1) As wide as the concrete placed, and
(2) Longitudinal length with sufficient surface contact to produce a texture approved by the Engineer.

Provide an artificial grass type carpeting for the carpet drag meeting the following characteristics and requirements:

(1) Molded polyethylene pile face,
(2) Blade length from ⅝ in to 1 in [15 mm to 25 mm], and
(3) Total weight of at least 70 oz per sq. yd [2.35 kg per sq. m].

Provide a backing made of a strong, durable material not subject to rot with the backing adequately bonded to the facing to withstand the specified use.

Immediately after carpet dragging the pavement surface, use a mechanized device providing a randomized tine spacing from ⅝ in to 1 in [16 mm to 26 mm] to apply a transverse metal-tine texture to the pavement meeting the following dimensions:

(1) Width from ½ in to ⅛ in [2 mm to 3 mm] and
(2) Depth from ⅛ in to $^{5}/_{16}$ in [3 mm to 8 mm].

Do not dislodge coarse aggregate particles. The Contractor may use manual methods to achieve similar results on ramps and other locations as approved by the Engineer. The Contractor may use other texturing equipment to obtain an equivalent texture as approved by the Engineer.

The Engineer will not require metal-tine texturing on subsidiary paving areas such as cross-overs and parking lanes exempted by the Engineer, or on areas with speed limits no greater than 35 mph [55 km/h] as specifically exempted by the Contract or the Engineer.

J Concrete Curing and Protection

After completing final finishing operations, cure all exposed concrete surfaces. Use one of the following curing methods:

(1) Place the membrane curing compound conforming to 3754 or 3755 within 30 minutes of concrete placement or once the bleed water has dissipated unless otherwise directed by the Engineer in accordance with 2301.3.J.1.a. Place the membrane curing compound on the edges within 30 minutes after permanent removal of the forms or curing blankets unless otherwise specified in the Contract.

(2) Place plastic curing blankets or completely saturated burlap curing blankets as soon as practical without marring the surface in accordance with 2301.3.J.1.b..

Whenever weather conditions are such as to cause unusual or adverse placing and finishing conditions or equipment failures occur, expedite the application of a curing method or temporarily suspend the mixing and placing operations, as the conditions require.

If necessary to remove the coverings to saw joints or perform other required work, and if the Engineer approves, remove the covering for the minimum time required to complete that work.

Failure to comply with the above provisions will result in the Engineer, in conjunction with the Concrete Engineer, applying a monetary deduction in accordance with 1503. When there is not a separate Structural Concrete bid price for an item of work, the Department will apply a monetary deduction of $30.00 per cu. yd [$39.00 per cu. m] or 50% of the Contractor-provided invoice amount for the concrete in question, whichever is less.

J.1 Curing Methods

J.1.a Membrane Curing Method

Before application, agitate the curing compound as received in the shipping container to obtain a homogenous mixture. Protect membrane curing compounds from freezing before application. Handle and apply the membrane curing compound in accordance with the manufacturer's recommendations.

Apply the curing compound in accordance with the following:

(1) At a rate of 1 gal per 150 sq. ft (1 L per 4 m^2) of surface curing area.

(2) Apply curing compound homogeneously to provide a uniform, solid, white opaque coverage on all exposed concrete surfaces (equal to a white sheet of typing paper). If using a Department - approved curing compound with a non-white base color, apply the compound to provide a uniform, solid, opaque consistency meeting the intent of the requirement in this section.

(3) If the curing compound is damaged during the curing period, immediately repair the damaged area by re-spraying.

(4) If the Engineer determines that the initial or corrective spraying result in unsatisfactory curing, the Engineer may require the Contractor to use the blanket curing method at no additional cost to the Department.

Use the fully-automatic, self-propelled mechanical power sprayer approved by the Engineer to apply the curing compound in accordance with the following:

(1) Operate the equipment to direct the curing compound to the surface from two different lateral directions,
(2) Do not allow the sprayer to ride on the pavement surface,
(3) Ensure the sprayer covers the entire lane width and atomizes the curing compound, and
(4) If puddling, dripping, or non-uniform application occurs, suspend the operation to perform corrections as approved by the Engineer.

Use a fully-automatic, self-propelled mechanical power sprayer equipped with the following to apply curing compound as approved by the Engineer:

(1) A re-circulating bypass system that provides for continuous agitation of the reservoir material,
(2) Separate filters for the hose and nozzle,
(3) Check valve nozzles,
(4) Multiple or adjustable nozzle system that provides for variable spray patterns,
(5) A shield to control loss of material by wind action, and
(6) A spray bar drive system that operates independently of the wheels or track drive system.

The Engineer will permit an airless spraying machine for applying the curing compound on pavements that are 10 feet (**3 m**) or less in width and irregular shaped surfaces that comply with the following:

(1) A re-circulating bypass system that provides for continuous agitation of the reservoir material,
(2) Separate filters for the hose and nozzle, and
(3) Multiple or adjustable nozzle system that provides for variable spray patterns.

J.1.b Blanket Curing Method

After completion of the finishing operations and without marring the concrete, cover the concrete with curing blankets. Install in a manner that envelops the exposed concrete and prevents loss of water vapor. After the concrete has cured, apply membrane curing compound to the concrete surfaces that will remain exposed in the completed work.

J.2 Protection Against Rain

Protect the concrete from damage due to rain. Have available, near the site of the work, materials for protection of the edges and surface of concrete. Should any damage result, the Engineer will suspend operations until corrective action is taken and may subject the rain-damaged concrete to 1503 and 1512.

J.3 Protection Against Cold Weather

If the national weather service forecast for the construction area predicts air temperatures of 36 °F [1 °C] or less within the next 24 h and the Contractor wishes to place concrete, submit a cold weather protection plan.

Protect the concrete from damage including freezing due to cold weather. Should any damage result, the Engineer will suspend operations until corrective action is taken and may subject the damaged concrete to 1503 and 1512.

J.3.a Cold Weather Protection Plan

Submit a proposed time schedule and Plans for cold weather protection of concrete in writing to the Engineer for acceptance that provides provisions for adequately protecting the concrete during

placement and curing. Do not place concrete until the Engineer accepts the Contractor's cold weather protection plans.

J.4 Vibratory and Backfilling Protection

Protect newly placed concrete from damage by adjacent vibratory or backfilling operations for a minimum of 24 hours. Resume vibratory and backfilling operations after the concrete has reached a minimum compressive strength of 2000 psi [13.7 MPa] or a flexural strength of 250 psi [1.7 MPa]. Cast concrete control specimens in accordance with 2461.4A5. The Engineer will test the control specimens. If the Engineer discovers evidence of damaged concrete, the Engineer will suspend work until the Contractor corrects the work. The Engineer may reject damaged concrete in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work."

The Contractor may use hand operated concrete consolidation equipment, walk behind vibratory plate compactors, rollers in "static" mode, and fine grading machines 24 h after placing the concrete, and other equipment as approved by the Engineer in conjunction with the Concrete Engineer.

K Removal of Forms

Do not remove side forms of pavement and back forms on integrant curb earlier than 12 h after placing the concrete, unless otherwise approved by the Engineer. Remove forms without exerting shock or strain, including temperature variations, on the pavement or curb. Cure concrete in accordance with 2301.3.J.1.a.

L Joint Sealing

Provide an approved sealant in accordance with 3725 and listed on the MnDOT Approved Products List, unless the type of sealant for contraction joints is otherwise specified in the Contract.

Do not seal joints with silicone in accordance with 3722 if the concrete mixture contains Class B coarse aggregate as defined in 3137.

Perform joint sealing as shown on the Plans and in accordance with the following:

(1) Seal joints after the Engineer inspects and approves the joints,
(2) Perform joint sealing on surface dry concrete after cleaning the joints of debris, dirt, dust, and other foreign matter, including accumulations of concrete,
(3) Lightly sandblast the joint walls before final compressed air cleaning,
(4) Immediately before sealing the joints, clean the joints with a jet of compressed air under pressure of at least 85 psi [580 kPa],
(5) Seal transverse integrant curb joints with the same joint sealer used to seal the pavement joints,
(6) Seal joints in accordance with the tolerances shown on the plans,
(7) Provide backer rod material compatible with the sealer as shown on the plans, and
(8) Remove and replace sealer at joints filled above the permissible level as shown on the Plans at no additional cost to the Department.

Handle and place joint sealer material as recommended by the manufacturer and in accordance with the following requirements:

L.1 Hot Poured Sealers

Heat hot poured sealers in a double-boiler type kettle or melter. Fill the space between inner and outer shells with oil or other material as allowed by the Manufacturer. Provide heating equipment with automatic temperature control, mechanical agitation, and recirculating pump. Use heating equipment as

recommended by the manufacturer of the sealer material. Do not melt quantities of sealer material greater than the quantity used within the same day. After heating the sealer material to the application temperature, maintain the material temperature until placement. Place the sealer material within 4 h after the initial heating to the application temperature.

Apply sealant to the pavement at ambient pavement temperatures greater than 39° F [4° C].

L.2 Silicone Sealers

Install silicone sealers as recommended by the manufacturer.

L.3 Preformed Sealers

Provide preformed seals in one continuous length for each joint, except the Contractor may use butt splices in transverse joints at longitudinal joints.

Do not stretch the preformed sealer material in the installation process by greater than 5 percent of the joint length.

M Workmanship and Quality

M.1 Defective Pavement

The Department will pay for concrete pavement meeting the requirements and tolerances in accordance with this section at the Contract unit price. Pavement that fails to meet the minimum requirements when tested in the prescribed manner is considered defective. The Department may reject or adjust the payment for defective concrete pavement in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work."

The Engineer will determine the limits of each individual defective pavement area. If adjusting the price for defective payment, the Engineer will measure the area to the nearest whole square yard [square meter], except the Engineer will consider areas less than 1 sq. yd [1 sq. m] as 1 sq. yd [1 sq. m]. The Engineer will determine the condition of each individual defective area of pavement based on the calculation of greatest deficiency within that area.

M.2 Random or Uncontrolled Cracking

Repair or replace pavement with random or uncontrolled cracks as directed by the Engineer. If repairing the pavement as directed by the Engineer, use a dowel bar load transfer technique in accordance with the Department's Concrete Pavement Rehabilitation Details on the Department's website. Submit the intended repair technique to the Engineer for approval. Perform pavement repairs at no additional cost to the Department. If the repair fails, replace the pavement at no additional cost to the Department. The Engineer will accept repairs in accordance with 1516, "Acceptance of Work."

M.3 Pavement Smoothness – IRI (International Roughness Index)

Provide concrete pavement smoothness in accordance with 2399.

N Thickness Requirements

Provide pavement with a finished pavement thickness as shown on the Plans or as modified, in writing, by the Engineer.

N.1 Procedure

Construct pavement to the thickness shown on the plans. On each Project and on each roadbed of a divided highway, evaluate pavement thickness in accordance with the following:

(1) Contractor Quality Control Probing (QCP),
(2) Probe Verification Core (PVC), and
(3) Quality Acceptance Core (QAC).

The Department defines plan thickness lot (PTL) as concrete pavement of the same thickness added together lineally. Establish a separate PTL for each concrete plan thickness on the Project.

The Department defines a sublot as the rate at which an individual measurement is taken over a given length. The Department considers a sublot as one lane wide, measured in accordance with the following:

(1) From the pavement edge to the adjacent longitudinal joint,
(2) From one longitudinal joint to the next, or
(3) In the absence of a longitudinal joint, between pavement edges.
(4) Each ramp and loop 18ft (5.5 m) wide or less is considered a single lane.

The Engineer will divide the PTL into sublots of 4,000 lineal lane ft [3,300 lineal lane m] to determine the QCP, PVC, and QAC locations. The Engineer will add partial sublots less than 2,000 ft [1,650m] to the previous lot. The Engineer will consider partial sublots equal to or greater than 2,000 lineal lane ft [1,650 lineal lane m] as individual sublots. If the PTL for the entire Project is less than 4,000 lineal lane ft [3,300 lineal lane m] the Engineer will consider the PTL as an individual sublot.

The Engineer will identify the QCP, PVC, and QAC thickness measurement locations in accordance with the following:

(1) Determine the longitudinal locations using random numbers multiplied by length of the sublot.
(2) Determine the transverse offset locations using a random number multiplied by the width of the traffic lane, ramp, or loop at the determined longitudinal location.
(3) Adjust the location to ensure the Contractor takes no measurements within 1 ft [0.3 m] of the pavement edge and takes no measurements within 2 ft [0.60 m] of any transverse or longitudinal joint or other obstructions.

N.2 Contractor Quality Control Probing (QCP)

Measure the pavement thickness of freshly finished concrete pavement at a rate of at least four QCP measurements per sublot. Notify the Engineer before performing probing thickness measurements in the plastic concrete so they may inspect or observe the Contractor's QCP tests during the paving operations.

Provide daily summary reports listing the results of the day's QCP thickness measurements and additional probing results to the Engineer.

N.3 Contractor QCP Probing Equipment and Probing Method

Provide the following equipment as approved by the Engineer to perform QCP probing:

(1) Probing rod meeting the following characteristics and requirements:
  (1.1) Non-flexing,
  (1.2) Length capable of completely penetrating the pavement for measuring,
  (1.3) Utilizes a circular or square top plate,

(1.4) Contains a centrally located hole in the top plate with a diameter allowing for easy maneuvering along the length of the probing rod, and
(1.5) Fitted with a locking device fixing the angle between the top plate and the probing rod at 90 degrees when locked.

(2) Base plate meeting the following characteristics and requirements:
(2.1) 10.5 in [267 mm] square 26 gage galvanized steel plates or 11.8 in [295 mm] diameter 28 gage high strength steel circular plates or,
(2.2) Rigid when in place, allowing the probing rod to be pushed against it without flexing, and

(3) Work bridge meeting the following characteristics and requirements:
(3.1) Spans the full width of the freshly laid concrete,
(3.2) Supports a person, and
(3.3) Height above the concrete allows for the use of the probing device.

(4) Tape measure accurate to nearest ⅛ in [even mm] and with a length capable of measuring the depth of penetration of the probing device into the plastic concrete pavement.

Perform probing in accordance with the following:

(1) Place the base plates at the randomly selected locations and anchor the plates to prevent movement during concrete placement. Mark the locations of the base plates to ensure ease of locating the plates after the paver has passed,
(2) Position the bridge at the selected locations to reach and locate each point,
(3) Assemble the probing device. Keeping the probing rod perpendicular to the pavement surface, insert the rod into the plastic concrete until the rod strikes the base plate,
(4) Slide the top plate down the probing rod until it contacts the pavement surface, then lock to the probing rod,
(5) Withdraw the probing device, and
(6) Measure the length of the probing rod inserted into the plastic concrete from the underside of the top plate to the end of the probing rod. Record this measurement to the nearest ⅛ in [even mm].

N.4 Quality Acceptance Testing – Coring

The Engineer will measure the pavement thickness of concrete for each sublot in accordance with the following:

(1) Probe Verification Core (PVC), and
(2) Quality Acceptance Core (QAC).

The Engineer will mark one of every four QCP measurement locations per sublot for a PVC. The Engineer will mark one QAC per sublot. The Contractor will core at the designated PVC and QAC locations.

N.5 PVC and QAC Coring Method

(1) Begin coring on concrete older than 7 days, when the control beams attain a flexural strength in accordance with Table 2301-1, or when the control cylinders attain a compressive strength of 3,000 psi [20.6 MPa]. Use 3U18 concrete or another concrete mix approved by the Engineer to fill the core holes within 72 h of coring at no additional cost to the Department. Provide traffic control for coring;
(2) Cut 4 in [100 mm] nominal diameter cores at marked locations. Lay the cores next to the holes in a curing condition. Protect the cores. Do not submit cores out of round, not perpendicular, or containing ridges;
(3) The Engineer will field measure the core thickness to the nearest ⅛ in [even mm], verify (Field ID Number) the cores, and record the field measurement on MnDOT Form 24327,

"Field Core Report" or a computerized spreadsheet available on the MnDOT Concrete Engineering website;

(4) Pick up the cores, accompanied by the Engineer. Store the cores in a water tank heated from 60° F to 80° F [15° C to 25° C] at the Department field office. The Engineer will not require the storage of cores in a curing condition for concrete older than 28 days;

(5) The Engineer will transport the cores in a curing condition, unless older than 28 days, to the MnDOT Office of Materials and Road Research; and

(6) The MnDOT Office of Materials and Road Research will determine the pavement thickness by measuring the length of the PVC and QAC cores in accordance with the procedure on file at the MnDOT Office of Materials and Road Research. Following this procedure, the MnDOT Office of Materials and Road Research will use nine probes interconnected in a hydraulic linkage to obtain the average length of the core in one operation. The MnDOT Office of Materials and Road Research will record the core length to the nearest 0.05 in [1 mm].

N.6 Non-conforming thickness

The Department will base acceptance of the pavement thickness and price adjustment for deficient thickness on the combination of both lab measured PVC and QAC coring.

The Department defines the tolerance limit for pavement thickness as the plan thickness lot (PTL) minus ½ in [13 mm]. If the QCP measurement shows a thickness deficiency greater than PTL minus ½ in [13 mm], take a core at the location of the deficient QCP. If any core thickness measurement (PVC or QAC) shows a thickness deficiency greater than PTL minus ½ in [13 mm], consider the pavement defective and take exploratory cores as directed by the Engineer.

The Department defines the defective pavement area as the entire area surrounding the deficient core within a traffic lane and between acceptable cores. The Department considers the pavement acceptable in the remaining areas as the increment where the cores show a thickness deficiency no greater than PTL minus ½ in [13 mm].

Take the first exploratory cores at any location within 10 ft [5 m] on each side of the deficient thickness location and at the same distance from the pavement centerline. Take an additional exploratory core in the adjacent traffic lane if the concrete was placed in the same operation. If the length of each of the first exploratory cores is at least equal to the PTL minus ½ in [13 mm], the Engineer will not require additional cores from this location. If any cores do not fall within the PTL minus ½ in [13 mm], take additional exploratory cores at 25 ft [10 m] intervals and at the same distance from the pavement centerline in the same lane as the original thickness measurement, as directed by the Engineer. Perform coring in the direction of the deficiency until obtaining a core with a length at least equal to the PTL minus ½ in [13 mm]. The Engineer will use exploratory cores to determine the extent of deficient pavement thickness for adjusting the unit bid price or requiring pavement removal and replacement.

For cores showing a pavement thickness greater than the PTL minus ½ in [13 mm] to 1 in [25 mm], the Contractor may choose one of the following:

(1) Remove and replace the defective pavement area, or

(2) Leave the pavement in place with a monetary deduction of $20 per sq. yd [$25 per sq. m] for the defective pavement area, as approved by the Engineer.

For cores showing a pavement thickness greater than PTL minus 1 in [25 mm], the Engineer, in conjunction with the Concrete Engineer, will determine whether the Contractor will remove and replace concrete pavement or leave the pavement in place at no cost to the Department and apply a monetary deduction of $20 per sq. yd [$25 per sq. m] for the defective pavement area in accordance with 1503.

The Engineer will use the PVC and QAC cores to determine the final average plan thickness lot (PTL), except for the following:

(1) If exploratory cores are taken to identify the defective pavement area, substitute the two outside exploratory cores that are within PTL minus ½ in [13 mm] for the deficient PVC or QAC.

(2) If the length of a PVC or QAC exceeds the by PTL plus 0.30 in [8 mm], the Engineer will limit the core length to the PTL plus 0.30 in [8 mm].

The Engineer will consider the pavement thickness as conforming provided the deficiency of the final average PTL does not exceed PTL minus 0.10 in [3 mm]. If the final average PTL is deficient by more than the PTL minus 0.10 in [3 mm], the Department will pay for the pavement in the PTL at the Contract unit price less the following monetary deductions in accordance with 1503 and Table 2301-14, excluding areas of defective pavement.

Table 2301-14
Deductions for Thickness Deficiencies

Thickness Deficiency Exceeding Permissible Deviations, *in [mm]*	**Adjusted unit bid price per sq. yd [sq. m] of Payment**
0.00 – ≤ 0.10 [≤ 3]	None (tolerance)
0.10 – ≤ 0.20 [3 – ≤ 5]	$0.20 [$0.25]
0.20 – ≤ 0.30 [5 – ≤ 8]	$0.40 [$0.50]
0.30 – ≤ 0.40 [8 – ≤ 10]	$0.70 [$0.90]
0.40 – ≤ 0.50 [10 – ≤ 13]	$1.00 [$1.25]
0.50 – ≤ 1.00 [13 – ≤ 25]*	$20.00 [$25.00]
* Perform exploratory coring as required by the Engineer.	

After Department thickness verification, the Department will test all of the cores for compressive strength at 60 days of age. The Department will test three of the cores from the entire Project for rapid chloride permeability (RCP) in lieu of compressive strength testing for information only.

O Opening Pavement to Traffic

Do not open a new pavement slab to general public traffic or operate paving or other heavy equipment on it until the concrete has attained an age of 7 days, or has reached a minimum flexural strength meeting the requirements of Table 2301-15 or minimum compressive strength of 3000 psi (**20.6 Mpa**), as approved by the Engineer. If the pavement joints are widened, seal the joints before operating paving or other heavy equipment and general public traffic on the pavement.

Cast the control specimens in accordance with 2461.4A5. Cure the control specimens in the same manner and under the same conditions as the pavement represented. The Engineer will test the control specimens in accordance with 2461.4A5.

Table 2301-15
Minimum Strength Requirements for Opening Pavements to Construction and to General Public Traffic

Slab Thickness, *in [mm]*	**Flexural Strength, *psi [Mpa]***
≤7.0 [175]	500 [3.4]
7.5 [190]	480 [3.3]
8.0 [200]	460 [3.2]
8.5 [215]	440 [3.0]
9.0 [225]	390 [2.7]
≥ 9.5 [240]	350 [2.4]

Perform operations on new pavement as approved by the Engineer and in accordance with the following:

(1) Construct a ramp to prevent damage to the pavement slab when moving on and off the pavement,
(2) Operate the paving equipment on protective mats to prevent damage to the pavement surface and joints. Sweep the pavement surface free of debris before placing the protective mats, and
(3) Operate equipment on a slab without causing damage. If damage results, suspend operations and take corrective action as approved by the Engineer. Do not operate the equipment wheels or tracks within 4 in [100 mm] of the slab edge.

2301.4 METHOD OF MEASUREMENT

A Concrete Pavement

If the Contract includes the Contract item *Concrete Pavement*, the Engineer will measure in accordance with the following:

(1) Measure the concrete pavement placed to a uniform cross-section thickness by the surface area of the pavement as constructed, including integrant curb;
(2) Verify the pavement thickness based on the final measurement of cores;
(3) Include measurements for concrete pavement without regard to grade, strength, or type of concrete, width, or thickness of the pavement in a single measurement, except if the Plans include a Contract item for high-early strength concrete; and
(4) Apply incentive or disincentive for *Concrete Pavement* based on the theoretical volume of concrete used, by multiplying the measured square yard [square meter] of concrete by the thickness shown on the plans.

B Place Concrete Pavement

If the Contract includes the Contract item *Place Concrete Pavement*, the Engineer will measure in accordance with the following:

(1) Measure concrete pavement placed to a variable cross-section thickness by area based on specified dimensions, including integrant curb. This measurement will represent the surface area of the pavement as constructed; and
(2) Verify the pavement thickness based on the lab measured cores.

B.1 Structural Concrete

If the Contract includes the Contract item *Structural Concrete*, the Engineer will measure in accordance with the following:

(1) Measure structural concrete placed to a variable cross-section thickness by volume;
(2) Verify the volume measurements from the computerized batch ticket printouts from the plant, as verified by cement cutoffs and the consideration of any waste;
(3) Include the volume of all specified concrete pavements into a single item without regard to grade, strength, width, or thickness of the concrete pavement, except if the Plans include a Contract item for high-early strength concrete, and
(4) Apply incentives or disincentives for *Structural Concrete* based on the cubic yard [cubic meter].

C Supplemental Pavement Reinforcement

The Engineer will measure supplemental pavement reinforcement over culverts, storm sewers, and water mains, by weight.

D Expansion Joints

The Engineer will separately measure dowelled expansion joints of each design designation as shown on the Plans by length along the joint line.

E Reinforcement Bars

The Engineer will not separately measure keyway bars, tie bars, taper steel, stopper bars, and other reinforcement bars.

F Integrant Curb

The Engineer will separately measure integrant curb of each design by length.

G Dowel Bars

The Engineer will measure dowel bars by the actual number of individual dowels placed. The Engineer will not measure dowels included in the Contract linear foot [meter] price for *Dowelled Expansion Joints, Design ___*.

H Concrete Coring

The Engineer will not separately measure the number of cores taken, identified, and delivered as required by the Contract or directed by the Engineer.

2301.5 BASIS OF PAYMENT

A Concrete Pavement

Unless the Plans include a separate Contract item for work incidental to *Concrete Pavement*, the Contract square yard [square meter] price for *Concrete Pavement* includes the cost of constructing the pavement, including the cost of batch materials and mixing operations; plant lab-office; producing the concrete; fine grading; forming, including all headers; furnishing and installing keyway and keyway bars, tie bars, taper steel, stopper bars, and other reinforcement bars; delivering; depositing; placing; spreading; screeding; vibration monitoring; finishing; curing; and protecting the concrete.

If the Plans include a separate Contract item for *Concrete Pavement High-Early* or if the Contractor requests high-early and the Engineer approves, the Department will not provide extra compensation for the production of high-early strength concrete. The Contract square yard [square meter] price for *Concrete Pavement High-Early* includes the cost of constructing the pavement, including the cost of batch materials and mixing operations; plant lab-office; producing the concrete; fine grading; forming, including all headers; furnishing and installing keyway bars, tie bars, taper steel, stopper bars, and other reinforcement bars; delivering; depositing; placing; spreading; screeding; vibration monitoring; finishing; curing; and protecting the concrete.

If the Plans do not include a separate Contract item for *Concrete Pavement High-Early* and the Engineer orders high-early concrete, the Department will pay for the additional cement at a rate of the invoice cost plus 15 percent.

B Place Concrete Pavement

Unless the Plans include a separate Contract item for work incidental to *Place Concrete Pavement*, the Contract square yard [square meter] price for *Place Concrete Pavement* includes the cost of constructing the pavement, including fine grading; forming, including all headers; furnishing and installing keyway and keyway bars, tie bars, taper steel, stopper bars, and other reinforcement bars; placing; spreading; screeding; vibration monitoring; finishing; curing; and protecting the concrete.

B.1 Structural Concrete

The Engineer will field calculate the volume of *Structural Concrete* and *Structural Concrete High Early* placed. Due to variations in the asphalt or asphalt bond breaker layer, the Contractor may request additional volume up to 102 percent of the Engineer's field calculated volume of *Structural Concrete*, *Structural Concrete High Early*, or both. The Engineer will verify additional volume of concrete from the computerized batch ticket printouts from the plant, with consideration of any waste. If the Engineer finds the Contractor's request for the additional volume valid, the Engineer will pay for the additional volume up to 102 percent of the calculated quantity. The Contract cubic yard [cubic meter] price for *Structural Concrete* and *Structural Concrete High-Early* includes the cost of producing, delivering, and depositing the concrete, including the cost of the batch materials and mixing operations and the plant-lab office. If the Plans include a separate Contract item for *Structural Concrete High-Early* or if the Contractor requests high-early and the Engineer approves, the Department will not provide extra compensation for the production of high-early strength concrete.

If the Plans do not include a separate Contract item for *Concrete Pavement High-Early* and the Engineer orders high-early concrete, the Department will pay for additional cement at a rate of the invoice cost plus 15 percent.

C Other Concrete Items

The Contract pound [kilogram] price for *Supplemental Pavement Reinforcement* includes the cost of furnishing and placing the metal reinforcement, including tie wires, supporting devices, and splicing.

The Contract linear foot [meter] price for *Dowelled Expansion Joints, Design* ___ includes the cost of constructing the joints complete in place as shown on the plans, including the costs of furnishing and placing dowel bar assemblies, filler, and sealer materials.

The Contract linear foot [meter] price for *Integrant Curb, Design* ___ includes the cost of forming and finishing the curb and protecting and curing the concrete.

The relevant Contract unit price for *Concrete Pavement* or *Place Concrete Pavement* includes the cost of coring, including the cost of material, labor, equipment, delivery, core hole filling, and traffic control.

The Department will pay for concrete pavement on the basis of the following schedule:

Item No.:	Item:	Unit:
2301.604	Concrete Pavement ___ in [___ mm]	square yard [square meter]
2301.604	Concrete Pavement ___ in [___ mm] High-Early	square yard [square meter]
2301.604	Place Concrete Pavement ___ in [___ mm]	square yard [square meter]
2301.511	Structural Concrete	cubic yard [cubic meter]
2301.513	Structural Concrete High-Early	cubic yard [cubic meter]
2301.608	Supplemental Pavement Reinforcement	pound [kilogram]
2301.603	Dowelled Expansion Joints, Design ___	linear foot [meter]
2301.538	Dowel Bar	each
2301.541	Integrant Curb, Design ___	linear foot [meter]

S-53 (2301) DRILL AND GROUT REINFORCEMENT BAR (EPOXY COATED) - MODIFIED

This work shall consist of drilling, grouting, and inserting No. 25 epoxy coated reinforcement bars in accordance with the provisions of MnDOT 2301 and the following:

Payment for all labor, equipment, and materials associated with this work (Drill and Grout Reinforcement Bar (Epoxy Coated)) shall be considered incidental to construction of Item No. 2301.502 Concrete Pavement 9.0". No additional compensation will be made for any costs associated with this work and for all costs included and incidental thereto.

S-54 (2357) BITUMINOUS TACK COAT

The provisions of MnDOT 2357 are hereby deleted and replaced with the following:

2357.1 DESCRIPTION

This work shall consist of the application of bituminous material (emulsion or liquid asphalt) on a bituminous or concrete pavement prior to paving a new lift of Hot Mixed Asphalt.

2357.2 MATERIALS

A Bituminous Material 3151

The bituminous material for tack coat will be limited to one of the following kinds of emulsified asphalt. However, the Engineer may authorize the use of medium cure cutback asphalt (MC-250) during the early and late construction season when it is anticipated the air temperature may drop below 32 degrees Fahrenheit.

Allowable grades are as follows:

Emulsified Asphalt
Anionic SS-1, SS-1h
Cationic CSS-1, CSS-1h

Cutback Asphalt
Medium Cure Liquid Asphalt MC-250

Only Certified Sources are allowed for use. MnDOT's Certified Source List is located at the following link: http://www.dot.state.mn.us/products/index.html.

2357.3 CONSTRUCTION REQUIREMENTS

A Restrictions

Tack coat operations shall be conducted in a manner that offers the least inconvenience to traffic, with movement in at least one direction permitted at all times without pickup or tracking of the bituminous material.

The tack coat shall not be applied when the road surface or weather conditions are unsuitable as determined by the Engineer. The daily application of tack coat shall be limited to approximately the area on which construction of the subsequent bituminous course can reasonably be expected to be completed that day.

B Equipment

The bituminous material shall be applied with a distributor meeting the requirements of 2321.3C1.

C Road Surface Preparations

At the time of applying bituminous tack coat material, the road surface shall be dry and clean and all necessary repairs or reconditioning work shall have been completed as provided for in the Contract and approved by the Engineer.

All objectionable foreign matter on the road surface shall be removed and disposed of by the Contractor as the Engineer approves.

Preparatory to placing an abutting bituminous course, the contact surfaces of all fixed structures and the edge of the in-place mixture in all courses at transverse joints and in the wearing course at longitudinal joints shall be given a uniform coating of liquid asphalt or emulsified asphalt, applied by methods that will ensure uniform coating.

D Application of Bituminous Tack Coat Material

Unless otherwise indicated in the Plans or provisions, the bituminous tack coat material shall be applied within the application rates shown below in Table 2357.3-D as based on pavement type or condition and type of bituminous material. The Engineer shall approve the time and rate of application. Only a MnDOT certified asphalt emulsion supplier is allowed to dilute the emulsion. When diluted, the supplier shall provide asphalt emulsion diluted 1 part emulsion to 1 part water. Dilution of asphalt emulsion in the field is not allowed. The Engineer may waive the tack coat requirement when multiple lifts are paved on the same day.

Table 2357.3-D
Tack Coat Application Rates

Pavement Type or Condition	Application Rate, liter/square meter **[gallons/sy]**		
	Undiluted Emulsion SS-1, SS-1H, CSS-1, CSS-1H	Diluted Emulsion (1 part Emulsion to 1 part water)[1] SS-1, SS-1H, CSS-1, CSS-1H	MC Cutback[2] MC-250
New HMA	0.14 – 0.23 **[0.03 – 0.05]**	0.28 – 0.46 **[0.06 – 0.10]**	0.14 – 0.23 **[0.03 – 0.05]**
Aged HMA[3] or Un-milled PCC	0.23 – 0.37 **[0.05 – 0.08]**	0.46 – 0.69 **[0.10 – 0.15]**	0.23 – 0.37 **[0.05 – 0.08]**
Milled HMA or Milled PCC	0.32 – 0.46 **[0.07 – 0.10]**	0.64 – 0.92**[0.14 – 0.20]**	0.32 – 0.46 **[0.07 – 0.10]**

1- As provided by the asphalt emulsion supplier
2- When approved by the Engineer
3- Older than 1 year

The temperature of the bituminous material at the time of application shall be approved by the Engineer, within the limits specified following:

SS-1, SS-1H, CSS-1, CSS-1H ..... 21 to 71°C (**70 to 160° F**)
MC-250 ..... 74 to 104°C (**165 to 220° F**)

Unless otherwise directed, sand shall be spread on the newly tacked surface at pedestrian crossings.

2357.4 METHOD OF MEASUREMENT

A Bituminous Material
Bituminous material used for tack coat will be measured by volume at 15°C (**60° F**).

2357.5 BASIS OF PAYMENT

Payment for the accepted quantity of asphalt emulsion and cutback shall be at the Contract price per unit of measure for undiluted asphalt emulsion and neat cutback. Furnishing and applying sand on newly tacked surfaces at pedestrian crossings shall be at no expense to the Department with no direct compensation being made therefore. Should the Contract fail to include a Contract Item covering payment for the bituminous material used for tack coat, all costs of furnishing and applying bituminous tack coat material will be included in the compensation provided for the bituminous mixture, with no measurement made of the bituminous material used and with no direct compensation being made therefore.

Payment for the tack coat will be made on the basis of the following schedule:

Item No.	Item	Unit
2357.502	Bituminous Material for Tack Coat	Liter (**gallon**)

S-55 (2360) PLANT MIXED ASPHALT PAVEMENT - MODIFIED
(2012 version)

MnDOT 2360 is hereby deleted from the MnDOT Standard Specifications and replaced with the attached **2360 (Plant Mixed Asphalt Pavement) Specification and as modified herein:**

S-55.1 The bituminous pavement shall be constructed in accordance with the provisions of 2360, except as modified below:

S-55.2 Field Tensile Strength Ratio (TSR) ASTM D4867-92, Mn/DOT Modified
If the Tensile Strength Ratio (TSR) does not meet the minimum test requirements, the Contractor shall provide anti-strip additive at no additional cost to the County or modify their aggregate sources so as to meet the minimum requirements.

S-55.3 Recycled Asphaltic Pavement Materials (RAP), Recycled Asphalt Shingles (RAS), Crushed Concrete and Salvaged Aggregate shall not be used in maintenance overlays or wearing courses.

S-55.4 Recycled Asphaltic Pavement Materials (RAP) will be permitted only in the non-wear courses at a maximum rate of 20 percent. Recycled Asphalt Shingles (RAS), Crushed Concrete and Salvaged Aggregate will not be permitted in the non-wear courses.

S-55.5 The Aggregate composition of the bituminous mixture shall contain a minimum of Fifty Percent (**50%**) Class A aggregate. The maximum allowable Class A Aggregate passing the 3/8" sieve is Twenty Percent (**20%**).

S-55.6 **Construction Requirements**
Construction requirements will be in accordance with 2360.3 and the following:

S-55.7 The centerline joint will be closed at the end of each paving day by paving adjacent lanes unless the County agrees it is not feasible.

S-55.8 In addition to a paver being used to place the mainline bituminous mixtures, Contractor shall furnish and use a separate paver for placing all driveways, intersections, and other areas not on the mainline. This work shall be done in conjunction with the placing of all mainline bituminous materials (Wearing and Non-wearing Courses) unless otherwise directed by the Engineer. Using the mainline paver for this work (during mainline production) will not be permitted. When a second paver is required by the Engineer for use on the mainline paving, all electronic grade controls shall be in satisfactory working condition. In the case of matching existing surfaces on both sides of the paver a joint matching device will be required on both sides of the paver for reference control in matching existing surface grades at joints.

S-55.9 The Contractor's paver shall be equipped with two paver attachment tools to help construct higher density, longer lasting longitudinal joints between asphalt mats. The unit shall be designed primarily to construct a

pre-compacted asphalt mat edge on the longitudinal joint. These units shall be considered to be a part of the paver and no other direct compensation will be made therefore.

S-55.10 A pick-up machine will be required to be used in front of the paver unless previously approved by the Engineer.

S-55.11 A skidloader will be required for all approach grading. A motor grader will not be allowed unless previously approved by the Engineer.

S-55.12 All necessary work needed in preparing driveways, field approaches, intersections, and any other area designated by the Engineer shall be done by the Contractor with no direct payment being made therefore.

S-55.13 **Compaction Operations**
Compaction shall be obtained by the Ordinary Compaction Method in accordance with specification 2360.3-D.2 and the following:

S-55.14 Contractor shall be required to use three individual rollers for compaction. Vibratory steel for breakdown, pneumatic shall be used for intermediate rolling, and a steel static roller for finish rolling. All rollers shall be self-propelled and shall meet the requirements of specification 2360 as pertains to rollers. All the rollers shall be equipped with spray attachments for moistening all rolling surfaces on both the front and back. Contractor may be required to add liquid detergent to water. The vibratory steel rollers shall have a minimum total weight of 8 tons.

S-55.15 Mix Designation Numbers for the bituminous mixtures on this Project are as follows:

Type SP 12.5 Wearing Course (4, C)
Type SP 12.5 Non-Wearing Course (4, C)
Type SP 12.5 Wearing Course (2, B)

S-55.16 Pavement smoothness requirements will be evaluated by IRI Equation HMA-A and PCC-A as specified in 2399.3D in Section S-2399 (PAVEMENT SURFACE SMOOTHNESS) of these Special Provisions.

S-55.17 **The first paragraph of 2360.3.D.1** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted and replaced with the following:

D.1 Maximum Density
Compact the pavement to at least the minimum required maximum density values in accordance with Table 2360-19, "Required Minimum Lot Density (Mat)".

S-55.18 **Table 2360-20 Longitudinal Joint Density Requirement** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted.

