

REV 11/17

STANDARD SPECIFICATIONS

All work required for the project shall be in accordance with the latest edition of the COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) Standard Specifications for Road and Bridge Construction, the CDOT M&S Standards, the Town of Castle Rock Public Works Regulations, the Town of Castle Rock Details Plans List, the latest edition of the Town of Castle Rock Grading, Erosion, Sediment Control (TECS) Manual and Drainage, Erosion, Sediment Control (DESC) Manual, and the Town of Castle Rock Standard Operations Procedures (SOP).

STANDARD SPECIAL PROVISIONS

All changes to the CDOT Standard Specifications for Road and Bridge Construction, to include revisions, additions, deletions, terms and definitions, are contained in the Special Provisions. All bids and all construction shall be in accordance with the Special Provisions.

DIVISION 100
GENERAL PROVISIONS

SECTION 101
DEFINITIONS AND TERMS

101.36 **Holidays.** Replace Subsection 101.36 with the following:

Holidays recognized by the Town of Castle Rock are:

- New Year's Day
- Martin Luther King Jr. Day
- Presidents' Day
- Memorial Day
- Independence Day
- Labor Day
- Veterans Day
- Thanksgiving Day
- Friday After Thanksgiving Day
- Christmas Eve Day (Close at 12 noon)
- Christmas Day

When New Year's Day, Independence Day, or Christmas Day falls on a Sunday, the following Monday shall be considered a holiday. When one of these days falls on a Saturday, the preceding Friday shall be considered a holiday.

**SECTION 102
BIDDING REQUIREMENTS AND CONDITIONS**

102

DELETE SECTION 102. Refer to "INFORMATION AND INSTRUCTIONS TO BIDDERS" and "GENERAL CONDITIONS".

**SECTION 103
AWARD AND EXECUTION OF CONTRACT**

103

DELETE SECTION 103. Refer to "INFORMATION AND INSTRUCTIONS TO BIDDERS" and "GENERAL CONDITIONS".

**SECTION 104
SCOPE OF WORK**

104.04 **Maintaining Traffic.** Replace paragraph three in Subsection 104.04 with the following:

Portions of the roadway that are not included in the contract work will be maintained by the Town of Castle Rock. Snow removal within the contract work limits will be the responsibility of the Contractor. The Contractor shall be responsible for maintaining all work that is included in the Contract, and maintaining approaches, crossings, intersections, and other features as may be necessary to accommodate traffic without direct compensation, except as provided in the Contract or described in (a) and (b) below.

104.04 **Maintaining Traffic.** Add the following to Subsection 104.04:

The Contractor shall be responsible for maintaining access to all residences and businesses along the Project areas during construction. Lane widths during construction shall not be less than 10 feet, and a minimum clearance of two (2) feet shall be maintained between traffic and the construction work zone.

The Contractor will not be permitted to have construction equipment or materials in the lane(s) open to traffic at any time unless permitted by the Director.

The Contractor is cautioned that all personal vehicle and construction equipment parking will be prohibited where it conflicts with safety, access, or the flow of traffic.

**SECTION 105
CONTROL OF WORK**

- 105.02 **Plans, Shop Drawings, Working Drawings, Other submittals, and Construction Drawings.** Replace Subsection 105.02(b)4. with the following:
- Unless otherwise specified, three (3) sets of shop drawings, and other submittals shall be submitted to the Engineer. One additional set of shop drawings shall be submitted for each railroad company.
- 105.03 **Conformity to the Contract.** Change the first sentence of the seventh paragraph of Subsection 105.03 as follows:
- Materials may be sampled and tested at the discretion of the Town in accordance with the CDOT Field Materials Manual.
- 105.90 **Coordination of Plans, Specifications, Supplemental Specifications, and Special Provisions.** Add the following to Subsection 105.09:
- (e) General Conditions
- 105.10 **Cooperation by Contractor.** Replace the first paragraph of Subsection 105.10 with the following:
- The Contractor will be supplied with three sets of contract documents and electronic files in portable document format (pdf).
- 105.10 **Cooperation by Contractor.** Add the following to Subsection 105.10:
- Not furnishing a FULL-TIME competent superintendence will be grounds for suspension of the Project until such superintendence is furnished by the Contractor. **CONTRACT TIME WILL CONTINUE IN THE EVENT OF A WORK SUSPENSION CAUSED BY LACK OF FURNISHING FULL-TIME PROJECT SUPERINTENDENCE SATISFACTORY TO THE TOWN.**
- 105.11 **Cooperation with Utilities.** Add the following to Subsection 105.11:
- The locations of all utilities shown on the Project plans should be considered approximate. It is therefore the responsibility of the Contractor to notify the appropriate utility and/or utility locating service to obtain more precise locations. No compensation will be made to the Contractor for any damage, delay or additional cost incurred as a result of failure to obtain utility locations.
- Utilities which are adjusted, removed, or reset for the construction convenience of the Contractor and which would not conflict with the line or grade of the proposed Project works shall be done at the Contractor's expense. This shall include, but not be limited to, sewer service lines, water service lines, telephone, gas and electrical lines.
- 105.125 **Protection of Survey Markers.** (Added Subsection)
- (a) *Permanent Survey Markers.* The Contractor shall notify the Director not less than seven (7) days prior to starting work in the vicinity of permanent survey monuments in order that the Director may take necessary measures to insure their preservation. The Contractor shall bear the expense of replacing any that may be disturbed without permission. Replacement shall be done by a registered land surveyor at no expense to the Owner.
- When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the monument cover or box shall be adjusted to the new grade.

- (b) *Lot Stakes.* Unless otherwise directed by the Director or shown in the plans, the Contractor shall preserve existing survey stakes that mark property lines and corners. Any stakes that become lost or disturbed by its operations shall be replaced, at the Contractor's expense, by a registered land surveyor, in accordance with Section 629. Any lot corners marked on sidewalks that are designated for removal by the Contract Documents or the Director are not the responsibility of the Contractor for replacement.

105.16 Inspection and Testing of Work. Add the following to Subsection 105.16:

The Public Works Department will provide all inspections during construction. The Inspector will oversee the materials testing. The Contractor shall keep the Inspector informed of future construction operations to facilitate scheduling of required inspection. The Contractor shall notify the Inspector 24 hours in advance of starting any construction operation that will require inspection. Failure of the Contractor to provide such notice shall relieve the Owner from any responsibility for extra costs or delays caused by such failure.

Inspection of the work or materials by the Owner shall not relieve the Contractor of the obligation to fulfill the requirements of the Contract. Work and materials not meeting such requirements shall be made good, and unsuitable work or materials may be rejected, notwithstanding that such work or materials have been previously inspected by the Owner or that payment thereof has been included in a progress estimate.

Inspection and acceptance of work pertaining to utilities not owned by the Town shall be made by a representative of the specific utility owner. The Contractor shall notify the owning utility prior to commencing any work so that a representative may be made available to approve the work to be performed.

105.21 Acceptance. Add the following to Subsection 105.21(a):

The one-year guarantee period for the portion or unit of the Project partially accepted will not begin until Final Acceptance of the entire Project unless otherwise agreed to by the Director.

105.22 Dispute Resolution. Change Subsection 105.22 as follows:

All references to CDOT in Subsection 105.22 shall mean the Town of Castle Rock.

All references to Project Engineer in Subsection 105.22 shall mean the Project Manager.

All references to Resident Engineer in Subsection 105.22 shall mean the Engineering Manager.

105.22 Dispute Resolution. Replace the third paragraph in Subsection 105.22(d) with the following:

If these meetings do not result in a resolution or the participants mutually agree that they have reached an impasse, the Contractor may further pursue resolution of the dispute by providing written notice to the Director of the Public Works within seven days, according to Subsection 105.22(e).

105.22 Dispute Resolution. Add the following to Subsection 105.22:

- (e) *Director of Public Works Review.* Within seven days after receipt of the Contractor's written notice to the Director of Public Works of unsatisfactory resolution of the dispute, the Project Manager, Engineering Manager, and Director of Public Works will meet with the Contractor to discuss the dispute. Meetings shall continue weekly for a period of up to 21 days and shall include a Contractor's representative with decision authority above the project level.

If these meetings result in resolution of the dispute, the resolution will be implemented in accordance with Subsections 108.08, 109.04, 109.05, or 109.10 and the dispute is resolved.

If these meeting do not result in a resolution or the participants mutually agree that they have reached an impasse, the Contractor may pursue resolution of the dispute by providing written notice to the Town

Manager within seven days, according to Subsection 105.22(f).

105.22 **Dispute Resolution.** Add the following to Subsection 105.22:

- (f) *Town Manager Review.* Within seven days after receipt of the Contractor's written notice to the Town Manager of unsatisfactory resolution of the dispute, the Director of Public Works and Town Manager will meet with the Contractor to discuss the dispute. Meetings shall continue weekly for a period up to 14 days and shall include a Contractor's representative with decision authority above the project level.

The Town Manager Review is the last administrative level of appeal.