S-55.19 **2360.3.D.1.h Mat Density Cores** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted and replaced with the following:

D.1.h Mat Density Cores
Obtain four cores in each lot. Take two cores from random locations as directed by the Engineer. Take the third and fourth cores, the companion cores, within 1 ft [0.3 m] longitudinally from the first two cores. Submit the companion cores to the Engineer immediately after coring and sawing. If the random core location falls on an unsupported joint, at the time of compaction, (the edge of the mat being placed does not butt up against another mat, pavement surface, etc.) cut the core with the outer edge of the core barrel 0.3 meters [**1 foot**] away (laterally) from the edge of the top of the mat (joint). If the random core location falls on a confined joint (edge of the mat being placed butts up against another mat, pavement surface, curb and gutter, or fixed face), cut with the outer edge of the core barrel 150 mm ± 12.5 mm [**6 inches ± 0.5 inch**] from the edge of the top of the mat (ex. center of 100 mm [**4 inch**] core barrel

200 mm ± 12.5 mm [**8 ± 0.5 inches**] from the edge of the top of the mat). Cores will not be taken within 300 mm [**1 foot**] of any unsupported edge. The Contractor is responsible for maintaining traffic, coring, patching the core holes, and sawing the cores to the paved lift thickness before density testing.

The Engineer may require additional density lots to isolate areas affected by equipment malfunction, heavy rain, or other factors affecting normal compaction operations.

S-55.20 **2360.3.D.1.j Companion Core Testing** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted and replaced with the following:

The Department will select at least one of the two companion cores per lot to test for verification.

S-55.21 **2360.3.D.1.n Longitudinal Joint Density** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted.

S-55.22 **2360.3.D.1.p Shoulders** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted.

S-55.23 **Table 2360-24 Payment Schedule for Longitudinal Joint Density (SP Wear and SP Shoulders, 4% Void)** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted.

S-55.24 **Table 2360-25 Payment Schedule for Longitudinal Joint Density (SP Non-wear and SP Shoulders, 3% Void)** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted.

S-55.25 **2360.3.D.1.r Pay Factor Determination** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted.

S-56 (2360) HOT MIXED ASPHALT - MIXTURE SAMPLING MODIFICATION

(2011 version)

The provisions of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** of these Special Provisions are hereby modified as follows in order to increase the randomness of the Quality Assurance sampling and testing.

S-56.1 **MIXTURE QUALITY MANAGEMENT**

(A) **2360.2.G.4.b Sampling and Testing** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** is hereby deleted and replaced with the following:

Take QC samples at random locations, quartered from a larger sample of mixture, from behind the paver and in accordance with the Schedule of Materials Control. The Contractor will obtain at least a 130 pound [60 kg] sample. Split the sample in the field at the paver (roadside) and in the presence of the Field Inspector. The Field Inspector will immediately retain possession of the Agency portion of each split sample that is taken and randomly submit a minimum of one sample, on a daily basis to the District Laboratory for Verification testing (see 2360.2.G.3). Store compacted mixture specimens and loose mixture companion samples for 10 calendar days. Label these split companion samples with companion numbers. Determine random numbers and locations using the Bituminous Manual, Section 5-693.7 Table A or ASTM D 3665, Section 5.

(B) Delete paragraphs 1,2, and 5 of **2360.2.G.7.a Asphalt Binder Content** of the attached **2360 (Plant Mixed Asphalt Pavement) Specification**.

(C) Modify **2360.2.G.3 Verification Sample** second paragraph of the attached **2360 (Plant Mixed Asphalt Pavement) Specification** to include:

Unless the extracted aggregate sample from the asphalt binder content determination has already been used to evaluate gradation and coarse and fine aggregate angularity as part of the QC program the Contractor shall retain the extracted aggregate samples in containers with field identification labels for a period of 10 calendar days. These samples may require additional testing for gradation and/or coarse and fine aggregate angularity as directed by the Engineer to satisfy the requirements of Verification Testing.

The requirements of this Special Provision supersede any conflicting provisions of the **2360 (Plant Mixed Asphalt Pavement) Specifications**.

S-57 (2399) PAVEMENT SURFACE SMOOTHNESS

(2012 version (Rev. 3/30/12))

The following is hereby added to the MnDOT Standard Specifications:

2399.1 DESCRIPTION

This work consists of measuring the smoothness of the final concrete or bituminous surface.

A Definitions

The Department defines "smoothness" as the composite International Roughness Index (IRI) value per 0.1 mi [0.1609 km] segment. The Department defines "areas of localized roughness" (ALR) as areas greater than or equal to the limiting criteria for a continuous IRI calculation with a 25 ft [7.62 m] interval, as calculated using the FHWA's Profile Viewing and Analysis (ProVAL) software.

2399.2 MATERIAL REQUIREMENTS

A Inertial Profiler (IP)

Provide a Department certified, calibrated, and documented IP meeting the requirements of ASTM E 950, Class 1 and procedures maintained by the MnDOT Pavement Engineering Section. Refer to the procedures maintained by the MnDOT Pavement Engineering Section or to the MnDOT Smoothness website for the required settings for individual certified profilers.

Provide an IP capable of producing a profilogram and exporting raw profile data in an unfiltered electronic Engineering Research Division (ERD) file format. Produce ERD filenames in the YYMMDD-T-N-D-L-W-S.ERD standardized format in accordance with Table 2399-1:

Table 2399-1
Electronic ERD File Standardized Naming Convention

Abbreviation	Definition
YY	Two-digit year
MM	Month (include leading zeros)
DD	Day of month (include leading zeros)
T	Route type (I, MN, US, CSAH, etc.)
N	Route number (no leading zeros) and auxiliary ID (if applicable, for example E, W, etc.)
D	Primary route direction (I or D)
L	Lane number (1 for driving lane, increasing by one for each lane to the left)
W	Wheel path (L, R, or B, indicating Left, Right, or Both)
S	Beginning station

B Profile Analysis Software

Use ProVAL software to conduct a profile analysis to determine smoothness and ALR. Report IRI values in units of in per mi to one digit right of the decimal [m per km to two digits right of the decimal] in accordance with conventional rounding procedures.

C Operator Certification

Provide an operator, trained in the operation of the particular IP in accordance with 2399.2.A, "Inertial Profiler," and knowledgeable in the use of the required profile analysis software in accordance with 2399.2.B, "Profile Analysis Software." Ensure profiler operators pass a proficiency test and possess a current certification issued by the Department. The Contractor may access a list of certified operators on the MnDOT Smoothness website. Provide documentation of operator certification to the Engineer.

D Submittals

D.1 Before Profiling

Provide the Engineer with current, valid documentation, issued by the Department, indicating the inertial profiling equipment certification and the operator's certification.

D.2 Day of Profiling

Submit a printout containing the inertial profiler's settings, each segment's IRI values, and the signature of the operator to the Engineer on the same day of the profiling.

Submit electronic files in ERD format representing the raw data from each pass on the same day of the profiling.

If the Contractor fails to submit actual data to the Engineer on the day of profiling, the Department will require the Contractor to reprofile the measured segments.

D.3 Upon Completion of Pavement Placement

Within 5 calendar days after all pavement placement and before beginning corrective work, submit a paper ProVAL summary report for each lane, indicating the results of the "Ride Quality" and "Smoothness Assurance" analyses. Use the ERD filenames in accordance with 2399.2.A, "Inertial Profiler" to create ProVAL summary reports.

If the summary reports indicate no ALR, submit a final spreadsheet summary in accordance with 2399.2.D.5, "After Corrective Work."

D.4 Before Corrective Work

If the summary reports indicate any ALR, submit a written corrective work plan to the Engineer in accordance with 2399.3.E, "Corrective Work." Include the beginning and ending points of locations planned for correction in the corrective work plan. Do not begin corrective work before the Engineer approves the plan.

If the Engineer elects to assess a monetary deduction for ALR in accordance with Table 2399-7 instead of requiring corrective work, submit a final spreadsheet summary in accordance with 2399.2.D.5, "After Corrective Work."

D.5 After Corrective Work

After reprofiling, submit a paper summary ProVAL report for each lane, indicating the results of updated "Ride Quality" and "Smoothness Assurance" analyses to the Engineer. Submit a spreadsheet summary in tabular form, with each 0.1 mi [0.1609 km] segment occupying a row to the Engineer. The Contractor may access an acceptable spreadsheet summary template in electronic form on the MnDOT Smoothness website.

2399.3 CONSTRUCTION REQUIREMENTS

Using an IP, measure the final mainline and other pavement surfaces for IRI in areas with a posted vehicle speed of 30 mph [48 km/hr] or greater unless otherwise excluded in Table 2399-3.

Unless otherwise approved by the Engineer, perform all smoothness testing in the presence of the Engineer. Mutually agree on a schedule for smoothness testing with the Engineer. Rerun tests performed in the absence of the Engineer as directed by the Engineer at no additional cost to the Department.

The Engineer will use a 10 ft [3.05 m] straightedge to evaluate areas excluded from surface testing with the IP in accordance with Table 2399-3.

A Pavement Surface Testing

Remove objects and foreign material from the pavement surface before performing the pavement surface evaluation. Provide traffic control required for testing and performing corrective work on the final pavement surface.

Run the IP in the direction of traffic. Measure profiles in the left and right wheel paths of each lane.

Test and evaluate each lane separately. The Engineer will determine the length in miles [kilometers] of each mainline traffic lane. Operate the IP at the optimum speed as recommended by the manufacturer.

Separate each lane into segments 0.1 mi [0.1609 km] in length. Evaluate the remainder segment less than 0.1 mi [0.1609 km] in each lane as an independent segment. The Engineer will prorate pay adjustments for length.

Make each pass continuously, regardless of length, and end passes before exclusions in accordance with Table 2399-3, "Areas Excluded from Smoothness and ALR Evaluation." Begin each subsequent pass 50 ft [15.24 m] before, and including, construction headers and end-of-day work joints. In concrete pavements, evaluate terminal headers tying into existing portland cement concrete pavement.

For percent improvement projects, measure the smoothness before the beginning of construction and after the completion of construction. Use the same stationing for the final smoothness measurement as the stationing used for the initial smoothness measurement, to allow for a direct comparison when calculating the percent improvement. Measure the initial IRI and the final IRI with the same IP.

The Engineer will use a 10 ft [3.05 m] straightedge to measure for surface deviations greater than ¼ in [6 mm] in 10 ft [3.05 m]. The Engineer will evaluate transverse joints by centering the straightedge longitudinally across the transverse joint.

B Exclusions

Table 2399-2 indicates areas that are excluded from smoothness evaluation, but still require measurement with an IP, and are subject to evaluation for ALR and the 10 ft [3.05 m] straightedge. Table 2399-3 indicates areas that are excluded from surface testing with the IP, but are subject to evaluation with the 10 ft [3.05 m] straightedge.

Table 2399-2 Areas Excluded from Smoothness Evaluation
For All Pavements
Paving in areas with a posted vehicle speed less than or equal to 45 mph [73 km/hr]
Ramps and loops
Acceleration and deceleration lanes less than or equal to 1,000 ft [304.8 m] in length
Projects less than 1,000 ft [304.8 m] in length
Bridge decks and approach panels – the occurrence of bridges shall not interrupt the continuity determination
For Bituminous Pavements
Single lift overlays over concrete
For Concrete Pavements
Intersections constructed under traffic – begin and end exclusion 100 ft [30.5 m] from the intersection radius

Table 2399-3 Areas Excluded from Smoothness and ALR Evaluation
For All Pavements
Turn lanes, crossovers
10 ft [3.05 m] on either side of obstructions in lane that obstruction is located
Side streets, side connections
For Bituminous Pavements
Paved shoulders
Intersections where mainline profiles are merged or blended into the cross street profile – begin and end exclusion 100 ft [30.5 m] from the intersection radius
For Concrete Pavements
Undoweled shoulders less than 10 ft [3.05 m] in width
Headers adjacent to colored concrete

C Calculations

C.1 Smoothness

Obtain the IRI for the left and right wheel paths in an individual lane using the ProVAL "Ride Quality" analysis with the 250 mm filter. Calculate pavement smoothness for each lane by averaging the IRI for the left and right wheel paths in the lane. The Engineer will use the averaged results to determine pay adjustments.

For percent improvement projects, use the initial IRI and final IRI to calculate the percent ride improvement.

C.2 Areas of Localized Roughness

Identify ALR using the ProVAL "Smoothness Assurance" analysis, calculating IRI with a continuous short interval of 25 ft [7.62 m] with the 250 mm filter. Use only the right wheel path to determine ALR.

D Pay Adjustments

D.1 Smoothness

Evaluate smoothness requirements using the equations and criteria in accordance with the following tables:

(1) Table 2399-4 for bituminous pavements,
(2) Table 2399-5 for concrete pavements, and
(3) Table 2399-6 for percent improvement projects.

The Engineer will base pay adjustments on the segment IRI value (or percent improvement value, for percent improvement projects) measured at the completion of surface pavement, unless corrective work is required by the summary report results. If a segment is less than 100 ft [30.5 m] in length and Table 2399-4, Table 2399-5, or Table 2399-6 requires corrective work, the Engineer will waive the corrective work requirement for the segment and instead assess a prorated maximum disincentive. The Department will still subject the segment to ALR analysis in accordance with Table 2399-7

For segments requiring corrective work, reprofile the entire 0.1 mi [0.1609 km] segment after performing corrective work as directed by the Engineer and enter the reprofiled left and right wheel path IRI values into the final spreadsheet summary. Calculate the segment IRI value by averaging the IRI values calculated from the left and the right wheel path passes.

D.1.a Bituminous Pavements

Table 2399-4 contains pay adjustments for bituminous pavements, see Section 2360 (PLANT MIXED ASPHALT PAVEMENT) of these Special Provisions for the projects' ride equation requirement.

Table 2399-4
Pay Adjustments for Bituminous Pavements

Equation	Composite IRI in/mi [m/km]	Pay Adjustment $/0.1 mi [0.1609 km]
HMA-A	< 30.0 [0.47]	400.00
	30.0 – 75.0 [0.47 – 1.18]	850.00 – 15.000 × IRI [850.00 – 957.450 × IRI]
	> 75.0 [1.18]	Corrective Work to ≤ 56.7 in/mi [0.89 m/km]
HMA-B	< 33.0 [0.52]	270.00
	33.0 – 85.0 [0.52 – 1.34]	600.00 – 10.000 × IRI [600.00 – 638.950 × IRI]
	> 85.0 [1.34]	Corrective Work to ≤ 60.0 in/mi [0.94 m/km]
HMA-C	< 36.0 [0.57]	180.00
	36.0 – 95.0 [0.57 – 1.50]	414.00 – 6.500 x IRI [414.00 – 410.500 x IRI]
	> 95.0 [1.50]	Corrective Work to ≤ 63.7 in/mi [1.01 m/km]

For bituminous projects, the Engineer will not pay a net incentive payment for smoothness if greater than 25 percent of all mainline density lots for the project fail to meet the minimum density requirements in accordance with 2360, "Plant-Mixed Asphalt Pavement."

D.1.b Concrete Pavements

For concrete pavements, the Engineer will use equation PCC-A. For concrete pavement rehabilitation projects or concrete grinding, the Engineer will use equation PCC-B if the contract requires pay adjustments for concrete grinding.

Table 2399-5 Pay Adjustments for Concrete Pavements		
Equation	**Composite IRI in/mi [m/km]**	**Pay Adjustment $/0.1 mi [0.1609 km]**
PCC-A	< 50.0 [0.79]	890.00
	50.0 – 90.0 [0.79 – 1.42]	2940.00 – 41.000 × IRI [2940.00 – 2597.800 × IRI]
	> 90.0 [1.42]	Corrective Work to ≤ 71.7 in/mi [1.13 m/km]
PCC-B	< 50.0 [0.79]	450.00
	50.0 – 71.2 [0.79 – 1.12]	1511.30 – 21.226 × IRI [1511.30 – 1344.900 × IRI]
	71.3 – 90.0 [1.13 – 1.42]	0.00
	> 90.0 [1.42]	Corrective Work to ≤ 71.3 in/mi [1.13 m/km]

D.1.c Percent Improvement Projects

The Engineer will base pay adjustments on the number of segments and the percent improvement values. The Engineer will not require corrective work and will not assess a negative pay adjustment if the initial segment IRI value is less than 60.0 in per mi [0.95 m per km] and the percent improvement is greater than zero. The Engineer will calculate the percent improvement in accordance with the following equation:

$$\%I = \left(\frac{InitialSegmentIRI - FinalSegmentIRI}{InitialSegmentIRI} \right) \times 100$$

Determine the Initial Segment IRI before patching or other repair. Determine the Final Segment IRI after the completion of paving.

Table 2399-6 Pay Adjustments for Percent Improvement Projects		
Equation	**Percent Improvement (%I)**	**Pay Adjustment, per $/0.1 mi [$/0.1609 km] segment**
PI	> 64.0	180.00
	15.0 to 64.0	–236.00 + 6.500 × (%I)
	< 15.0	Corrective work to %I of at least 36.3

For bituminous percent improvement projects, the Engineer will not pay a net incentive payment for smoothness if greater than 25 percent of all mainline density lots for the project fail to meet minimum density requirements in accordance with 2360, "Plant-Mixed Asphalt Pavement."

Correct segments with a percentage improvement of less than 15 percent at no additional cost to the Department as required by the Engineer.

D.2 Areas of Localized Roughness

The Engineer will evaluate ALR in accordance with Table 2399-7, "ALR Monetary Deductions and Corrective Work Requirements."

Table 2399-7 ALR Monetary Deductions and Corrective Work Requirements		
Equation	**25 ft [7.62 m] Continuous IRI, in/mi [m/km]**	**Corrective Work or Monetary Deduction, per linear 1.0 ft [0.3048 m]**
HMA-A or HMA-B, and a posted vehicle speed > 45 mph [73 km/hr]	< 125.0 [1.97]	Acceptable
	≥ 125.0 [1.97] to < 175.0 [2.76]	Corrective work or $10.00, as directed by the Engineer
	≥ 175.0 [2.76] to < 250.0 [3.94]	Corrective work or $25.00, as directed by the Engineer
	≥ 250.0 [3.94]	Corrective work or $50.00, as directed by the Engineer
PCC-A or PCC-B, and a posted vehicle speed > 45 mph [73 km/hr]	< 125.0 [1.97]	Acceptable
	≥ 125.0 [1.97] to < 175.0 [2.76]	Corrective work or $10.00, as directed by the Engineer
	≥ 175.0 [2.76] to < 250.0 [3.94]	Corrective work or $25.00, as directed by the Engineer
	≥ 250.0 [3.94]	Corrective work as directed by Engineer
HMA-C, PI, ramps, loops, concrete intersections constructed under traffic, or any paving with a posted vehicle speed ≤ 45 mph [73 km/hr]	< 175.0 [2.76]	Acceptable
	≥ 175.0 [2.76] to < 250.0 [3.94]	$10.00
	≥ 250.0 [3.94]	$25.00

The Engineer will consider areas of ALR acceptable if the retested segment contains no ALR. The Department will reduce payment for ALR remaining after retesting as determined by the Engineer and in accordance with Table 2399-7, "ALR Monetary Deductions and Corrective Work Requirements."

D.3 Straightedge Evaluation

The Engineer will allow variations less than or equal to ¼ in [6 mm] within the span of the straightedge in the longitudinal or transverse direction to remain in place without correction or penalty.

The Engineer will require corrective work on surface deviations greater than ¼ in [6 mm] within the span of the straightedge in any direction. For corrected variations, the Engineer will accept deviations less than or equal to ¼ in [6 mm] within the span of a 10 ft [3.05 m] straightedge in any direction.

E Corrective Work

Notify the Engineer at least 24 hr before beginning corrective work. Do not begin corrective work before the Engineer approves the methods and procedures in writing.

Perform corrective work using a surface diamond grinding device consisting of multiple diamond blades, unless otherwise approved by the Engineer. Fog-seal diamond ground bituminous surfaces as required by the Engineer and at no additional cost to the Department. Repair and replace joint sealant

damaged by diamond grinding on concrete pavement as directed by the Engineer and at no additional cost to the Department.

The Contractor may correct bituminous pavements by overlaying the area or replacing the area by milling and inlaying as approved by the Engineer. If milling and inlaying or overlaying, perform work in accordance with 2399, "Pavement Surface Smoothness," over the entire length of the correction. If milling and inlaying or overlaying, use a transverse saw cut to begin and end the surface correction.

Perform smoothness corrective work for ALR across the entire lane width. Maintain the pavement cross slope through corrective areas.

Perform coring to determine if diamond grinding corrective work results in thin pavements, as directed by the Engineer. Provide additional coring for thickness verification at no additional cost to the Department. The Department may reduce the payment for thin pavement sections after diamond grinding. Handle residue and excess water resulting from diamond grinding in accordance with 1717, "Air, Land, and Water Pollution."

Perform surface corrections before placing permanent pavement markings. Replace permanent pavement marking damaged or destroyed by corrective work at no additional cost to the Department.

Reprofile segments containing corrected areas with the same certified IP in accordance with 2399.2.A, "Inertial Profiler" within 5 calendar days after the completion of corrective work required by the Engineer.

F Retesting

Perform retesting as directed by the Engineer and within 30 days of the original profiling.

If the retested IRI values differ from the original IRI values by greater than 10 percent, the Engineer will use the retested values as the basis for acceptance and pay adjustments. If the retested values differ from the original values by greater than 10 percent, the Department will not pay for the cost of retesting.

If the retested IRI values differ by less than or equal to 10 percent of the original IRI values, the Engineer will use the original values. If the Engineer verifies the accuracy of the original results, the Department will pay for retesting as directed by the Engineer, except for retesting required after corrective work, at $100.00 per lane mi [$62.14 per lane km] retested or $500.00, whichever provides the greater amount.

2399.4 METHOD OF MEASUREMENT — (BLANK)

2399.5 BASIS OF PAYMENT

The Department will include the cost of the IP, testing, and traffic control in the relevant contract unit price for wearing course mixture for bituminous pavements, concrete pavement for concrete pavements, or for concrete grinding.

S-58 (2406) BRIDGE APPROACH PANELS

(2012 Version)

Any references to bridge approach panels in MnDOT 2301 shall be deleted and replaced with the following:

2406 BRIDGE APPROACH PANELS

2406.1 DESCRIPTION

This work consists of constructing bridge approach panels.

2406.2 MATERIALS

A Concrete **2461**

A1 Mix Designation ..... Mix No. 3A42

B Reinforcement Bars **3301**

C Steel Fabric **3303**

D Preformed Joint Filler **3702**

E Curing Materials

E.1 Burlap Curing Blankets 3751

E.2 Poly-Alpha Methylstyrene (AMS) Membrane Curing Compound 3754

E.3 Linseed Oil Membrane Curing Compound 3755

E.4 Plastic Curing Blankets 3756

F Granular Materials **3149**

2406.3 CONSTRUCTION REQUIREMENTS

A Foundation Preparations

Excavate, shape, and compact the foundation to a firm, uniform bearing surface that conforms to the planned section and established grade shown on the Plans and in accordance with 2105.

B Forms

Provide forms made of non-reactive metal, wood, or other material in accordance with 1805 capable of maintaining the concrete until the concrete can retain the molded shape. Provide forms with a height at least equal to the approach panel thickness of the formed concrete as shown in the plans. Support the forms on the foundation to maintain the line and grade as shown on the plans.

On curves with a radius of 100 feet (**30 m**) or less, use flexible or curved forms of the radius as shown on the plans.

Before placing the concrete, coat the contact surfaces of all forms with form treating material conforming to 3902.

C Placing and Finishing Concrete

Immediately prior to placing the concrete, thoroughly wet the foundation and forms.

Place the concrete in a manner that will prevent segregation. Consolidate the concrete to fill voids using internal vibration. Strike-off the concrete to the required grade, and float the surface smooth.

After the water sheen has disappeared, provide the same surface texture as the bridge deck and construct in accordance with 2401 or 2404.

Finish all edges with a 3/8 inch (**10 mm**) radius edging tool.

Keep side forms in place for at least 12 hours after casting the concrete.

D Joint Construction

Place joints in accordance with the plans.

E Metal Reinforcement

Provide and place metal reinforcement as shown on the Plans and in accordance with 2472.

F Workmanship and Finish

Ensure completed concrete work is uniform in surface contour and texture and conforms to the lines and grades shown on the plans. Finish the flow line surface of gutters as necessary to eliminate low spots and avoid entrapment of water.

The Engineer will use a 10 ft [3 m] straight edge to measure the surface. The Engineer will consider horizontal or vertical irregularities of 3/8 in [10 mm] or greater in the surface of any 10 ft [3 m] length of the finished concrete approach panel as unacceptable work. Remove and replace extensive areas with deviations greater than ½ in [13 mm.] Remove and replace unacceptable work as directed by the Engineer.

If the Engineer does not direct removal of unacceptable work, the Contractor may leave the work in place and the Department will make the following adjustments to the Contract unit prices:

(1) For deviations from 3/8 in [10 mm] to ½ in [13 mm], 75 percent of the Contract unit price, and
(2) For minor areas with deviations greater than 1/2 in [13 mm], 50 percent of the Contract unit price.

G Concrete Curing and Protection

After completing final finishing operations, cure all exposed concrete surfaces. Use one of the following curing methods:

(1) Place the membrane curing compound conforming to 3754 or 3755 within 30 minutes of concrete placement or once the bleed water has dissipated, unless the Engineer directs otherwise in accordance with 2406.3.G.1.a. Place the membrane curing compound on the edges within 30 minutes after permanent removal of the forms or curing blankets, unless the Contract requires otherwise.
(2) Place plastic curing blankets or completely saturated burlap curing blankets as soon as practical without marring the surface in accordance with 2406.3.G.1.b.

Failure to comply with these provisions will result in the Engineer applying a monetary deduction in accordance with 1503. When there is not a separate Contract unit price for Structural Concrete, the Department will apply a monetary deduction of $50.00 per cu. yd [$65.00 per cu. m] or 50 percent of the Contractor-provided invoice amount for the concrete in question, whichever is less.

Whenever weather conditions are such as to cause unusual or adverse placing and finishing conditions, expedite the application of a curing method or temporarily suspend the mixing and placing operations, as the conditions require.

If necessary to remove the coverings to saw joints or perform other required work, and if the Engineer approves, remove the covering for the minimum time required to complete that work.

G.1 Curing Methods

G.1.a Membrane Curing Method

Before application, agitate the curing compound as received in the shipping container to obtain a homogenous mixture. Protect membrane curing compounds from freezing before application. Handle and apply the membrane curing compound in accordance with the manufacturer's recommendations.

Apply the curing compound with an approved airless spraying machine in accordance with the following:

(1) At a rate of 1 gal per 150 sq. ft (1 L per 4 m^2) of surface curing area.
(2) Apply homogeneously to provide a uniform solid white opaque coverage on all exposed concrete surfaces (equal to a white sheet of typing paper). Some MnDOT approved curing compounds may have a base color (i.e. yellow) that cannot comply with the above requirement. In this case, provide a uniform solid opaque consistency meeting the intent of the above requirement.
(3) If the curing compound is damaged during the curing period, immediately repair the damaged area by re-spraying.

The Engineer will approve the airless spraying machine for use if it is equipped with the following:

(1) A re-circulating bypass system that provides for continuous agitation of the reservoir material,
(2) Separate filters for the hose and nozzle, and
(3) Multiple or adjustable nozzle system that provides for variable spray patterns.

If the Engineer determines that the initial or corrective spraying may result in unsatisfactory curing, the Engineer may require the Contractor to use the blanket curing method, at no additional cost to the Department.

G.1.b Curing Blanket Method

After completion of the finishing operations and without marring the concrete, cover the concrete with curing blankets. Install in a manner that envelops the exposed concrete and prevents loss of water vapor. After the concrete has cured, apply membrane curing compound to the concrete surfaces that will remain exposed in the completed work.

G.2 Protection Against Rain

Protect the concrete from damage due to rain. Have available, near the site of the work, materials for protection of the edges and surface of concrete. Should any damage result, the Engineer will suspend operations until the Contractor takes corrective action and may subject the rain-damaged concrete to 1503 and 1512.

G.3 Protection Against Cold Weather

If the national weather service forecast for the construction area predicts air temperatures of 36 °F [1 °C] or less within the next 24 h and the Contractor wishes to place concrete, submit a cold weather protection plan.

Protect the concrete from damage including freezing due to cold weather. Should any damage result, the Engineer will suspend operations until corrective action is taken and may subject the damaged concrete to 1503 and 1512.

G.3.a Cold Weather Protection Plan

Submit proposed time schedule and plans for cold weather protection of concrete in writing to the Engineer for acceptance that provides provisions for adequately protecting the concrete during placement and curing. Do not place concrete until the Engineer accepts the cold weather protection plans.

H Backfill Construction

Protect newly placed concrete from damage by adjacent vibratory or backfilling operations for a minimum of 24 hours. Resume vibratory and backfilling operations after the concrete has reached a minimum compressive strength of 2000 psi [13.7 MPa] or a flexural strength of 250 psi [1.7 MPa]. Cast concrete control specimens in accordance with 2461.3.G.5. The Engineer will test the control specimens. If damage results from any of these operations the Engineer will suspend all operations until corrective action is taken and a new method is approved. The Engineer may subject damaged concrete to 1503 and 1512.

The Contractor may hand operate concrete consolidation equipment and walk behind vibratory plate compactors 24 h after placing the concrete, and other equipment as approved by the Engineer in conjunction with the Concrete Engineer. The Contractor may also use rollers in "static" mode and fine grading machines.

As soon as possible after the curing is complete and without subjecting the concrete work to damaging stresses, perform the backfill or embankment construction to the elevations shown on the plans. If the Contract does require a specific backfill material, use suitable grading materials from the excavations in accordance with 2105. Place and compact the backfill material in accordance with 2105.

Dispose of surplus excavated materials in accordance with 2105.

I Preformed Expansion Joint Sealers

Install expansion joint material in accordance with the manufacturer's recommendations, the plans, and the following:

Select a preformed material utilized for sealing the E8 expansion from the MnDOT approved products list.

2406.4 METHOD OF MEASUREMENT

When the Proposal contains an item (or items) for construction of bridge approach panels, their construction will be measured and paid for separately as complete in place items. Measurements will be by the total area of all panels of the same basic design. In the absence of such items, the panel construction will be measured for payment under the several items provided for pavement construction.

2406.5 BASIS OF PAYMENT

Payment for construction of bridge approach panels will be made under 2301.553 Bridge Approach Panels at the Contract bid price per square yard **(square meter)** for all panels and will be

compensation in full for all costs of constructing the bridge approach panels as detailed in the Plans, including the costs of furnishing and placing concrete, steel, drainage system, polyethylene sheeting, construction of integrant curb, terminal headers, concrete sills, protecting and curing the concrete, joints and other incidental work not specifically included for payment under other Contract items.

Item No.	Item:	Unit:
2301.553	Bridge Approach Panels	square yard (square meter)

S-59 (2461) STRUCTURAL CONCRETE

(2012 Version)

The provisions of MnDOT 2461 are modified in accordance with the following:

- MnDOT 2461.3B shall be deleted and replaced with the following:

B Classification of Concrete

The Department will classify concrete by type, grade, consistency, and aggregate size. Refer to the mix number and Table 2461-2 to determine the mix requirements for each item of work.

Table 2461-2
Mix Number Identification

First Digit	Second Digit	Third Digit	Fourth Digit	Additional Digits
Type	Grade	Slump range	Coarse aggregate gradation range	Class A coarse aggregate when required, modified mix designation, or both

Refer to individual Contract items in the Standard Specification for Mix Numbers. Deviations from the specified Mix Numbers require coordination with the Concrete Engineer.

If the Contract does not show a concrete mix number, provide Type 3, Grade Y concrete with a slump and aggregate gradation determined by the Engineer.

The Department will designate grout by type and grade followed by the word "GROUT." Do not provide grout containing coarse aggregate. If the Plans do not show a type or grade for grout, provide 3A GROUT.

B1 Type Designation

Provide Type 1 or Type 3 concrete in accordance with Table 2461-3:

Table 2461-3 Concrete Type Designation		
Concrete Type	**Target Air Content*, %**	**Maximum Water/Cement Ratio‖**
1	2.0	≤ 0.53 for 1A43 ≤ 0.68 for 1C62 ≤ 0.64 for 1C Grout
3	6.5 †	≤ 0.45†#

* For concrete mix design purposes only
‖ The water/cement ratio is defined as the ratio of the total water weight to the total cementitious weight.
† Unless otherwise required by 2301 or elsewhere in the Contract.
#The maximum water/cement ratio for machine placed concrete is 0.42.

B2 Grade Designation

The Department will designate concrete grade using a letter to represent the anticipated compressive strength and the minimum cementitious content in accordance with 2461.3C, "Cementitious Content," and Table 2461-4:

Table 2461-4 Concrete Grade Designation		
Concrete Grade	**Type 1 Anticipated Compressive Strength, *psi [MPa]* ***	**Type 3 Anticipated Compressive Strength, *psi [MPa]* ***
U	6,300 [43]	5,600 [39]
V	6,000 [41]	5,300 [37]
W	5,700 [39]	5,000 [34]
X	5,400 [37]	4,700 [32]
Y	5,000 [34]	4,300 [30]
A	4,500 [31]	3,900 [27]
B	4,100 [28]	3,400 [23]
C	3,200 [22]	2,700 [19]

* Anticipated minimum strength produced in accordance with the Department specifications and cured for 28 days under laboratory conditions.

The Concrete Engineer, in coordination with the Engineer, may increase the cement content for concrete with test cylinder results less than the anticipated compressive strength in accordance with Table 2461-4, "Concrete Grade Designation." The Contractor may request an increase in the cement content as approved by the Engineer, in conjunction with the Concrete Engineer.

B3 Slump Designation

Refer to the slump designation for the upper limit of the slump range without a water reducer in accordance with Table 2461-5:

Table 2461-5 Slump Designation	
Slump Designation	**Slump Range without Water Reducer, *in [mm]***
1	½ – 1 [12 – 25]
2	1 – 2 [25 – 50]
3	1 – 3 [25 – 75]
4	2 – 4 [50 – 100]
5	2 – 5 [50 – 125]
6	3 – 6 [75 – 150]

B4 Coarse Aggregate (CA) Designation

Refer to the coarse aggregate designation for the range of optional coarse aggregates gradations allowed in the mix in accordance with Table 3137-4, "Coarse Aggregate Designation for Concrete," and Table 2461-6:

Table 2461-6 Coarse Aggregate Designation for Concrete	
Range	**Optional Coarse Aggregate Designation**
0	CA-00 only
1	CA-15 to CA-50, inclusive
2	CA-15 to CA-60, inclusive
3	CA-35 to CA-60, inclusive
4	CA-35 to CA-60, inclusive
5	CA-45 to CA-60, inclusive
6	CA-50 to CA-70, inclusive
7	CA-70 only
8	CA-80 only

B5 Additional Designations

For mix designs that require a specified class of coarse aggregate as defined in 3137.2.B, an additional letter will follow the fourth digit of the Mix Number such as "A" (Class A Aggregate Requirement).

The Engineer may identify special concrete mix designations with additional letters following the last digit such as "HE" (High Early), "WC" (Water-Cement Ratio), "HPC" (High Performance Concrete), "MS" (Microsilica), or others.

- MnDOT 2461.3E shall be deleted and replaced with the following:

E Concrete Admixtures 3113

The Contractor may use the following approved admixtures at their discretion as listed on the Approved Products list:

(1) Type A, "Water Reducing and Mid Range Water Reducing Admixtures"
(2) Type B, "Retarding/Hydration Stabilizer Admixtures"
(3) Type D, "Water Reducing and Retarding Admixtures"
(4) Type S, "Viscosity Modifying Admixtures"

Use of any other admixtures in the concrete requires approval of the Concrete Engineer unless otherwise required by or allowed in the Contract.

When incorporating admixtures into the concrete:

(1) Use admixture dosage rates recommended by the manufacturer.
(2) Add all admixtures at the plant.
(3) Provide admixture additions at the job site that are the same products as originally incorporated into the mix.
(4) Use calcium chloride in concrete as approved by the Engineer, in conjunction with the Concrete Engineer. Do not use calcium chloride in units containing prestressing steel or in bridge superstructure concrete.

E1 Use of Additional Admixtures

On a case by case basis, the Engineer, in conjunction with the Concrete Engineer, will consider the use of the following admixtures, added either at the plant or at the job site, as listed on the Approved Products list:

(1) Type C, "Accelerating Admixtures"
(2) Type E, "Water Reducing and Accelerating Admixtures"
(3) Type F, "Water Reducing, High Range Admixtures"
(4) Type G, "Water Reducing, High Range and Retarding Admixtures"

E1a Delivery Time Beyond 90 Minutes

If the haul time does not facilitate mixing and placing the concrete within 90 minutes, perform the following procedures for pre-qualifying a concrete mix to extend the delivery time to 120 minutes. Extending the delivery time beyond 120 minutes will require additional testing at 30 minute intervals up to the maximum desired delivery time as directed by the Concrete Engineer.

(1) Provide a contractor mix design in accordance with 2461.3G2 for each combination of materials.
(2) Specification 2461.3D is modified to allow up to 25% fly ash replacement for cement. All other requirements of 2461 apply.
(3) Laboratory trial batching on the proposed mix includes the following testing requirements:
    (a) Perform all laboratory trial batching at an AMRL accredited laboratory.
    (b) Perform all plastic concrete testing after adding all admixtures to the concrete mixture.
    (c) Perform slump, air content, unit weight and temperature testing immediately after batching and at 90 and 120 minutes.
    (d) Fabricate concrete cylinders for compressive strength at 90 and 120 minutes (sets of 3) and cylinders for hardened air content testing at 90 and 120 minutes (sets of 5).
    (e) Test the cylinders for compressive strength at 28 days.
    (f) Determine the hardened air content (ASTM C457) at a minimum of 7 days. The Contractor is required to test at 2 samples representing 90 minutes and 2 samples representing 120 minutes and provide MnDOT with the other 6 samples for testing at their discretion. Retain any hardened concrete test specimens for a minimum of 90 days for MnDOT to examine at their discretion.
    (g) Ensure the admixture manufacturer's technical representative is present during the trial batching.
    (h) Contact the MnDOT Concrete Engineering Unit a minimum of 2 days prior to mixing. This same 2 day notification is required prior to any physical testing on hardened concrete samples.
    (i) Once accepted by the Concrete Engineer, the laboratory trial batching is considered acceptable for use for 5 years, unless it is determined the material

sources have changed significantly since the initial laboratory testing and acceptance. In all cases, the Engineer will require field trial batching on a project specific basis.

(4) Field trial batching on the proposed mix for each specific project shall include batching in the presence of the Engineer and the following:

(a) Provide a QC Plan for extending the delivery time beyond 90 minutes.

(b) Mix and transport the concrete using the same materials as were utilized in the laboratory trial batching.

(c) Batch a minimum 5 cu. yd (4 cu. m) of concrete utilizing the same methods intended for use when supplying concrete placed into the permanent work.

(d) Maintain the ready mix truck in transit; by either driving around the yard or on the roadway; and maintain the drum speed at 5 to 7 revolutions per minute for the entire 120 minutes.

(e) Perform all plastic concrete testing after adding admixtures to the concrete mixture.

(f) Perform slump, air content, unit weight and temperature testing at 90 and 120 minutes.

(g) Fabricate concrete cylinders for compressive strength at 90 and 120 minutes (sets of 3) and cylinders for hardened air content testing at 90 and 120 minutes (sets of 2).

(h) Test the cylinders for compressive strength at a minimum of 7 days.