If these meetings result in resolution of the dispute, the resolution will be implemented in accordance with Subsections 108.08, 109.04, 109.05, or 109.10 and the dispute is resolved.

If these meeting do not result in a resolution or the participants mutually agree that they have reached an impasse, the Contractor may file a claim in accordance with Subsection 105.24.

105.23 **Dispute Review Board.** Delete Subsection 105.23.

105.24 **Claims for Unresolved Disputes.** Change Subsection 105.24 as follows:

All references to CDOT in Subsection 105.24 shall mean the Town of Castle Rock.

All references to Project Engineer in Subsection 105.24 shall mean the Project Manager.

All references to Resident Engineer in Subsection 105.24 shall mean the Engineering Manager.

All references to Regional Transportation Director in Subsection 105.24 shall mean the Director of Public Works.

All references to Chief Engineer in Subsection 105.24 shall mean the Town Manager.

105.24 **Claims for Unresolved Disputes.** Replace the fifth paragraph of Subsection 105.24 with the following:

The venue for all unresolved disputes with an aggregate value \$15,000 or less shall be the County Court for the County of Douglas.

105.24 **Claims for Unresolved Disputes.** Replace the first sentence of Subsection 105.24(a) with the following:

Within 30 days after rejection of the Town Manager's recommendation issued in accordance with Subsection 105.22(f), the Contractor shall provide the director of Public Works with a written notice of intent to file a claim.

105.24 **Claims for Unresolved Disputes.** Delete Subsection 105.24(c).

105.24 **Claims for Unresolved Disputes.** Replace the third paragraph of Subsection 105.24(f) with the following:

If the Contractor selected litigation, then de novo litigation shall proceed in accordance with the Colorado Rules of Civil Procedure and the proper venue is the Colorado State District Court in and for the County of Douglas, unless both parties agree to the use of arbitration.

**SECTION 106
CONTROL OF MATERIAL**

106.03 **Samples, Tests, Cited Specifications.** Replace Subsection 106.03 as follows:

Materials sampling and testing shall be performed at the expense of the Contractor. The Contractor shall employ an independent materials testing company to sample and test the materials or the finished product in accordance with Section 720, Materials Sampling and Testing, of the Special Provisions. All materials sampling, testing and inspection shall be performed by certified field technicians who work under the supervision of a registered professional engineer in the State of Colorado. Acceptance will be based on the applicable requirements of Subsection 105. Any work in which untested and uninspected materials are used shall be performed at the Contractor's risk and may be considered as unacceptable and unauthorized work.

Field technicians shall furnish copies of failed test results to the Director promptly as the results become available. On a weekly basis, the Contractor shall furnish the Director with copies of all test results taken that week and a cover letter, signed by the supervising registered professional engineer, which summarizes the results and discusses any failed tests or inconsistencies.

Unless otherwise designated, all specifications, standards or policies referenced in Section 720 shall be the latest edition as revised or updated by approved supplements published and issued prior to the date of the advertisement for bids.

106.08 **Storage of Materials.** Add the following to Subsection 106.08:

The Contractor will not receive compensation for storage of topsoil or other materials generated onsite that are stored either onsite or offsite for later disposal or inclusion into the Work.

All materials supplied by the Town will be located at:

Signal Poles & Arms: 675 Justice Way, Castle Rock, CO 80104

All Other Material: 4175 Castleton Ct, Castle Rock, CO **80109**

106.14 **Trade Names, Approved Equals, or Substitutes.** (Added Section)

In order to establish a basis of quality, certain processes, types of machinery and equipment, or kinds of materials may be specified either by description or process or by designating a manufacturer by name and referring to that brand or product designation or by specifying a kind of material. It is not the intent of the specifications to exclude other processes, equipment or materials of equal value, utility or merit.

Whenever a process is designated, or a manufacturer's name, brand or item designation is given, or whenever a process or material covered by patent is designated or described, it shall be understood that the words "or approved equal" follow such name, designation, or description, whether in fact they do so or not.

If it is desirable to furnish items of equipment by manufacturers other than those specified as a substitute after the Contract is executed, the Contractor shall secure approval prior to placing a purchase order or furnishing the same.

If the proposal includes a list of equipment, materials, or articles for which the Contractor must name the manufacturer at the time of submission of the bid, no substitutions therefore will be permitted after a proposal has been accepted without the express consent of the Owner.

**SECTION 107
LEGAL RELATIONS AND
RESPONSIBILITY TO PUBLIC**

107 **General.** Change section 107 as follows:

All references to Engineer in section 107 shall mean the Project Manager.

All references to Department in section 107 shall mean the Town of Castle Rock.

All references to CDOT in section 107 shall mean the Town of Castle Rock.

107.02 **Permits, Licenses and Taxes.** Replace Subsection 107.02 with the following:

The Contractor will obtain all licenses and permits required to do the Work. This refers to all permits required by the Town as well as those required by County, State and Federal Agencies. Permit fees are waived for Town permits, excluding the Grading, Erosion, and Sediment Control (TECS) permit.

Pursuant to 39-26-114, C.R.S. as amended, the Town of Castle Rock is exempt from paying sales or use taxes. Materials and equipment purchased solely for Town projects that will become a permanent part of the final Project are tax-exempt. Contractors must obtain their own tax-exempt number from the Colorado State Department of Revenue for each project. The Town will furnish its tax-exempt numbers for the Contractor to reference when applying for its own tax-exempt number.

107.12 **Protection and Restoration of Property and Landscape.** Add the following to Subsection 107.12:

Property pins, right-of-way markers and any other survey markers shall remain undisturbed until a method of preserving or perpetuating such markers is approved by Owner. Should any such markers be obliterated without obtaining said approval, the Contractor shall be assessed for any costs incurred in resurveying and resetting said markers.

107.15 **Responsibility for Damage Claims.** Add the following to Subsection 107.15:

Certificates of Insurance shall be attached to the executed Contract Documents and shall become a part of the Contract. These certificates shall include a provision that thirty (30) days prior to insurance cancellation, written notice shall be given to the Town.

Indemnification of Owner. Contractor hereby indemnifies and agrees to hold the Owner harmless for and on account of any act or omission in the completion and execution of the Project specified herein, which indemnification shall extend to and include any damage of whatever sort or description suffered by any person or entity and shall include compensatory, punitive or special damages. Contractor agrees to defend Owner hereunder, at Contractor's sole expense, and if he fails to do so, to thereafter indemnify Owner in addition to the above indemnification for all court costs and attorney's fees incurred in any defense required to be undertaken by the Owner.

107.18 **Contractor's Responsibility During Warranty.** (Added Subsection)

The Contractor shall, at his sole expense and cost, remedy any defects in the Work and pay for any damage to other work resulting there from which shall appear within a period of one (1) year from the date of final acceptance of work unless a longer period is specified. The Owner will give notice of defects with reasonable promptness upon their discovery. The Standard Specifications and Special Provisions of the original Contract shall apply to all warranty work.

107.25 **Water Quality Control.**

Delete second sentence of first paragraph of Subsection 107.25.

Replace Subsections 107.25 (a) through 107.25 (c). Refer to current "Town of Castle Rock, Grading, Erosion, and Sediment Control (TECS) Manual and Drainage, Erosion and Sediment Control (DESC) Manual".

Replace "(d) above" with "the Town of Castle Rock, Grading, Erosion, and Sediment Control (TECS) Manual and Drainage, Erosion and Sediment Control (DESC) Manual".

**SECTION 108
PROSECUTION AND PROGRESS**

108 **General.** Change section 108 as follows:

All references to Engineer in section 108 shall mean the Project Manager.

108.02 **Notice to Proceed.** Replace the last sentence of Subsection 108.02 as follows:

The Contractor shall commence work within ten (10) calendar days of the date of the Notice to Proceed. Saturday work will be permitted with a minimum 48-hour notice and approval of the Project Manager.

108.03 **Schedule.** Eliminate the words "either" and "or Primavera Scheduling" from the first sentence of Subsection 108.03 (b).

108.05 **Limitation of Operations.** Add the following to Subsection 108.05:

Working hours under this Contract shall be between 7:00 a.m. and 5:00 p.m. The Contractor shall not operate or move equipment before 7:00 a.m. and shall schedule all Work operations to be completed before 5:00 p.m. Work after 5:00 p.m. will not be allowed except when required for circumstances beyond the Contractor's control and when approved by the Director. Work between 5:00 p.m. and 6:00 p.m. on more than two consecutive working days will be charged as one-half working day. Work after 6:00 p.m. on any day will be charged as one-half working day.

Contractor operations in lanes open to traffic are not allowed between the hours of 6:30 a.m. to 8:30 a.m. and 3:30 p.m. to 6:30 p.m. unless otherwise approved by the Director. These restrictions apply to temporary delays including ingress and egress of materials, etc.

108.08 **Determination and Extension of Contract Time.** Add the following to Subsection 108.08:

Written requests for extension of Contract time must be submitted prior to the Contract completion date as stated on the weekly statement. Written requests shall include but not be limited to daily time reports for labor, materials and equipment, interruption of a controlling or "critical path" bid item or process. The decision by the Owner of the term of any extension or denial thereof shall be final.