(i) Determine the hardened air content (ASTM C457) at a minimum of 7 days. The Contractor is required to test 1 sample representing 90 minutes and 1 sample representing 120 minutes and provide MnDOT with the other 2 samples for testing at their discretion. Retain any hardened concrete test specimens for a minimum of 90 days for MnDOT to examine at their discretion.

(j) Incorporate the trial batch concrete into other work with the approval of the Engineer.

(k) The Contractor must demonstrate to the Engineer the ability to properly mix, control and place the concrete.

(5) The Concrete Engineer, in coordination with the Engineer, will review the trial batch results and all related concrete testing for compliance with the QC Plan and the Contract. Final approval of the mixture is based on satisfactory field placement and performance.

- MnDOT 2461.3F shall be deleted.

- MnDOT 2461.3G, 2461.3H, and 2461.3J shall be deleted and replaced with the following:

G Job Mix Proportions

G1 Department Designed

The Department will provide the estimated composition of concrete mixes unless otherwise required by the Contract.

The Department may adjust the mix composition of the concrete without adjusting the Contract unit price for any items of work.

G1a Concrete Yield

The Department defines concrete yield as the ratio of the volume of mixed concrete, less accountable waste, to the planned volume of the work constructed. The Department will not assume responsibility for the yield from a given volume of mixed concrete.

G1b High-Early Strength Concrete

When the Engineer requires high-early strength concrete, the concrete is designed in accordance with the following:

- Increasing the cement content of the concrete up to 30 percent and/or using an approved accelerator as allowed by the Engineer, in conjunction with the Concrete Engineer
- Using 100 percent portland cement unless allowed by the Contract or the Engineer
- A maximum cement content for a cubic yard [cubic meter] of concrete not to exceed 900 lb [**535 kg**].
- A w/c ratio not to exceed 0.38 for Type 3 Concrete unless specified elsewhere in the Contract.

G2 Contractor Designed

Design the concrete mix based on an absolute volume of 27.00 cu. ft ± 0.10 cu. ft [**1.000 cu. m ± 0.003 cu. m**] for the following:

(1) Concrete paving mixes in accordance with 2301,
(2) Concrete mixes with an anticipated or required 28-day compressive strengths of at least 5,000 psi [**34 Mpa**],
(3) Precast concrete in accordance with 2405, 2412, 3236, 3238, 3621, 3622, 3630, 3661, and 3667
(4) Colored concrete
(5) Stamped concrete
(6) Cellular Concrete Grout – Controlled Low Strength Material (CLSM)
(7) Extended Delivery Times Beyond 90 minutes
(8) Concrete as otherwise required by the Contract.

Submit the concrete mixes utilizing the MnDOT Contractor Mix Design Submittal Package available on the Department's website at least 21 calendar days before initial placement of the concrete mix. The Concrete Engineer will provide specific gravity and absorption data for mix design calculations.

The Concrete Engineer will review the mix design submittal and approve the materials and mix design for compliance with the Contract.

The Contractor assumes full responsibility for the mix design and performance of the concrete.

The Engineer determines final acceptance of concrete for payment based on satisfactory field placement and performance.

- MnDOT 2461.4A2(c) shall be deleted and replaced with the following:

Do not place concrete when the air temperature at the point of placement is below 36 °F [2 °C] or is expected to fall below 36 °F [2 °C] within the following 24 h period unless approved cold-weather provisions are in-place. Discontinue concrete placement if the air temperature falls below 36 °F [2 °C].

- MnDOT 2461.4A4a shall be deleted and replaced with the following:

A4a Consistency

The Engineer will test the concrete for consistency using the slump test during the progress of the work. The Department may reject concrete batches with consistencies outside of the slump range in accordance with Table 2461-10. If any test shows the slump in excess of the upper limit of the slump range, the Engineer will reject the concrete represented by that test unless the Contractor makes adjustments to the concrete before use.

Adjust the slump within the allowable range to optimize both placement and finishing.

If not using a Department approved Type A water reducer at the manufacturer's recommended dosage rates listed on the Approved Products list, meet the slump values for the slump range without water reducer in accordance with Table 2461-10.

If using a Department approved Type A water reducer at the manufacturer's recommended dosage rates listed on the Approved Products list, meet the slump values for the slump range with water reducer in accordance with Table 2461-10.

Table 2461-10
Slump Range Designation

Slump Designation	**Slump Range without Water Reducer,** ***in [mm]***	**Slump Range with Water Reducer,** ***in [mm]***
1	½ – 1 [**12 – 25**]	½ – 1 [**12 – 25**]
2	1 – 2 [**25 – 50**]	1 – 3 [**25 – 75**]
3	1 – 3 [**25 – 75**]	1 – 4 [**25 – 100**]
4	2 – 4 [**50 – 100**]	2 – 5 [**50 – 125**]
5	2 – 5 [**50 – 125**]	2 – 6 [**50 – 150**]
6	3 – 6 [**75 – 150**]	3 – 7 [**75 – 175**]

Contact the Engineer if encountering unusual placement conditions that render the specified slump range unsuitable. The Department will provide mix composition modifications to provide the desired change in consistency while maintaining the other specified properties of the concrete mix. Do not add water solely to temporarily facilitate the placement of concrete.

A4a(1) Concrete Placed by the Slip-Form Method

Place concrete that does not slough and is adequately consolidated at a slump value that optimizes placement for the designated mixture.

A4a(2) Non-Conforming Material

Only place concrete meeting the slump requirements in the work. If the Contractor places concrete not meeting the slump requirements into the work, the Engineer will not accept nonconforming concrete at the Contract unit price.

For concrete not meeting the required slump, the Engineer will make determinations regarding the disposition, payment, or removal. The Department will adjust the Contract unit price for the Contract pay item of the concrete in accordance with Table 2461-11A, 2461-11B, 2461-11C and 2461-11D. When there is not a separate Structural Concrete bid price for an item of work or the concrete is a minor component of the unit bid price, the Department will reduce payment based on a concrete price of $100.00 per cu. yd [$130.00 per cu. m] or Contractor-provided invoice amount for the concrete in question, whichever is less.

Table 2461-11A General Concrete*	
Outside of Slump Range	**Adjusted Contract Unit Price**
Below slump range*	The Department will pay 95 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
≤ 1½ in [**40 mm**] above slump range	The Department will pay 75 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
1¾ in [**45 mm**] – 2¼ in [**55 mm**] above slump range	The Department will pay 50 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
> 2¼ in [**55 mm**] above slump range	The Department will pay 25 percent of the relevant Contract unit price for materials placed as approved by the Engineer
* If the Contractor places piling or footing concrete below the slump range, the Department will deduct $100 per cu. yd [**$130 per cu. m**] or a Contractor-provided invoice amount to the relevant Contract unit price of the concrete represented by the slump test, whichever is less. The Department will not reduce Contract unit price for low slump concrete placed with the slip-form method as approved by the Engineer.	

Table 2461-11B Bridge Deck Concrete	
Outside of Slump Range	**Adjusted Contract Unit Price**
Below slump range	The Department will pay 95 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
≤ 1½ in [**40 mm**] above slump range	The Department will pay 75 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
> 1½ in [**40 mm**] above slump range	The Department will pay 25 percent of the relevant Contract unit price for materials placed as approved by the Engineer.

Table 2461-11C Low Slump Bridge Deck Concrete From ½ in [12 mm] to 1 in [25 mm]	
Outside of Slump Range	**Adjusted Contract Unit Price**
Below slump range	No deduction for materials placed as approved by the Engineer
≤ ½ in [**12 mm**] above slump range	The Department will pay 50 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
> ½ in [**12 mm**] – ¾ in [**20 mm**] above slump range	The Department will not pay for concrete placed but will allow the concrete to remain in place as approved by the Engineer.
> ¾ in [**20 mm**] above slump range	The Department will not pay for concrete. Provide additional testing as directed by the Engineer to determine if the concrete can remain or place or is subject to removal and replacement.

Table 2461-11D Low Slump Concrete — Patching From ½ in [12 mm] to 1 in [25 mm]	
Outside of Slump Range	**Adjusted Contract Unit Price**
Below slump range	No deduction for materials placed as approved by the Engineer
≤ ½ in [**12 mm**] above slump range	The Department will pay 75 percent of the relevant Contract unit price for materials placed as approved by the Engineer.
≥ ¾ in [**20 mm**] above slump range	The Department will pay 25 percent of the relevant Contract unit price for materials placed as approved by the Engineer.

- MnDOT 2461.4A4b shall be deleted and replaced with the following:

A4b Air Content

Maintain the air content of Type 3 general concrete at the specified target of 6.5.percent ±1.5 percent of the measured volume of the plastic concrete in accordance 1503.

Make any adjustments immediately to maintain the desired air content.

Measure the air content at the point of placement but before consolidation.

A4b(1) Non-Conforming Material

Only place Type 3 concrete meeting the air content requirements in the work. If the Contractor places Type 3 concrete not meeting the air content requirements into the work, the Engineer will not accept nonconforming concrete at the Contract unit price.

For concrete not meeting the required air content, the Engineer will make determinations regarding the disposition, payment, or removal. The Department will adjust the Contract unit price for the Contract pay item of the concrete in accordance with Table 2461-17. When there is not a separate Structural Concrete bid price for an item of work or the concrete is a minor component of the unit bid price, the Department will reduce payment based on a concrete price of $100.00 per cu. yd [**$130.00 per cu. m**] or the Contractor-provided invoice amount for the concrete in question, whichever is less.

General Concrete (Target Air Content 6.5%)	
Air Content, %	**Adjusted Contract Unit Price**
> 10.0	The Department will pay 75 percent of the relevant Contract unit price for the concrete represented for material placed as approved by the Engineer.
>8.0 – 10.0	The Department will pay 95 percent of the relevant Contract unit price for the concrete represented for material placed as approved by the Engineer.
5.0 – 8.0	The Department will pay 100 percent of the relevant Contract unit price for the concrete represented, for material placed as approved by the Engineer.
>4.0 – <5.0	The Department will pay 75 percent of the relevant Contract unit price for the concrete represented for material placed as approved by the Engineer.
>3.5 – 4.0	The Department will pay 25 percent of the relevant Contract unit price for the concrete represented and placed as approved by the Engineer. If the Engineer, in conjunction with the Concrete Engineer, determines the surface is exposed to freeze-thaw cycling, coat the concrete with an approved epoxy penetrant sealer from the MnDOT Approved Products list.
≤ 3.5	Remove and replace concrete in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work" as directed by the Engineer. If the Engineer, in conjunction with the Concrete Engineer, determines the concrete can remain place, the Engineer will not pay for the concrete and if the Engineer determines the surface is exposed to salt-brine freeze-thaw cycling, coat with an approved epoxy penetrant sealer from the MnDOT Approved Products list.

- MnDOT 2461.4A5 shall be deleted and replaced with the following:

A5 Test Methods and Specimens

The Engineer will furnish molds for the test specimens in accordance with the following based on the maximum aggregate size:

(1) 4 in × 8 in [**100 mm × 200 mm**] cylinder molds,

(2) 6 in × 12 in [**150 in × 300 mm**] cylinder molds for maximum aggregate sizes greater than 1¼ in [**31.5 mm**],
(3) 6 in × 6 in × 20 in [**150 in × 150 in × 500 mm**] beam molds, use other beam mold sizes as approved by the Engineer.

Provide curing tanks of adequate size and number for curing all of the concrete test specimens in accordance with 2031.3.C. Supply the curing tanks with heaters to maintain a water temperature of 73° F ± 3° F [**23° C ± 2° C**].

If Contractor testing is required in the Contract, perform the following:

(1) Provide a MnDOT Certified Concrete Field 1 Technician to perform all Contractor Testing.
(2) Determine the required testing rates in accordance with the Schedule of Materials Control,
(3) Take samples after the first ¼ cu yd [cu. m] and before discharging the last ¼ cu. yd [**cu. m**] of the batch,
(4) Perform concrete sampling and testing meeting the requirements of the MnDOT Concrete Manual,
(5) Measure slump and air content, and make strength specimens when placing the concrete,
(6) Record field measurements, including strength specimen identifications on MnDOT Form 2448, *Weekly Concrete Report*, to provide to the Concrete Engineer.

The Engineer will transport the cylinders to the Agency laboratory for testing.

A5a Standard Strength Cylinders

The Department will perform the following for standard strength cylinders:

(1) Cast cylinders for testing at 28 days,
(2) Mark cylinders for identification of the represented unit or section of concrete,
(3) Cure the cylinders meeting the requirements of the MnDOT Concrete Manual, and
(4) Submit cylinders and a completed cylinder identification card to the Agency laboratory.

The Producer of precast units is responsible for casting standard strength cylinders.

A5b Control Strength Cylinders

The Engineer will use control cylinders to determine when the sequence of construction operations is dependent upon the rate of concrete strength development. The Engineer will cast enough control cylinders to determine when the concrete attains the required strength for all desired control limitations.

The Department will perform the following for control strength cylinders:

(1) Cast up to three (3) control cylinders. Any additional control cylinders are the responsibility of the Contractor,
(2) Cure the cylinders in the same location and under the same conditions as the concrete structure or unit involved meeting the requirements of the Concrete Manual,
(3) Mark control cylinders for identification of the represented unit or section of concrete, and
(4) Submit cylinders and a completed cylinder identification card to the Agency laboratory.

If the Agency is unavailable to test the control cylinders, the Contractor shall submit the control cylinders to an independent testing facility for testing or the Contractor may perform the testing on the

control cylinders on a portable mechanical or hydraulic testing machine checked and calibrated with a standard proving ring as approved by the Engineer and in the presence of the Engineer.

The Producer of precast units is responsible for casting control strength cylinders.

A5c Strength Specimens for Concrete Paving

Use flexural beams to determine strength or provide cylinders as allowed by the Contract or approved by the Engineer.

Cast standard beams or cylinders for testing at 28 days.

Cast a sufficient number of control beams or cylinders to determine when the concrete attains the required strength for all desired control limitations.

Cure the standard beams or cylinders meeting the requirements of the MnDOT Concrete Manual.

Cure the control beams or cylinders in the same location and under the same conditions as the concrete structure or unit involved meeting the requirements of the MnDOT Concrete Manual.

The Engineer will test the flexural beams and record the results on MnDOT Form 2162, "*Concrete Test Beam Data.*"

If using cylinders, the Engineer will submit cylinders and a completed identification card to the Agency laboratory.

- MnDOT 2461.4D1 shall be deleted and replaced with the following:

D Certified Ready-Mix Concrete

D1 Definition

The Department defines ready-mix concrete as one of the following:

(1) Central-mixed concrete proportioned and mixed in a stationary plant and hauled to the point of placement in revolving drum agitator trucks or a truck mixer, or
(2) Truck-mixed concrete proportioned in a stationary plant and fully mixed in truck mixers.

Commonly uses certified ready-mix terms are defined in the following:

Certified Ready-Mix Terminology	
Term	Definition
Mix design water	The maximum allowable water content for 1 cu. yd [**1 cu. m**] of concrete in accordance with MnDOT Form TP 02406, *Estimated Composition of Concrete Mixes.*
Total moisture factor	Factor used to determine total amount of water carried by a given wet aggregate.
Absorption factor	Factor used to determine the water contained within the pores of the aggregate and is held within the particles by capillary force.
Free moisture	The water that is carried on the surface of the aggregate that becomes part of the total water.
Batch water	Water actually batched into the truck by the batcher.
Total water	Batch water added to free moisture. Total water may also include the water used in diluting admixture solutions.
Temper water	Water added in mixer to adjust slump.
Total actual water	The water in the concrete mixture at the time of placement from any source other than the amount absorbed by the aggregate. It includes all batch water placed in the mixer, free moisture on the aggregate and any water added to the ready mix truck prior to placement.
Ready-Mix Producer or "Producer"	Party that is producing the concrete for the Contract. It is understood that the Ready-Mix Producer is the agent of the Contractor.

- MnDOT 2461.4D2 shall be deleted and replaced with the following:

D2 General Requirements

Supply all ready-mix concrete from MnDOT Certified Concrete Plants in accordance with 2461.4D7.

The Engineer will reject ready-mix concrete delivered to the work site not meeting the specified requirements for delivery time, consistency, quality, air content, or other properties as unacceptable work in accordance with 1512, "Unacceptable and Unauthorized Work."

Provide batches for a delivered load of concrete in sizes of at least 1 cu. yd [**1 cu. m**].

Handle washout water in accordance with 1717.

- MnDOT 2461.4D3 shall be deleted and replaced with the following:

D2 Notice of Inspection

Notify the Engineer at least 24 h before beginning concrete production to allow the Engineer time to provide inspection forces needed for the work and to approve preparations for concrete placement. If the Contractor fails to provide 24 h notice, the Engineer may delay concrete placement in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work."

If the producer needs to change plants during placement, notify the Engineer and obtain approval before changing the plant.

- The first two paragraphs of MnDOT 2461.4D5c shall be deleted and replaced with the following:

D5c Mixing In Truck Mixer

Charge the materials into the truck mixer drum by introducing sufficient water before adding solid materials. Perform charging operations without losing materials.

Leave the truck mixer at the plant site for a minimum of 5 minutes or 50 revolutions during the mixing period. Transport the concrete at agitating speed to the point of placement.

- MnDOT 2461.4D6 shall be deleted and replaced with the following:

If using a Department approved Type A, "Water reducing or Mid Range Water Reducing Admxiture" at the manufacturer's recommended dosage rates listed on the Approved Products list, meet the slump values for the slump range with water reducer in accordance with Table 2461-10.

D6 Delivery Requirements

Place concrete into the work in accordance with the following:

(1) Type 1 Concrete – within 90 minutes of batching, and
(2) Type 3 Concrete – within 90 minutes of batching when all admixtures are added at the plant at the manufacturer's recommended dosage rates listed on the Approved Products list. If the haul time does not facilitate mixing and placing the concrete within 90 minutes, test the concrete in accordance with 2461.3E1a.

In any case, do not add additional mixing water once the concrete is 60 minutes old.

Mix the load a minimum of 5 minutes or 50 revolutions at mixing speed after addition of any admixture.

The Contractor may transport Type 3 concrete in non-agitating equipment if the concrete is discharged within 45 minutes of batching.

Batch time starts when the batch plant or the transit mix truck adds the cement to the other batch materials.

D6a Field Adjustments

The Engineer will test the concrete for compliance with 2461.4A4a and 2461.4A4b according to the following:

(1) If the first test taken by the Engineer passes, the Engineer will resume verification testing according to the Schedule of Materials Control.
(2) If the first test taken by the Engineer fails, make adjustments and perform any quality control testing prior to the Engineer performing a final test. Acceptance or rejection of the truck is based on the Engineer's final test result.
(3) The Engineer will test up to 2 additional trucks according to 2461.4D6a(1) and 2461.4D6a(2).
(4) If the concrete is not within specification after the first 3 trucks, the Engineer will reduce their verification testing rate to once per truck for acceptance.
(5) Once the Engineer returns to normal verification testing according to the Schedule of Materials Control and a failing test occurs, the Engineer will repeat 2461.4D6a(2), 2461.4D6a(3) and 2461.4D6a(4).

- MnDOT 2461.4D7 shall be deleted and replaced with the following:

D7 Certified Ready-Mix Plant Program

Provide ready-mix concrete produced by a certified ready-mix plant. Perform quality control of concrete production under a certification program for ready-mix concrete plants.

Complete all concrete plant documentation utilizing the Concrete Ready-mix Plant QC Workbook available from the MnDOT Concrete Engineering website. Electronically submit the QC Workbook to the Engineer by the Tuesday immediately following the previous week's production.

D7a Plant Certification

Before concrete production each season, ensure the producer performs the following:

(1) Performs an on-site inspection at the concrete plant with the Engineer who completes a MnDOT Form 2163, *Concrete Plant Contact Report.*
(2) Signs the report certifying compliance with the Certified Ready-Mix requirements and continual maintenance of the plant. The Engineer will also sign MnDOT Form 2163, *Concrete Plant Contact Report.*
(3) Provides a copy of the current MnDOT Concrete Manual and retain on-site.
(4) Equips the Certified Ready-Mix Plant with a working facsimile machine or an email address.
(5) Keeps plant reports, charts, and supporting documentation on file at the plant site for 5 calendar years.
(6) Provides electronic scales for weighing all materials.

D7b Sampling and Testing

Provide a MnDOT Certified Concrete Plant Level 2 Technician to oversee testing and plant operations and to remain on-site during concrete production or have cellular phone capability.

Provide facilities in accordance with 1604 for the use of the plant technician in performing tests.

Ensure the producer provides technicians with certification at least meeting MnDOT Concrete Plant Level 1 to perform all of the duties in accordance with the MnDOT Concrete Manual. The Engineer will provide technicians with certification at least meeting MnDOT Concrete Plant Level 1 to perform all of the duties in accordance with the MnDOT Concrete Manual.

Ensure the producer performs testing in accordance with the MnDOT Concrete Manual and determines testing rates meeting the requirements of the Schedule of Materials Control. The Engineer performs testing in accordance with the MnDOT Concrete Manual and determines testing rates meeting the requirements of the Schedule of Materials Control.

Take samples randomly using ASTM D 3665, Section 5.

Perform testing at the certified ready-mix plant site. Perform additional testing as directed by the Engineer. The Engineer may oversee the quality control sampling process.

Provide equipment and perform calibrations meeting the requirements of the following:

(1) AASHTO T 27, "Sieve Analysis of Fine and Coarse Aggregates,"
(2) AASHTO T 255, "Total Moisture Content of Aggregate by Drying,"
(3) AASHTO M 92, "Wire-cloth Sieves for Testing Purpose," and
(4) AASHTO M 231, "Weighing Devices Used in the Testing of Materials."

D7c Gradations and Aggregate Quality

Determine the gradation of the fine aggregates and the coarse aggregates as required by the Contract. Use mechanical shakers for sieve analysis of fine and coarse aggregates.

Identify quality control companion samples with the following information:

(1) Date,
(2) Test number,
(3) Time,
(4) Type of material,
(5) Plant, and
(6) Sampling location.

Document gradation results on MnDOT Form 2449, *Weekly Concrete Aggregate Report.*

Chart the results of all producer and Department gradation results of the coarse aggregate and the No. 8 [**2.36 mm**], No. 30 [**600 µm**], and No. 50 [**300 µm**] sieves of the fine aggregate.

The producer may request a reduction in testing rates as approved by the Engineer, in conjunction with the Concrete Engineer.

If the gradation tests on split samples from quality control or verification samples result in a variation between the producer and the Department greater than that set forth in the table below, the parties shall follow the procedures for test result dispute resolution available from the MnDOT Concrete Engineering website.

Allowable Variations on Percent Passing Sieves	
Sieve Size	**Allowed Percentage**
2 in [**50 mm**] – ⅜ in [**9.5 mm**]	± 6
No. 4 [**4.75 mm**] – No. 30 [**600 µm**]	± 4
No. 50 [**300 µm**]	± 3
No. 100 [**150 µm**]	± 2
No. 200 [**75 µm**]	± 0.6

D7c(1) Non-conforming Material

Only place concrete meeting the gradation requirements in the work. If the Contractor places concrete not meeting the gradation requirements into the work, the Engineer will not accept nonconforming concrete at the Contract unit price.

For concrete not meeting the required gradation, the Engineer will make determinations regarding the disposition, payment, or removal. The Department will adjust the Contract unit price for the Contract pay item of the concrete in accordance with Table 2461-9 and 2461-10. When there is not a separate Structural Concrete bid price for an item of work or the concrete is a minor component of the unit bid price, the Department will reduce payment based on a concrete price of $100.00 per cu. yd [**$130.00 per cu. m**] unless an invoice amount for the concrete in question is provided, whichever is greater.

Table 2461-7A **General Concrete for Individual Aggregate Fractions** **Fine and Coarse Aggregate Specification Sieves other than Fine Aggregate No. 200 [75 µm]**	
Outside of Specification, %	**Adjusted Contract Unit Price**
≤ 3	The Department will pay 98 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.
4 to 6	The Department will pay 95 percent of the relevant

Table 2461-7A General Concrete for Individual Aggregate Fractions Fine and Coarse Aggregate Specification Sieves other than Fine Aggregate No. 200 [75 µm]	
Outside of Specification, %	**Adjusted Contract Unit Price**
	Contract unit price for concrete placed as approved by the Engineer.
7 to 10	The Department will pay 90 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.
> 10	The Department will pay 75 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.

Table 2461-7B General Concrete for No. 200 [75 µm] Sieve of Fine Aggregate	
Outside of Specification, %	**Adjusted Contract Unit Price**
≤ 0.3	The Department will pay 98 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.
0.4 to 0.6	The Department will pay 95 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.
0.7 to 1.0	The Department will pay 90 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.
> 1.0	The Department will pay for 75 percent of the relevant Contract unit price for concrete placed as approved by the Engineer.

If a failure occurs on the fine aggregate No. 200 [**75 µm**] sieve and on other sieves concurrently, the Department will only reduce the price based on the larger percentage deduction.

The Engineer, in conjunction with the Concrete Engineer, will determine adjusted Contract unit prices for coarse aggregate quality failures in accordance with 1503.

D7d Moisture Content

Ensure the producer performs the following:

(1) Determine the moisture content using the oven dry method in all fractions of the aggregate.
(2) Document moisture tests on MnDOT Form 2152, *Concrete Batching Report*.
(3) Chart the moisture content of each aggregate.

In addition to the oven dry moisture test, the producer may obtain the moisture content in the fine aggregate using a moisture probe.

To obtain approval for the use of a moisture probe, calibrate the moisture probe before each construction season meeting the requirements of the MnDOT Concrete Manual. Verify and chart both the probe moisture content and the oven-dry verification moisture test each week.

D7e Plant Diaries

Provide daily plant diaries in accordance with the MnDOT Concrete Manual using an approved form from the Department's website.

D7f Batch Weight Verification

The Engineer will observe the batching process to verify weights shown on the Certificate of Compliance.

The Engineer will observe the actual water batched during each collection of verification gradations in accordance with the following:

(1) Watching the ready-mix truck reverse the drum after washing,
(2) Verifying use of the current moisture test,
(3) Verifying that any additional water added to adjust the slump is recorded, and
(4) Validating water weights on the load batched and comparing the total water with the design water

The Engineer will document the actual water batched on MnDOT Form 24143, *Weekly Certified Ready-Mix Plant Report* and submit a copy to the Engineer to provide to the Concrete Engineer.

The Engineer will provide plant diaries in accordance with the MnDOT Concrete Manual.

D7g Certificate of Compliance

Provide a computerized Certificate of Compliance with each truckload of ready-mixed concrete at the time of delivery. The Department defines computerized to mean a document that records mix design quantities from load cells and meters.

If the computer that generates the Certificate of Compliance malfunctions, the Engineer may allow the Contractor to finish any pours in progress if the producer issues a handwritten MnDOT Form 0042, *Certificate of Compliance* with each load. Do not allow the producer to begin new pours without a working computerized Certificate of Compliance.

Provide a computerized Certificate of Compliance from the producer for each item of information, including the following:

(1) Name of the ready-mix concrete plant,
(2) Name of the Contractor,
(3) Date,
(4) State Project Number (SP) or (SAP),
(5) Bridge Number (when applicable),
(6) Time concrete was batched,
(7) Truck number,
(8) Quantity of concrete in this load,
(9) Running total of each type of concrete, each day for each project,
(10) Type of concrete (MnDOT Mix Designation Number),
(11) Cementitious materials using MnDOT Standard Abbreviations,
(12) Admixtures using MnDOT Standard Abbreviations
(13) Aggregate sources using 5 digit State Pit Numbers, and
(14) Admixture quantity fl. oz. per 100 pounds of cementitious [**mL per kg**] or oz per cu. yd [**mL per cu. m**]
(15) Batch information for materials using MnDOT standardized labels to represent each column shown in Table 2461-7C. Present the information in the order listed across the page (a through k) or print the information using two lines provided that the materials are identified in each line of information.

Table 2461-7C
Standardized Certificate of Compliance Labels

	Category	Formula	Standard Label
a)	Ingredients (aggregate, cementitious, water, admixtures)	—	Ingredient
b)	Product Source (MnDOT Standard Abbreviation)	—	Source
c)	Total Moisture Factor (in decimals to 3 places)	—	MCFac
d)	Absorption Factor (in decimals to 3 places)	—	AbsFac
e)	MnDOT mix design oven dry (OD) weights, *lb/cu. yd* ***[kg/cu. m]***	—	OD
f)	Absorbed moisture in the aggregates, *lb/cu. yd* ***[kg/cu. m]***	(e × d)	Abs
g)	Saturated surface dry (SSD) weights for aggregates, *lb/cu. yd* ***[kg/cu. m]***)	(e + f)	SSD
h)	Free moisture, *lb/cu. yd* ***[kg/cu. m]***	(c - d) × e	Free Mst
i)	Target weights for one cubic yard [cubic meter] of concrete, *lb/cu. yd* ***[kg/cu. m]***	(g + h)	CY Targ **[CM Targ]**
j)	Target batch weights, *lb* ***[kg]***	(cu. yd × i) **[cu. m x i]**	Target
k)	Actual batch weights, *lb* ***[kg]***	—	Actual

NOTE: Actual cubic yards [**cubic meters**] batched may vary due to differences in air content, weight tolerances, specific gravities of aggregates, and other variables.

(16) Total Water (Batch Water + Free Moisture) in pounds [kilograms]

(17) Water available to add [(Mix Design Water) × (Target CY (CM)) – Total water] in gallons [**liters**]

(18) Space to note the water adjustment information, including:

(18.1) Water in gallons [**liters**] added to truck at plant filled in by producer, enter zero (0) if no water is added.

(18.2) Water in gallons [**liters**] added to truck at the jobsite filled in by producer or Engineer, enter zero (0) if no water is added.

(18.3) Total actual water in pounds [**kilogram**] (Total Water from Certificate of Compliance plus any additions).

(19) The following information printed with enough room beside each item to allow the Engineer to record the test results:

(19.1) Air content,

(19.2) Air temperature,

(19.3) Concrete temperature,

(19.4) Slump,

(19.5) Cylinder number,

(19.6) Location or part of structure,

(19.7) Time discharged, and

(19.8) Signature of Inspector.

(20) Location for the signature of the MnDOT Certified Plant 1 Technician representing the Producer. The technician will review the first Certificate of Compliance for each mix type, each day, for accuracy and hand sign the Certificate of Compliance at a location designated for signature signifying agreement to the terms of this policy and to certify that the materials itemized in the shipment comply with the specifications and plans.

D7h Decertification

If the Contractor provides concrete from a plant that cannot produce concrete that fails to perform testing, report accurate results, or complete required documentation, the Engineer may reject the concrete as unacceptable in accordance with 1503, "Conformity with Plans and Specifications" and 1512, "Unacceptable and Unauthorized Work.".

The Concrete Engineer, with coordination from the Engineer, may decertify the plant and halt production of concrete if the producer performs the following:

(1) Procedural changes made after the completion of the Concrete Plant Contact Report and after starting the work that cause non-compliance with the program,
(2) Continually produces concrete in non-compliance with this section,
(3) Completely disregards the requirements of this section, and
(4) Submits fraudulent test reports

If decertifying the plant, the Concrete Engineer may perform the following:

(1) Revoke plant certification.
(2) Revoke technician certification for individuals involved,
(3) Revoke bidding privileges as determined by the Construction Engineer, and
(4) Criminal prosecution for fraud as determined by the Attorney General.

S-60 (2471) STRUCTURAL METALS

S-60.1 The Contractor is hereby referred to Section SB-12 (STRUCTURAL METALS) in Division SB which is attached to this Proposal. The provisions in SB-12 (STRUCTURAL METALS) shall be applicable to the entire Contract.

S-61 (2501) PIPE CULVERTS - MODIFIED

This work consists of furnishing and installing pipe culverts and fittings in accordance with the Plans, the applicable MnDOT Standard Specifications, Section 12 of the AASHTO LRFD Bridge Design Specifications, and the following:

S-61.1 **Concrete culvert sections shall be tied together with approved fasteners.**

S-61.2 MEASUREMENT
Measurement will be made by the length of pipe culvert furnished and installed as specified.

S-61.3 PAYMENT
Payment for pipe culverts will be made in accordance with the schedule set forth below at the appropriate Contract unit bid price for each separate item of work, which shall, in each instance, be compensation in full for the costs of all materials, equipment, and labor required to complete the work as specified, to the satisfaction of the Engineer.

Item No.	Description	Unit
2501.603	___ mm [__"] Pipe Culvert	meter [**linear foot**]

S-62 (2502) SUBSURFACE DRAINS, SUBCUT DRAIN TYPE - MODIFIED

This work shall consist of constructing subcut drains in accordance with the applicable provisions of MnDOT 2502, the Plan, and these Special Provisions. This drain is intended to collect and discharge infiltration water that may accumulate in the bottom of granular-backfilled subcuts. Subcut drains may also be used to control high groundwater conditions.

S-62.1 MATERIAL REQUIREMENTS
Subcut drain pipe shall be 100 mm [**4 inch**] perforated Corrugated Polyethylene (PE) Tubing, MnDOT 3278. **Pipe shall NOT be wrapped with Geotextile**, MnDOT 3733, Type I. **Coarse Filter Aggregate is required** and shall meet the requirements of MnDOT 3149.

S-62.2 CONSTRUCTION REQUIREMENTS

(A) Subcut drains may connect directly to permanent drainage structures or be outletted to the ditch via a discharge pipe and headwall. Where so specified, connections to drainage structures shall be incidental work and shall meet the approval of the Engineer.

Pipe shall generally be placed according to the Plan details, but other configurations may be approved by the Engineer to accomplish the desired results. Unless otherwise specified, drain grades shall not be less than 0.2 percent and outlets to the ditch shall be at low points or at a maximum spacing of 152.4 m [**500 feet**]. Structure outlets may be at maximum spacings of 243.8 m [**800 feet**], provided both ends of the pipe are tied to structures. The Contractor shall supply and use laser grade control equipment when placing all TP pipe and for PE pipe when pipe grades do not follow working grades at a constant depth.

The Contractor shall place 100 mm [**4 inch**] perforated Corrugated Polyethylene (PE) Tubing after the subcut is partially or totally backfilled.

Drains shall be placed by machine trencher capable of cutting the trench, shaping the trench bottom to cradle the lower one-third of the pipe, laying the pipe, and backfilling with coarse filter aggregate in one simultaneous and continuous operation. Plowing will not be permitted. The trenching head shall be equipped with a shield to prevent adjacent material from caving. Trench width shall be 200 mm [**8 inch**] minimum, 250 mm [**10 inch**] maximum, with pipe being centered therein.

The trench shall be backfilled with Coarse Filter Aggregate. Coarse filter aggregate shall be free-flowing and receive vibratory compaction to the satisfaction of the Engineer. In addition to the required trench compaction, at least one pass of general compaction (as directed by the Engineer) shall be made over the trench prior to placing the overlying required pavement structure.

The trenching operation may be performed anytime after the subgrade has been graded and compacted to the satisfaction of the Engineer.

S-62.3 MEASUREMENT AND PAYMENT

Measurement will be made by the length of furnished and satisfactorily installed Subsurface Drain, Subcut Drain Type, approved by the Engineer. Regardless of option chosen, payment will be made under Item 2502.541 (100 mm [**4"**] Perforated TP Pipe Drain) at the Contract bid price per meter [**linear foot**], which shall be full compensation for fabric wrapped pipe, furnished and installed as specified, filter aggregate backfill and compaction, and all other associated work.

S-63 (2502) SUBSURFACE DRAINS, DISCHARGE PIPE

This work shall consist of furnishing and placing discharge pipe and connection(s) for subsurface drains (edge drains, permeable aggregate base drains, subcut drains and all others that are outletted to the ditch) in accordance with the applicable provisions of MnDOT 2502, the Plan and these Special Provisions.

S-63.1 MATERIALS

Discharge pipe and connection(s) shall be nonperforated rigid Thermoplastic (TP) Pipe, MnDOT 3245. A 100 mm [**4 inch**] diameter (TP) discharge pipe shall be used for 75 mm [**3 inch**] and 100 mm [**4 inch**] polyethylene (PE) subsurface drains and a 150 mm [**6 inch**] diameter (TP) discharge pipe for 150 mm [**6 inch**] (PE) subsurface drains. The connection between the 75 mm [**3 inch**] (PE) subsurface drain and the 100 mm [**4 inch**] diameter x 300 mm [**12 inch**] straight length of (TP) pipe, shall be made with a 75 mm x 100 mm [**3 inch x 4 inch**] (TP) increaser. The 100 mm [**4 inch**] (PE) subsurface drain shall be connected to the 100 mm [**4 inch**] diameter x 300 mm [**12 inch**] straight length of (TP) pipe with a (TP) connector. The connection between the 300 mm [**12 inch**] length (TP) pipe and the variable length straight (TP) discharge pipe shall be made with a 90 degree, solvent-weld, Bell and Spigot elbow with a minimum radius of approximately 915 mm [**3 feet**]. Configurations other than the above may be approved by the Engineer to the extent that size, radius and pipe quality are similar.

S-63.2 CONSTRUCTION REQUIREMENTS

(A) The discharge pipe to the drain outlet shall be constructed concurrently with the drains and be laid at roughly right angles to the roadway centerline. A 300 mm [**12 inch**] straight length of (TP) connecting pipe shall be provided to connect the (PE) subsurface drain to the (TP) discharge pipe. This connector pipe shall be attached to the (PE) edge drain to provide easy entry (alignment) for probes, cleaners or video cameras.

All connections and solvent joints shall be secure to the extent that they will not decouple during backfilling and will prevent soil intrusion. If the potential for soil intrusion exists, the Engineer may require that the connections be wrapped with geotextile. All loose joints shall be taped to prevent separation. All increasers shall be oriented with the "smooth flow" portion being aligned with the pipe invert. Connection and coupling method(s) shall be approved by the Engineer.

When two drain runs come together at a low point, they shall be connected to a (TP) "Y" connection which shall be outletted via the (TP) discharge pipe to a single headwall.

The discharge trench shall be constructed similar to the drains, but shall be backfilled with compacted mineral soil. Mineral soils for this use shall have at least 5 percent minus 75 µm [**200**] (sieve) sized material and have a moisture content suitable for compaction as judged by the Engineer. Discharge pipe grades shall be no less than the subsurface drain and a minimum of 2 percent. Trench widths greater than 250 mm [**10 inches**] for the discharge pipe may be approved by the Engineer provided the pipe invert is properly cradled and compaction of soil adjacent to and above the pipe is carefully controlled so as not to crush the pipe and proper density is obtained during backfilling.

(B) Compaction equipment shall be appropriate for the drain trench. Extra compactive effort under bituminous shoulder areas will be required by the Engineer to prevent settlement, including a maximum backfill lift thickness of 150 mm [**6 inch**]. Should shoulder settlement occur above the discharge pipe, the Engineer may require that corrective action be taken, which may include removal, replacement, and recompaction of shoulder aggregate/ bituminous, all at no cost to the State. Crushed or deformed discharge pipe or connection shall be replaced by the Contractor at no cost to the State.

(C) Headwall outlets shall be kept 300 mm [**12 inches**] above ditch grades whenever possible, with the absolute minimum being 150 mm [**6 inches**]. When drains discharge to storm sewers rather than headwalls, the height above invert should be 300 mm [**12 inches**] (150 mm [**6 inches**] minimum) and the connection method shall be approved by the Engineer. Cost of the connection shall be incidental to other work.