An extension of time for completion of the Work shall be the Contractor's sole remedy for delays in performing this Contract if such delay is caused, in whole or in part, by acts or omissions of the Town or its agents unless the Department accepts responsibility.

An extension of time for completion of the Work shall be the Contractor's remedy for delays in performing this Contract caused by the failure of a utility company or special district to relocate its facilities in a timely manner. Relief from failure of utility companies to fulfill their responsibilities is discussed in Section 105.06 of these Standard Specifications, and Special Provisions.

108.09 **Failure to Complete Work on Time.** Replace Subsection 108.09 as follows:

A daily charge will be made against the Contractor for each working day that any Work shall remain uncompleted after elapse of Contract Time. Completion date shall be defined as the date on the Notice of Construction Completion. This daily charge, determined by the original Contract amount for the Project from the Table below, will be deducted from any money due the Contractor. This deduction will not be considered a penalty but as liquidated damages.

The schedule of liquidated damages set forth below is an amount agreed to for purposes of this Contract by the Contractor and the Town as reasonably representing the additional costs incurred by the Town for its time, labor and expenses and for those damages and inconveniences suffered by the residents of the Town as a result of delay in completion of the Project.

Schedule of Liquidated Damages

Original Amount of Contract		Per Diem Amount Liquidated Damages
For More Than	Up to & Incl.	
\$ 0	\$ 100,000	\$ 500
100,000	500,000	750
500,000	1,000,000	1,000
1,000,000	2,000,000	1,750
2,000,000		2,400

Due account shall be taken of any adjustments of the Contract Time for completion of the Work granted under the provisions of Section 108.08.

Permitting the Contractor to continue and finish the Work or any part thereof after the Contract Time has elapsed shall not be construed as a waiver on the part of the Town of any of its rights under the Contract.

Any deduction assessed as liquidated damages under this Section shall not relieve the Contractor from liability for any damages or costs resulting from delays to other Contractors on the Project or other Projects caused by a failure of the assessed Contractor to complete the Work according to Contract Time.

**SECTION 109
MEASUREMENT AND PAYMENT**

- 109.04(c) Compensation for Changes and Force Account Work.** Change Subsection 109.04(c) as follows:
- Delete the formulas for Hourly Rate and Standby Rate (RR and SR respectively). Payment will be made on a flat rate for hourly and standby rental rates plus EOC. Hourly rate compensation will only be made for the actual hours the equipment is actually working on the Project.
- 109.04(f) Compensation for Changes and Force Account Work.** Add the following to Subsection 109.04(f):
- The Contractor and Director will compare records on a daily basis and mutually agree on the equipment and manpower hours and material incorporated into the extra and force account work.
- 109.04(h) Compensation for Changes and Force Account Work.** Add the following to Subsection 109.04(h):
- Time extension for force account work shall be allowed only if a controlling operation or critical path item of the Project is interrupted. Time extension requests shall meet the requirements of Sec. 108.08. Force account items shall be completed in a workmanlike manner so as not to cause undue delays.
- 109.06 Partial Payments.** Add the following to Subsection 109.06:
- At the time of the Preconstruction meeting, the Contractor shall submit to the Town a schedule of partial progress payments. This schedule will show the percentage of Work completed and the date and dollar amount of each anticipated progress payment.
- The Town will pay any monies due the Contractor as a result of a Request for Partial Payment within thirty (30) calendar days of receipt and approval of same.
- 109.06(a) Partial Payments.** Replace Subsection 109.06(a) as follows:
- Standard Amount Retained.* The Town will make a deduction from the progress estimate in the amount considered necessary to protect the interests of the Town, pursuant to Section 24-91-103, CRS. The amount to be retained will be 5 percent of the valued of the completed work. The withheld percentage of the contract price may be retained until the contract is completed satisfactorily and finally accepted by the Town of Castle Rock.
- At no time may the amount retained exceed 5 percent of the total Contract Price.
- 109.06(b) Partial Payments.** Replace Subsection 109.06(b) as follows:
- Securities in Lieu of Standard Amount Retained.* Securities are not acceptable to the Town in lieu of standard amount retained.
- 109.11 Final Guarantee.** (Added Subsection)
- All Work shall be and is guaranteed by the Contractor for a specified period of one (1) year from and after the date of written Final Acceptance as the Notice of Construction Completion of all Work by the Owner. All other current applicable state statutes shall apply.
- If within the guarantee period, repairs, changes, or replacements are required in connection with guaranteed work which, as determined by the Owner, is rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner:
- (a) Place in satisfactory condition, in every particular, all of such guaranteed work, correct all defects

therein, or proceed with replacement of defective or unsatisfactory work where deemed necessary by the Director; and

- (b) Make good all damage to the building or site, or equipment or contents thereof which, in the opinion of the Director, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract; and
- (c) Make good any work or material disturbed, or the equipment and contents of any building or structure on the site, in fulfilling any such guarantee.

**SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

202.02 **General.** Add the following to Subsection 202.02:

Areas designated as removal of asphalt mat shall be sawcut to the full depth of the asphalt or cut by a method approved by the Director, which leaves a vertical face on the existing pavement and no deformation of the surface at the cut. Limits of cutting, for patching shall be as directed by the Director

202.025 **Trees and Shrubs.** (Added Subsection)

Trees with a specified trunk diameter measured three (3) feet above the adjacent ground surface and shrubs that are designated for removal under this Section shall be removed in accordance with the requirements of Section 201, Clearing and Grubbing. Removal of remaining vegetation as required by the Project will be paid under the Section 201, Clearing and Grubbing pay item.

202.03 **Salvable Material.** Add the following to Subsection 202.03:

All inlet castings, manhole rings and covers and other metal items relating to structures to be removed shall remain the property of the Town or the owning utility company. This material shall be reused on the Project where possible or as directed by the Director. Material not reused on the Project shall be delivered to the owning utility company unless arrangements have been made for it to be picked up by the owning utility company.

202.05 **Pavement Markings.** Add the following to Subsection 202.05:

Contractor will be responsible for the installation of temporary pavement markings. This includes control points consisting of 4 inch by 1 foot paint marks installed per the **Town of Castle Rock detail TPM-1**; these may be placed as guide markers for the installation of temporary or final pavement markings. Control points shall not be used as a substitute for any required marking.

202.07 **Pavements, Sidewalks, Curbs.** Add the following to Subsection 202.07:

Concrete from curbs, gutters, sidewalks and pavements may not be used in fills unless crushed to meet the general gradation requirements for Class 4 Aggregate Base Course.

202.09 **Removal of Asphalt Mat (Planing).** Delete the following from the first paragraph of Subsection 202.09:

Reference to CDOT Form 43.

202.09 **Removal of Asphalt Mat (Planing).** Add the following to Subsection 202.09:

Removal of Asphalt Mat (Planing) will be called Asphalt Planing and shall be removal of asphalt pavement to a specified depth at the edges of a planer pass.

Asphalt Edge Planing shall be a bid item with a specified width for tapered asphalt planing from the lip of the curb. Asphalt Edge Planing shall be removal of a tapered section of asphalt that is one (1) inch in depth at the lip of the gutter unless specified otherwise on the plans, tapering to the existing asphalt grade at a width from the lip as specified in the bid item.

Asphalt Planing shall be a bid item with a specified depth of asphalt removal over the entire width of the pass.

All planing shall be done parallel to the flow of traffic unless otherwise approved by the Director. Planers shall

operate moving against traffic in areas being planed in order to ensure that trucks used in hauling removed materials will be able to arrive and depart with the flow of traffic.

Planing shall result in a surface acceptable to the Director. Acceptability shall be based upon the following criteria:

1. Free of surface ridges in excess of one-quarter inch
2. Planed surface parallel to lane lines
3. Surface area free of excess surface fines
4. All planed surfaces, especially wheel ruts, show scoring by planer teeth
5. Specified cut depth attained at edges of roadway appurtenances and curb lips

Vertical cuts adjacent to traffic lanes from planing over one (1) inch depth shall be delineated at 50-foot intervals immediately after removal operations.

Asphalt planing shall be accomplished by the use of an approved planing machine or grinder. Planers for lip milling shall be capable of planing the specified distance in one pass. Planers shall be capable of planing a minimum depth of six (6) inches in one pass.

All asphalt millings shall become the property of the contractor. The hauling, disposal and/or stockpiling of millings will not be measured and paid for separately but shall be included in the work.

The Contractor shall use caution when planing around manholes, water valve boxes and other roadway appurtenances. Manholes, water valve boxes and other similar structures shall either be adjusted to below the bottom of the cut prior to commencing planing operations or cut around using planing equipment. The maximum deviation between the top of the milled pavement and top of the manhole or water valve box shall be no more than three-quarter-inch in areas open to traffic. This condition may be achieved by placing a temporary wedge taper of HBP around the structure. This temporary taper shall be removed prior to placement of paving fabric and new HBP.