If headwalls are not placed at the time the discharge pipe is installed and there is any possibility that pipe could be briefly buried by subsequent construction activities, the Contractor shall suitably mark discharge points for ease of future location. The drain opening shall be screened and shall remain open and operative after installation so that water does not collect in the pipe. Unless otherwise approved by the Engineer, all discharge pipes shall have concrete headwalls attached prior to termination of the construction season. If headwalls are not attached, all pipe ends shall be left open with screening and free-flowing.

S-63.3 MEASUREMENT AND PAYMENT

Measurement will be made by the length in meters [**feet**] of furnished and satisfactorily installed nonperforated Discharge Pipe approved by the Engineer. The connecting pipe footage and coupling(s) shall be included for payment with the discharge length.) Payment will be made under Item 2502.521 (100 mm [**4"**] TP Pipe Drain) at the Contract bid price per meter [**linear foot**], which shall be full compensation for trenching, furnishing and placing pipe and connection, coupling(s), cap, backfill and compaction, and all other associated work. (For TP "Y" connections extra pipe, connections and couplings for low-point discharges, shall be incidental to the discharge pipe.)

S-64 (2503) PIPE SEWERS - MODIFIED

This work shall consist of furnishing and installing pipe sewers and fittings in accordance with the Plans, the applicable MnDOT Standard Specifications, Section 12 of the AASHTO LRFD Bridge Design Specifications and the following:

S-64.1 **Concrete Pipe Sewers shall be tied together with approved fasteners**

S-65 (2503) CONNECT TO EXISTING STORM SEWER

This work consists of constructing connections into existing storm sewers in accordance with the applicable MnDOT Standard Specifications and the following:

Measurement will be made by the number of connections constructed as specified. Payment will be under Item 2503.602 (Connect to Existing Storm Sewer) at the Contract bid price per each, which shall be compensation in full for all costs incidental thereto, including but not limited to, all materials and labor necessary to connect the proposed drainage structure to the existing storm sewer pipe. Any damage caused to the existing storm sewer pipe shall be repaired at no expense to the Department and to the satisfaction of the Engineer.

S-66 (2506) MANHOLES AND CATCH BASINS

MnDOT 2506 is hereby modified and/or supplemented with the following:

S-66.1 A 100 mm [**4 inch**] thick concrete encasement shall be placed around the outside of the manhole or catch basin as detailed in current MnDOT Standard Plate 4026. This encasement shall be placed at the time of final casting placement and shall be incidental for which no payment will be made.

S-66.2 Adjusting Rings manufactured from High Density Polyethylene (H.D.P.E.) are approved as an alternate to concrete adjusting rings. It is important that the H.D.P.E. adjusting ring be sealed with the product recommended by the manufacturer.

S-67 (2511) RIPRAP - MODIFIED

Riprap shall be furnished in accordance with the provisions of 2511 and the following:

S-67.1 The Contractor shall place riprap at locations shown in the plan and to dimensions as directed by the Engineer. The use of salvaged concrete materials will not be permitted for use as riprap. Riprap will be paid for by in-place volume of the material based on the surface dimensions staked and the specified thickness. Payment will not be made by weight of material basis.

S-67.2 Furnishing and place Granular Filter under the entire riprap areas. Granular Filter Material shall be paid as Item 2511.511 Granular Filter by the Cubic Yard (CY). Geotextile Fabric will not be allowed as a substitution for Granular Filter Material.

S-68 (2521) WALKS

(2012 Version (Rev. 1/18/12))

The provisions of MnDOT 2521 are modified in accordance with the following:

- MnDOT 2521.3C3 is hereby modified to include the following provision:

After completing final finishing operations, cure all exposed concrete surfaces. Use one of the following curing methods:

(1) Place the membrane curing compound conforming to 3754 or 3755 within 30 minutes of concrete placement or once the bleed water has dissipated, unless the Engineer directs otherwise in accordance with 2521.3.E.1.a. Place the membrane curing compound on the edges within 30 minutes after permanent removal of the forms or curing blankets, unless the Contract requires otherwise.

(2) Place plastic curing blankets or completely saturated burlap curing blankets as soon as practical without marring the surface in accordance with 2521.3.E.1.b.

Failure to comply with these provisions will result in the Engineer applying a monetary deduction in accordance with 1503. When there is not a separate Contract unit price for Structural Concrete, the Department will apply a monetary deduction of $50.00 per cu. yd [$65.00 per cu. m] or 50 percent of the Contractor-provided invoice amount for the concrete in question, whichever is less.

Whenever weather conditions are such as to cause unusual or adverse placing and finishing conditions, expedite the application of a curing method or temporarily suspend the mixing and placing operations, as the conditions require.

If necessary to remove the coverings to saw joints or perform other required work, and if the Engineer approves, remove the covering for the minimum time required to complete that work.

C3a Curing Methods

C3a(1) Membrane Curing Method

Before application, agitate the curing compound as received in the shipping container to obtain a homogenous mixture. Protect membrane curing compounds from freezing before application. Handle and apply the membrane curing compound in accordance with the manufacturer's recommendations.

Apply the curing compound with an approved airless spraying machine in accordance with the following:

(1) At a rate of 1 gal per 150 sq. ft (1 L per 4 m^2) of surface curing area.
(2) Apply homogeneously to provide a uniform solid white opaque coverage on all exposed concrete surfaces (equal to a white sheet of typing paper). Some MnDOT approved curing compounds may have a base color (i.e. yellow) that cannot comply with the above requirement. In this case, provide a uniform solid opaque consistency meeting the intent of the above requirement.
(3) If the curing compound is damaged during the curing period, immediately repair the damaged area by re-spraying.

The Engineer will approve the airless spraying machine for use if it is equipped with the following:

(1) A re-circulating bypass system that provides for continuous agitation of the reservoir material,
(2) Separate filters for the hose and nozzle, and
(3) Multiple or adjustable nozzle system that provides for variable spray patterns.

If the Engineer determines that the initial or corrective spraying may result in unsatisfactory curing, the Engineer may require the Contractor to use the blanket curing method, at no additional cost to the Department.

C3a(2) Curing Blanket Method

After completion of the finishing operations and without marring the concrete, cover the concrete with curing blankets. Install in a manner that envelops the exposed concrete and prevents loss of water vapor. After the concrete has cured, apply membrane curing compound to the concrete surfaces that will remain exposed in the completed work.

C3b Protection Against Rain

Protect the concrete from damage due to rain. Have available, near the site of the work, materials for protection of the edges and surface of concrete. Should any damage result, the Engineer will suspend operations until the Contractor takes corrective action and may subject the rain-damaged concrete to 1503 and 1512.

C3c Protection Against Cold Weather

If the national weather service forecast for the construction area predicts air temperatures of 36 °F [1 °C] or less within the next 24 h and the Contractor wishes to place concrete, submit a cold weather protection plan.

Protect the concrete from damage including freezing due to cold weather. Should any damage result, the Engineer will suspend operations until corrective action is taken and may subject the damaged concrete to 1503 and 1512.

C3c(1) Cold Weather Protection Plan

Submit proposed time schedule and plans for cold weather protection of concrete in writing to the Engineer for acceptance that provides provisions for adequately protecting the concrete during placement and curing. Do not place concrete until the Engineer accepts the cold weather protection plans.

- MnDOT 2521.3E is hereby deleted and replaced with following:

E Backfilling

Protect newly placed concrete from damage by adjacent vibratory or backfilling operations for a minimum of 24 hours. Perform vibratory operations and backfilling 72 hours after placing the concrete or after the concrete reaches a compressive strength of at least 3,000 psi [**20.7 Mpa**]. The Engineer will cast, cure, and test the concrete control specimens in accordance with 2461.3G5. If damage results from any of these operations the Engineer will suspend all operations until corrective action is taken and a new method is approved. The Engineer may subject damaged concrete to 1503 and 1512.

The Contractor may hand operate concrete consolidation equipment and walk behind vibratory plate compactors 24 hours after placing the concrete, and other equipment as approved by the Engineer in conjunction with the Concrete Engineer.

After curing, backfill or perform embankment construction to the elevations shown on the plans, without damaging the concrete. Use suitable grading materials from the excavation for backfill material in accordance with 2105, unless otherwise required by the Contract. Place and compact the backfill material in accordance with 2105.

Dispose of surplus excavated materials in accordance with 2105.

S-69 (2531) CONCRETE CURBING

(2012 Version)

The provisions of MnDOT 2531 are supplemented and/or modified with the following:

- The last paragraph of MnDOT 2531.3C shall be deleted and replaced with the following:

  Longitudinal construction joints between a concrete median or gutter section and a concrete pavement shall not be sawed or sealed.

- MnDOT 2531.3G is hereby modified to include the following provision:

After completing final finishing operations, cure all exposed concrete surfaces. Use one of the following curing methods:

(1) Place the membrane curing compound conforming to 3754 or 3755 within 30 minutes of concrete placement or once the bleed water has dissipated, unless the Engineer directs otherwise in accordance with 2521.3.E.1.a. Place the membrane curing compound on the edges within 30 minutes after permanent removal of the forms or curing blankets, unless the Contract requires otherwise.

(2) Place plastic curing blankets or completely saturated burlap curing blankets as soon as practical without marring the surface in accordance with 2521.3.E.1.b.

Failure to comply with these provisions will result in the Engineer applying a monetary deduction in accordance with 1503. When there is not a separate Contract unit price for Structural Concrete, the Department will apply a monetary deduction of $50.00 per cu. yd [$65.00 per cu. m] or 50 percent of the Contractor-provided invoice amount for the concrete in question, whichever is less.

Whenever weather conditions are such as to cause unusual or adverse placing and finishing conditions, expedite the application of a curing method or temporarily suspend the mixing and placing operations, as the conditions require.

If necessary to remove the coverings to saw joints or perform other required work, and if the Engineer approves, remove the covering for the minimum time required to complete that work.

G1 Curing Methods

G1a Membrane Curing Method

Before application, agitate the curing compound as received in the shipping container to obtain a homogenous mixture. Protect membrane curing compounds from freezing before application. Handle and apply the membrane curing compound in accordance with the manufacturer's recommendations.

Apply the curing compound with an approved airless spraying machine in accordance with the following:

(1) At a rate of 1 gal per 150 sq. ft (1 L per 4 m^2) of surface curing area.

(2) Apply homogeneously to provide a uniform solid white opaque coverage on all exposed concrete surfaces (equal to a white sheet of typing paper). Some MnDOT approved curing compounds may have a base color (i.e. yellow) that cannot comply with the above requirement. In this case, provide a uniform solid opaque consistency meeting the intent of the above requirement.

(3) If the curing compound is damaged during the curing period, immediately repair the damaged area by re-spraying.

The Engineer will approve the airless spraying machine for use if it is equipped with the following:

(1) A re-circulating bypass system that provides for continuous agitation of the reservoir material,

(2) Separate filters for the hose and nozzle, and

(3) Multiple or adjustable nozzle system that provides for variable spray patterns.

If the Engineer determines that the initial or corrective spraying may result in unsatisfactory curing, the Engineer may require the Contractor to use the blanket curing method, at no additional cost to the Department.

G1b Curing Blanket Method

After completion of the finishing operations and without marring the concrete, cover the concrete with curing blankets. Install in a manner that envelops the exposed concrete and prevents loss of water vapor. After the concrete has cured, apply membrane curing compound to the concrete surfaces that will remain exposed in the completed work.

G2 Protection Against Rain

Protect the concrete from damage due to rain. Have available, near the site of the work, materials for protection of the edges and surface of concrete. Should any damage result, the Engineer will suspend operations until the Contractor takes corrective action and may subject the rain-damaged concrete to 1503 and 1512.

G3 Protection Against Cold Weather

If the national weather service forecast for the construction area predicts air temperatures of 36 °F [1 °C] or less within the next 24 h and the Contractor wishes to place concrete, submit a cold weather protection plan.

Protect the concrete from damage including freezing due to cold weather. Should any damage result, the Engineer will suspend operations until corrective action is taken and may subject the damaged concrete to 1503 and 1512.

G3a Cold Weather Protection Plan

Submit proposed time schedule and plans for cold weather protection of concrete in writing to the Engineer for acceptance that provides provisions for adequately protecting the concrete during placement and curing. Do not place concrete until the Engineer accepts the cold weather protection plans.

- MnDOT 2531.3J is hereby deleted and replaced with the following:

J Backfilling

Protect newly placed concrete from damage by adjacent vibratory or backfilling operations for a minimum of 24 hours. Perform vibratory operations and backfilling 72 h after placing the concrete or after the concrete reaches a compressive strength of at least 3,000 psi [**20.7 Mpa**]. The Engineer will cast, cure, and test the concrete control specimens in accordance with 2461.3G5. If damage results from any of these operations the Engineer will suspend all operations until corrective action is taken and a new method is approved. The Engineer may subject damaged concrete to 1503 and 1512.

The Contractor may hand operate concrete consolidation equipment and walk behind vibratory plate compactors 24 hours after placing the concrete, and other equipment as approved by the Engineer in conjunction with the Concrete Engineer.

After curing, backfill or perform embankment construction to the elevations shown on the Plans, without damaging the concrete. Use suitable grading materials from the excavation for backfill material in accordance with 2105, unless otherwise required by the Contract. Place and compact the backfill material in accordance with 2105.

Dispose of surplus excavated materials in accordance with 2105.

S-70 (2531) TRUNCATED DOME SYSTEMS

This work consists of constructing pedestrian curb ramps with Truncated Dome Systems (detectable warning surfaces) in compliance with the Public Rights-of-Way Accessibility Guidelines (PROWAG).

This work shall be performed in accordance with the applicable MnDOT Standard Specifications, these Special Provisions, the details in the Plan, and the following:

S-70.1 The Contractor shall select a truncated dome product from the approved products list at http://www.dot.state.mn.us/products/miscmaterials/truncateddomes.html . Only approved products are allowed. Stamped concrete is not allowed.

S-70.2 The truncated dome area will be measured by the square meter [**square foot**]. Payment will be made under Item 2531.604 (Truncated Domes) at the Contract bid price per square meter or Item 2531.618 (Truncated Domes) at the Contract bid price per [**square foot**], which shall be compensation in full.

S-71 (2533) PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337

The Contractor shall furnish and install portable precast concrete median barriers in accordance with current MnDOT Standard Plate No. 8337, these provisions , the Plan details and the following:

- All portable precast concrete median barrier shall be placed as shown in the Plans and as directed by the Engineer. The barrier shall not be removed until the Engineer approves the removal.

- The implementation dates of Technical Memorandum No. 08-03-TS-01 shall not apply to this Contract. Only barrier built using Standard Plate No. 8337B shall be allowed.

- The portable precast concrete median barrier shall remain the property of the Contractor upon completion of the Project. The Contractor shall arrange for disposal of the barrier outside of the Right of Way at the completion of the Project.

- The Contractor shall only place barrier that is deemed to be acceptable.

  To be acceptable, the barrier section shall meet the following minimum requirements:

  - Connecting loops shall be intact and undamaged. In the case of wire rope, there shall be no delamination or missing strands.
  - May have no more than hairline cracking due to handling and wear present.
  - Barrier faces and/or ends may have areas where surface concrete has been lost, but no area that would affect impacting vehicle travel/direction or overall structural integrity.
  - Rebar surface may be partially exposed but is not likely to affect impacting vehicle travel/direction or overall structural integrity.
  - Finished edges are reasonably square with no loss of concrete and may have minimal chipping due to wear.

  The barrier is **unacceptable** in the following cases:

  - Any connecting loops are cracked or, in the case of wire rope, are delaminated or missing strands.
  - Barrier section has major cracking that is likely to affect its structural integrity.
  - Barrier faces have extensive loss of surface concrete which would affect vehicle travel/direction.
  - Finished edges are so worn and rounded that the Type "F" face is no longer well-defined.
  - Barrier is delaminated to the point that rebars are completely exposed and are likely to affect impacting vehicle travel/direction or structural integrity.

Additional information regarding acceptable and unacceptable barrier can be found at the website for the Office of Traffic, Safety and Technology. Which can be found at: http://www.dot.state.mn.us/products

- The Contractor will be subject to a non-compliant charge for **unacceptable** Portable Concrete Barrier sections. Non-compliance charges, for each incident, will be **assessed at a rate of $250.00 per hour**, for each or any portion thereof, which the Engineer determines that the Contractor has not complied.

- The Contractor will be subject to a non-compliant charge for failure to properly connect the Portable Concrete Barrier sections. Non-compliance charges, for each incident, will be **assessed at a rate of $250.00 per hour**, for each or any portion thereof, which the Engineer determines that the Contractor has not complied.

- Measurement will be made by the length of Portable Concrete Barrier installed. Payment will be made under Item 2533.507 (Portable Precast Concrete Barrier Design 8337) at the Contract bid price per meter [**linear foot**], which shall be compensation in full, but not limited to, loading, hauling and installing the concrete median barrier and subsequent loading, hauling and removal of the barrier.

S-72 (2533) RELOCATE PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337

This work shall consist of relocating portable concrete median barrier within the Project limits as directed by the Engineer and the following:

- When portable median barrier has to be removed from the Project roadways, but will be needed again in a later phase of the work, the Engineer may direct that it be stockpiled on or near the Project site. When this is done, payment will be made under Item 2533.508 (Relocate Portable Precast Concrete Barrier Design 8337). Payment will be made once for removing the barrier from the roadway and placing it in the stockpile; and again for removing it from the stockpile and installing it in the roadway.

S-73 (2554) TRAFFIC BARRIERS

Traffic Barriers shall be constructed in accordance with the provisions of MnDOT 2554 and the following:

Guardrail block-outs of composite or recycled material which meet the criteria of NCHRP 350 may be substituted for wood block-outs in the construction of Plate Beam Guardrail systems.

S-74 (2554) END TREATMENT - TANGENT TERMINAL

This work shall consist of constructing a commercial type energy absorbing terminal in accordance with MnDOT 2554, the details in the Plan, as recommended by the manufacturer, as directed by the Engineer, and the following:

S-74.1 Energy Absorbing Terminal options shall be as indicated on the Plan.

S-74.2 If the Contractor chooses to install either an ET-2000 or ET-2000 PLUS Energy Absorbing Terminal, it shall be of the type manufactured by Trinity Industries, Inc., Dallas, TX.

If steel posts are to be used they shall be steel breakaway posts as specified by the manufacturer.

The adhesive object marker is sold separately from the terminal and shall be incidental to Item 2554.523 (End Treatment – Tangent Terminal) for which no direct payment will be made. The object marker to use with the ET-2000 or ET-2000 PLUS is striped yellow and black.

S-74.3 If the Contractor chooses to install an SKT-350 Sequential Kinking Terminal, the terminal shall be an SKT-350 of the type manufactured by Road Systems, Inc., Big Spring, TX.

The adhesive object marker is sold separately from the terminal and shall be incidental to Item 2554.523 (End Treatment - Tangent Terminal) for which no direct payment will be made. The object marker to use with the SK-350 is striped yellow and black.

S-74.4 The Contractor is responsible for obtaining the most current details from the manufacturer. The Contractor shall provide one copy for the Engineer.

S-75 (2554) IMPACT ATTENUATOR BARRELS

This work shall consist of furnishing and installing commercial type inertial barrier systems in accordance with the applicable provisions of MnDOT 2554, and the following:

The barrier shall be of a type as indicated on the Qualified Product List. The Qualified Product List can be found on the MnDOT Office of Traffic, Safety and Technology website. The Contractor will not be allowed to mix modules, only one barrel system will be allowed at a given location.

S-75.1 MATERIALS

(A) Inertial barriers shall consist of barrel-type modules complete with parts for proper retention of predetermined sand content and tight fitting covers.

(B) Sand for filling the modules shall be reasonably dry and mixed with a minimum of 5% by weight of sodium chloride.

S-75.2 CONSTRUCTION REQUIREMENTS

(A) The modules shall be placed at the location shown in the Plan and as directed by the Engineer in accordance with the manufacturer's recommendations, all to the satisfaction of the Engineer. The Contractor is responsible for obtaining the most current details from the manufacturer. The Contractor shall provide one copy for the Engineer.

(B) The Contractor shall maintain a sufficient supply of replacement modules on hand during the course of this Contract to maintain or replace the installations. The Contractor shall replace any modules which get damaged within as short a time period as possible, and shall supply to the Engineer three names of Contractor personnel who can be contacted in case of damage occurring during non-work hours.

S-75.3 MEASUREMENT AND PAYMENT

(A) Measurement will be made by the number of impact attenuator barrels furnished, installed, maintained and removed as specified. Payment will be made under Item 2554.602 (Impact Attenuator Barrels) at the Contract bid price per each, which shall be compensation in full for all costs relative to furnishing, installing, maintaining, and removing the barrels complete in place as specified.

S-76 (2554) RELOCATE IMPACT ATTENUATOR BARRELS

This work shall consist of relocating impact attenuator barrels within the Project limits as directed by the Engineer, and the following:

S-76.1 The relocated impact attenuator barrels shall be filled with the proper sand content in accordance with the manufacturer's recommendations.

S-76.2 When impact attenuator barrels have to be removed from the Project roadways, but will be needed again in a later phase of the work, the Engineer may direct that they be stockpiled on or near the Project site. When this is done, payment will be made under Item 2554.602 (Relocate Impact Attenuator Barrels). Payment will be made once for removing the impact attenuator barrels from the roadway and placing them in the stockpile; and again for removing them from the stockpile and installing them on the roadway.

S-76.3 Measurement will be made by the number of impact attenuator barrels relocated. Payment will be made under Item 2554.602 (Relocate Impact Attenuator Barrels) at the Contract bid price per each, which shall be payment in full for all costs incidental thereto.

S-77 (2563) RAISED PAVEMENT MARKERS TEMPORARY (TRPMS)

This work shall consist of constructing temporary raised pavement markers and the selected mounting system, placing the marker on the roadway, and removing the marker in accordance with the specification TEMPORARY RAISED PAVEMENT MARKERS (TRPM) and the following:

- The specification TEMPORARY RAISED PAVEMENT MARKERS (TRPM) can be accessed on the MnDOT Office of Traffic, Safety, and Technology website.
- TRPMs will be measured by the number of markers installed. Payment will be made under Item 2563.602 (Raised Pavement Marker Temporary) at the Contract bid price per each.

S-78 (2557) FENCING

The provisions of MnDOT 2557 are hereby modified as follows:

S-78.1 Add the following two paragraphs to the end of MnDOT 2557.3 C1:

Fences with a tension wire shall have a flow through (loop) type cap with the tension wire passing through the post cap. A hog ring shall attach the tension wire to the fabric and shall be located 150 mm (**6 inches**) on each side of a post. Additional hog rings shall be spaced 450 mm (**18 inches**) apart.

Wire ties, which attach the fabric to posts, should be spaced evenly with a tie as near to the top and a tie as near to the bottom of the fabric as practical. The number of ties on each post shall equal the height of the fabric in feet.

S-79 (2571) PLANT INSTALLATION

MnDOT 2571 is hereby deleted from the MnDOT Standard Specifications and replaced with the attached Specification "2571 -- PLANT INSTALLATION AND ESTABLISHMENT" **Revised 02/01/2012.**

S-80 (2573) STORM WATER MANAGEMENT - MODIFIED

The provisions of MnDOT 2573 are supplemented and/or modified with the following:

S-80.1 Bidders are advised the Engineer may use plan items for temporary erosion control items. The Contractor will be required to mobilize to the site for the use of these items for temporary erosion control. The temporary erosion control items will be paid individually by the item used at the contract unit price. For example the Engineer can direct the Contractor to perform the application of Mulch Type 1 or Hydraulic Soil Stabilizer Type 5 with or without disk anchoring, seed, seeding, and fertilizer.

S-80.2 The second paragraph of MnDOT 2573.3A1 Erosion Control Supervisor, is revised to read as follows:

The Erosion Control Supervisor shall be a responsible employee of the prime Contractor and/or duly authorized by the prime Contractor to represent the prime Contractor on all matters pertaining to the NPDES construction stormwater permit compliance. The Erosion Control Supervisor shall have authority over all Contractor operations which influence NPDES permit compliance including grading, excavation, bridge construction, culvert installation, utility work, clearing/grubbing, and any other operation that increases the erosion potential on the Project. In addition, the Erosion Control Supervisor shall **implement the Contractor's quality control program and other provisions in accordance with 1717.2 and** be available to be on the Project

within 24 hours at all times from initial disturbance to final stabilization as well as perform the following duties:

S-80.3 MnDOT 2573.3 A2, Construction of Temporary Storm Water Basins, is revised to read as follows:

Temporary storm water basins shall be constructed concurrently with the start of soil disturbing activities whenever practicable. The basins must be made fully functional and have storm water runoff from the localized watershed directed to the basins. The exposed sideslopes of the basins must be mulched and/or seeded within the time periods as set forth in 1717, or as directed by the Engineer.

S-80.4 The second paragraph of MnDOT 2573.3 A5, Vehicle Tracking Onto Paved Surfaces, is revised to read as follows:

The Contractor is responsible for insuring paved streets are clean at the end of each working day or more often as necessary to provide safety to the traveling public. Tracked sediment on paved surfaces must be removed by the Contractor within 24 hours of discovery, in accordance with 1717.2. Payment for street sweeping to provide safe conditions for the traveling public, environmental reasons or regulatory requirements shall be as provided in accordance with 1514.

S-80.5 The first sentence of MnDOT 2573.3E2 is revised to read as follows:

The bioroll shall be installed and anchored with wood stakes. The stakes shall be at a minimum nominally 25 mm x 50 mm (**1 inch x 2 inch**) and a minimum of 400 mm (**16 inches**) long with a pointed end.

S-80.6 The first paragraph of MnDOT 2573.3J Filter Log Installation, is revised to read as follows:

J Filter Log Installation
Filter logs shall be placed in accordance with the Plan. Straw and wood fiber filter logs shall be staked in place with wood stakes. Wood stakes shall be at a minimum 25 x 51 mm (**1 x 2 inch**) nominal size by 400 mm (**16 inches**) long. The stakes shall be driven through the back half of the log at an angle of approximately 45 degrees with the top of the stake pointing upstream. When more than one log is needed for length, the ends shall be overlapped 150 mm (**6 inches**) with both ends staked. Staking shall be every 0.3 m (**1 foot**) along the log unless precluded by paved surface or rock.

S-80.7 MnDOT 2573.5 Basis of Payment, is revised to read as follows:

Payment for storm water management and sediment control items will be compensation in full for all labor, materials, equipment, and other incidentals necessary to complete the work as specified, including the costs of maintenance and removal as required by the Contract. The Contractor will receive compensation at the appropriate Contract prices, or in the absence of a Contract bid price, according to the following unit prices, or in the absence of a Contract price and unit price, as Extra Work. In the absence of a Contract item for Erosion Control Supervisor, this work shall be considered incidental.

S-80.8 MnDOT 2573.5 E, Unit Prices, is revised to read as follows:

The Department will pay the following unit prices for temporary sediment control items in the absence of a Contract bid price:

(1) Bale Barrier ..... $13.45/m (**$4.10 per linear foot**)
(2) Silt Fence, Heavy Duty ..... $10/m (**$3.00 per linear foot**)
(3) Flotation Silt Curtain, Type: Still Water, 1.2 m (**4 foot**) depth ..... $54.10/m (**$16.50 per linear foot**)

(4) Sediment Trap Excavation ..... $7.20/m^3 (**$5.50 per cubic yard**)
(5) Bituminous Lined Flume ..... $6.00/m^2 (**$5.00 per square yard**)
(6) Silt Fence, Type Machine Sliced ..... $6.50/m (**$2.00 per linear foot**)
(7) Sediment Removal, Backhoe ..... $175 per hour
(8) Filter Log, Type Straw Bioroll $1.00/m (**$3.00/foot**)
(9) Filter Log, Type Rock Log $16.50/m (**$5.00/foot**)
(10) Flocculant Sock ..... $300 each

S-81 (2573) EROSION CONTROL SUPERVISOR

2573.4S is deleted and replaced by the following:

S-81.1 S Erosion Control Supervisor

A) No measurement will be made of the various duties that the Erosion Control Supervisor performs or of the number of hours required, but all such work will be construed to be included in the single Lump Sum Payment under Item 2573.601 (Erosion Control Supervisor). Upon satisfactory completion of one half of the allowable Working Days for the Project, the Engineer may authorize partial payment not exceeding 50 percent of the Contract bid price. The remaining percentage will be paid upon completion of the Project.

S-82 (2575) CONTROLLING EROSION AND ESTABLISHING VEGETATION - MODIFIED

The provisions of MnDOT 2575 are hereby modified and/or supplemented with the following:

S-82.1 Bidders are advised the Engineer may use plan items for temporary erosion control items. The Contractor will be required to mobilize to the site for the use of these items for temporary erosion control. The temporary erosion control items will be paid individually by the item used at the contract unit price. For example the Engineer can direct the Contractor to perform the application of Mulch Type 1 or Hydraulic Soil Stabilizer Type 5 with or without disk anchoring, seed, seeding, and fertilizer.

S-82.2 MnDOT 2575.3D paragraph 2 and table 2575-2 are hereby deleted and replaced with the following:

The Contractor shall sow the seed uniformly at the rate of application specified in Table 3876-5.

S-82.3 MnDOT 2575.4D is hereby deleted and replaced with the following:

D Seed

When a bulk rate seed mixture is specified as shown in table 3876-5, the measurement will be made on that bulk mass. When a PLS rate seed mixture is specified as shown in table 3876-5, the measurement will be made on the PLS mass.

S-82.4 MnDOT 2575.5C is hereby deleted and replaced with the following:

C Seed

When a seed mixture is specified at a bulk rate as shown in table 3876-5, the payment will be made on that bulk mass. When a seed mixture is specified at a PLS rate as shown in table 3876-5, the payment will be made on the PLS mass.

Payment for seed not meeting germination and purity or PLS requirements of 3876 shall be subject to 1503. When components are missing from the specified mixture the affected seeded areas shall be reseeded with the missing components by the Contractor at no additional cost to the Department.

S-83 (2575) RAPID STABILIZATION SPECIFICATIONS

This work shall consist of operations necessary to rapidly stabilize small critical areas, to prevent off site sedimentation and/or to comply with permit requirements. The work may be performed at any time during the Contract and will be conducted on small areas that may or may not be accessible with normal equipment. This work shall be done in accordance with the applicable MnDOT Standard Specifications, the details shown in the Plan, and the following:

S-83.1 **BASIS OF PAYMENT**

In the absence of a Contract bid price, the Department will pay the following unit prices for Rapidly Stabilizing Small Scattered Critical Areas directly abutting Waters of the State during rough grading and as required in the NPDES permit. These unit prices shall be construed to include mobilizations for this activity.

Rapid Stabilization	Pre-Approve Prices	
Method 1	$900/ha (**$400/acre**)	Approved price reflects small quantities. Quantities installed per Project visit are assumed to require approximately 0.4 to 0.8 ha **[1 to 2 acres]** of coverage.
Method 2	$2220/ha (**$898/acre**)	Approved price reflects small quantities. Quantities installed per Project visit are assumed to require approximately 0.4 to 0.8 ha **[1 to 2 acres]** of coverage.
Method 3	$149.50/m^3 (**$566/M gallon**)	Approved price reflects small quantities. Quantities installed per Project visit are assumed to require approximately 11.4 to 34 m^3 **[3000 to 9000 gallons]** of product slurry.
Method 4	$3.00/m^2 (**$2.50/SY**)	Approved price reflects small quantities. Quantities installed per Project visit are assumed to require approximately 150 to 650 m^2 **[200 to 800 SY]** of coverage.
Method 5	$48.60/metric ton (**$45/ton**)	Approved price reflects small quantities. Quantities installed per Project visit are assumed to require approximately 9 to 18 metric tons **[10 to 20 tons]** of riprap.

S-84 (2581) REMOVABLE PREFORMED PLASTIC MASK (BLACK)

This work shall consist of furnishing, placing and removing temporary pavement marking material over inplace pavement markings when traffic control must be temporarily changed. This work shall be in accordance with the provisions of Mn/DOT 2581, as modified below. The removable preformed plastic pavement marking material shall conform to the requirements of Mn/DOT 3355.

S-84.1 The 2nd paragraph of Mn/DOT 2581.4 is changed to read as follows:

The measurement is based on a 150 mm [**6 inch**] wide marking tape. Broken line marking will be measured by the actual length of material used and will not include the gap between the broken lines.

S-84.2 Measurement will be made by the length in meters [**linear feet**].

S-84.3 Payment for pavement markings of each type will be made in accordance with the schedule set forth below at the appropriate Contract bid price for the specified unit of measure. Such payment, in each instance, shall be compensation for all costs of furnishing, placing, maintaining, replacing, and removing the Marking.

ITEM NO.	DESCRIPTION	UNIT
2581.603	Removable Preformed Plastic Mask (Black)	meter [**linear foot**]

S-85 (2582) PERMANENT PAVEMENT MARKINGS

The provisions of MnDOT 2582 are hereby modified and/or supplemented with the following:

S-85.1 The provisions of MnDOT 2582.2 are hereby deleted and replaced with the following:

A Preformed Plastic Markings for Permanent Traffic Lane Delineation and Legends.....3354
B Epoxy Resin Pavement Markings (Free of Toxic Heavy Metals).....3590
C High Solids Water-Based Traffic Paint.....3591
D Drop-On Glass Beads.....3592

Qualified materials can be found on MnDOT's Qualified Products List on the Office of Traffic, Safety and Operations website. Other materials may be used on a provisional basis as detailed in the QPL process and as approved by the Engineer. Type of material used will be as specified by Contract Documents.

S-85.2 MnDOT 2582.3A2 is hereby deleted.

S-85.3 MnDOT 2582.3G is hereby deleted and replaced with the following:

Contractors applying pavement markings for MnDOT under a contract **are required** to fill out the "Construction Striper Operations Daily Log" form which can be found on the Office of Traffic, Safety and Technology website and as approved by the Engineer.

S-85.4 The provisions of MnDOT 2582.5 are hereby deleted and replaced with the following:

2582.5 BASIS OF PAYMENT
Payment for pavement markings installed at Contract prices per unit of material shall be compensation in full for all costs incurred in materials, traffic control, installation, surface preparation, use of primers, in accordance to Contract documents or as approved by the Engineer.

ITEM NO.	ITEM	UNIT
2582.501	Pavement Message (1) (2)	Each
2582.502	__ mm (__inch) width (3) (4) (2)	meter (**linear foot**)
2582.503	Crosswalk Marking - (2)	square meter (**square foot**)

(1) Specify Message
(2) Specify Material
(3) Specified Type of Line (Solid, Broken or Dotted)
(4) Specify Color

S-86 (2582) PERMANENT PAVEMENT MARKINGS (POLY PREFORMED)

The provisions of MnDOT 2582 are hereby modified and/or supplemented with the following:

S-86.1 The language below applies to permanent pavement markings for this Project that utilize Poly Pref.

S-86.2 The pavement marking material utilized for this Project must be listed within **Tape System-Permanent** category on the MnDOT Approved/Qualified Products Lists.

S-86.3 The provisions of MnDOT 2582.2 are hereby deleted and replaced with the following:

A Preformed Plastic Markings for Permanent Traffic Lane Delineation and legends.....3354

Qualified materials can be found on MnDOT's Qualified Products List (QPL) on the Office of Traffic, Safety and Technology website. The Pavement Marking Materials QPL can be found at http://www.dot.state.mn.us/products/pavementmarkings/pmmaterials.html. Other materials may be used on a

provisional basis as detailed in the QPL process and as approved by the Engineer. Type of material used will be as specified by Contract Documents.

S-86.4 The provisions of MnDOT 2582.3A2 are hereby deleted and replaced with the following:

Training of a striping Contractor – To assure the proper installation of pavement markings, the Contractor's crew shall obtain manufacturer certification. Certification is typically achieved by attending an application training seminar. The training shall address surface preparation and all application requirements and techniques necessary for successful marking tape applications. Upon completion of the seminar for these personnel, the manufacturer of the marking tape shall provide written certification of approval to each person approved. On-site Contractor personnel shall present a valid training certification card upon request of the Engineer or other state project personnel.

S-86.5 MnDOT 2582.3G is hereby deleted and replaced with the following:

Contractors applying pavement markings for MnDOT under a contract **are required** to fill out the "Construction Striper Operations Daily Log" form which can be found on the Office of Traffic, Safety and Technology website and as approved by the Engineer.

S-86.6 The provisions of MnDOT 2582.5 are hereby deleted and replaced with the following:

2582.5 BASIS OF PAYMENT

Payment for pavement markings installed at Contract prices per unit of material shall be compensation in full for all costs incurred in materials, traffic control, installation, surface preparation, use of primers, in accordance to Contract documents or as approved by the Engineer.

ITEM NO.	ITEM	UNIT
2582.501	Pavement Message (1) Poly Preform	Each
2582.502	__ mm (__inch) width (2) (3) – Poly Preform	meter (**linear foot**)
2582.503	Crosswalk Marking – Poly Preform	square meter (**square foot**)

(1) Specify Message
(2) Specified Type of Line (Solid, Broken or Dotted)
(3) Specify Color

S-87 (2582) PERMANENT PAVEMENT MARKINGS (POLY PREFORMED GROUND IN) - MODIFIED

The provisions of Mn/DOT 2582 are hereby modified and/or supplemented with the following:

S-87.1 The language below applies to permanent pavement markings for this Project that are to be recessed pavement markings, utilizing Poly Pref (GR IN).

S-87.2 The pavement marking material utilized for this Project must be listed within **Tape System-Permanent** category on the Mn/DOT Approved/Qualified Products Lists.

S-87.3 The provisions of Mn/DOT 2582.2 are hereby deleted and replaced with the following:

A Preformed Plastic Markings for Permanent Traffic Lane Delineation and legends.....3354

Qualified materials can be found on Mn/DOT's Qualified Products List (QPL) on the Office of Traffic, Safety and Technology website. The Pavement Marking Materials QPL can be found at http://www.dot.state.mn.us/products/pavementmarkings/pmmaterials.html. Other materials may be used on a provisional basis as detailed in the QPL process and as approved by the Engineer. Type of material used will be as specified by Contract Documents.

S-87.4 The provisions of Mn/DOT 2582.3A2 are hereby deleted and replaced with the following:

Training of a striping Contractor – To assure the proper installation of pavement markings, the Contractor's crew shall obtain manufacturer certification. Certification is typically achieved by attending an application training seminar. The training shall address surface preparation and all application requirements and techniques necessary for successful marking tape applications. Upon completion of the seminar for these personnel, the manufacturer of the marking tape shall provide written certification of approval to each person approved. On-site Contractor personnel shall present a valid training certification card upon request of the Engineer or other state Project personnel.

S-87.5 **GROOVING BITUMINOUS *and/or* CONCRETE PAVEMENT SURFACES FOR POLYMER PREFORMED TAPE PAVEMENT MARKINGS**

The polymer preformed tape pavement markings are to be grooved into the pavement surfaces. **GRINDER-TYPE CUTTING HEADS CANNOT BE USED.** The goal of the grooving process is to protect the pavement marking from snowplow damage and ultimately extend the service life of the pavement markings. Grooving operations are incidental to permanent pavement marking operations.

S-87.6 The following is hereby added to Mn/DOT 2582.3B, Application:

The Contractor has the option to dry or wet groove the pavement while the roadway is open or closed to traffic. The grove must be cleaned completely prior to pavement marking application, using an air compressor with at least 185 CFM air flow and 120 PSI air pressure. The compressor must be equipped with a moisture and oil trap, and cannot have more than 50 feet of 3/4 inch ID hose between the compressor and the air nozzle. The air nozzle must have an inside diameter of 1/2 inch or greater.

(A) Grooving Equipment

The grooving shall be performed by a self-propelled machine equipped with gang stacked diamond cutting blades mounted on a floating head with controls capable of providing uniform depth and alignment.

The cutting heads shall consist of stacked 3 mm to 9 mm [**1/8 inch to 3/8 inch**] wide diamond tipped cutting blades. The spacers between each blade must be such that the raise in the bottom of the finished groove between the blades is less than 25% of the groove depth. The resulting bottom of the groove shall have a fine corduroy finish. If a coarse tooth pattern is present, the Contractor shall increase the number of blades and/or decrease the thickness of the spacers on the cutting head.

The equipment shall be capable of grooving the total width of the groove in one pass or be capable of grooving uniform depths with multiple passes. The maximum number of passes is detailed below. If multiple passes are used, the ridge between passes shall be mechanically removed prior to groove cleaning and pavement marking application.

The equipment shall be capable of grooving double lines simultaneously or parallel lines to a uniform depth with two passes.

The equipment shall be self-vacuuming and leave the cut groove ready for pavement marking installation. Dry cut grooving without a vacuum will only be allowed if markings run perpendicular to the roadway, such as Stop Bars. The pavement marking manufacturer shall approve the equipment and method used.

(B) Grooves

The grooving shall be preformed within the following tolerances. Failure to meet these tolerances will result in the suspension of work until the Contractor can demonstrate that these tolerances can be met to the satisfaction of the Engineer. **The pavement marking system shall be applied so that it is centered within the groove.**

GROOVE WIDTH AND MAXIMUM NUMBER OF PASSES		
MARKING WIDTH	GROOVE WIDTH	MAX NUMBER OF PASSES
100 mm **[4 inches]**	130 mm ± 3 mm **[5" ± 1/8"]**	1
150 mm **[6 inches]**	180 mm ± 3 mm **[7" ± 1/8"]**	1
200 mm **[8 inches]**	230 mm ± 3 mm **[9" ± 1/8"]**	1
300 mm **[12 inches]**	330 mm ± 3 mm **[13" ± 1/8"]**	2
600 mm **[24 inches]**	635 mm ± 3 mm **[25" ± 1/8"]**	3

The groove depth shall be 110 mil ± 10 mil.

Since pavements are irregular, the depth of groove across the width may vary. To compensate for this, the depth of the groove shall be measured from the bottom of the groove to a straight edge extended over the groove from the pavement surface opposite the pavement joint.

FULL DEPTH GROOVE LENGTHS	
Full Depth Groove Length (Broken Line)	3 m ± 75 mm **[10 feet ± 3 inches]**
Tapers At End of Each Line	150 mm ± 230 mm **[6 inches to 9 inches]**
Space Between Double lines	100 mm ± 6 mm **[4 inches ± 1/4 inch]**

The groove shall be placed 50 mm ± 25 mm **[2 inches ± 1 inch]** from the edge of joints or seams along edge or centerline, unless otherwise indicated in the Plan.

Grooving alignment deviations from the control guide or existing lines specified by the Engineer shall not exceed 50 mm **[2 inches]**.

All pavement markings to be grooved in shall be placed in accordance with pavement marking or element manufacturer's instructions.

If the Poly Pref (GR IN) markings are to be installed in the same location where there are existing pavement markings, including interim or temporary, the removal of the existing pavement markings shall be incidental to and included within the Poly Pref (GR IN) pay item. The Contractor may cut the groove and remove the existing marking in a simultaneous operation.

S-87.7 Mn/DOT 2582.3G is hereby deleted and replaced with the following:

Contractors applying pavement markings for Mn/DOT under a contract **are required** to fill out the "Construction Striper Operations Daily Log" form which can be found on the Office of Traffic, Safety and Technology website and as approved by the Engineer.

S-87.8 The provisions of Mn/DOT 2582.5 are hereby deleted and replaced with the following:

2582.5 BASIS OF PAYMENT

Payment for pavement markings installed at Contract prices per unit of material shall be compensation in full for all costs incurred in materials, traffic control, installation, surface preparation, use of primers, in accordance to Contract documents or as approved by the Engineer.

ITEM NO.	ITEM	UNIT
2582.501	Pavement Message (1) Poly Preform (GR IN)	Each
2582.502	__ mm (__inch) width (2) (3) – Poly Preform (GR IN)	meter (**linear foot**)
2582.503	Crosswalk Marking – Poly Preform (GR IN)	square meter (**square foot**)

(1) Specify Message
(2) Specified Type of Line (Solid, Broken or Dotted)
(3) Specify Color

S-88 (3103) PORTLAND-POZZOLAN CEMENT

MnDOT 3103 is hereby deleted and replaced with the following:

Portland-Pozzolan cement shall be from certified sources only. Portland-Pozzolan cement furnished under this Specification shall conform to AASHTO M 240, Type IS, Type I(SM), Type IP, Type I(PM), Type IP-A or any other portland-pozzolan cement as approved by the Concrete Engineer, except as modified by the following:

(1) The fly ash constituent of the interground cement shall not exceed 20 percent.
(2) The fly ash constituent of blended cement shall not exceed 15 percent.
(3) The ground granulated blast furnace slag constituent of the interground cement shall not exceed 35 percent.
(4) The ground granulated blast furnace slag constituent of blended cement shall not exceed 35 percent.

All delivery invoices shall include a standardized Cement Certification Statement which is as follows: (insert company name) certifies that the cement produced at (insert plant and location) conforms to AASHTO and MnDOT Specifications for Type (insert Type) cement. The change of source or color, or both, of cement on a Project will not be permitted without the written approval of the Concrete Engineer.

S-89 (3137) COARSE AGGREGATE FOR PORTLAND CEMENT CONCRETE

(2011 Version (Rev. 4/27/11))

MnDOT 3137 shall be deleted and replaced with the following:

3137.1 SCOPE

Provide coarse aggregate for use in portland cement concrete.

3137.2 REQUIREMENTS

A General

Provide coarse aggregate consisting of clean, sound, durable particles, uniform in quality, and free from wood, bark, roots, and other deleterious material.

The Engineer, in conjunction with the Concrete Engineer, may consider the following as the basis for acceptance of coarse aggregate for portland cement concrete:

(1) Results of laboratory tests,
(2) Behavior under natural exposure conditions,
(3) Behavior of other portland cement concrete with aggregate from the same or similar geological formations or deposits, and
(4) Any other tests or criteria as deemed appropriate by the Engineer, in conjunction with the Concrete Engineer.

B Classification

Provide coarse aggregate meeting the requirements of one of the following classifications:

(1) Class A: Crushed quarry rock including quartzite, gneiss, and granite, or mine trap rock including basalt, diabase, gabbro, and other igneous rock types. Class A aggregate may contain no greater than 4.0 percent non-Class A aggregate. The Department will not allow the intentional blending or adding of non-Class A aggregate.
(2) Class B: All other crushed quarry or mine rock types including carbonates, rhyolite, and schist.
(3) Class C: Natural or partly crushed gravel obtained from a natural gravel deposit.
(4) Class D: Mixture of at least two classes of coarse aggregate. The Engineer, in conjunction with the Concrete Engineer, will determine the suitability of the Class D aggregate for the proposed use including proportioning.
(5) Class R: Aggregate obtained from recycling concrete. The Engineer, in conjunction with the Concrete Engineer, will determine the suitability of the Class R aggregate for the proposed use including proportioning.

C Washing

Wash Class B, Class C, Class D, and Class R coarse aggregate. Wash Class A aggregate as needed to comply with the requirements of Table 3137-1.

D Quality

Quality requirements are based on each individual aggregate fraction unless otherwise allowed by the Engineer, in conjunction with the Concrete Engineer with the exception of the following:

(1) When 100 percent of the fractions from a single source pass the 1 in [**25 mm**] sieve, quality requirements are based on the composite value of the combined aggregates.
(2) When less than 100 percent of the fractions from a single source pass the 1 inch [**25 mm**] sieve:
    (a) Those fractions passing the 1 inch [**25 mm**] sieve are combined and based on the composite value;
    (b) The fractions greater than or equal to 1 inch [**25 mm**] are based on each individual aggregate fraction.

D1 Coarse Aggregate for General Use

Provide coarse aggregate for general use concrete in accordance with Table 3137-1.

Table 3137-1
Coarse Aggregate for General Use

	Quality Test	Maximum Percent by Weight
(a)	Shale:	
	Fraction retained on the ½ in [**12.5 mm**] sieve	0.4
	Fraction retained on the No. 4 [**4.75 mm**] sieve, as a percentage of the total material	0.7
(b)	Soft iron oxide particles (paint rock and ochre)	0.3
(c)	Total spall materials*:	
	Fraction retained on the ½ in [**12.5 mm**] sieve	1.0
	Fraction retained on the No. 4 [**4.75 mm**] sieve, as a percentage of the total material	1.5
(d)	Soft particles‖	2.5
(e)	Clay balls and lumps	0.3
(f)	Sum of (c) total spall materials, (d) soft particles, and (e) clay balls and lumps†	3.5
(g)	Slate	3.0
(h)	Flat or elongated pieces‡	15.0
(i)	Quantity of material passing No. 200 [**75 µm**] sieve:	
	Class A and Class B aggregates#	1.5
	Class C and Class D aggregates§	1.0
(j)	Los Angeles Rattler, loss on total sample	40.0
(k)	Soundness of magnesium sulfate**	15.0

* Includes the percentages retained by shale and soft iron oxide particles, plus other iron oxide particles, unsound cherts, pyrite, and other materials with similar characteristics.
‖ Exclusive of shale, soft iron oxide particles, and total spall materials.
† Sum of the total spall materials, soft particles, and clay balls and lumps. For total spall materials, use the percent in the total sample retained on the No. 4 [**4.75 mm**] sieve.
‡ Thickness less than 25 percent of the maximum width. Length greater than 3 times the maximum width.
\# Each individual fraction at the point of placement consists of dust from the fracture and free of clay or shale.
§ For each individual fraction at the point of placement.
** Loss at 5 cycles for any fraction of the coarse aggregate. Do not blend materials from multiple sources to obtain a fraction meeting the sulfate soundness requirement.

D2 Coarse Aggregate for Bridge Superstructure

Provide coarse aggregate in accordance with 3137.2D1 except as modified by Table 3137-2 for use in the following:

(1) Bridge superstructure (deck, railing, posts, curbs, sidewalks, and median strips);
(2) Approach panels; and
(3) Precast concrete panel facings for Mechanically Stabilized Earth walls.

Table 3137-2 Coarse Aggregate for Bridge Superstructure		
Quality Test		**Maximum Percent by Weight**
(a)	Shale:	
	Fraction retained on the ½ in [**12.5 mm**] sieve	0.2
	Fraction retained on the No. 4 [**4.75 mm**] sieve as a percentage of the total material	0.3
(b)	Soft iron oxide particles (paint rock and ochre)	0.2
(c)	Total spall materials*:	
	Fraction retained on the No. 4 [**4.75 mm**] sieve as a percentage of the total material	0.5
(d)	Soft particles‖	2.5
(e)	Clay balls and lumps	0.3
(f)	Sum of (c) total spall materials, (d) soft particles, and (e) clay balls and lumps, use the percent in the total sample retained on the No. 4 [**4.75 mm**] sieve	3.0
(g)	Absorption for Class B aggregate	1.10
(h)	Carbonate in Class C and Class D aggregates by weight	30.0

* Includes the percentages retained by shale and soft iron oxide particles, plus other iron oxide particles, unsound cherts, pyrite, and other materials with similar characteristics.
‖ Exclusive of shale, soft iron oxide particles, and total spall materials.
† Sum of the total spall materials, soft particles, and clay balls and lumps. For total spall materials, use the percent in the total sample retained on the No. 4 [**4.75 mm**] sieve.

D3 Coarse Aggregate for Concrete Pavement

Provide coarse aggregate in accordance with 3137.2D1, except as modified by Table 3137-3, for use in the following:

(1) Concrete pavement, and
(2) Concrete pavement rehabilitation.

Table 3137-3 Coarse Aggregate for Concrete Pavement		
Quality Test		**Maximum Percent by Weight**
(a)	Absorption for Class B aggregate	1.75
(b)	Carbonate in Class C aggregate by weight	30.0

E Gradation

Provide coarse aggregate in accordance with Table 3137-4 including all sizes within the specified limits. The Department defines coarse aggregate as the uniform product of the producing plant, unless some sizes are removed to meet the gradation requirements. Do not use broken or noncontinuous gradations.

If the coarse aggregate has less than 100 percent passing the 1 in [**25 mm**] sieve, proportion the coarse aggregate using at least two fractions. Gradation requirements are based on the composite value of the combined coarse aggregates.

Table 3137-4
Coarse Aggregate Designation for Concrete,
percent by weight passing square opening sieves

Aggregate	2 in [50 mm]	1½ in [37.5 mm]	1¼ in [31.5 mm]	1 in [25.0 mm]	¾ in [19.0 mm]	⅝ in [16.0 mm]	½ in [12.5 mm]	⅜ in [9.5 mm]	No.4 [4.75 mm]
CA-00	—	—	—	100	95 – 100	—	—	—	0 – 10
CA-15	100	95 – 100	—	—	35 – 65	—	—	5 – 25	0 – 7
CA-25	100	95 – 100	—	—	50 – 80	—	—	20 – 40	0 – 7
CA-35	—	100	95 – 100	—	55 –85	—	—	20 – 45	0 – 7
CA-45	—	—	100	95 – 100	65 – 95	—	—	25 – 55	0 – 7
CA-50	—	—	—	100	85 – 100	—	—	30 – 60	0 – 12
CA-60	—	—	—	—	100	85 – 100	—	40 – 70	0 – 12
CA-70	—	—	—	—	—	100	85 – 100	50 – 100	0 – 25
CA-80*	—	—	—	—	—	—	—	100	55 – 95

* Do not allow greater than 5 percent to pass the No. 50 [300 μm] sieve.

If producing Class R aggregate, remove reinforcing steel from the concrete and any concrete material passing the No 4 [**4.75 mm**] sieve.

3137.3 SAMPLING AND TESTING

Sample and test coarse aggregate fractions separately in accordance with Table 3137-5.

Table 3137-5
Preliminary Coarse Aggregate Testing

Aggregate	Notification and Testing Requirement
New source	Notify the Engineer at least 1 month before use. Perform new source concrete aggregate testing in accordance with the procedure on the Department's website.
Previously tested aggregate	Notify the Engineer at least 2 weeks before use. Perform additional testing as directed by the Engineer, in conjunction with the Concrete Engineer.

Sample and test coarse aggregate in accordance with Table 3137-6.

Table 3137-6
Coarse Aggregate Test Methods

Test	Testing Method
Sampling	MnDOT Concrete Manual
Sieve analysis	MnDOT Concrete Manual
Shale test	MnDOT Laboratory Manual 1207
Quantity of material passing the No. 200 [**75 µm**] sieve	MnDOT Concrete Manual
Specific gravity and absorption	MnDOT Laboratory Manual 1204
Density	AASHTO T 19 or MnDOT Laboratory Manual 1211
Los Angeles Rattler loss	AASHTO T 96
Void content	AASHTO T 19* or MnDOT Laboratory Manual 1211
Deleterious materials	MnDOT Laboratory Manual 1209
Soundness; magnesium sulfate	MnDOT Laboratory Manual 1219
Soft particles	MnDOT Laboratory Manual 1218
Flat or elongated pieces	ASTM D 4791
Clay balls or lumps	MnDOT Concrete Manual

* Base the void content on an oven-dry and compacted-by-rodding condition of the aggregate and a value of 62.4 lb per cu. ft [**1,000 kg per cu. m**] for water.

S-90 (3138) AGGREGATE FOR SURFACE AND BASE COURSES

The provisions of MnDOT 3138 are hereby modified as follows:

S-90.1 The second paragraph of MnDOT 3138.2B Gradation Tables 3138-1 and 2, is revised to read as follows:

If Class 7 is substituted for Classes 1, 3, 4, 5, or 6, it shall meet the gradation requirements of the substituted class (Table 3138-1); except that, for Class 5 and 6, up to 5 percent by mass **(weight)** of the total composite mixture may exceed 25.0 mm (**1 inch**) sieve but 100 percent must pass the 37.5 mm (**1.5 inch**) sieve. Surfacing aggregate mixtures containing salvaged materials shall meet the gradation requirements of the materials specified in the Plan. All gradations will be run on the composite mixture before extraction of the bituminous material.

S-90.2 TABLE 3138-1 in MnDOT 3138.2B Gradation Tables 3138-1 and 2, is hereby deleted and replaced with the following:

TABLE 3138-1
BASE AND SURFACING AGGREGATE
Total Percent Passing

Sieve Size	Class 1 (A)	Class 2	Class 3 (A)	Class 4 (A)	Class 5 (A) (B)	Class 6 (A) (B)
75 mm (3 inches)	--	--	--	--	--	--
50 mm (2 inches)	--	--	100	100	--	--
37.5 mm (1½ inches)	--	--	--	--	--	--
25.0 mm (1 inch)	--	--	--	--	100	100
19.0 mm (3/4 inch)	100	100	--	--	90-100	90-100
9.5 mm (3/8 inch)	65-95	65-90	--	--	50-90	50-85
4.75 mm (No. 4)	40-85	35-70	35-100	35-100	35-80	35-70
2.00 mm (No. 10)	25-70	25-45	20-100	20-100	20-65	20-55
425 µm (No. 40)	10-45	12-30	5-50	5-35	10-35	10-30
75 µm (No. 200)	8.0-15.0	5.0-13.0	5.0-10.0	4.0-10.0	3.0-10.0	3.0-7.0

(A) When salvaged materials are substituted for another class of aggregate, it shall meet the gradation requirements of the class being replaced except as amended in 3138.2 B.

(B) The gradation requirements for aggregates containing 60% or more crushed quarry rock may be amended with the concurrence of the Project Engineer and the Grading and Base Engineer.

S-90.3 The first paragraph of MnDOT 3138.3 Sampling and Testing, is hereby deleted and replaced with the following:

Samples for testing to determine compliance with the aggregate gradation specifications for base and shoulder surfacing shall be obtained from the roadway at a time when the material is ready for compaction. However, Class 1, 2, and 7 shoulder surfacing aggregates may be sampled from a stockpile, tested, and accepted before roadway placement, provided that:

(a) No more than 25 percent of the stockpile samples fail to meet gradation requirements.
(b) The average of all stockpile tests meet requirements.
(c) The Contractor mixes the material during placement to the satisfaction of the Engineer.

S-90.4 The fifth paragraph of MnDOT 3138.3 Sampling and Testing, is revised to read as follows:

The stockpile shall be sampled at the rate of one field gradation test per 1,000 metric tons (**tons**) of aggregate used on the Project.

S-91 (3139) GRADED AGGREGATE FOR BITUMINOUS MIXTURES - MODIFIED
(2012 Version)

SP2005-250.1

MnDOT 3139 is hereby deleted and replaced with the following:

3139 Graded Aggregate for Bituminous Mixtures

3139.1 Scope

Provide graded aggregate for use in bituminous mixtures.

3139.2 PLANT MIXED ASPHALT Requirements

A Composition

Provide graded aggregate composed of any combination of the following sound durable particles as described in 3139.2B.

Do not use graded aggregate containing objectionable materials including:

(1) Metal,
(2) Glass,
(3) Wood,
(4) Plastic,
(5) Brick, or
(6) Rubber.

Provide coarse aggregate free of coatings of clay and silt.

Do not add soil materials such as clay, loam, or silt to compensate for a lack of fines in the aggregate.

Do not blend overburden soil into the aggregate.

Feed each material or size of material from an individual storage unit at a uniform rate.

Do not place blended materials from different sources, or for different classes, types, or sizes together in one stockpile unless approved by the Engineer as a Class E aggregate.

B Classification

B.1 Class A

Provide crushed igneous bedrock consisting of basalt, gabbro, granite, gneiss, rhyolite, diorite, and andosite. Rock from the Sioux Quartzite Formation may contain no greater than 4.0 percent non-Class A aggregate. Do not blend or add non-Class A aggregate to Class A aggregate.

B.2 Class B

Provide crushed rock from other bedrock sources such as carbonate and metamorphic rocks (Schist).

B.3 Class C

Provide natural or partly crushed natural gravel obtained from a natural gravel deposit.

B.4 Class D

Provide 100 percent crushed natural gravel produced from material retained on a square mesh sieve with an opening at least twice as large as Table 3139-2 allows for the maximum size of the aggregate in the composite asphalt mixture. Ensure the amount of carryover, material finer than the selected sieve, no greater than 10 percent of the Class D aggregate by weight.

B.5 Class E

Provide a mixture consisting of at least two of the following classes of approved aggregate:

(1) Class A,
(2) Class B, and
(3) Class D.

B.6 Steel Slag

Steel slag cannot exceed 25% of the total mixture aggregate and be free from metallic and other mill waste. The Engineer will accept stockpiles if the total expansion is no greater than 0.5 percent as determined by ASTM D 4792

B.7 Taconite Tailings

Obtain taconite tailings from ore mined westerly of a north-south line located east of Biwabik, Minnesota (R15W-R16W) or from ore mined in southwestern Wisconsin.

B.8 Recycled Asphalt Shingles (RAS)

Provide recycled asphalt shingles manufactured from waste scrap asphalt shingles (MWSS) or from tear-off scrap asphalt shingles (TOSS). Consider the percentage of RAS used as part of the maximum allowable Recycled Asphalt Pavement (RAP) percentage. See Table 3139-3.

B.8.A RAS Gradation..... MnDOT Laboratory Procedure 1801

Provide RAS in accordance with the following gradation requirements:

Table 3139-1
RAS Gradation

Sieve size	Percent passing
½ in [12.5 mm]	100
No. 4 [4.75 mm]	90

B.8.B Binder Content

Determine the binder content using chemical extraction meeting the requirements of MnDOT Lab Procedure 1851 or 1852.

B.8.C Bulk Specific Gravity

The Contractor may use an aggregate bulk specific gravity (Gsb) of 2.650 in lieu of determining the shingle aggregate Gsb in accordance with MnDOT Lab Procedure 1205.

B.8.D Waste Materials

Do not allow extraneous materials including metals, glass, rubber, nails, soil, brick, tars, paper, wood, and plastics greater than 0.5 percent by weight of the graded aggregate as determined by material retained on the No. 4 [4.75 mm] sieve as specified in MnDOT Laboratory Procedure 1801.

B.8.E Stockpile

Do not blend an RAS stockpile with other salvage material. Do not blend MWSS and TOSS. The Contractor may blend virgin sand material with RAS to minimize agglomeration if the Contractor accounts for the blended sand in the final mixture gradation.

B.8.F Certification

Ensure the processor provides RAS certification on the following Department form "Scrap Asphalt Shingles from Manufacture Waste" or "Tear-Off Scrap Asphalt Shingles" at www.dot.state.mn.us/materials/bituminous.html

B.9 Crushed Concrete and Salvaged Aggregate

The Contractor may incorporate no greater than 50 percent of crushed concrete and salvaged aggregate in non-wear mixtures. Do not use crushed concrete in wearing courses.

B.10 Ash

Sewage sludge ash and waste incinerator ash are allowed as an aggregate source at a maximum of 5% of the total weight of the mixture. Sewage sludge ash for use as an aggregate source in wear or non-wear courses must be approved by examination with the Hazard Evaluation Process by MnDOT's Office of Environmental Stewardship.

B.11 Recycled Asphalt Pavement (RAP)

B.11.A Aggregate Angularity

Provide combined RAP and virgin aggregates that meet the composite coarse and fine aggregate angularity for the mixture being produced.

B.11.B Objectionable Material

Do not use RAP containing objectionable materials including metal, glass, wood, plastic, brick, or rubber.

B.11.C Asphalt Binder Content

Determine the asphalt binder content using the MnDOT Lab Manual Method 1851 and 1852.

B.11.D Bulk Specific Gravity

Determine the bulk specific gravity in accordance with MnDOT Laboratory Procedure 1205 or 1815.

C Quality

C.1 Los Angeles Rattler Test..... MnDOT Laboratory Procedure 1210

Ensure a coarse aggregate loss no greater than 40 percent.

C.2 Soundness (Magnesium Sulfate) ..... MnDOT Laboratory Procedure 1219

Maximum loss after 5 cycles on the coarse aggregate fraction (material retained on No. 4 [4.75 mm] sieve for any individual source within the mix) as follows:

(1) Percent passing the ¾ in [19 mm] sieve to percent retained on the ½ in [12.5 mm] sieve, ≤ 14%,
(2) Percent passing the ½ in [12.5 mm] sieve to percent retained on the ⅜ in [9.5 mm]sieve, ≤18%,
(3) Percent passing the ⅜ in [9.5 mm] sieve to percent retained on the No. 4 [4.75 mm] sieve, ≤ 23%,
(4) For the composite if all three size fractions are tested, the composite loss ≤ 18%, and acceptance will be granted if:
  (4.1) If the Contractor meets the composite requirement, but fails to meet at least one of the individual components, the Engineer may accept the source if each individual component is no greater than 110 percent of the requirement for that component.
  (4.2) If the Contractor meets each individual component requirement, but fails to meet the composite, the Engineer may accept the source if the composite is no greater than 110 percent of the requirement for the composite.

Coarse aggregate that exceeds the requirements in this section for material passing the No. 4 [4.75 mm] sieve cannot be used.

C.3 Spall Materials and Lumps ..... MnDOT Laboratory Procedure 1219

Stop asphalt production if the percent of spall or lumps measured in the stockpile or cold feed exceeds the values listed in Table 3139-3. Determine lump compliance by dry batching.

C.4 Insoluble Residue Test ..... MnDOT Laboratory Procedure 1221

If using Class B carbonate materials ensure the portion of the insoluble residue passing the No. 200 [75 μm] sieve is no greater than 10 percent.

D Gradation

Ensure the aggregate gradation broad bands meet the following requirements in accordance with AASHTO T-11 (passing the No. 200 [75 μm] wash) and AASHTO T-27.

Table 3139-2
Aggregate Gradation Broad Bands (percent passing of total washed gradation)

Sieve size	A	B	C	D
1 in [25.0 mm]	—	—	100	—
¾ in [19.0 mm]	—	100*	85 – 100	—
½ in [12.5 mm]	100*	85 – 100	45 – 90	—
⅜ in [9.5 mm]	85 – 100	35 – 90	—	100
No. 4 [4.75 mm]	60 – 90	30 – 80	30 – 75	65 – 95
No. 8 [2.36 mm]	45 – 70	25 – 65	25 – 60	45 – 80
No. 200 [0.075 mm]	2.0 – 7.0	2.0 – 7.0	2.0 – 7.0	3.0 – 8.0

* The Contractor may reduce the gradation broadband for the maximum aggregate size to 97 percent passing for mixtures containing RAP, if the oversize material originates from the RAP source. Ensure the virgin material meets the requirement of 100 percent passing the maximum aggregate sieve size.

Table 3139-3
Mixture Aggregate Requirements

Aggregate Blend Property	Traffic Level 2	Traffic Level 3	Traffic Level 4	Traffic Level 5
20 year Design ESAL's	<1 million	1 - 3 million	3 - 10 million	10 – 30 million
Min. Coarse Aggregate Angularity (ASTM D5821) (one face / two face), %- Wear (one face / two face), %- Non-Wear	 30/- 30/-	 55 / - 55 / -	 85 / 80 60/ -	 95 / 90 80 / 75
Min. Fine Aggregate Angularity (FAA) (AASHTO T304, Method A) %- Wear %-Non-Wear	40 40	42 40	44 40	45 40
Flat and Elongated Particles, max % by weight, (ASTM D 4791)	-	10 (5:1 ratio)	10 (5:1 ratio)	10 (5:1 ratio)
Min. Sand Equivalent (AASHTO T 176)	-	-	45	45
Max. Total Spall in fraction retained on the #4 [4.75mm] sieve – Wear Non-Wear	5.0 5.0	2.5 5.0	1.0 2.5	1.0 2.5
Maximum Spall Content in Total Sample – Wear Non-Wear	5.0 5.0	5.0 5.0	1.0 2.5	1.0 2.5
Maximum Percent Lumps in fraction retained on the #4 [4.75mm] sieve	0.5	0.5	0.5	0.5
Class B Carbonate Restrictions				
Maximum% -#4 [-4.75mm] Final Lift/All other Lifts	100/100	100/100	80/80	50/80
Maximum% +#4 [+4.75mm] Final Lift/All other Lifts	100/100	100/100	50/100	0/100
Max. allowable scrap shingles–MWSS(1) Wear/Non Wear	5/5	5/5	5/5	5/5
Max. allowable scrap shingles –TOSS(1) Final Lift/All other Lifts	5/5	5/5	0/5	0/0

(1) MWSS is manufactured waste scrap shingle and TOSS is tear-off scrap shingle.

3139.3 Permeable Asphalt Stabilized Stress Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB) Requirements

A Restrictions

Do not use recycled materials including glass, concrete, bituminous, shingles, ash, and steel slag.

B Gradation

The Gradation limits are also considered the Job Mix Formula (JMF) limits.

B.1 PASB

Table 3139-4 **PASB Aggregate Gradation**	
Sieve Size	Percent Passing
1 ½ inch [37.5 mm]	100
1 inch [25.0 mm]	95 - 100
¾ inch [19.0 mm]	85 – 95
3/8 inch [9.5 mm]	30 – 60
No. 4 [4.75 mm]	10 – 30
No. 8 [2.36 mm]	0 – 10
No. 30 [600 µm]	0 – 5
No. 200 [75 µm]	0 – 3

B.2 PASSRC

Table 3139-5 **PASSRC Aggregate Gradation**	
Sieve Size	Percent Passing
5/8 inch [16.0 mm]	100
1/2 inch [12.5 mm]	85 – 100
3/8 inch [9.5 mm]	50 – 100
No. 4 [4.75 mm]	0 – 25
No. 8 [2.36 mm]	0 – 5

C Quality

Requirements will meet all of 3139.2.C.

D Mixture Quality Requirements

Table 3139-6 **Mixture Aggregate Requirements for PASSRC & PASB**	
Aggregate Blend Property	
Coarse Aggregate Angularity (ASTM D5821) (one face/two face) % PASSRC (1) PASB (1)	 95/- -/65
Fine Aggregate Angularity (FAA) (AASHTO T304, Method A) %	NA
Flat and Elongated Particles, max(2) % by weight, (ASTM D 4791)	NA
Clay Content (2) (AASHTO T 176)	NA
Total Spall in fraction retained on the 4.75mm [#4] sieve	3.0
Maximum Spall Content in Total Sample	5.0
Maximum Percent Lumps in fraction retained on the 4.75mm [#4] sieve	0.5

(1) Carbonate Restrictions: If Class B (as defined in 3139.2.B.2), crushed carbonate quarry rock (limestone or dolostone), is used in the mixture, or if carbonate particles in the

material retained on the 4.75 mm [**No. 4**] sieve exceeds 55 percent, by weight, the minus 0.075 mm [# **200**] sieve size portion of the insoluble residue shall not exceed 10 percent.

3139.4 Ultra Thin Bonded Wearing Course (UTBWC) Requirements.

A. Restrictions

Do not use recycled materials including glass, concrete, bituminous, shingles, ash, and steel slag.

B. Coarse Aggregate

Provide a Class A aggregate, as defined in 3139.2.B.1, in accordance with the following requirements:

Table 3139-7
UTBWC Coarse Aggregate Requirements

Tests	MnDOT Laboratory Manual Method	Limit, %
Flat and elongated ratio at 3:1	1208	≤ 25
Los Angeles Rattler Test (LAR)	1210	≤ 40
Bulk Specific Gravity	1204	

C. Fine Aggregate

Provide fine aggregate, passing the No. 4 [4.75 mm] sieve in accordance with the following requirements:

Table 3139-8
Fine Aggregate Requirements

Tests	Method	Limit, %
Sand equivalent*	AASHTO T 176	≥ 45
Uncompacted void content	MnDOT Laboratory Manual 1206	≥ 40
Bulk Specific Gravity	MnDOT Laboratory Manual 1205	

3139.5 SAMPLING AND TESTING

Perform sampling, sieve analysis, lumps, crushing, and shale testing meeting the requirements of the MnDOT Laboratory Manual.

S-92 (3236) REINFORCED CONCRETE PIPE

The provisions of MnDOT 3236 are modified and/or supplemented with the following:

S-92.1 Manufacturers of reinforced concrete pipe may produce an alternate "offset joint" on the spigot end of the pipe. This type of offset joint is to be used with the profile or prelubricated pipe seal systems. See MnDOT Standard Plate 3006.

S-92.2 The first paragraph of MnDOT 3236.2A3 is hereby deleted and replaced with the following:

Cement substitutions as addressed in 2461.3D are hereby modified as follows to allow:

(a) 30 percent Class F or Class C fly ash by weight
(b) 35 percent ground granulated blast furnace slag by weight
(c) 35 percent substitution with a combination of ground granulated blast furnace slag and Type F or Type C fly ash by weight

All other provisions of 2461.3D shall apply. The use of admixtures shall conform to 2461.3E.

S-93 (3301) REINFORCEMENT BARS

The third to the last paragraph of MnDOT 3301.2 is hereby deleted and replaced with the following:

When epoxy coated reinforcement bars are specified, coating shall be in conformance with AASHTO M 284M/M 284-06. Application of epoxy coating shall be made in a fusion bonded epoxy coating plant that has been granted "Certification" by the Concrete Reinforcing Steel Institute, or an organization approved by the Materials Engineer.

S-94 (3302) DOWEL BARS

MnDOT 3302 is hereby deleted and replaced with the following:

Dowel bars shall be fabricated from Grade 40 or 60 steel in accordance with AASHTO M31 and be epoxy coated in conformance with AASHTO M254. The ends of the dowel bars may be epoxy coated at the discretion of the fabricator. Application of epoxy coating shall be made in a fusion bonded epoxy coating plant that has been granted "Certification" by the Concrete Reinforcing Steel Institute, or an organization approved by the Materials Engineer.

The plant's quality control office shall maintain documentation containing the data required by certification. This documentation shall contain test data and measurements taken at times and locations approved by the Engineer, ensuring that monitoring, by personnel not directly involved in production, is sufficient for compliance with approved procedures.

All dowel bars shall be stored and protected in accordance with 2472.

Shearing will be permitted provided the coating is not damaged and subject to permissible deformation. Any deformation larger than true shape shall not exceed 1 mm (**0.04 inch**) increase in diameter or thickness and shall not extend more than 10 mm (**0.40 inch**) from the dowel end.

S-95 (3310) HIGH STRENGTH LOW ALLOY COLUMBIUM-VANADIUM STEEL

The second paragraph of MnDOT 3310.2 is hereby deleted and replaced with the following:

Sheet and strip supplied to this Specification shall conform to ASTM A 1011/A 1011M, Grade 340 (50), Class 1; ASTM A 1018/A 1018M, Grade 340 (50), Class 1; and 3308.

S-96 (3376) FENCE WIRE

MnDOT 3376 is hereby deleted and replaced with the following:

3376.1 Scope

This Specification covers fencing wire of the barbed, woven, and chain link types, together with wire fasteners, tie wires, and tension wire.

3376.2 REQUIREMENTS

A Barbed Wire

Barbed wire shall meet the requirements of AASHTO M280. Unless otherwise specified, either zinc-coated or aluminum–coated barbed wire may be supplied. Barbs shall be 4-point full round with 9.5 mm (**0.375 inch**) minimum barb length. Zinc coated barbed wire shall meet Class 3 coating requirements. Aluminum-coated barbed wire may be Standard or High Security Grade.

B Woven Wire

Woven wire fence fabric shall be metallic-coated steel and shall conform to the requirements of AASHTO M 279, for the size and construction specified. Fabric shall be either Type A or Type Z with Class 3 coating.

When size and construction are unspecified, any 3.8 mm (**9 gauge**) diameter wire design may be furnished at the Contractor's option.

The vertical stay wires shall be joined to each horizontal line wire by the hinge joint method consisting of not less than one and one-half twists tightly wrapped.

C Chain Link

Chain link fabric shall conform to AASHTO M 181 for the type specified. The finished wire size, size of mesh, type of selvage, and height of fabric shall be as shown in the Plans.

Type IV fabric, PVC coated steel, shall be Class A extruded and bonded, or shall be Class B bonded.

D Miscellaneous Items

Wire fasteners, tension wire, fittings, and hardware items shall be furnished in Compliance with AASHTO M 181, except as noted or unless otherwise indicated in the Contract or approved by the Engineer.

Staples for attaching wire to wood posts shall be galvanized L or U shaped fasteners produced from 3.8 mm (**9 gauge**) diameter wire, with shank length as specified in 2557.3C2. L-shaped staples shall have barbed, serrated or ring shanks. The staples shall be galvanized after fabrication in accordance with ASTM A 153.

Flat metal bands may be approved for use in lieu of wire fasteners.

All polymer coated tension wires shall have a Class 2A or 2B polymer coating thickness in accordance with Specification ASTM F 1664.

All polymer coated hog rings and wire ties shall have a Class 2A or 2B polymer coating thickness in accordance with Specification ASTM F 668.

All polymer coated truss rods, truss rod tighteners, tension bands, brace bands, post and line caps, and cups shall have a Class 2B polymer coating thickness in accordance with Specification ASTM F 668, but shall have a minimum coating thickness of 0.25 mm (**0.010 inches**).

Tension wire shall meet the requirements of AASHTO M181 Class 1 for zinc, or it shall meet the requirements of AASHTO M181 for aluminum coating.

Non-polymer coated hog rings shall be a minimum of 12 gauge galvanized steel meeting the requirements of ASTM F 626, with a minimum of 244 g/m^2 (**0.80 ounces per square foot**) of zinc coating.

Polymer coated hog rings shall be 12 gauge minimum galvanized steel meeting the requirements of AASHTO M 181 with a minimum of 92 g/m^2 (**0.30 ounces per square foot**) of zinc coating.

Non-polymer coated wire ties shall meet the requirements of one of the following:

a) Nine-gauge steel 3.76 +/- 0.13 mm (**0.148 +/- 0.005 inch**) with a tensile range of 55 to 65 ksi coated with a minimum of 275 g/m^2 (**0.90 ounces per square foot**) of zinc coating in accordance with Specification ASTM A 641 (A 641M), class 3 or A coating, or coated with 122 g/m^2 (**0.40 ounces per square foot**) of aluminum in accordance with Specification ASTM A 809.

b) 4.55 mm (**0.179 inch**) minimum aluminum alloy conforming to Specification ASTM B 211, alloy 1100 H18.

Polymer coated wire ties shall meet the requirements of one of the following:

a) Nine-gauge steel 3.76 +/- 0.13 mm (**0.148 +/- 0.005 inch**) with a tensile range of 55 to 65 ksi coated with a minimum of 100 g/m^2 (**0.35 ounces per square foot**) of zinc coating in accordance with Specification ASTM A 641 (A 641M), Class 1, or coated with a minimum of 61 g/m^2 (**0.20 ounces per square foot**) of aluminum.

b) 4.55 mm (**0.179 inch**) minimum aluminum alloy conforming to Specification ASTM B 211, alloy 1100 H18.