202.095 Concrete Pavement Grinding (Planing). (Added Subsection)

This subsection covers diamond grinding of Portland cement concrete pavement to eliminate joint faulting, and restore proper drainage and ride quality. This work shall be accomplished in accordance with these specifications, the details shown on the plans, and as directed by the engineer.

The grinding equipment shall use diamond tipped saw blades mounted on a power driven, self-propelled machine that is specifically designed to smooth and texture PCC pavement. The equipment shall grind the pavement to the specified texture and smoothness tolerances. The equipment shall not damage the underlying surface of the pavement, cause excessive ravels, aggregate fractures, spalls, or otherwise disturb the transverse or longitudinal joint

The plans/specifications will designate areas of pavement surfaces to be ground. Grinding of roadway shoulders and bridge decks will not be required unless indicated on the plans, or is directed by the engineer. Grinding shall be performed in a longitudinal direction and shall begin and end at lines normal to the pavement centerline in any ground section. However, this is not required at the end of each work shift.

The grinding shall produce a uniform finished surface, eliminate joint or crack faults, and provide positive lateral surface drainage. Auxiliary or ramp lane grinding shall transition as required from the mainline edge to maintain or provide positive lateral drainage and an acceptable riding surface.

Grinding will provide a positive lateral drainage by maintaining a constant cross slope across each lane. The entire area designated on the plans shall be textured and surfaces on both sides of the transverse joints or cracks shall be in essentially the same plane, in accordance with smoothness specifications. A 1 by 30-meter (3-foot x 100-foot) test area shall require 95% coverage. However, extra depth grinding to eliminate minor depressions is not required.

The slurry or residue resulting from the grinding operations shall be continuously removed from the pavement. The slurry shall not be allowed to flow across lanes occupied by traffic or to flow into gutters or other drainage facilities. However, in rural areas it may be deposited directly onto adjacent slopes.

The ground pavement surface shall be uniform in appearance with longitudinal corduroy type texture. The grooves shall be between 2 and 4 mm (0.10 and 0.15 inches) wide. The land area between the grooves shall be between 1.5 and 3.5 mm (0.065 and 0.125 inches). The peak of the ridges shall be approximately 1.5 mm (1/16 inch) higher than the bottom of the grooves. Adjusting the blade spacing may be necessary to achieve the specified texture.

The ground pavement shall meet a surface tolerance at least as stringent as the specifying agency's surface tolerance for new pavement. The pavement surface shall be measured for riding quality using a multiple wheel profilograph or a profiler. If a profilograph is used, the pavement is to be evaluated in 1.6 km (0.1 mile) sections. When using a profilograph, the profile index shall not exceed 40 inches per mile for a 0.10 inch blanking band. A unit price adjustment may be used for a profile index of 40 to 50 inches per mile in lieu of re-grinding to meet the 40 inches per mile criterion. No payment will be made for a profile index in excess of 50 inches per mile. The profiler tolerance will be the same as the agency's surface tolerance for new pavement.

A straight-edge requirement may be used to control bumps and/or rides in the pavement surface. Grinding along the inside edge of existing pavement shall conform to the highway agency's straight-edge requirement. Straight-edge requirements do not apply across longitudinal joints or outside the ground areas. The transverse slope of the pavement shall be uniform to a degree that there shall be no depressions or misalignment of slope greater than 1/8 inch between passes of the cutting head when tested by string line or straight-edge placed perpendicular to the centerline. Transverse joints and random cracks shall be visually inspected to insure that adjacent surfaces are in the same plane. Misalignment of the planes of these surfaces shall not exceed 1.5 mm per meter (1/16 inch in 3 feet

202.11

Method of Measurement. Add the following to Subsection 202.11:

The accepted quantities of trees removed with specified diameters measured three (3) feet above the ground surface adjacent to the tree and shrubs removed will be paid for at the Contract unit price for each tree and shrub removed. Multiple tree trunks from one root structure with one trunk being the specified diameter measured three (3) feet above the ground surface adjacent to the tree will be considered one tree for the purpose of the tree removal pay item. When the Bid Schedule does not include removal of trees and shrubs as separate pay items, removal of trees and shrubs shall be included in the bid item for clearing and grubbing.

Asphalt Edge Planing will be measured by the linear foot, completed from the gutter lip to the required distance from the gutter, and accepted. Existing asphalt pavement that may be above the lip of the gutter will not be considered as additional depth at the lip but shall be included in the pay item for Asphalt Edge Planing.

Removal of existing asphalt mat will be measured by the square yard of surface area removed. Sawcutting for patch areas will not be measured but shall be included in the Work.

Temporary HBP wedge tapers will not be measured but shall be included in the Work.