Truss rod tighteners, tension bands, brace bands, rail ends, brace bands, post and line caps, and cups shall have zinc coating meeting the requirements of ASTM F 626, 366 g/m^2 (**1.2 ounces per square foot**) minimum.

Truss rods shall have zinc coating of 183 g/m^2 (**0.6 ounces per square foot**) minimum, and shall be polymer coated, for both a polymer and non-polymer coated fence.

Zinc coatings on tension bars shall meet the requirements of AASHTO M111, Grade 85.

Nuts and bolts shall be zinc coated in accordance with AASHTO M 232, and when polymer coating is specified, may be shop or field-painted in lieu of polymer coating.

3376.3 INSPECTION AND TESTING

Inspection and testing for compliance with the specified requirements shall be done at such time and place as the Engineer elects.

S-97 (3401) FLANGED CHANNEL SIGN POSTS

The provisions of MnDOT 3401 are hereby modified and/or supplemented with the following:

S-97.1 The last sentence of MnDOT 3401.2A Material, is hereby revised to read as follows:

The steel shall conform to the mechanical requirements of ASTM A 499, Grade 420 (**60**) and to the chemical requirements of ASTM A 1 for rails having nominal mass of 45 kg per m [**91 pounds per yard**] of length or heavier.

S-97.2 MnDOT 3401.2C Mass, is hereby deleted and the following substituted therefore:

C Mass (Weight)

The nominal mass (**weight**) of the posts shall be as specified in the Plans, 3.0, 3.7, 4.1, 4.5, or 6.0 kg/m (**2.0, 2.5, 2.75, 3.0, or 4.0 pounds per foot**) of length, before punching and exclusive of galvanizing, anchor plates, and other attachments. A variation up to 5 percent under the specified mass (**weight**) will be permitted.

S-97.3 MnDOT 3401.2D, Shape and Dimensions, is hereby deleted and the following substituted therefore:

D Shape and Dimensions

The posts shall be of channel section design with flanges against which the sign will be placed. The front face of the flanges shall be flat and in the same plane so as to provide smooth, uniform bearing for the sign. The back of the flanges and the posts shall be flat and parallel to the front.

The cross section of the posts shall be symmetrical about the central axis perpendicular to the front and back.

The posts shall be straight, free from excessive bow, twist, and other injurious or unsightly defects.

S-97.4 Table 3401-1 is hereby deleted and the following substituted therefore:

TABLE 3401-1 NOMINAL DIMENSIONS					
Mass per Unit of Length	3.0 kg **(2.0 pound)**	3.7 kg **(2.5 pound)**	4.1 kg **(2.75 pound)**	4.5 kg **(3.0 pound)**	6.0 kg **(4.0 pound)**
Wide overall across front	76 mm **(3 inches)**	76 mm **(3 inches)**	76 mm **(3 inches)**	83 mm **(3¼ inches)**	89 mm **(3½ inches)**
back surface	25 mm **(1 inch)**	25 mm **(1 inch)**	25 mm **(1 inch)**	32 mm **(1¼ inches)**	32 mm **(1¼ inches)**
flanges (bearing surface)	13 mm **(½ inch)**	13 mm **(½ inch)**	13 mm **(½ inch)**	16 mm **(⅝ inch)**	19 mm **(¾ inch)**
Depth overall, front to back	35 mm **(1⅜ inches)**	35 mm **(1⅜ inches)**	38 mm **(1½ inches)**	38 mm **(1½ inches)**	43 mm **(1.7 inch)**
Thickness of Metal, Flanges & Back	3 mm **(1/8 inch)**	3 mm **(1/8 inch)**	5 mm **(3/16 inch)**	4 mm **(0.16 inch)**	5 mm **(0.20 inch)**
Sides	3 mm **(1/10 inch)**	3 mm **(1/8 inch)**	3 mm **(1/8 inch)**	4 mm **(0.15 inch)**	4 mm **(0.15 inch)**

NOTE: Dimension requirements are for flat flange sections.

S-98 (3403) ROLLED STEEL FENCE POSTS

The provisions of MnDOT 3403 are hereby modified and/or supplemented with the following:

S-98.1 MnDOT 3403.2 is hereby deleted and the following substituted therefore:

3403.2 REQUIREMENTS

Rolled steel line posts and all angle post assemblies (for end, gate, corner, or intermediate brace assemblies) shall be furnished in accordance with ASTM A 702 and the details in the Plans.

Standard Plates 9321E and 9324C are modified as follows:

a) The 21 square inch anchor plate is not required; the anchor plate must meet ASTM A 702.
b) Line Posts shall be 7' - 0" and the posts shall be driven into the ground 3' - 0".

S-99 (3406) STRUCTURAL METAL FENCE POSTS

MnDOT 3406 is hereby deleted and replaced with the following:

3406.1 SCOPE

This Specification covers tubular metal posts and rails, and metal rolled-formed "C" posts, and fittings, for fencing.

3406.2 REQUIREMENTS

A Materials

The posts and rails shall be manufactured in accordance with AASHTO M181, except as noted.

Round posts shall be Grade 1.

When the "ALTERNATE ROLL FORMED" posts as shown on Standard Plate 9322 are used, the weights and other properties shall conform to the requirements of ASTM F1043 for heavy industrial fence with Type A coating. Pull, end, and corner posts shall be 5.10 pounds per foot nominal weight. Line posts shall be 2.40 pounds per foot nominal weight. Brace Bars shall be 1.35 pounds per foot nominal weight.

Coatings on posts, rails, and fittings shall be applied after welding and fabrication activities.

Tie wires, clips, and bands used for fastening chain link fabric to posts, rails, and braces shall be as specified in 3376.

Type IV (PVC) posts, rails, frames, sleeves, and hardware items shall be first coated with zinc and then Class B bonded to a minimum polymer thickness of 250 μm **(0.010 inch).**

B Dimensions

Posts, rails, and stretcher bars shall be as shown in the Contract. The AASHTO M 181 acceptable tolerance shall govern, except that posts more the 25 mm **(1.0 inch)** under the specified length will not be accepted.

All fittings and hardware shall be designed in the proper manner. The tops shall be designed to fit securely over the posts.

3406.3 INSPECTION AND TESTING

Inspection for compliance with the foregoing requirements will be at such time and place as the Engineer elect.

Along with the samples, The Contractor shall provide a manufacturer's certificate that the material was manufactured, sampled, tested, and inspected in accordance with these Specifications and has been found to meet these requirements.

S-100 (3590) EPOXY RESIN PAVEMENT MARKINGS (FREE OF TOXIC HEAVY METALS)

The provisions of MnDOT 3590.3 are hereby deleted and replaced with the following:

3590.3 SPECIFIC REQUIREMENTS

A Epoxy Resin Material

The material shall be composed of epoxy resins and pigments only. No solvents are to be given off to the environment upon application to a pavement surface.

The composition shall be within the tolerance permitted for the product tested and approved by MnDOT. Type II material shall be completely free of TMPTA (Tri-Methyol Propane Tri-Acrylate) and other multi-functional monomers.

All materials shall be free of lead, cadmium, mercury, hexavalent chromium and other toxic heavy metals as defined by the United States Environmental Protection Agency.

Color:

The color of the white epoxy shall be a pure flat white, free of tints. The color of the yellow epoxy shall closely match Color Number 33538 of Federal Standard 595 and shall conform to the following CIE Chromaticity limits using illuminant "C":

x | 0.470 | 0.485 | 0.520 | 0.480

y | 0.440 | 0.460 | 0.450 | 0.420

Daylight Directional Reflectance (Y), white, minimum 83
Daylight Directional Reflectance (Y), yellow, minimum 50

Testing will be according to:
Daylight Directional Reflectance..... ASTM D 2805
Color..... ASTM D 2805

Adhesion Capabilities:
When the adhesion of the material to portland cement concrete (the concrete shall have a minimum of 2 070 kPa [**300 psi.**] tensile strength) is tested according to American Concrete Institute Committee 403 testing procedure, the failure of the system must take place in the concrete. The concrete shall be 32°C [**0°F**] when the material is applied, after which the material shall be allowed to cure for 72 hours at 23 ± 2°C [**73 ± 36° F**].

Abrasion Resistance:
When the abrasion resistance of the material is tested according to ASTM C 501 with a CS-17 wheel under a load of 1000 grams for 1000 cycles, the wear index shall be no greater than 82. (The wear index is the weight in milligrams that is abraded from the sample under the test conditions).

Hardness:
The Type D durometer hardness of the material shall be not less than 75 nor more than 90 when tested according to ASTM D2240 after the material has cured for 72 hours at 23 ± 2°C [**73 ± 36° F**].

Tensile Strength:
The tensile strength of the material, when tested according to ASTM D 638, shall not be less than 41 370 kPa [**6,000 psi.**] after 72 hours cure at 23 ± 2°C [**73 ± 36° F**].

Compressive Strength:
The compressive strength of the material, when tested according to ASTM D 695, shall not be less than 82,700 kPa [**12,000 psi.**] after 72 hours cure at 23±2°C [**73 ± 36° F**].

Thickness:
The epoxy pavement marking wet film thicknesses shall be a minimum of 380 µm [**15 mil**] on all pavement surfaces. For the Spec 2360 SUPERPAVE wearing courses the epoxy pavement marking wet film thicknesses shall be increase from a minimum of 380 µm [**15 mil**] to a minimum thickness of 508 µm [**20 mil**] wet film.

B Glass Beads

Glass beads shall meet the requirements of AASHTO M247, Type I, and:

a. Coatings -- the beads shall be treated according to the manufacturers recommendations and meet the requirements of Section 4.4.2 of M247, and
b. Roundness-- the beads shall have a roundness of at least 80%.

For 380 µm [**15 mil**] applications, glass beads shall be applied at a rate of at least 3.0 kg/L [**25 pounds per gallon**]. A greater bead application rate may be necessary for meeting the performance criteria (minimum levels of retroreflectivity). This will require contractors to consult with all the material manufacturers.

Time to No-Track:
Type I material shall be in "no-tracking" condition in 15 minutes or less and within 45 minutes for Type II material. The "no-tracking" condition shall be determined on an application of specified thickness

to the pavement and covered with glass beads at the rate of at least 3.0 kg/L [**25 pounds per gallon**]. The lines for this test shall be applied with striping equipment operated so as to have the material at manufacturer's recommended application temperature. This maximum "no-tracking" time shall not be exceeded when the pavement temperature varies from 10 to 49° C [**50 to 120° F**] and under all humidity conditions, providing the pavement is dry. The no-tracking time shall be determined by passing over the line with a passenger car or pickup truck at a speed of 40 to 55 km/hr [**25 to 35 mph**] in a simulated passing maneuver. A line showing no visual deposition of the material to the pavement surface when viewed from a distance of 15 m [**50 feet**] shall be considered as showing "no-tracking" and conforming to this requirement for time to "no-track."

S-101 (3591) HIGH SOLIDS WATER BASED TRAFFIC PAINT

The following is hereby added to MnDOT 3591.2 C:

C5 Glass beads shall be applied immediately after application of a paint line at a rate of 960 gram per Liter (**8 pounds per gallon**). Beads shall be evenly distributed on pavement. All material shall be placed in a workmanlike manner, which shall result in a clearly defined line that has been adequately reflectorized with glass beads.

S-102 (3592) DROP-ON GLASS BEADS

The provisions of MnDOT 3592.3 are hereby deleted and replaced with the following:

3592.3 **SPECIFIC REQUIREMENTS**

Glass beads shall meet the requirements of AASHTO M247, Type I, "standard gradation" except the beads will have a minimum of 80 percent true spheres. The dual treated beads will meet the moisture resistant requirements of AASHTO M 247 Section 4.4.2 and pass the adherence treatment Dansyl Chloride Test. The moisture resistant silicone treated beads will meet AASHTO M 247 Section 4.2.2.

S-103 (3721) PREFORMED ELASTOMERIC COMPRESSION JOINT SEALS FOR CONCRETE

The provisions of MnDOT 3721 are hereby modified with the following:

S-103.1 The following is hereby inserted into MnDOT 3721.2A3 after Compression-Deflection Characteristics:

17.5 mm (**11/16 inch**) Seal:

Force @ 14 mm,	0.70 N/mm min	MnDOT Method *(C)*
Force @ 0.55 inch pounds/linear inch	[**4 min**]	MnDOT Method *(C)*
Force @ 10 mm,	3.50 N/mm max.	MnDOT Method *(C)*
Force @ 0.40 inch pounds/linear inch	[**20 max**]	MnDOT Method *(C)*

S-103.2 Table 3721-2 is hereby deleted from MnDOT 3721.3C3 and replaced with the following:

TABLE 3721-2
SPECIFIED SPECIMEN SIZE AND TEST DEFLECTIONS

Nominal Width of Seal mm (inches)	Column A Specimen Length ± 5 mm (± 0.2 inch)	Column B Test Width for Min. Pressure mm (inches)	Column C Test Width for Max. Pressure mm (inches)
17.5 mm (11/16 inch)	100 mm (4 inch)	14mm (0.55 inch)	10 mm (0.40 inch)
20 mm (13/16 inch)	100 mm (4 inch)	16.5mm (0.65 inch)	10 mm (0.41 inch)
32 mm (1-1/4 inch)	100 mm (4 inch)	25.0 mm (1.00 inch)	11 mm (0.44 inch)
50 mm (2 inch)	150 mm (6 inch)	41.0 mm (1.62 inch)	17 mm (0.69 inch)
90 mm (3-1/2 inch)	150 mm (6 inch)	75.0 mm (3.00 inch)	35 mm (1.38 inch)

S-104 (3753) TYPE 1-D MEMBRANE CURING COMPOUND
(2011 Version)

The following is hereby added to the MnDOT Standard Specifications:

3753 TYPE 1-D MEMBRANE CURING COMPOUND

3753.1 SCOPE

Provide clear or translucent liquid membrane forming curing compounds with a Type 1-D fugitive dye for spray application on portland cement colored or stamped surfaces, where a finished white surface would mask the decorative finished concrete surface when exposed to the air.

3753.2 REQUIREMENTS

A General

Provide membrane curing compound meeting the following requirements:

- All membrane-curing compounds pre-approved by the Department before use. The most current approved lots and batches with product expiration dates are available from the Approved Products list,
- Meets the requirements of the MnDOT Curing Compound Manufacturer Approval Program, as listed in the MnDOT Approved Products List, including pre-testing of materials by the manufacturer,
- Meets the requirements of ASTM C 309, Type 1-D Curing Compound, and
- The Engineer will not allow the use of curing compound that is over 1 year from the manufacture date.

The Contractor may use Type 1-D curing compound in other concrete applications as approved by the Engineer or as shown on the Special Provisions. Use of any other Type 1 curing compound is at the discretion of the Engineer in conjunction with the Concrete Engineer.

3753.3 SAMPLING AND TESTING

Provide samples for testing meeting the requirements of the Schedule of Materials Control.

Test the material at an application rate of 200 sq. ft. per gal [**5 sq. m per L**].

S-105 (3754) POLY-ALPHA METHYLSTYRENE (AMS) MEMBRANE CURING COMPOUND

(2011 Version)

MnDOT 3754 is hereby deleted and replaced with the following:

3754 POLY-ALPHA METHYLSTYRENE (AMS) MEMBRANE CURING COMPOUND

3754.1 SCOPE

Provide poly-alpha methylstyrene liquid membrane curing compounds for spray application on portland cement concrete surfaces exposed to the air.

3754.2 REQUIREMENTS

Provide membrane-curing compound meeting the following requirements:

(1) All membrane-curing compounds pre-approved by the Department before use. The most current approved lots and batches with product expiration dates are available from the Approved Products list.
(2) Meets the requirements of the MnDOT Curing Compound Manufacturer Approval Program, including pre-testing of all materials by the manufacturer.
(3) Meets the requirements of ASTM C 309 for the type required by the Contract.
(4) The Engineer will not allow the use of curing compound that is over 1 year from the manufacture date.
(5) White pigmented Type 2, Class B.
(6) Resin is 100 percent poly-alpha methylstyrene.

Table 3754-1
Requirements for 3754 AMS Curing Compound

Properties	Range
Total solids, % by weight of compound	≥ 42
% reflectance in 72 h (ASTM E 1347)	≥ 65
Loss of Water, kg/sq. m in 24 h (ASTM C 156)	≤ 0.15
Loss of Water, kg/sq. m in 72 h (ASTM C 156)	≤ 0.40
Settling Test, ml/100 ml in 72 h*	≤ 2
V.O.C. Content, g/L	≤ 350
Infrared Spectrum, vehicle‖	100% α methylstyrene

* Test in accordance with the method on file at the Materials Laboratory.
‖ Match the infrared scan for the dried vehicle from the curing compound to the infrared scan on file at the Materials Laboratory

3754.3 SAMPLING AND TESTING

Provide samples for testing meeting the requirements of the Schedule of Materials Control.

Test the material at an application rate of 200 sq. ft per gal [**5 sq. m per L**].

S-106 (3755) LINSEED OIL MEMBRANE CURING COMPOUND

(2011 Version)

The following is hereby added to the MnDOT Standard Specifications:

3755 LINSEED OIL MEMBRANE CURING COMPOUND

3755.1 SCOPE

Provide extreme service white pigmented, heavy bodied linseed oil emulsion for application as a membrane cure and sealer.

3755.2 REQUIREMENTS

Provide membrane curing compounds meeting the following requirements:

(1) All membrane-curing compounds pre-approved by the Department before use. The most current approved lots and batches with product expiration dates are available from the Approved Products list.
(2) Meets the requirements of the MnDOT Curing Compound Manufacturer Approval Program, including pre-testing of materials by the manufacturer,
(3) Composed of a blend of boiled linseed oil and high viscosity, heavy bodied linseed oil emulsified in a water solution meeting the requirements of ASTM C 309, Type 2, except the Department will waive the drying time,
(4) The Engineer will not allow the use of curing compound that is over 1 year from the manufacture date,
(5) Sprayable at temperatures of at least 40° F [**4° C**], and
(6) Chemical requirements in accordance with the following table:

Table 3755-1
Chemical Requirements of Linseed Oil Membrane Curing Compound (volumes exclusive of added pigment)

Material Requirements	Percent by Weight
Oil phase (50% ± 4% by volume):	
Boiled linseed oil	80
Z-8 viscosity linseed oil	20
Water phase (50% ± 4% by volume)	100

3755.3 SAMPLING AND TESTING

Provide samples for testing meeting the requirements of the Schedule of Materials Control.

Test membrane curing compound at an application rate of 200 sq. ft per gal [**5 sq. m per L**].

S-107 (3861) PLANT STOCK

The provisions of MnDOT 3861 are supplemented and/or modified with the following:

S-107.1 The third to last paragraph of MnDOT 3861.3 Sampling and Inspection, is revised to read as follows:

During the spring planting season, coniferous plants that have candled out (put out new growth) while being stored in a holding bin may be planted, however, coniferous plants that are dug after candling out will be rejected. Coniferous trees not fully branched from bottom to top will be rejected. Only coniferous trees with buds or new growth at the terminal ends of branches shall be accepted, provided the tree meets the dimensional requirements defined in the current edition of the "Inspection and Contract Administration Manual for MnDOT Landscape Projects". Sheared or previously de-budded conifers may have enlarged trunk growth that is out of balance with a typical transplanted root system that is now too small. Therefore, previously sheared or de-budded coniferous trees will be subject to the minimum trunk caliper to root ball size relationship for deciduous trees as defined in the current edition of the "Inspection and Contract Administration Manual for MnDOT Landscape Projects". Pine trees shall have a terminal leader bud and terminal

leaders shorter than 500 mm (**18 inches**) in length. A new central leader must be trained in conifers delivered with multiple or missing leaders.

S-108 (3876) SEED

The provisions of MnDOT 3876 are supplemented and/or modified with the following:

S-108.1 The second paragraph of MnDOT 3876.1 is hereby deleted and replaced with the following:

Pure live seed (PLS) is the percent of seed germination plus dormant and/or hard seed times the percent of seed purity of each species divided by 100.

S-108.2 MnDOT 3876.2A General Requirements is hereby deleted and replaced with the following:

A General Requirements

All seed lots shall conform to the latest seed law of the State (Minnesota Statutes 21.80-21.91, last revised 8/2/06), and any applicable federal regulations, including those governing labeling and weed seed tolerances. Seed lots sold or offered for sale in the state of Minnesota are subject to inspection, sampling, and testing for verification of label claims and compliance with the Minnesota Seed Law by the Department of Agriculture (M.S. 18J.04). Tolerances for germination and purity factors will be applied as established in Rules 1510.0050, 1510.0060, 1510.0070, 1510.0080, 1510.0090 and 1510.0100 to seed lots sampled and tested by official methods. For all seed used in MnDOT mixes or projects, tests for viability (including germination and TZ tests) are valid for 12 months from the test date, exclusive of the month the test was completed. Seed shall be installed while tests are still valid.

All legume seed, including native legumes, shall have been pre-inoculated with the proper bacterial culture for the species being inoculated and with the bacteria culture designed for this purpose (pre-inoculation), in the manner and within the time specified by the manufacturer.

A1 Labeling

Contractor shall supply seed that is labeled according to the labeling requirements for agricultural seed as set forth in the Minnesota Seed Law, section 21.82. The Contractor shall supply seed that also contains the following information:

a) County of genetic origin for each native component (List at least two counties for germplasm comprising accessions from multiple counties)
b) PLS percent for each mix component (Purity x Total Germination and Hard or Dormant Seed/100) for each mix component **(For PLS component of mix's)**
c) Total PLS weight for the bag. The tag shall identify this as the pay item. **(For PLS component of mix's)**
d) Total bulk weight for the bag
e) Area covered by the amount of seed in the bag when applied at the rate specified for the mix
f) All information pertaining to individual components in a mix is required for all components, including those that constitute less than 5% of the total mix.

Tags must not be hand written. If any of the above mentioned information is not included on the tag the material will be subject to specification 1503. When multiple bags are required to keep certain species or groups of species separate for the purpose of seeding those bags may be placed inside of a larger bag as long as each bag is labeled separately and the outer bag is labeled with the name of the mix.

Each package of seed must include a "Certified Vendor" tag that is issued by MnDOT Erosion Control unit. This will indicate that the seed has come from a MnDOT Approved Seed Vendor as described in 3876.3.

A2 Seed Cleaning

Contractor shall use seed that has been cleaned to an extent sufficient to allow its passage through appropriate seeding equipment. Seed of introduced species must be suitable for use in conventional seeders. Seed of native species must be suitable for use in native seed drills without plugging up the boxes, drop tubes, or planting units of the seed drills. Contractor shall not use seed that has been conditioned so much that it suffers reduced viability as a result.

A3 Substitutions

Alternate species or germplasm may only be used by requesting permission from the Office of Environmental Services Turf and Erosion Control Engineering Unit. Requests for permission must include written proof from three potential suppliers that the specified germplasm is not available. Approved substitutions will be named in a memo at the time they are approved. All currently approved substitutions will be posted on the Office of Environmental Services Erosion Control Unit website. Use of germplasm not listed herein will be considered unacceptable and will be subject to 1503.

A4 Requirements for seed of native species

Contractor shall supply and plant all seed in the 300 series mixes as pure live seed (PLS). This includes the cover crop, grass, sedge, and forb components. All seed in the cover crop component of mixes in the 300 series must be certified by the Minnesota Crop Improvement Association (MCIA) or the appropriate seed certifying agency in the seed's state of origin, if other than Minnesota.

All native seed used in mixes in the 300 series shall be certified by the Minnesota Crop Improvement Association (MCIA) in the Source Identified class. The genetic origin for this seed shall be within Minnesota or eastern North Dakota, eastern South Dakota, northern Iowa, or western Wisconsin.

Source Identified seed shall be accompanied by the appropriate quality mark documentation from the MCIA, in the form of a MCIA-labeled yellow tag or certification certificate. County of genetic origin shall be clearly identified on the seed label for all native seed. Selected class and Tested class germplasm of native species listed in Table 3876-1 located on the website of the Office of Environmental Services Erosion Control unit may be used in 100 and 200 series seed mixtures.

If a specified species or germplasm is not available, substitutions will be granted for native seed in the 300 series mixes according to the following order of preference:

1) First preference, MCIA certified Source Identified class with a genetic origin in Minnesota or eastern North Dakota, eastern South Dakota, northern Iowa, or western Wisconsin
2) Second Preference: Source Identified seed certified by a seed certifying agency other than MCIA but with a genetic origin in Minnesota or eastern North Dakota, eastern South Dakota, northern Iowa, or western Wisconsin
3) Third Preference: Certified seed of varieties/germplasm listed in Table 3876-1.
4) Fourth Preference: Wild Type from Minnesota or eastern North Dakota, eastern South Dakota, northern Iowa, or western Wisconsin. Wild type seed is defined as seed of a local or regional ecotype that has originated from remnant native stands and that has not undergone any intentional selection process.

S-108.3 MnDOT Table 3876-1 is hereby deleted and replaced with the following:

TABLE 3876-1
NATIVE GRASSES
SEED COUNTS AND ACCEPTABLE GERMPLASM

Trade Name	Scientific Name+	Acceptable Varieties/Germplasm*	Seeds Per Pound
Big Bluestem	Andropogon gerardi	Bonilla, Bison	131,200
Sideoats Grama	*Bouteloua curtipendula*		96,000
Blue Grama	*Bouteloua gracilis*		640,000
Fringed Brome	*Bromus ciliatus*		160,000
Kalm's Brome	*Bromus kalmii*		128,000
Hairy wood chess	*Bromus purgans*		121,600
Buffalo grass	*Buchloe dactyloides*		51,200
Blue-joint grass	*Calamagrostis Canadensis*		3,360,000
Bottle Brush Sedge	*Carex comosa*		384,000
Tussock Sedge	*Carex stricta*		848,000
Fox Sedge	*Carex vulpinoidea*		1,440,000
Canada Wild Rye	*Elymus canadensis*	Mandan	67,200
Bottle brush grass	*Elymus hystrix*		75,200
Slender Wheat Grass	*Elymus trachycaulus*	Revenue	135,000
Virginia Wild Rye	*Elymus virginicus*		62,400
Western Wheat Grass	*Elytrigia smithii*		113,600
Reed Manna Grass	*Glyceria grandis*		1,280,000
Fowl Manna Grass	*Glyceria striata*		2,560,000
Common rush	*Juncus effusus*		16,000,000
June Grass	*Koeleria macrantha*		2,400,000
Switch Grass	*Panicum virgatum*	Forestburg, Dacotah	224,000
Fowl Bluegrass	*Poa palustris*		2,080,000
Canada Bluegrass	*Poa compressa*		2,400,000
Little Bluestem	*Schizachyrium scoparium*	Itasca Germplasm	140,800
Green Bulrush	*Scirpus atrovirens*		2,240,000
Wool-grass	*Scirpus cyperinus*		2,880,000
Soft-stem Bulrush	*Scirpus validus*		496,000
Indian Grass	*Sorghastrum nutans*	Tomahawk	132,800
Prairie Cordgrass	*Spartina pectinata*	Red River Germplasm	105,600
Rough Dropseed	*Sporobolus asper*		480,000
Sand Dropseed	*Sporobolus cryptandrus*		3,200,000
Prairie Dropseed	*Sporobolus heterolepsis*		224,000
Green Needle Grass	*Stipa viridula*		120,000

* Varieties listed are approved for use in 100 and 200 series mixes. Their substitution for MCIA Source Identified seed in 300 series mixes is only allowed upon satisfaction of the requirements of 3876.2 A5. When multiple varieties are listed for a single species, they are listed in order of preference.

S-108.4 Delete MnDOT 3876.2B Requirements for Native Grasses, Sedges, Rushes (label and paragraphs) and replace with:

B **Requirements for Native Grasses, Sedges, and Rushes ..... Table 3876-1**
(Keep table 3876-1)

S-108.5 Delete MnDOT 3876.2E Requirements for Native Forbs (Wildflowers): (label and paragraphs) and replace with:

E **Requirements for Native Forbs (Wildflowers) ..... Table 3876-4**
(Keep table 3876-4)

S-108.6 Mixtures 260 and 270 in MnDOT Table 3876-5 are hereby deleted and replaced with the following:

Mixture: 260			
Common Name	**Bulk Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Bluegrass, Kentucky "Certified Park"	35.8	40	32.0
Bluegrass, Canada	11.2	12.5	10.0
Bluegrass, Kentucky - Low Maintenance[1]	33.6	37.5	30.0
Fescue, hard	9.0	10	8.0
Rye-grass, perennial	22.4	25	20.0
GRAND TOTALS:	**112**	**125**	**100.0**
[1] Any accepted low maintenance Kentucky Bluegrass Except "Park"			
Purpose: Commercial Turf			

Mixture: 270			
Common Name	**Bulk Rate**		**% of Mix Component**
	kg/ac	**lb/ac**	
Bluegrass, Kentucky - Elite	33.6	37.5	25.0
Bluegrass, Kentucky - Improved	33.6	37.5	25.0
Bluegrass, Kentucky - Low Maintenance	33.6	37.5	25.0
Red fescue, creeping	10.8	12	8.0
Rye-grass, perennial	22.8	25.5	17.0
GRAND TOTALS:	**134.4**	**150**	**100.0**
Purpose: Residential Turf			

S-108.7 The 300 series mixes from MnDOT Table 3876-5 are hereby deleted and replaced with the following:

Table 3876-5

Mixture: 310			
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Bluestem, big	2.8	2.5	25.0
Indian grass	2.8	2.5	25.0
Wild-rye, Virginia	2.2	2.0	20.0
Switch grass	0.6	0.5	5.0
Blue-joint grass	0.3	0.25	2.5
Green bulrush	0.3	0.25	2.5
Wool grass	0.3	0.25	2.5
Giant bur reed	0.3	0.25	2.5
Cordgrass, prairie	1.7	1.5	15.0
Grass Totals:	**11.3**	**10.0**	**100.0**
	kg/ha	**lb/ac**	
Winter Wheat*	62.7	56.0	80.0
Rye-grass, annual	12.5	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals:	**78.3**	**70**	**100.0**
Wet Forbs Mixture (Table 3876-6)	**2.2**	**2.0**	**100.0**
GRAND TOTALS:	**91.8**	**82.0**	**100.0**
*Oats to be substituted for spring plantings			
Purpose: Native mix for wetter areas. Infiltration ponds, dry ponds, wet ditches. Tall height.			

Mixture: 325			
	PLS Rate		% of Mix
Common Name	kg/ha	lb/ac	Component
Bluestem, big	1.7	1.5	15.0
Fringed brome	1.7	1.5	15.0
Wheat grass, slender	1.7	1.5	15.0
Virginia wild-rye	1.7	1.5	15.0
Switch grass	0.6	0.5	5.0
Fowl bluegrass	1.7	1.5	15.0
Indian grass	1.7	1.5	15.0
Prairie cord grass	0.6	0.5	5.0
Grass Totals:	**11.4**	**10.0**	**100.0**
	PLS Rate		% of Mix
Common Name	kg/ha	lb/ac	Component
Blue-joint grass	0.22	0.2	10.0
Bottlebrush sedge	0.34	0.3	15.0
Tussock sedge	0.22	0.2	10.0
Fox sedge	0.22	0.2	10.0
Reed manna grass	0.22	0.2	10.0
Fowl manna grass	0.22	0.2	10.0
Green bulrush	0.22	0.2	10.0
Wool grass	0.22	0.2	10.0
Soft-stem bulrush	0.34	0.3	15.0
Sedge Totals:	**2.22**	**2.0**	**100.0**
	PLS Rate		% of Mix
Common Name	kg/ha	lb/ac	Component
Winter Wheat*	61.6	56	80.0
Rye-grass, annual	12.3	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals:	**77**	**70**	**100.0**
Wet Forbs Mixture (Table 3876-6)	**2.2**	**2.0**	**100.0**
GRAND TOTALS:	**92.8**	**84.0**	**100.0**
*Oats to be substituted for spring plantings			
Purpose: Native sedge/prairie meadow mix. Reaches a height of 915 mm to 1220 mm (36 to 48 inches). Developed for use on hydric soils and for wetland restoration.			

Mixture: 328			
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Bluestem, big	2.2	2	12.5
Brome, fringed	2.2	2	12.5
Wild-rye, Virginia	4.4	4	25.0
Switchgrass	1.1	1	6.3
Bluegrass, fowl	5.5	5	31.2
Indian grass	2.2	2	12.5
Grass Totals:	**17.6**	**16.0**	**100.0**
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Winter Wheat*	61.6	56.0	80.0
Rye-grass, annual	12.3	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals:	**77**	**70**	**100.0**
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Milkweed, marsh	0.33	0.3	15.0
Prairie clover, purple	0.33	0.3	15.0
Tic-trefoil, showy	0.33	0.3	15.0
Sunflower, early	0.33	0.3	15.0
Black-eyed Susan	0.55	0.5	25.0
Vervain, blue	0.33	0.3	15.0
Economy Forbs Totals:	**2.2**	**2.0**	**100.0**
GRAND TOTALS:	**96.8**	**88.0**	**100.0**
*Oats to be substituted for spring plantings			
Purpose: Native mix for infiltration ponds, dry ponds, temporary wet ditches. Tall height.			

Mixture: 330			
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Grama, sideoats	3.4	3.0	21.5
Grama, blue	2.8	2.5	18.0
Bluestem, little	3.9	3.5	25.0
June grass	1.1	1.0	7.0
Dropseed, sand	1.1	1.0	7.0
Wild-rye, Canadian	3.4	3.0	21.5
Grass Totals:	**15.7**	**14.0**	**100.0**
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Winter Wheat*	62.7	56.0	80.0
Rye-grass, annual	12.5	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals:	**78.3**	**70**	**100.0**
Dry Forbs Mixture (Table 3876-6)	**0.6**	**0.5**	**100.0**
GRAND TOTALS:	**94.6**	**84.5**	**100.0**
*Oats to be substituted for spring plantings			
Application: Native mix for Sandy/dry areas. Short height.			

Mixture: 340			
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Bluestem, big	3.3	3.0	21.5
Bluestem, little	2.8	2.5	18.0
Wild-rye, Canadian	2.2	2.0	14.0
Grama, sideoats	2.2	2.0	14.0
Switch grass	0.6	0.5	4.0
Dropseed, sand	0.6	0.5	3.5
Bluegrass, Canada	3.4	3.0	21.5
June grass	0.6	0.5	3.5
Grass Totals:	**15.7**	**14.0**	**100.0**
Common Name	**PLS Rate**		**% of Mix Component**
	kg/ha	**lb/ac**	
Winter Wheat*	62.7	56.0	80.0
Rye-grass, annual	12.5	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals:	**78.3**	**70**	**100.0**
Dry Forbs Mixture (Table 3876-6)	**0.6**	**0.5**	**100.0**
GRAND TOTALS:	**94.6**	**84.5**	**100.0**
*Oats to be substituted for spring plantings			
Purpose: Native mix for Sandy/Dry areas. Mid-height.			

Mixture: 350			
Common Name	**PLS Rate kg/ha**	**PLS Rate lb/ac**	**% of Mix Component**
Bluestem, big	3.4	3.0	21.5
Indian grass	2.8	2.5	18.0
Bluestem, little	2.8	2.5	18.0
Grama, sideoats	3.4	3.0	21.5
Wild-rye, Canadian	2.2	2.0	14.0
Switch grass	1.1	1.0	7.0
Grass Totals:	**15.7**	**14.0**	**100.0**
Common Name	**PLS Rate kg/ha**	**PLS Rate lb/ac**	**% of Mix Component**
Winter Wheat*	62.7	56.0	80.0
Rye-grass, annual	12.5	11.2	16.0
Wheatgrass, slender	3.1	2.8	4.0
Cover Crop Totals:	**78.3**	**70**	**100.0**
Mesic Forbs Mixture (Table 3876-6)	**0.6**	**0.5**	**100.0**
GRAND TOTALS:	**94.6**	**84.5**	**100.0**
*Oats to be substituted for spring plantings			
Application: Native mix for general roadside areas.			

S-108.8 MnDOT Table 3876-6 is hereby deleted and replaced with the following:

Table 3876-6

Mixture: Mesic Forbs		
Common Name	**Botanical Name**	**% of Mix**
Aster, smooth-blue	*Aster laevis*	5.0
Milkvetch, Canada	*Astragalus canadensis*	5.0
Prairie clover, white	*Dalea candidum*	5.0
Prairie clover, purple	*Dalea purpureum*	5.0
Tick-trefoil. Showy	*Desmodium canadense*	5.0
Coneflower, narrow-leaved	*Echinacea angustifolia*	5.0
Ox-eye, common	*Heliopsis helianthoides*	5.0
Coneflower, grey-headed	*Ratibida pinnata*	5.0
Blazingstar, rough	*Liatris aspera*	5.0
Blazingstar, tall	*Liatris pycnostachya*	5.0
Bergamot, wild	*Monarda fistulosa*	5.0
Penstemon, showy	*Penstemon grandiflorum*	5.0
Mint, mountain	*Pycnathemum virginianum*	5.0
Coneflower, columnar	*Ratibida columnifera*	5.0
Black-eyed Susan	*Rudbeckia hirta*	5.0
Goldenrod, stiff	*Solidago rigida*	5.0
Vervain, blue	*Verbena hastata*	5.0
Vervain, hoary	*Verbena stricta*	5.0
Alexanders, heart-leaved	*Zizea aptera*	5.0
Alexanders, golden	*Zizia aurea*	5.0
	Total:	**100.0**
Rate: 0.6 kg/ha (½ pounds per acre) PLS.		

Mixture: Dry Forbs		
Common Name	**Botanical Name**	**% of Mix**
Leadplant	*Amorpha canescens*	10.0
Milkweed, butterfly	*Asclepias tuberosa*	2.0
Aster, heath	*Aster ericoides*	4.0
Tic-seed, stiff	*Coreopsis palmate*	2.0
Yarrow	*Achillea millefolium*	2.0
Long-leaved bluets	*Hedyotis longifolia*	1.0
Bushclover, round-headed	*Lespedeza capitata*	3.0
Blazingstar, rough	*Liatris aspera*	4.0
Blazingstar, dotted	*Liatris punctata*	3.0
Lupine, wild	*Lupinus perennis*	5.0
Prairie clover, white	*Dalea candidum*	5.0
Prairie clover, purple	*Dalea purpureum*	16.0
Prairie rose	*Rosa arkansana*	1.0
Black-eyed susan	*Rudbeckia hirta*	18.0
Goldenrod, gray	*Solidago nemoralis*	3.0
Goldenrod, upland	*Solidago ptarmicoides*	1.0
Goldenrod, stiff	*Solidago rigida*	2.0
Goldenrod, showy	*Solidago speciosa*	2.0
Vervain, hoary	*Verbena stricta*	14.0
Alexander's,golden	*Zizea aurea*	2.0
	Total:	**100.0**
Rate: 0.6 kg/ha (½ pounds per acre) PLS		

Mixture: Wet Forbs		
Common Name	**Botanical Name**	**% of Mix**
Hyssop, fragrant giant	*Agastache foeniculum*	2.0
Water plantain	*Alisma subcordatum*	4.0
Meadow garlic	*Allium canadense*	1.0
Anemone, Canada	*Anemone Canadensis*	1.0
Milkweed, marsh	*Asclepias incarnata*	2.0
Aster, panicled	*Aster simplex*	3.0
Aster, New England	*Aster novaeangliae*	3.0
Aster, red-stalked	*Aster puniceus*	3.0
Aster, flat-topped	*Aster umbellatus*	1.0
Tick trefoil, Canada	*Desmodium glutinosum*	1.0
Joe-pye weed	*Eupatorium maculatum*	17.0
Boneset	*Eupatorium perfoliatum*	10.0
Goldenrod, grass-leaved	*Solidago graminifolia*	2.0
Sneezeweed	*Helenium autumnale*	1.0
Giant sunflower	*Helianthus giganteus*	2.0
Ox-eye, common	*Heliopsis helianthoides*	1.0
Great St. John's wort	*Hypericum pyvamidatum*	2.0
Iris, wild	*Iris versicolor*	1.0
Blazingstar, tall	*Liatris pycnostachya*	8.0
Bergamot, wild	*Monarda fistulosa*	1.0
Prairie clover, white	*Dalea candidum*	1.0
Prairie clover, purple	*Dalea purpureum*	2.0
Mountain mint	*Pycnathemum virginianum*	1.0
Black-eyed susan	*Rudbeckia hirta*	6.0
Goldenrod, stiff	*Solidago rigida*	2.0
Tall meadow rue	*Thalictrum dasycarpum*	2.0
Vervain, blue	*Verbena hastata*	14.0
Ironweed	*Veronia fasciculate*	1.0
Culver's root	*Veronicastrum virginicum*	3.0
Alexander's, golden	*Zizea aurea*	2.0
	Total:	**100.0**
Rate: 2.2 kg/ha (2 pounds/acre) PLS		

S-109 (3889) TEMPORARY DITCH CHECKS

The provisions of MnDOT 3889 are supplemented and/or modified with the following:

S-109.1 MnDOT 3889.2B Type 2: Bioroll, is revised to read as follows:

Type 2 ditch checks shall consist of 3897 Filter Log Type; Straw Bioroll or Wood Fiber Bioroll.

S-109.2 MnDOT 3889.2C Type 3: Bioroll Blanket System, is revised to read as follows:

Type 3 ditch checks shall consist of two components; Filter Log Type; Straw Bioroll or Wood Fiber Bioroll in accordance with 3897, staked on top of a Category 3, specification 3885 erosion control blanket. The blanket shall form a minimum width of 3.7 m **(12 feet)** perpendicular to the ditch gradient.

S-110 (3891) STORM DRAIN INLET PROTECTION

provisions of MnDOT 3891 are supplemented and/or modified with the following:

S-110.1 MnDOT 3891.3A Rock Log, is revised to read as follows:

Rock logs shall meet the requirements of 3897.2 Filter Log Type Rock Log.

S-110.2 MnDOT 3891.3B Compost Log, is revised to read as follows:

Compost logs shall meet the requirements of 3897.2 Filter Log Type Compost Log

BRIDGE PLANS

The plans for this Project, consisting of the sheets tabulated below, were approved by the State Bridge Engineer.

BRIDGE NO.	TOTAL SHEETS	SHEET NO.	DATE OF APPROVAL
07587	50	B1-B50	

New or revised sheets were approved as listed below:

BRIDGE NO.	SHEET NO.	DATE OF APPROVAL

I hereby certify that the Special Provisions for bridge construction (Division SB) contained in this Proposal were prepared by me or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Janet Elizabeth Gronert

(Janet Elizabeth Gronert)

Date: 4/24/12 Lic. No. 44325

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SB-1 (1706) EMPLOYEE HEALTH AND WELFARE

The provisions of MnDOT 1706 are supplemented as follows:

The Contractor shall submit a plan, at the preconstruction conference, for providing all OSHA required safety equipment (safety nets, static lines, false decks, etc.) for all work areas whose working surface is 1.8 meters (**6 feet**) or more above the ground, water, or other surfaces. Submittal of this plan will in no way relieve the Contractor of his/her responsibility for providing a safe working area.

All safety equipment, in accordance with the Contractor's plan, must be inplace and operable in adequate time to allow MnDOT personnel to perform their required inspection duties at the appropriate time. No concrete shall be placed in any areas affected by such required inspection until the inspection has been completed.

The installation of safety lines, safety nets, or other systems whose purpose is to reduce the hazards of bridge work may require the attachment of anchorage devices to beams, girders, diaphragms, bracing or other components of the structure. Clamp type anchorage systems which do not require modification of structural members may be used provided they do not interfere with proper execution of the work; however, if the Contractor desires to use an anchorage system which requires modification of structural members, s/he shall request approval, in writing, for plan modification as provided in MnDOT Specifications. Requests to install systems which require field welding or drilling of primary stress carrying members of a bridge will not be approved. The Contractor shall indicate any portions of anchorage devices which will remain permanently in the structure.

On both ends of each pier cap extending 1.8 meters (**6 feet**) or more above the ground, the Contractor shall install an insert or other suitable anchorage to which safety lines can be attached. Any portion of said device extending outside the finished lines of the pier cap shall be removed unless otherwise approved by the Engineer. Any void or cavity resulting from the installation or removal of this device shall be repaired or sealed to prevent the ponding or entry of water as directed by the Engineer.

Approved anchorage systems shall be furnished, installed, and removed at no increased cost to the State for materials, fabrication, erection, or removal of the bridge component or anchorage system.

SB-2 CONSTRUCTION OPERATIONS ADJACENT TO ROADWAYS

This work shall be performed in accordance with the provisions of MnDOT 1404, 1502, and 1707 except as modified below:

The Contractor shall, when necessary to adequately prevent undermining of the existing roadbed and protect traffic, sheet and shore the roadway side and end of each footing excavation having a traveled roadway adjacent thereto. The sheeting and shoring shall remain in place until the excavated area has been properly backfilled.

The Contractor will be permitted to construct his/her protective installations so as to just clear the neat lines of the footings along the roadway sides of those footings having a traveled roadway adjacent thereto.

At least six weeks before starting construction of the pier and abutments, supply the Engineer with five copies of the detailed Plans and Specifications and two copies of the associated calculations of the proposed system for constructing an installation adjacent to traveled roadways. Design the protective installations in accordance with AASHTO "Guide Design Specifications for Bridge Temporary Works". The Plans and Specifications shall be prepared by an engineer, thoroughly checked by a second engineer for completeness and accuracy, and certified by one of the aforementioned professional engineers licensed in the State of Minnesota. Include in the documents sufficient details so that construction of the proposed system, be it staged or not staged, can be completed solely by reference to the Plans and Specifications. No work will be permitted adjacent to traveled roadways until these plans have been approved by the Engineer.

SB-3 (1717) AIR, LAND AND WATER POLLUTION

The provisions of 1717 are supplemented as follows:

The Contractor's attention is hereby directed to MPCA Rule 7011.0150 as it relates to sandblasting and/or concrete removal operations. (http://www.pca.state.mn.us/index.cfm).

SB-4 BRIDGE APPROACH PANELS

This work shall consist of furnishing all materials, labor, and equipment required to construct the bridge approach panel(s) detailed in the Plans. The work shall be performed in accordance with all applicable provisions of MnDOT 2201, 2301, 2502, 2506, the referenced standard detail plates, and the following:

SB-4.1 Reinforcement bars shall be epoxy coated in accordance with 3301.

SB-4.2 Requirements for the preformed material utilized for sealing the E8 expansion joints:

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Backer Strips for Cold- and Hot-Applied Sealants: Shall conform to ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

C. and have the following requirements:
   1. ASTM D545 using a (1/2" (12.7 mm) thick test specimen).
      a. Compression: 13 psi (9 g/mm²) 89.6 kPa.
      b. Extrusion: 0.1" (2.5 mm).
      c. Recovery: 98%.
      d. Water Absorption, volume %: 0.3.
   2. ASTM D 1752, Type II.
   3. ASTM D5249, Type II.

E-8 Pressure relief joint material shall be installed in accordance with the manufacturer's recommendations and as follows:

(A) Expansion joint filler material used for a 100 mm (**4 inch**) pressure relief joint consists of a preformed foam product having minimum dimensions of 115 mm (**4.5 inches**) in width (may be laminated) and 200 mm (**8 inches**) in depth. Each section shall have a minimum length of 3 meters (**10 feet**). When the concrete depth is greater than the depth of the pressure relief material, fill the void below the material with polystyrene. The material shall be installed under compression with a lubricant adhesive applied to the concrete contact surfaces.

(B) Saw or form the joints 100 mm (**4 inches**) wide by the full-depth of the slab. Inspect to assure that the inside walls of the joint have been sandblasted, are dry, smooth and free of debris and loose particles. Apply tape to the top 25 mm (**1 inch**) of the inside walls to prevent the lubricant adhesive from contaminating the concrete bonding surfaces of the subsequently placed hot pour joint sealer.

(C) Paint the inside walls of the joint with lubricant adhesive at the rate of approximately 1 liter per 4 meters (**1 gallon per 50 lineal feet**) of joint.

(D) Pinch the bottom of the material together and push down into the joint. Walk the material down into the joint; use a sledgehammer and a 2X4 if necessary. When butting two pieces together paint the ends with lubricant adhesive.

(E) Install the foam relief joint material so that the top surface is depressed to a depth of approximately 22 mm (**7/8 inch**) below the concrete surface. After proper installation, remove the tape and fill the void on top of the foam material with approximately 13 mm (**1/2 inch**) of MnDOT 3723 or 3725 hot pour joint sealer to a level of 9.5 mm ± 6.3 mm (**3/8 inch ±1/4 inch**) below the surface. The hot joint sealer should only slightly melt into the foam pressure relief joint material. To prevent excessive melting of the joint material, place the hot-pour sealer at the lower end of the temperature specification. Check for correct temperature by placing hot pour sealer on a sample of waste foam material.

SB-4.3 All bridge approach panel work as tabulated in the Plans, complete in place, will be included under Item No. 2301.553 "Bridge Approach Panels".

At locations where the Bridge Approach Treatment is deleted, all additional backfill work required to permit construction of the bridge approach panel will be incidental work for which no direct payment will be made.

SB-5 (2401) CONCRETE BRIDGE CONSTRUCTION

The provisions of MnDOT 2401 are modified and/or supplemented with the following:

Delete the first sentence of the first paragraph of 2401.3G:

Cure newly placed concrete by providing protection against rapid loss of moisture, freezing temperatures, high temperatures, abrupt temperature changes, and vibration exceeding a normal or reasonable limit as described in the Bridge Construction Manual chapter .362, shock waves, and prematurely applied loads.

Add the following to the end of the second paragraph of 2401.3G:

All sections not included in superstructures.....45

SB-5.1 Concrete Aggregate for Bridges

The provisions of 2401.2A shall apply except as modified herein:
Delete the second paragraph of 2401.2A and substitute the following therefor:

Class A Coarse Aggregate, as defined in 3137.2B, shall be used in all concrete for

bridge superstructures, except that coarse aggregate requirements for precast concrete members fabricated under 2405 shall be as specified in 2461.2D.

SB-5.2 Joint Filler and Sealing

The provisions of 2401.3J1 are supplemented as follows:

Prior to installation of sealing materials, concrete curing shall be completed. A minimum of 7 days drying is required prior to application of sealers. Sawcut joints shall be sandblasted, blown clean, and the concrete surfaces shall be dry at the time sealer is installed.

Preformed joint shall be as detailed in the Plans and in conformance with the following requirements.

1. Bituminous felt shall comply with AASHTO M33, modified to the extent that the load required to compress the test specimen to 50 percent of its thickness before test shall be not more than 8274 kPa (**1200 psi**).

2. Cork shall comply with Mn/DOT 3702 and AASHTO M153 Type II.

3. Polystyrene shall comply with the following:

Type	Minimum Compressive Strength (5 percent deflection)	Characteristics
A	207 kPa (**30 psi**)	Closed Cell Expanded Polystyrene
B	69 kPa (**10 psi**)	Molded Polystyrene

Testing for compressive strength of polystyrene shall be in accordance with ASTM D 1621. The Contractor shall, if requested by the Engineer, furnish evidence that the material meets these requirements.

The quantity of preformed cork joint filler material given in the Plans is for the Contractor's convenience only. Any additional joint filler required shall be furnished by the Contractor with no additional compensation.

SB-5.3 Architectural Concrete Texture

SB-5.3 Architectural Concrete Texture (Fractured Fin)

SB-5.3.1 Description of Work

This work consists of applying a fractured rib finish on all designated architectural concrete surfaces of Bridge No. 07587 in accordance with the provisions of Mn/DOT 2401, the Plan details and the following:

SB-5.3.2 Architectural Concrete Texture

A. The concrete surface shall be formed using a form lining system made of high-strength urethane elastomer capable of withstanding anticipated concrete pour pressures without leakage or causing physical defects. Form liners shall attach easily to forms and be removable without causing concrete surface damage. The liners shall be designed to form surfaces conforming to the design intent including the shape, lines, and dimensions shown in the plans and to avoid visible pattern repeats. Match pattern features at form liner joints to minimize visible pattern repeats and make the formed concrete surface appear uniform and continuous without visible seams and form marks. When joints are unavoidable, make joints along main features of the pattern.

Form liners shall produce a textured effect of a tooled fractured vertical fin pattern. Surfaces having a smooth, slick or shiny surface will be rejected. Texture relief shall be a minimum 1 1/4" inches in depth. Ribs shall be spaced 4 inches on center. Pattern shall be similar to (example: Scott Systems, Inc., Pattern No. 130, "Florida Fractured Fin"), or an approved equal.

Form liner manufacturer must have five years minimum experience making liners used to create formed concrete surfaces.

Form liner materials may be obtained from one of the following manufacturers:

1. Scott System, Inc.
2. Symons Corporation
3. Fitzgerald Formliners
4. Milestones, Inc.
5. Custom Rock International, Inc.
6. Other manufacturers approved by the Engineer.

B. All form ties shall be made of non-corrosive materials when the portion permanently embedded in the concrete is less than ¾" from the finished surface.

C. Form release agents shall be fully compatible with the form liner material and the special surface finish to be applied to the textured surfaces.

SB-5.3.3 Submittals

A. For product data, submit manufacturer's technical information and use instructions for form liner placement and release.

B. Submit actual samples of form ties that will be permanently embedded in the concrete.

C. Submit qualification data for firms and person specified below under Quality Assurance to demonstrate their capabilities and experience. Include a list of completed projects with project names, addresses, names of architects, engineers and owners, plus any other pertinent information.

D. Submit drawings indicating form liner layout and termination details. Indicate backup, rustication. Reveal and chamfer strip locations. Include jointing, form tie location, pattern placement, pattern match details, and end, edge and other special conditions. Indicate tolerances and procedures of installation and separation.

SB-5.3.4 Quality Assurance

A. Manufacturer's Qualifications: The form liner manufacturer must have five years minimum experience making liners used to create formed concrete surfaces matching the pattern designated in the plans.

B. Installer Qualifications: The form liner installer shall have had a minimum of five consecutive years of experience in textured formed concrete construction.

SB-5.3.5 Construction Requirements

Surface Preparation: All conventionally formed concrete surfaces to receive fractured rib texture shall be water blasted to break the surface film and to remove all laitance detrimental to the finish coating system performance. Sandblasting will not be allowed for cleaning concrete surfaces, as it will reduce the architectural concrete texture specified in this Special Provision. Pressure washing with water at a pressure of **3000 psi** at a rate of **3 to 4 gallons** per minute using a fan nozzle held perpendicular to the surface at a distance of **one to two feet** shall be used.

Match pattern features at form liner joints to make the formed concrete surface appear uniform and continuous without grout leakage at the joints. When concrete vertical construction joints are required, place form liner joints in the valley of the grooves, or as approved by the Engineer. Following removal of forms finish improperly formed joints to achieve a smooth and uniform cast concrete surface. No visible vertical and horizontal seams or conspicuous form marks created by butt-joining form liners will be allowed. Where it is not possible to locate a vertical groove at a construction joint, the concrete surface shall be finished to

reduce visibility of the construction joints.

Strip formwork in accordance with the form liner manufacturer's recommendations to avoid concrete surface deterioration or weakness planes in the substrate. Finish form tie holes in accordance with 2401.3F2a using approved patching materials. Following removal of forms, finish minor defects to blend with the balance of the pattern surface. Visible vertical or horizontal seams or conspicuous form marks shall be repaired at the Contractor's expense to the satisfaction of the Engineer.

Clean and repair surfaces of form liners to be reused. Split, frayed, delaminated or otherwise damaged form liner material will not be acceptable for exposed surfaces. Form liners shall be cleaned and free of concrete buildup prior to each pour. Do not use "patched" forms for exposed concrete surfaces unless acceptable to the engineer.

SB-5.3.6 Method of Measurement

Measurement for Architectural Concrete Texture will be made by the plan area in square feet of the finished surface area constructed to the limits shown and noted in the Plans.

SB-5.3.7 Basis of Payment

Payment for texturing will be made under **Item No. 2411.618 "ARCH CONC TEXTURE (Fractured Fin)",** at the Contract bid price per square foot, which shall be compensation in full for all costs incidental thereto, including the additional concrete required to achieve the specified texture relief.

SB-5.4 Architectural Surface Finish (Single Color)

A. Description of Work

This work consists of applying an architectural surface finish to all exposed concrete surfaces of the Architectural Concrete Texture (Fractured Fin) on Bridge Nos. 81006, 81007, 81008, 81009, 81011, 81012, and 81016 under this Contract. The work shall be performed in accordance with the applicable provisions of Mn/DOT 2401, the Plans, and the following:

<u>Architectural Surface Finish (Single Color)</u>

Architectural Surface Finish (Single Color) shall be applied to the areas of the abutment faces and wing walls so designated in the Plans to receive Architectural Concrete Texture (Fractured Fin.)

Architectural Surface Finish (Single Color) shall be a single-color stain. The

color shall match Mn/DOT Gray Modified, as described in SB-5.5, adjusted by field testing as required to match to the color of the Special Surface Treatment.

B. Surface Color

The surface coloring for the Architectural Surface Finish described above shall be performed using approved stains or paint systems applied in a manner consistent with the aesthetic design requirements of the Project.

For Architectural Surface Finish (Single Color), the color shall be provided by a two-coat stain application. The application of the base coat shall follow ordinary concrete finish operations and be by air or airless sprayer. Allow to thoroughly dry before applying topcoat. The topcoat shall be applied in a uniform manner, moving in one direction, 5.5 to 6.5 mils wet film thickness equivalent to 1.5 to 2.0 mils dry film thickness. Use sufficient material to provide color uniformity, but avoid buildups and runs.

C. Stain Materials

Stain shall be a 100 percent acrylic; water-repellant, semi-opaque, tinted emulsion sealer designed for concrete and masonry surfaces. Acceptable products shall allow moisture and vapor transmission, be formulated for exterior application with resistance to freeze/thaw, moisture, alkali, acid and mildew, mold or fungus, discoloration or degradation and meet the following requirements:

1. Physical or performance properties:

- Volume Solids.....29-31 percent (Calculated Lab Value)
- Weight Solids.....44-46 percent (Calculated Lab Value)
- Viscosity .....65-85 KU (Calculated Lab Value)
- Accelerated Weathering.....1,000 Hours Minimum (ASTM G-26)

2. Color pigments for tinted products shall be derived from synthetic mineral oxides.

3. Subject to compliance with requirements, provide colored concrete finishing products from one of the following manufacturers:

- Harris Specialty Chemicals, Inc.
- The Sherwin-Williams Company
- Tamms Industries
- TK Products
- United Coatings
- Other approved sources

To the greatest practical extent, all concrete finishing products shall be obtained from a single source.

All materials shall be furnished, prepared, applied, cured and stored according to the product manufacturer's directions and as specified herein. Special attention shall be given to the recommended temperature range for application.

D. Submittals by Contractor

Within 60 calendar days of execution and approval of the Contract, the Contractor shall submit the following to the Engineer for approval:

1. Product data including manufacturer's technical information, label analysis, and application instructions for each material proposed for use.

2. Laboratory test reports showing that materials proposed for use meet physical or performance property requirements.

3. 12-inch x 12-inch square samples of the Color System on the fractured fin textured surface patterns. Final color selections will be based upon completion of the test panel specified below.

E. Surface Preparation

Following removal of forms, all exposed textured concrete surfaces shall receive an ordinary surface finish in accordance with Mn/DOT 2401.3F2a prior to the surface preparation described below. Minor defects shall be finished to blend with the balance of the textured surfaces. Visible vertical or horizontal seams or conspicuous form marks shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

All formed concrete surfaces shall be a minimum of 28 days old prior to the application of Architectural Surface Finish.

All formed concrete surfaces to receive Architectural Surface Finish (single color) shall be water-blasted to break the surface film and to remove all laitance detrimental to the color system performance. Sandblasting will not be allowed for cleaning concrete surfaces, as it will reduce the architectural surface treatment texture. Pressure washing with water at a pressure of **300 psi** at a rate of **3 to 4 gallons** per minute using a fan nozzle held perpendicular to the surface at a distance of one to two feet shall be used.

F. Basis of Payment

Payment for Architecture Surface Finish (Single Color) shall be made under **Item No. 2411.618, "ARCHITECTURAL SURFACE FINISH (Single Color)"**, at the Contract price per square foot, which shall be compensation in full for performing all work described above, including all incidentals thereto.

SB-5.5 Finish of Concrete Surfaces

Cure concrete for a minimum of 28 days or as recommended by the manufacturer prior to applying special surface finish (SSF) or acrylic paint. Thoroughly flush all surfaces that are to receive SSF with clean water not more than 24 hours before commencing with the SSF finishing.

A. Special Surface Finish

The provisions of 2401.3F2c apply except as modified herein:

Apply SSF on the exposed concrete surfaces as designated below for Bridge No.(s). 07587.

1. Outside surfaces of barrier railing and parapets
   Wingwalls
   Copings
   Edges of slabs
   Bottom of overhangs
   Abutments
   Piers/pier cap

Provide a finish color for all SSF matching [MnDOT standard color "Gray-Modified" on file in the MnDOT Chemical Laboratory (651-366-5548)] [Federal Standard 595 B No. (26622 pearl gray)]. Provide paint free of toxic metals and toxic pigments.

Provide a test area, 1 meter x 1 meter (**3 foot x 3 foot**), for final color selection and have the Engineer approve the test area after the color has been added to it.

Add the following sentence after the fourth sentence in the second paragraph of 2401.3F2c:

Furnish only one approved system of mortar, bonding agent, water, and 100% acrylic paint (meeting MnDOT 3584) from the "Approved/Qualified Product Lists of Special Surface Finish" (http://www.dot.state.mn.us/products/index.html) to produce the color(s) specified in this special provision.

B. Finishing Roadway and Trail Faces and Tops of Barrier and Parapet Railing

1. Finish conventionally formed roadway faces, tops of barrier and parapet railings (and medians, and trail faces), as per 2401.3F2d and the following:

a) Plan and execute concrete placement, form removal, and finishing operations so that the surface finishing can be started immediately after forms are removed. Remove the roadway face forms as soon as the concrete can retain its molded shape. In no case shall the elapsed time between concrete placement and initial surface finishing exceed 24 hours.

b) After completion of the curing period, paint the roadway faces, trail faces and tops of the barrier railings (and median) with an approved acrylic paint conforming to 3584. The color of the acrylic paint shall conform to [MnDOT standard color "Gray-Modified" on file in the MnDOT Chemical Laboratory (651-366-5548)] [Federal Std. No. 595 B, No. 26622 pearl gray,]. Apply the paint at a rate of 7.4 m^2 per L (**300 ft^2 per gallon**). Commence or suspend the painting operation when the air and surface temperature meet or exceed the manufacturer's recommendations.

2. Finish slipformed roadway faces and tops of barrier and parapet railings (and median and trail faces), in accordance with the following:

a) Lightly broom the railing surface immediately after passage of the slipformer.

b) Coat the roadway & trail faces and top of the barrier and parapet railing as described above for the conventionally formed railing.

C. Finishing Precast Concrete Girders

Apply 100% acrylic paint (MnDOT 3584) on the exposed concrete surfaces as designated below for Bridge No.(s). 07587.

1. Outside face of fascia girder
   Bottom of bottom flange of fascia girder

Provide a finish color for acrylic paint matching [MnDOT standard color "Gray-Modified" on file in the MnDOT Chemical Laboratory (651-366-5548)] [Federal Standard 595 B No. (26622 pearl gray)].

Apply the paint at a rate of 7.4 m^2 per L (**300 ft^2 per gallon**). Commence or suspend the painting operation when the air and surface temperature meet or exceed the manufacturer's recommendations.

D. Basis of Payment

Finishing of concrete surfaces, except as otherwise provided in these special provisions, special surface finish, application of topcoat, and painting are considered an incidental expense to the respective concrete mixes for this construction, and no additional compensation will be made for this work.

SB-6 (2402) STEEL BRIDGE CONSTRUCTION

This work shall be performed in accordance with the provisions of Mn/DOT 2402 except as modified below:

Delete the first paragraph of 2402.3D and substitute the following:

At least six weeks before starting construction of the structural steel erection falsework, the Contractor shall supply the Engineer with three copies of the detailed Plans and Specifications and two copies of the associated calculations of the proposed system for constructing the falsework. Design of the falsework shall be in accordance with AASHTO "Guide Design Specifications for Bridge Temporary Works". The Plans and Specifications shall be prepared by an Engineer, thoroughly checked by a second Engineer for completeness and accuracy, and certified by one of the aforementioned professional Engineers licensed in the State of Minnesota. The documents shall include sufficient details so that construction of the proposed system can be completed solely by reference to the Plans and Specifications. The design criteria shall be shown on the first sheet of the Plans.

Delete the first paragraph of 2402.3F and substitute the following:

Structural steel members shall be erected in a manner that will provide safety to the workers, inspectors, and the public, at all times, as well as reasonable assurance against damage to the steel members. Prior to placement of diaphragms, the primary members, such as beams and girders, shall be temporarily anchored, braced, and stabilized as they are erected so as to preclude sliding, tipping, buckling, or other movement that may otherwise occur.

If active vehicular or railroad traffic will be permitted to travel beneath beams prior to complete erection of all the beams and diaphragms in a span, the Contractor shall submit an erection plan prepared by an engineer, thoroughly checked by a second engineer for completeness and accuracy, and certified by one of the aforementioned professional engineers licensed in the State of Minnesota which details all temporary works necessary to brace and stabilize beams. Struts, bracing, tie cables, and other devices used for temporary restraint shall be of a size and strength that will ensure their adequacy. Plans shall specify the required bolt tension and number of bolts to be installed in permanent diaphragm connections and in other bracing necessary to stabilize the beams. The Contractor shall arrange the work schedule so that at least two adjacent girders will be erected (including diaphragms and bolts fully tightened) and braced in any one span before operations are suspended for the day.

The last sentence of 2402.3F, paragraph (3), is hereby modified to read as follows:

Connections for primary members, diaphragms, and other secondary members shall have a sufficient number of holes filled with erection pins and bolts so that the plates are drawn into full contact and so that the holes are properly matched prior to placing the permanent connectors.

SB-6.1 Dimensional Tolerances

Maximum variation from flatness for fascia beam webs shall be 1/2 the limit given in the "ANSI/AASHTO/AWS D1.5, Bridge Welding Code".

SB-6.2 Expansion Joint Devices

The following consists of fabricating waterproof expansion devices in accordance with 2402 and installing them at the locations shown in the Plan.

A. The Contractor shall:

1. Furnish a single diaphragm unreinforced neoprene gland whose physical and chemical properties conform to 3721 except:

(a) Do not use the requirements and test methods for the Compression-Deflection Characteristics and the Recovery Under Deflection specified in 3721.2A3 and

(b) Substitute Durometer requirement of 60 plus or minus 5 for that which is shown in 3721.2A3.

2. Make the gland 6.4 mm (**¼ inch**) thick, subject to a minimum thickness of 5.6 mm (**7/32 inch**).

3. Submit 300 mm (**12 inches**) of seal material from each lot of material for testing if required by the Project Engineer.

4. Furnish certified test results from the manufacturer attesting to the physical and chemical properties of the expansion joint devices in accordance with 1603. Provide copies of the test results for the Project Engineer, the Materials Engineer, and the Structural Metals Engineer.

B. Provide only one of the devices shown on the Department's "Approved/Qualified Product Lists for Bridge Products, "Expansion Joint System" (http://www.dot.state.mn.us/products). For products not on the Department's prequalified list, provide information as required on the web site.

C. The Fabricator will be permitted to weld pre-galvanized sections of expansion device steel rail, complete with anchorages. If the steel rail is pre-galvanized, the Fabricator shall:

1. Provide roadway sections that are not less than 3 meters (**10 feet**) long.

2. Provide an anchorage within 229 mm (**9 inches**) of each end of the sections. This may require inclusion of additional anchorages.

3. Bevel abutting ends 6 mm (**¼ inch**) on 3 edges and de-burr the edges.

4. Prepare the surfaces to be welded as per 2471.3F2.

5. Groove weld the sections on 3 sides and take care to prevent weld metal from entering the gland groove.

6. Grind the weld smooth that is across the top of the extrusion.

7. Repair the welded surface as per 2471.3L1.

D. Unless the gland is shop installed, the Fabricator shall install filler material in the gland groove in the steel rail to protect against entry of dirt and debris. Filler material shall be installed at the fabrication shop prior to storage or transportation of completed expansion device.

E. The Contractor shall:

1. Remove filler material and clean all neoprene to steel contact areas of all dirt, oil, grease, or other contaminants before installing the neoprene gland.

2. Lightly sandblast the contact areas so as to roughen but not damage the galvanized surface just before applying the lubricant adhesive.

3. Apply lubricant adhesive on both neoprene and steel contact areas when installing the gland.

4. Install the gland with tools recommended by the manufacturer for gland installation (use of other tools is prohibited).

F. Lubricant Adhesive

The lubricant adhesive shall conform to the requirements of ASTM D 4070. Provide only one of the approved lubricant adhesives shown on the Department's "Approved/Qualified Product Lists for Bridge Products, "Expansion Joint Lubricant Adhesive" (http://www.dot.state.mn.us/products). For lubricant adhesives not on the Department's prequalified list, provide information as required on the web site.

G. All expansion joint cover plates on pedestrian bridges and sidewalk areas shall be raised pattern plate.

SB-6.3 Metal Railing

This work consists of furnishing, coating, and installing metal railing, including all anchorages and fittings, in accordance with the applicable provisions of 2402, 2433, 2471, 2478, the Plans and the following. The Prime contractor is responsible for communicating all applicable specifications, special provisions, standards, and requirements to all subcontractors.

A. Engineer

Engineer, as used herein, when relating to shop fabrication and coatings, shall mean the Departments Bridge Construction and Maintenance Engineer.

B. Materials

All materials shall be in accordance with the Plan details. If not specified, all steel shall comply with 3306, except that pipe and pipe sleeves shall comply with 3362. Threaded rods, bolts, nuts, and washers shall meet 3391 and shall be galvanized in accordance with 3392 or electroplated in accordance with ASTM B 633, Type III, SC 4.

C. Anchorages

Except when part of a proprietary anchorage assembly, provide threaded rods and bolts shall meet the requirements of 3385 and 3391, respectively.

Use cast-in-place type anchors unless otherwise specified in the contract.

C1. Drilled in Anchorages

Drilled in anchorages may be used in the following location(s): ORNAMENTAL METAL RAILING.

There is no MnDOT approved product list for adhesive anchorages having an ultimate pull-out tension greater than 5000 lbs. (**22 kN**). Every adhesive system will need to be accepted by the Engineer in conjunction with the Regional Bridge Construction Engineer. To accomplish this, furnish independent laboratory test data certifying that static load tests for ultimate pull-out strengths were performed and are acceptable, as specified. Provide independent lab test data in accordance with ASTM E 488.

If the Contractor chooses adhesive anchors, the Contractor shall submit, for approval by the Engineer, the following chemical adhesive supplier's product literature or calculations to establish embedment depth. This information will demonstrate compliance with the specification:

- Name of supplier
- Full product name (as given in supplier's literature)
- Embedment depth as determined from supplier's literature

Anchorages for fastening rail posts shall have an ultimate pull out strength, as specified in the Plan, and shall be installed in sound concrete to a depth equal to a minimum depth of six times the rod or bolt diameter. Bolt heads and/or nuts shall be in contact with the adjacent surface and shall be torqued to:

- 1/2 inch diameter = 30 foot pounds (**41 Nm**)
- 5/8 inch diameter = 60 foot pounds (**81 Nm**)
- 3/4 inch diameter and larger = 80 foot pounds (**108 Nm**)

unless a different torque is recommended by the manufacturer. Adhesive anchorages shall consist of a continuously threaded rod secured by an adhesive or mortar.

Laboratory tests, that include static load tests for ultimate pullout strengths, shall be performed on anchorage systems that are subject to tensile loads. The tests, in accordance with ASTM E 488, shall be performed and certified by an independent testing laboratory. The Contractor shall furnish the Engineer with the test reports and the specification sheets that are prescribed by ASTM E 488.

The Contractor shall demonstrate the anchorage system for drilled-in anchorage systems at the first site of field installation prior to actual use in the Project. The demonstration shall include installation and a static tension test in the presence of the Engineer, in accordance with test procedures prescribed in ASTM E 488. No portion of the testing device shall bear on the concrete surface within a distance equal to the anchorage embedment depth. Three anchorages shall be tested to not less than ½ the required minimum ultimate pull out strength or the value given in Table 1, whichever is less. Failure of an anchorage test will

require a modification of installation procedures or use of a different anchorage system.

In addition to the three tests stated above, the Engineer will require that each bridge have an additional 2% (not less than 1 test) of the remaining anchorages tested at a latter date. The Engineer will determine the locations of the additional anchors. If a failure occurs while testing the additional 2%, more testing will be required at the rate of an additional 1% per each failure at the Contractor's expense. Compensation for costs of testing is included in the payment for anchorage type reinforcement bars.

Location	Bolt or Rod Diameter mm **(inches)**	Minimum Embedment Depth mm **(inches)**	Ultimate Pull-out Strength kN **(pounds)**
Ornamental Metal Railing Type Special	5/8"	5"	20,000 lbs
Beams (for sign structures)	½"	3 ½"	8000 lbs

TABLE 1

ANCHOR ROD PROOF LOADS, KN **(kips)**
TYPE OF ROD, FROM SPEC. 3385

DIA., mm (inches)	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
13 (**1/2"**)	21.0 (**4.75**)	25.0 (**5.7**)	45.0 (**10.1**)	22.0 (**4.9**)
16 (**5/8"**)	33.0 (**7.4**)	39.5 (**8.9**)	70.0 (**15.8**)	34.0 (**7.6**)
19 (**3/4"**)	47.0 (**10.6**)	56.0 (**12.6**)	101.0 (**22.8**)	49.0 (**11.0**)
22 (**7/8"**)	65.0 (**14.5**)	77.0 (**17.4**)	138.0 (**31.0**)	67.0 (**15.0**)
25 (**1"**)	85.0 (**19.0**)	100.0 (**22.6**)	180.0 (**40.5**)	86.0 (**19.5**)

Installation of anchorages shall be in accordance with the manufacturer's recommendations and as specified in the Plan.

Any voids occurring between the top of the anchorages and the concrete in which it is embedded shall be filled with caulk approved by the Engineer.

D. Fabrication and Inspection Requirements

Fabricator shall supply QA/QC documentation verifying that all fabricated railing components are within the necessary tolerances for proper fit up and installation of the railing, including measurements between railing base plates that indicate that the as fabricated base plate hole locations are within 1/8 inch of the specified plan dimensions, based on the plan specified rail post spacing.

All metal railing shall be fabricated in accordance with 2471 and the Plan. The welding code shall be AWS D1.1-Structural Welding Code-Steel. Welding Procedure Specifications (WPSs) shall be submitted to the Engineer, for approval, prior to the start of fabrication.

Prior to fabrication the Contractor shall submit a Quality Control Plan (QCP) and fabrication drawings that are acceptable to the Engineer. Any work started prior to receiving approved drawings WPSs, and a QCP, shall be subject to 1512. The Contractor shall also give the Engineer at least 5 working days notice prior to beginning work so that Quality Assurance (QA) inspection may be provided.

All metal railing will be inspected by the Engineer. The purpose of the inspection(s) is to establish compliance with the Contract Documents. The shop inspection(s) is not intended to supplement or replace the Contractor's own Quality Control (QC). The Contractor is ultimately responsible for the correction of errors and faulty workmanship or for the replacement of nonconforming materials.

All parts of the fabrication are to be visually inspected and the inspections are to be documented by the Contractor's QC personnel. Any Nondestructive Testing required by the Contract Documents shall be performed and documented by an ASNT-TC-1A Level II qualified inspector.

Parts found to be in nonconformance shall be documented by using a Nonconformance Report form (NCR). The NCR shall describe in detail the fabrication error and the proposed repair procedure(s) in accordance with the QCP. Repair(s) performed shall be subject to the written approval of the Engineer.

E. Coating Requirements

All railing material shall be galvanized in accordance with 3394 after fabrication and painted (Duplex Coated) using the applicable provisions of 2478. The primer coat shall not be used on galvanized surfaces. The color of the finish coat shall match Federal Standard 595 B No. 10075 (Corten Brown) and have a semi-gloss finish.

Pre-Galvanized Procedure(s):

1. Calibrate dry film thickness gages in accordance with SSPC-PA 2-Measurement of Dry Coating Thickness with Magnetic Gauges.

2. Prepare all fabricated material surfaces by abrasive blast cleaning to a minimum of SSPC-SP 6/NACE No. 3-Commercial Blast Cleaning, prior to galvanizing.

3. Purchase Order(s) shall inform the galvanizer as to which specific items are going to be duplex coated so that they may comply with any additional cleaning required to meet the "Post Galvanizing Procedures", and, as necessary, meet the visual requirements of aesthetic, ornamental products. The galvanizer shall also be informed which materials, to be galvanized, are reactive (e.g. 3309, etc.).

Galvanizing Procedure(s):

1. All metal railing to be galvanized will be processed utilizing a "dry" kettle. The metal railing shall be prefluxed prior to the galvanizing bath using an aqueous tank of zinc chloride/ammonium chloride. The use of a "top flux" blanket on the molten zinc bath will not be permitted.

2. Air cool the metal railing to ambient temperature before handling for shipment and/or storage. Do not quench the metal railing or apply any post-galvanizing treatments.

3. Lumps, projections, globules, or heavy deposits of zinc, which will interfere with the "intended use of the product", will not be permitted. Damage to the galvanized zinc coating resulting in uncoated "black" and/or bare areas, blisters, flux deposits, and dross inclusions will also be considered unacceptable. Galvanized material that does not meet the requirements of 3394, shall be repaired in accordance with the methods described in ASTM A780. Required repair(s) may be subject to written approval of the Engineer. "Intended use of the product" shall be defined as surface conditions that, when painted, will produce acceptable aesthetic and/or visual qualities.

4. Galvanized metal railing shall be stored in a manner that will prevent the formation of "white-rust" or wet storage painting. "White rust" or staining of the galvanizing is not acceptable. A written repair procedure shall be subject to the approval of the Engineer. All repairs shall be performed at no expense to the owner.

5. The galvanizer shall provide the Engineer with all galvanizing process-related Quality Control documents prior to shipment of the galvanized product.

These documents shall include the following: coating material certifications, visual examinations, and coating thickness examinations.

6. The galvanized metal railing shall have a straightness tolerance of 3 mm in 3000 mm (**1/8 inch in 10 ft**), prior to any subsequent paint applications. Any galvanized metal railing not meeting this tolerance shall be straightened.

7. It is the galvanizer's responsibility to provide the Engineer with advanced notification of at least 5 working days of intent to ship so that the Engineer can perform a Quality Assurance audit.

Post Galvanizing Surface Preparation:

1. Prepare of the galvanized surfaces for painting in accordance with SSPC SP16 and ASTM D6386.

Paint Application:

1. Surface cleaning shall be by the solvent cleaning method and surface preparation shall be performed by sweep blasting.

2. All sweep blasted galvanized railing shall be coated with the subsequent coat(s) within the time frame defined in ASTM D 6386, Sect. 5.4.1, or within the same 8-hour shift, maintaining manufacturer defined control and environmental conditions. The Contractors QC personnel shall document that all parameters were followed.

3. All coating material shall be applied in accordance with the contract documents and the manufacturer's Product Data Sheet (PDS) and application guides for the material and system specified.

4. Coating material(s) shall meet the requirements of 3520. The color of the intermediate coat shall present a distinct contrast from other applied coatings.

5. QC Inspections of all coated products shall be accomplished by an observer with normal color vision, in a "well lighted" area, during each coating phase and prior to final acceptance.

"Well-lighted" shall be defined as a minimum of 50 foot candles of artificial light or natural daylight. A light meter with readings in foot candles shall be used to verify the adequacy of the lighting.

Handling and Shipping of Coated Metal Railing:

All completed, fabricated, and coated metal railing shall be protected during handling, and shipping, to prevent any damage to the coating(s). Coated metal railing shall not be moved or handled until the coating has cured, but in no case sooner than recommended by the coating manufacturer.

Metal railing may be padded to protect it from direct contact with wood, steel, or other packaging materials that could scratch, mar or otherwise damage the final coated railing finish. Softeners may be used in conjunction with high-density foam or other acceptable packaging materials at all points of contact.

Storage of Coated Metal Railings:

All completed coated metal railing shall be stored in accordance with 1606 and the following:

1. All railing shall be clearly tagged/piece marked by the fabricator prior to final storage. Identification markings shall include, as a minimum: individual piece marks, bridge and/or project number(s), fabricator and applicator job numbers. All marking(s) shall not be visible to the public when the railing is in its installed position. The method of identification shall be included in the fabricators QCP.

2. It is the Contractors responsibility to provide the Engineer with advance notification of at least 5 working days of intent to ship, so that the Engineer can perform a QA audit prior to shipping.

F. Construction Requirements

Provide the Engineer with a QA/QC plan that will be used to insure that the cast-in-place anchorages are installed in the correct location using templates or other means insuring that the exposed threads of the anchorages will not be damaged or contaminated and that the anchorages will not be displaced or allowed to move during concrete placement.

After the cast-in-place anchorages have been installed in the forms, but prior to placing the barrier concrete, the Contractor shall provide written documentation verifying that all of the anchorages are within the necessary tolerances to place the tubular railing without modifying the railing base plate configuration.

The steel posts shall be adjusted to obtain the grade and alignment as shown in the Plans by one of the following methods:

1. The steel posts shall be shimmed with steel shims or washers to the proper grade and alignment, not to exceed 6 mm (**1/4 inch**) of shim height. Before attaching the nuts, coat the surface between the base plate and concrete rail with an approved silicone caulk. Tighten the anchor rod nuts (as per section "C"-Anchorages) and neatly smooth the caulk around the perimeter of the railpost base plate.

2. The anchor rods shall have leveling nuts threaded on them and turned down to the base of the anchor rods. The rails shall be installed and the steel posts set to the proper grade and alignment by adjusting the leveling nuts. Install the top nuts and tighten them firmly to the base plate. The space between the base plate and the concrete shall be filled and neatly finished with grout that is approved by the Engineer.

Ground all metal railings. Install all electrical grounding in accordance with the applicable provisions of MnDOT specification 2557 and the National Electrical Code. Clamp or braze the ground wires to the grounding device, then practicably route and attach to the nearest rail by clamping, brazing, or any other approved means that will provide a permanent positive connection. If rail has non-continuous sections, use a #6 AWG solid copper wire to connect adjacent railing panels.

If the bridge does not include exposed electrical equipment, then ground the rails at points directly below or adjacent to the railing at all abutment corners. The grounding system will consist of a #6 AWG solid copper wire connected to the railing which in turn is connected to a copper coated steel rod having a nominal diameter of 15 mm (**5/8 inch**) or more and a minimum length of 2.4 m (**8 feet**) installed to an elevation approximately flush with the ground surface.

If the bridge includes exposed electrical equipment, such as roadway lighting, traffic signals, variable message signs, surveillance cameras, or ramp metering, then bond the railing grounding system to the exposed electrical equipment grounding system. Refer to the electrical plans and electrical special provisions for details regarding bonding multiple electrical grounding systems.

G. Repairs of Coated Steel Railings:

Any damaged coated surfaces, identified through either Quality Control or Quality Assurance inspections as being unacceptable, either after the application of the paint or after shipping and handling, shall be subject to the provisions of 1512.

H. Method of Measurement

Measurement will be by length in m (**feet**) based on Plan dimensions between the outside ends of metal railings (with deductions for the lengths of concrete end posts).

I. Basis of Payment

Payment for Item No. 2402.583 "ORNAMENTAL METAL RAILING TYPE SPECIAL" will be made at the contract price per m (**foot**) and shall be compensation in full for all costs of fabrication, (galvanizing), surface preparation, painting, delivery, and installation, as described above. Failure to comply with any of these requirements will result in rejection of the material and/or reduction in payment.

B-6.4 Bolted Connections

All bolted field connections for steel bridges shall be prepared and installed using Direct Tension Indicator (DTI) washers. DTIs shall conform to the requirements of 3391 and ASTM F 959. All DTIs shall have unique markings to indicate the gap locations between the protrusions and to allow the inspector to visibly differentiate them from a standard washer after installation. DTIs shall be supplied mechanically galvanized in accordance to 3392.

Installation of fasteners shall be in accordance with the DTI manufacturer's recommendations and 2402. Installation shall also meet the requirements of AASHTO LRFD Bridge Construction Specifications, Second Edition, Article 11.5.6.4.7 Direct Tension Indicator Installation Method. A DTI manufacturer's representative shall be on-site at the beginning of the bolting operations to provide training and ensure proper installation.

Use of DTIs, as described above, shall be considered as an incidental expense to the structural steel and no direct compensation will be made therefore.

Delete the first sentence of 2402.3G2c(3) and replace it with the following:

When direct tension indicators are used to provide the required bolt tension, installation of the indicators, including snug tight fit-up, shall be in accordance with the manufacturer's recommendations, except as follows. Insert a hardened flat washer between the DTI and fastener when bolting through a short-slotted or oversized hole as per MnDOT 2471.3H1a. Installation of a DTI will be permitted under the turned element if a washer is used to separate the turned element from the DTI per AASHTO LRFD Bridge Construction Specification 11.5.6.4.7.

SB-7 (2404) CONCRETE WEARING COURSE FOR BRIDGES

The provisions of Mn/DOT 2404 are modified and/or supplemented with the following:

SB-7.1 Concrete Wearing Course 3U17A

The provisions of 2404 shall apply except as modified herein.

Add the following to 2404.3A:

Special precautions shall be taken to control and abate the dust generated by the blasting operation in accordance with MPCA Rule 7011.0150 https://www.revisor.leg.state.mn.us/rules/?id=7011.0150. The Contractor shall submit his/her proposed plan for dust abatement at least 14 days before the start of this work. This abatement plan shall include, but not necessarily be limited to, the following operations and procedures:

A. The bridge (and approach) slab(s) shall be thoroughly swept prior to blasting. A power sweeper shall use the least amount of water necessary to minimize the dust from the sweeping operation.

B. The blast wheel or blasting nozzle or nozzles shall be enclosed in a housing or directed into a housing. The housing shall have a negative air emission control system that draws the confined air and dust into an adequate filter collection system. The capacity of the exhaust system shall be sufficient to readily relieve the pressure generated within the housing by the blasting equipment. The filter collection system shall be cleaned, as necessary, to assure proper filtration. The sides and corners of the housing shall be flexible at the bottom to the extent that the bottom of the housing shall be in contact with the deck surface during all blasting operations.

C. The housing and/or filter collection system shall be constructed, maintained, and operated so that avoidable dust emissions are eliminated.

D. After blasting, the prepared surface shall be thoroughly hand swept or swept with a "Pickup" type power sweeper equipped with adequate dust storage capacity. All minor debris remaining after the sweeping operation shall be completely removed by airblasting. The air supply system shall be so constructed that a suitable oil trap is placed in the air supply line between the storage tank and the nozzle.

Measurement will be made by the area, in square meters (**feet**), based on the bridge roadway dimensions between gutterlines and from end of (slab) (approach) to end of (slab) (approach).

Payment for performing this work, as described above, will be made under Item No. 2404.618 "BLASTING (SPECIAL)", at the Contract price per square foot.

SB-8 (2405) PRESTRESSED CONCRETE BEAMS

The provisions of MnDOT 2405 are modified and/or supplemented with the following:

Delete the first paragraph of 2405.3M and substitute the following:

Prestressed concrete beams shall be erected in a manner that will provide safety to the workers, inspectors, and the public, at all times, as well as reasonable assurance against damage to the prestressed members. Prior to the placement of diaphragms, the prestressed beams shall be temporarily anchored, braced, and stabilized as they are erected so as to preclude sliding, tipping, buckling, or other movement that may otherwise occur. If active vehicular or railroad traffic will be permitted to travel beneath beams prior to complete erection of all the beams and diaphragms in a span, the Contractor shall submit an erection plan prepared by an engineer, thoroughly checked by a second engineer for completeness and accuracy, and certified by one of the aforementioned professional engineers licensed in the State of Minnesota which details all temporary works necessary to brace and stabilize beams. Struts, bracing, tie cables, and other devices used for temporary restraint shall be of a size and strength that will ensure their adequacy. The Contractor shall arrange the work schedule so that each beam will be connected to an adjacent beam and at least two adjacent girders will be erected (including diaphragms and bolts fully tightened) and braced and stabilized in any one span before operations are suspended for the day.

Add the following immediately before the last paragraph of 2405.3M:

Threaded rods used to attach prestressed concrete beams to cast-in-place concrete diaphragms shall either be galvanized per MnDOT specification 3392 or electroplated in accordance with ASTM B633, service condition SC4.

SB-8.1 Prestressed Concrete Fabricator Certification

The Fabricator's quality control office shall maintain documentation containing the data required by the specifications and the State Materials Engineer. This documentation shall contain test data and measurements taken at times and locations approved by the Engineer, assuring that monitoring, by personnel not directly involved in production, is sufficient to ensure compliance with approved procedures.

If the Engineer's review of fabrication work discloses that approved procedures are not being followed, the Fabricator shall immediately correct the procedure.

The Engineer will determine what additional testing work must be done by the Fabricator or, if necessary, what part of the work must be repaired or replaced if

fabrication work is not properly monitored and documented by the Fabricator.

Any and all costs of required additional monitoring and testing shall be at the expense of the Contractor with no additional compensation.

SB-8.2 Steel Intermediate Diaphragms

In lieu of providing the steel intermediate diaphragm shown in detail B403 of the plans, the Contractor may substitute a bent plate diaphragm. The bent plate diaphragm shall be made of 8 mm (**5/16"**) thickness plate bent as shown in detail B402 of Mn/DOT Bridge Details Manual. The minimum depth for diaphragm shall be dimension "C" shown in B403; minimum flange width shall be 125 mm (**5"**).

SB-8.3 Prestress Transfer

The Fabricator of prestressed concrete beams shall closely monitor the ends of the beams during the strand release process. The following sequence of releasing the individual prestressing strands will be required if cracks occur in the ends of the beams during the fabricator's releasing sequence.

Delete the first sentence of the second paragraph of 2405.3H.

Add the following to 2405.3H:

Prestress transfer shall be conducted in a sequential and alternating manner symmetrical to the vertical axis of the beam in order to minimize the lateral eccentricity of the prestress forces and diminish cracking of the concrete. The sequence of individual prestressing strand release shall be in accordance with the following criteria unless different criteria are approved by the Engineer.

1) Beginning with the *straight* strands closest to the vertical axis of the beam and in the second row from the bottom of the beam, release the strands each side of center. Move two columns away from this column in the same row and release the strand on each side of the center. Then proceed to the outermost strands in this row and release the strand on each side of the center. Repeat the sequence for the third and subsequent rows from the bottom upward until approximately one-fourth of the straight strands have been released.

2) Release approximately one-half (+/- one strand) of the *draped* strands alternating about the vertical axis, starting from the bottom.

3) Release the hold-down anchors for the draped strands.

4) Release the remainder of the *draped* strands alternating about the vertical axis.

5) Release the remainder of the *straight* strands beginning with the strand in the bottom row nearest the vertical axis. The strands are released alternating each side of the center. Release all the strands in that column moving upward. Proceed two columns away from this column and release the strands bottom to top alternating each side of the center. Next, move to the outer most column and release strands bottom to top continuing to alternate each side of the center. The remainder of the strands shall be released bottom to top starting with the inner most column alternating each side of the center.

Once release has started, all strands of that beam shall be released in the sequence described above even if cracking is noticed near the end of the beam. The Engineer shall be notified immediately of any cracking and no other beams with the same strand pattern may be fabricated until the Engineer has approved a revised release sequence.

SB-9 (2451) STRUCTURE EXCAVATIONS AND BACKFILLS

The provisions of Mn/DOT 2451 are modified and/or supplemented with the following:

SB-9.1 Structure Excavation

The item Structure Excavation shall include all excavation, sheeting and shoring and/or other protection, preparation of foundation, and placing of backfill, and disposal of surplus material necessary for construction of Bridge(s) No.07587, which is not specifically included in the grading portion of the Contract. At the abutment, excavate material necessary to construct to finished grade as shown in the "Finished Grading Section" on MnDOT Standard 5-297.233 and 5-297.234.

No measurement for payment will be made for approach surcharge material or select granular modified abutment approach treatment material as part of the structure excavation pay item. Refer to the grading portion of the contract for measurement and payment of these items.

No measurement will be made of the excavated or backfill material that is included in the structure excavation pay item. All work performed as specified above will be considered to be included in a single lump sum for which payment is made under Item No. 2401.601, "STRUCTURE EXCAVATION".

For purposes of partial payments, the portion of the lump sum Structure Excavation at each substructure unit will be defined as follows:

Bridge 07587	Each Abutment 30% Each Pier 40%

SB-10 (2452) PILE COATING

SB-10.1 DESCRIPTION

The purpose of the pile coating is to provide reduced, or eliminated, friction between the pile and the soil, in order to reduce potential effects of downdrag.

This work shall consist of sandblasting and cleaning of the piling, furnishing and applying pile coating and primer to steel pile surfaces as required in the plans and as specified herein.

SB-10.2 MATERIALS

Material shall provide 80-90% reduced friction between the pile and the surrounding soil, in order to reduce the potential effects of downdrag.

A. Coating shall be:

- **Silicone/Epoxy-**treated coating as manufactured by Wearlon Industrial Coatings under the trade name "Slickcoat"

  or

- Epoxy Coal Tar Coating as manufactured under the trade name "Hi-Mil Sher-Tar Epoxy" by Sherwin Williams, or "Bitumastic 300M Coal Tar Epoxy Protective Coating" by Carboline

  or an acceptable substitution.

B. Primer. Primer shall conform to the requirements of AASHTO M116.

SB-10.3 CONSTRUCTION REQUIREMENTS

All surfaces to be coated shall free of oil and grease by Solvent Cleaning specification SSPC-SP01, be dry and thoroughly blast cleaned using a sharp, angular abrasive. The blast-cleaned pipe shall meet the requirements of the Near White Blast Cleaning specification per SSPC-SP10/NACE 2.

Application of the prime coat shall be with a brush or other approved means and in a manner to thoroughly coat the surface of the piling with a continuous film of primer. The purpose of the primer is to provide a suitable bond of the coating to the pile. The primer shall be applied the same day as it is cleaned or before flash rusting occurs and set thoroughly before the coating is applied. The primer shall be compatible with the manufacturer's recommended specifications.

Application and recoating of the friction reduction coating to the piles shall be per

manufacturer's recommendations. The minimum thickness of the coating for **Silicone/Epoxy--**treated pile shall be 5 mils and for epoxy coal tar pile shall be 20 mils, both measured in the dry state.

Coated piles shall be stored immediately after the coating is applied for protection from sunlight and heat. Pile coatings shall not be exposed to damage or contamination during storage, hauling, or handling. Once the coating has been applied, the Contractor will not be allowed to drag the piles on the ground or to use cable wraps around the pile during handling. Pad eyes, or other suitable devices, shall be attached to the pile to be used for lifting and handling. If necessary, the Contractor shall recoat the piles, at his expense, to comply with these requirements.

A nominal length of pile shall be left uncoated where field splices will be required. After completing the field splice, the splice area shall be coated to the specified minimum thickness in accordance with the manufacturer's recommended procedures. **The Contractor is specifically notified that coating the splice area will cause some delay to pile driving operations. The Contractor is advised to schedule their work accordingly.**

Piles shall be driven such that the full coating length per Plans is to be installed. Piles that stop short will need special evaluation and possibly additional PDA testing. If capacity is not achieved during the initial driving at the design length, then the piles should be restruck after a period of at least 72 hours to access the amount of increase in capacity through setup.

PDA test piles will need at least 3 feet of uncoated length at the top of the pile in order to attach the gauges.

SB-10.4 QUALITY ASSURANCE AND SUBMITTALS

Prior to coating the piles, the Contractor shall submit a Quality Control Plan that is acceptable to the Owner. The Contractor shall give the Owner at least (5) working days notice prior to beginning work so that Quality Assurance (QA) inspection may be provided.

All steps involved in the pile coating will be inspected by the Owner. The purpose of the inspection(s) is to establish compliance with the Contract Documents. The shop inspection(s) is not intended to supplement or replace the Contractor's own Quality Control (QC). The Contractor is ultimately responsible for the correction of errors or faulty workmanship or for the replacement of non-conforming materials.

All parts of the pile coating operation are to be visually inspected and the inspections are to be documents by the Contractor's QC personnel.

The Contractor shall provide the Engineer with all coating related Quality Control documents prior to shipment of the coated product. These documents shall include the following: pile coating material certifications, (including primer), visual examinations, and coating thickness examinations. The coating thickness shall be tested at a frequency of 1 test per 20 linear feet.

It is the Contractor's responsibility to provide the Owner with advanced notification of at least 5 working days of intent to ship so that the Owner can perform a Quality Assurance audit.

SB-10.5 METHOD OF MEASUREMENT

Pile coating will be measured by the linear foot of coating in place on the pile surfaces. No separate payment will be made for the primer or coating of the splice areas.

SB-10.6 METHOD OF PAYMENT

The accepted quantities of coating will be paid for under Item 2452.603 "PILE COATING", at the contract unit price per linear foot. The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, quality control, and incidentals; and for doing all the work involved in preparing the surfaces, applying the coating and primer, as shown in the plans, as specified in these specifications, and as directed by the Owner.

SB-11 (2452) PILING

The provisions of MnDOT 2452 are modified and/or supplemented with the following:

Delete the second paragraph of 2452.3H and substitute the following:

Pile welders shall be qualified using AWS D1.1 standards or current Mn/DOT welding certification.

Delete the first sentence of the second paragraph of 2452.3D7 and substitute the following:

Piles designated by the Engineer to be redriven shall have a required minimum time delay of 72 hours between the initial driving and redriving.

Initially, drive the test piles to a resistance of at least 25 blows per foot and to a pile tip penetration of not less than elevation 920. If the required bearing capacity has not been achieved, after a 72 hour delay, re-drive the test piles to determine the set up capacity. After the set up capacity has been determined, continue to drive the test pile full length or until substantial refusal is reached.

SB-11.1 Equipment for Driving

Delete the first and second paragraph of 2452.3C1 and substitute the following:

All pile driving equipment to be furnished by the Contractor shall be subject to approval by the Engineer. Approval is based on the satisfactory results of a wave equation analysis.

At least 30 calendar days prior to the start of pile driving operations, the Contractor shall submit the following:

1. A completed pile and driving equipment data form for each hammer proposed for the project. The form may be downloaded from the following website:
http://www.pile.com/pdi/users/grlweap/equipdatafrm-en.pdf

2. A wave equation analysis in accordance with GRL WEAP or similar program for each pile type and hammer. A hard copy of the results of the analysis, including a WEAP bearing graph, shall be submitted to the Engineer.

For the pile driving equipment to be acceptable, the required number of hammer blows indicated by the wave equation at 155% of the pile factored design load as shown in the Plans shall be between 30 and 180 blows per foot.

The pile stresses indicated by the wave equation shall be reviewed to determine that the piles can be driven as described in 2452.3D without failure. If stress levels are such that damage to the piling is considered to be likely, adjustments shall be made to the pile driving system or to the strength of the pile until satisfactory results are obtained. Substantial refusal is defined in subsequent paragraphs.

All costs associated with providing the wave equation analysis and submittals as described above shall be an incidental expense to the test piles and no additional compensation will be made for this work.

SB-11.2 Penetration and Bearing

Delete 2452.3E and substitute the following:

A. General

The nominal pile bearing resistances shown in the Plans were calculated using design loadings and indicate the factored loads that the piles are required to support. The nominal resistance determined using the dynamic methods, defined under Determination of Nominal Bearing Resistances, is the basis for establishing the minimum criteria for pile acceptance in which the driving resistance is not less

than the resistance specified in the Plans. It may be necessary to drive the foundation piles beyond the specified resistance until the required penetration as shown in the Plan is reached, or until the piles have been driven to a penetration as determined by the engineer based on the test pile results.

Since the purpose of a test pile is to provide information for authorizing the length of the foundation piles, it shall be driven full length unless substantial refusal (as defined below) is encountered at a lesser penetration. If the test pile has been driven full length and 115% of the nominal resistance required for the foundation piles has not been attained the Engineer may order the test pile be driven further as per 2452.3D2 and 2452.4A. If pile redriving is specified in the Plan, the penetrations and time delays shall be in accordance with 2452.3D7 and/or these special provisions.

Substantial refusal, as referenced in 2452.3D, shall be considered to have been attained when the penetration rate is equal to 0.05 inches per blow.

B. Determination of Nominal Bearing Resistance

The required nominal resistance shown in the Plans is based on a field control method as noted. The driven pile nominal resistance shall be determined in accordance with the following provisions using the appropriate corresponding field control method indicated in the Plans. Unless otherwise specified, if more than one field control method is shown, the method used shall be determined in accordance with the following:

When the "Pile Analysis" pay item is included for a bridge, the Pile Driving Analyzer (PDA) shall be required for the field control.

When the "Pile Analysis" pay item is <u>not</u> included for a bridge, the field control method shall be at the Contractor's option. The cost of the PDA shall be incidental to the cost of Piling Driven.

B1. Mn/DOT Nominal Resistance Pile Driving Formula Used as Field Control Method

The nominal pile bearing resistance shall be determined by dynamic formula as follows:

All types of piling driven with power-driven hammers.

$$R_n(metric) = \frac{867E}{S+5} x \frac{W+(CxM)}{W+M} \qquad R_n(english) = \frac{10.5E}{S+0.2} x \frac{W+(CxM)}{W+M}$$

WHERE:

R_n = Nominal Pile Bearing Resistance in Newtons (**pounds**).
W = Mass of the striking part of the hammer in kilograms (**pounds**).
H = Height of fall in millimeters (**feet**).
S = Average penetration in millimeters (**inches**) per blow for the last 10 or 20 blows, except in cases where the pile may be damaged by this number of blows.
M = Total mass of pile plus mass of the driving cap in kilograms (**pounds**).
C = 0.1 for Timber, Concrete and shell type piles, 0.2 for Steel H piling

*The following definition is for Metric units. See English units below:

E = WHx0.00981 for single acting power-driven hammers. It is equal to the joules or newton-meters (joule = newton-meter) of energy per blow for each full stroke of either single acting or double acting hammers as given by the manufacturer's rating for the speed at which the hammer operates.

*The following definition is for English units:

E = WH for single acting power-driven hammers. It is equal to the foot pounds of energy per blow for each full stroke of either single acting or double acting hammers as given by the manufacturer's rating for the speed at which the hammer operates.

NOTES:

When provisions are not made available for field determination of the energy output on a power-driven hammer, such as measurement of the drop for single-acting hammers, or such as pressure gauges or determination of energy on the basis of the frequency of the blows (cycles per minute) for double-acting hammers, the manufacturer's rated energy shall be reduced by 25 percent. This reduction is not intended to apply when determining the required hammer size. Double-acting hammers, for the purpose of these requirements, will include all hammers for which a power source is utilized for acceleration of the down-stroke of the ram. The dynamic formula specified herein-before are applicable only when:

(a) The hammer has a free fall.
(b) The head of the pile is free from broomed or crushed fibre.
(c) The penetration of the pile is at a reasonably uniform rate.

(d) There is not noticeable bounce after the blow. When there is a noticeable bounce, twice the bounce height shall be deducted from H to determine the value of H in the formula.

B2. Pile Driving Analyzer (PDA) Used as Field Control Method

The nominal pile bearing resistance shall be determined using the pile driving analyzer and the Case Pile Wave Analysis Program (CAPWAP) in accordance with the following section, Dynamic Monitoring of Pile Driving. The WEAP bearing graph listed below under deliverables shall be used to determine the bearing resistances that are recorded on the pile driving report (attach a copy of the bearing graph to the report). For informational and comparison purposes, the bearing resistances shall also be computed using the Mn/DOT formula and recorded on the report.

B3. Piling Supporting Concrete Retaining Walls

The nominal pile bearing resistances shown on Mn/DOT Standard Concrete Retaining Wall Sheets (Mn/DOT Standard Figures 5-297.620 through 5-297.632 dated May 31, 2006) were calculated using the Allowable Stress Design (ASD) Method, Not the LRFD method. If dynamic formulas are used to determine pile resistance for concrete retaining walls in the field, follow Mn/DOT specification 2452.3E as detailed in the 2005 Standard Specifications for Construction in lieu of 2452.3E-A and 2452.3E-B1 shown above. Do not use the formulas shown above to compute pile capacities for concrete retaining walls. For retaining wall plan sheets dated later than May 31, 2006 the inspector must confirm which dynamic formula to use.

SB-11.3 Dynamic Monitoring of Pile Driving

A. Description of Work

The Contractor shall provide all equipment and personnel necessary to perform dynamic pile testing of driven piles using a Pile Driving Analyzer (PDA). The work shall be performed in accordance with the requirements of ASTM 4945. The dynamic pile testing shall be performed on the initial driving and redriving of the test piles as directed by the Engineer. Testing may also be required on additional piles as designated by the Engineer.

B. Pile Preparation and Wave Matching

The Contractor shall prepare each pile to be tested by attaching instrumentation to the piles except that for testing on initial driving of steel shell piles, the Contractor shall attach the instrumentation after the pile has been placed in the leads. In addition, the Contractor shall perform wave matching of the PDA data using the Case Pile Wave Analysis Program (CAPWAP). This work shall be performed by

an engineer experienced in dynamic testing and CAPWAP analysis. The program shall be run on all piles dynamically tested, or as directed by the Engineer.

C. Wave Equation Analysis

Following the wave matching, the Contractor shall use the GRLWEAP program and CAPWAP data to produce a refined Wave Equation Analysis Program (WEAP) bearing graph and inspector's chart to be used as the basis for pile acceptance. The bearing graph shall be used to determine the foundation pile's nominal bearing resistance that is to be recorded on the pile driving report. The wave matching analysis and wave equation analysis shall be performed in a timely manner.

D. Deliverables

The Contractor shall provide the following items to the Engineer within the specified time intervals described herein:

1. Results from each dynamic test performed with the PDA and checked with the CAPWAP program. The results shall be in the form of a hard copy of columnar data produced with the PDAPLOT program. The data shall consist of blow counts, stresses in the pile, pile capacities, hammer energies and hammer strokes for each one foot (0.25 meter) depth increment. The results shall be provided in a timely manner. In addition, the Contractor shall provide expert advice regarding the analysis of the PDA and CAPWAP data.

2. A WEAP bearing graph and inspection chart showing blow count-versus-pile resistance and stroke-versus-blow count that will be used for determining the nominal bearing resistance of the foundation piles. The graph/charts shall be developed based on the results of the PDA and CAPWAP data. Both the maximum force and maximum transferred energy calculated by WEAP shall match within 10% of those calculated by the CAPWAP. The bearing graphs shall be delivered to the Engineer within two days after completion of driving the test piles at any single substructure unit. These graphs/charts shall also be documented in the appropriate reports listed below.

3. A brief report for the piles at each substructure tested including a summary of the PDA and CAPWAP results. In addition, the Contractor shall supply one or more 3.5 inch diskettes or CD containing all data for the piles tested for that substructure. The data shall be in the form of X01 (PDA file) and Q00 (PDAPLOT file) files and shall be properly labeled. These reports shall be sent to the Engineer no later than three working days after dynamic pile tests have been completed at any given substructure unit.

4. A PDA summary report which summarizes the findings from the PDA and the associated CAPWAP computer program and the developed GRLWEAP bearing graphs. This report shall be sent to the Engineer no later than one week following the completion of the dynamic pile tests, addressed separately.

E. Method of Measurement

When the Pile Driving Analyzer field control method is required by the contract, measurement will be by the number of piles on which the pile driving analysis is performed. Initial analysis and redrive analysis on an individual pile shall be counted as one pile analysis. The Department reserves the right to increase or decrease the number of piles which are required to be dynamically monitored.

When the Pile Driving Analyzer field control method is not required by the contract but is chosen at the Contractor's option, no measurement will be made of the analyses performed and all costs associated with the dynamic testing will be at the Contractor's expense.

F. Basis of Payment

Payment for Item No. 2452.602 "PILE ANALYSIS" will be made at the Contract price per each and shall be compensation in full for all of the Contractor's expenses associated with the dynamic testing of a pile during initial driving and redriving. This includes, but is not limited to, additional time needed in driving operations, labor, consultants and equipment necessary for performing all of the work described above, including all incidentals thereto. This includes the payment for the dynamic testing of the redrive but all other work associated with the redrive itself will be paid for under the "Pile Redriving" pay item per each.

No unit price adjustment will be made in the event of increased or decreased Contract quantities for Pile Analysis.

SB-11.4 Extensions and Splices

Delete the fourth paragraph of 2452.3H and substitute the following:

Commercial drive fit splices will NOT be permitted (on this project) (on Bridge No. 07587).

SB-12 (2471) STRUCTURAL METALS

The provisions of Mn/DOT 2471 are modified and/or supplemented with the following:

Delete the fourth paragraph of 2471.3A2 and substitute the following:

The Contractor/Fabricator performing coating application must demonstrate qualification by obtaining the AISC Sophisticated Paint Endorsement (SPE), the SSPS QP Certification, or a Quality Control Plan (QCP) that is acceptable to the Engineer.

Add the following to the end of the second paragraph of 2471.3C:

The Engineer will audit suppliers with approved QCP's on a biannual or annual basis or as deemed necessary by the Engineer to determine if the QCP is being implemented. The Department will invoke its Corrective Action Process if the audit indicates non-conformance. Corrective action, up to and including the supplier hiring a third party Quality Control Inspector, may be required as a disciplinary step, at no cost to the Department. A copy of the Departments Corrective Action Process is available from the Engineer.

Add the following to 2471.3E1 as the first paragraph:

Steel plates and splice plates for major structural components shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile or compressive stresses.

Add the following to 2471.3F:

F1b Web-to-Flange Welds

For the purpose of this specification, a repair is defined as any area of the welded product not in compliance with the current edition of AASHTO AWS D1.5 Bridge Welding Code. Limit each individual web-to-flange weld repairs to 2 percent of the weld length and grinding web-to-flange weld repairs to 5 percent of the weld length. Exceeding these limits will result in revocation of the Welding Procedure Specification (WPS) used to perform the initial production welding.

Add the following as 2471.3G1:

G1 Fracture Critical Welder Qualifications

Fracture Critical Welder Qualifications shall be in accordance with AASHTO/AWS D1.5-Bridge Welding Code. Annual requalification shall be based upon acceptable radiographic test results of either a production groove weld or test plate. If a welder is requalified by test, a WPS written in accordance with the requirements of D1.5, shall be used and the test plate shall be as shown in Figure 5.24. The WPS shall be included in the Fabricators QCP.

Add the following to 2471.3N1:

Work that is not performed in accordance with the suppliers approved QCP shall be subject to rejection in accordance with 1512.

SB-13 CONDUIT SYSTEMS

Each Conduit System shall be furnished and installed in accordance with the Plans, approved erection drawing, the applicable requirements of 2545, 2550, 2565 and the following:

All conduit runs shall be straight and true and all offsets and bends shall be uniform and symmetrical. The Contractor shall adjust the elevations of the conduit assembly, for its full length, to approximately the same gradient as the finished roadway, and s/he shall furnish and install in the approaches such suitable spacers and framing as may be necessary to maintain the correct grade and alignment.

Ferrous components of fittings shall be hot dip galvanized. All fittings shall be carefully installed according to the manufacturer's recommendations and at the locations shown in the Plans. At time of installation, adjacent conduit sections to be coupled by fittings shall be in true alignment.

Fabrication and inspection of structural metals used for each Conduit System shall be in accordance with the applicable requirements of 2471.

The ends of conduits shall be identified as lighting, signals, telephone, telegraph, power, etc. by the use of embossed metallic tags or other equally durable identification.

Non-metallic conduit and fittings shall conform to the requirements of the NEMA Standards Publication No. TC 14, entitled "Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings."

Three sets of erection drawings of each Conduit System shall be furnished to the Engineer for preliminary review. Two sets will be forwarded to the Bridge Construction and Maintenance Engineer for review and one set will be returned to the Contractor showing any necessary corrections.

The drawings shall be to a scale of not less than 50:1 (**1/4" = 1'-0"**) and shall show the locations of the diaphragms and inserts, a conduit placement scheme, and detailed views of the placement of the sleeves through the parapets, end webs, and diaphragms. The locations of the sleeves shall be defined from established reference points or lines and elevations, such as working points or centerlines and bridge seat elevations. The locations and manufacturer of expansion fittings shall be shown in the drawings.

Concrete inserts for hanger assemblies shall be spaced in such a manner that the assemblies will not interfere with conduit couplings. Hanger spacing shall not exceed 3 meters (**10 feet**). Conduit shall be installed in 3 meter (**10 foot**) lengths where practicable.

Each expansion fitting shall be in accordance with 3839, except that the fitting shall provide for greater than 100 mm (**4 inch**) linear movement when required by the Plans.

Each expansion/deflection fitting shall be an approved watertight unit which can accommodate 20 mm (**3/4 inch**) of linear expansion or contraction of conduit, 20 mm (**3/4 inch**) of parallel misalignment of adjacent conduit sections, and up to 30° of angular misalignment of the axes of adjacent conduit sections. To prevent damage to internal bonding jumper, fittings should not be twisted during installation.

A combination expansion/deflection fitting shall consist of an expansion fitting and an expansion/deflection fitting connected by a nipple. The expansion fitting shall be in accordance with 3839, except that the fitting shall provide for greater than 100 mm (**4 inch**) linear movement when required by the Plans. Each expansion/deflection fitting shall be an approved watertight unit which can accommodate 20 mm (**3/4 inch**) of linear expansion or contraction of conduit, 20 mm (**3/4 inch**) of parallel misalignment of adjacent conduit sections, and up to 30E of angular misalignment of the axes of adjacent conduit sections. To prevent damage to internal bonding jumper, fittings should not be twisted during installation.

The Contractor shall seal any remaining conduit opening at the back face of each abutment with an approved sealant after the conduit is in place.

All sidewalk or flush mounted junction boxes shall be removable flange (NEMA 5) galvanized cast iron with checkered cast iron covers. These junction boxes shall be equipped with 13 mm (**1/2 inch**) diameter pipe drains. Each conduit

entrance and the pipe drain entrance shall be bossed and threaded to provide five full threads. The cover and flange shall be fastened with stainless steel screws. The cover shall have pry bar slots and shall be equipped with a neoprene gasket.

Each junction box conduit entrance shall include an insulating bushing of the appropriate size.

SB-14 (3371) STEEL SHELLS FOR CONCRETE PILING

The provisions of Mn/DOT 3371.2 are modified and/or supplemented with the following:

Add the following to 3371.3:

The use of small quantities of piling from the Contractor's surplus of cut-offs and overruns may be submitted for use and approved by the Engineer. These materials shall be certified by the Contractor to be remaining quantities of materials previously submitted with accompanying Mill Test Reports and subsequently approved for use on other projects. Pile splices used to make up authorized pile lengths shall be considered to have been made at the Contractor's convenience and shall not be considered eligible for extra compensation under 2452.4B.

SB-15 (3391) FASTENERS

Delete the contents of 3391.2B and substitute the following:

Field and shop bolts for steel bridges shall meet ASTM A325, Type 3 bolts. The bolts shall project through the nut not less than 3 mm (**1/8"**) nor more than 10 mm (**3/8"**). Field and shop nuts for steel bridges shall meet ASTM A563/A563M, Grade C3 or DH3 nuts and field and shop washers for steel bridges shall meet ASTM F436/F436M, Type 3 washers.

For all other bridges and structures the bolts shall meet ASTM A325, Type 1 (for painted and/or galvanized applications) or Type 3 (for unpainted weathering steel applications). The bolts shall project through the nut not less than 3 mm (**1/8"**) nor more than 10 mm (**3/8"**). The nuts shall meet ASTM A563/A563M and the washers shall meet ASTM F436/F436M.

ASTM A325 bolts may only be retightened once after having been previously fully tightened.

At the time of installation of fasteners, all nuts, regardless of their specified finish, shall be lubricated with a lubricant of contrasting color as per ASTM A 563

Supplementary requirements S1, S2, and S3.

SB-15.1 Delete the first two sentences of 3391.2E and add the following:

Stainless steel bolts are to meet the requirements of ASTM F 593, Condition CW1, Type 304, 316, or 316L, with a minimum yield strength of 415 MPa (**60,000 psi**), an ultimate tensile strength of 660 MPa (**95,000 psi**), and a minimum elongation of 20 percent in 50 mm (**2 inches**). The nuts are to meet the requirements of ASTM F 594, Condition CW1, Type 304, 316, or 316L.

SB-16 (3741) ELASTOMERIC BEARING PADS

The provisions of 3741 shall apply except as modified below:

Replace the first sentence in 3741.2A with the following:

The elastomeric portion of the bearing pads shall be in accordance with AASHTO M251-04 with a specified Shore A scale hardness of 60 ±5 durometers. The elastomer compounds shall be classified as of low-temperature Grade 4 as specified by the grade requirements of Table 14.7.5.2-2, "Low temperature Zones and Minimum Grade of Elastomer", of the *AASHTO LRFD Bridge Design Specifications*.

Delete all of 3741.2B1 except for the last paragraph.

END OF DOCUMENT