Temporary pavement markings will not be measured but shall be included in the work.

202.12

Basis of Payment. Add the following to Subsection 202.12:

Pay Item	Pay Unit
Removal of Tree (4" or greater)	Each
Removal of Tree (< or > ___")	Each
Removal of Shrub	Each
Asphalt Planing (____')	Square Yard
Asphalt Edge Planing (____')	Linear Feet
Removal of Asphalt Mat (Patching)	Square Yard
Concrete Pavement Grinding (Planing)	Square Yard
Removal of Pavement Markings	Square Foot

Payment for concrete pavement grinding (planing) will be full compensation for furnishing all labor, materials, supplies, tools, equipment, any incidental work, and for doing all work involved in grinding and texturing the pavement and shoulders and cleaning the pavement.

**SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

202.02 **General.** Add the following to Subsection 202.02:

Areas designated as removal of asphalt mat shall be sawcut to the full depth of the asphalt or cut by a method approved by the Director, which leaves a vertical face on the existing pavement and no deformation of the surface at the cut. Limits of cutting, for patching shall be as directed by the Director

202.025 **Trees and Shrubs.** (Added Subsection)

Trees with a specified trunk diameter measured three (3) feet above the adjacent ground surface and shrubs that are designated for removal under this Section shall be removed in accordance with the requirements of Section 201, Clearing and Grubbing. Removal of remaining vegetation as required by the Project will be paid under the Section 201, Clearing and Grubbing pay item.

202.03 **Salvable Material.** Add the following to Subsection 202.03:

All inlet castings, manhole rings and covers and other metal items relating to structures to be removed shall remain the property of the Town or the owning utility company. This material shall be reused on the Project where possible or as directed by the Director. Material not reused on the Project shall be delivered to the owning utility company unless arrangements have been made for it to be picked up by the owning utility company.

202.05 **Pavement Markings.** Add the following to Subsection 202.05:

Contractor will be responsible for the installation of temporary pavement markings. This includes control points consisting of 4 inch by 1 foot paint marks installed per the **Town of Castle Rock detail TPM-1**; these may be placed as guide markers for the installation of temporary or final pavement markings. Control points shall not be used as a substitute for any required marking.

202.07 **Pavements, Sidewalks, Curbs.** Add the following to Subsection 202.07:

Concrete from curbs, gutters, sidewalks and pavements may not be used in fills unless crushed to meet the general gradation requirements for Class 4 Aggregate Base Course.

202.09 **Removal of Asphalt Mat (Planing).** Delete the following from the first paragraph of Subsection 202.09:

Reference to CDOT Form 43.

202.09 **Removal of Asphalt Mat (Planing).** Add the following to Subsection 202.09:

Removal of Asphalt Mat (Planing) will be called Asphalt Planing and shall be removal of asphalt pavement to a specified depth at the edges of a planer pass.

Asphalt Edge Planing shall be a bid item with a specified width for tapered asphalt planing from the lip of the curb. Asphalt Edge Planing shall be removal of a tapered section of asphalt that is one (1) inch in depth at the lip of the gutter unless specified otherwise on the plans, tapering to the existing asphalt grade at a width from the lip as specified in the bid item.

Asphalt Planing shall be a bid item with a specified depth of asphalt removal over the entire width of the pass.

All planing shall be done parallel to the flow of traffic unless otherwise approved by the Director. Planers shall

operate moving against traffic in areas being planed in order to ensure that trucks used in hauling removed materials will be able to arrive and depart with the flow of traffic.

Planing shall result in a surface acceptable to the Director. Acceptability shall be based upon the following criteria:

1. Free of surface ridges in excess of one-quarter inch
2. Planed surface parallel to lane lines
3. Surface area free of excess surface fines
4. All planed surfaces, especially wheel ruts, show scoring by planer teeth
5. Specified cut depth attained at edges of roadway appurtenances and curb lips

Vertical cuts adjacent to traffic lanes from planing over one (1) inch depth shall be delineated at 50-foot intervals immediately after removal operations.

Asphalt planing shall be accomplished by the use of an approved planing machine or grinder. Planers for lip milling shall be capable of planing the specified distance in one pass. Planers shall be capable of planing a minimum depth of six (6) inches in one pass.

All asphalt millings shall become the property of the contractor. The hauling, disposal and/or stockpiling of millings will not be measured and paid for separately but shall be included in the work.

The Contractor shall use caution when planing around manholes, water valve boxes and other roadway appurtenances. Manholes, water valve boxes and other similar structures shall either be adjusted to below the bottom of the cut prior to commencing planing operations or cut around using planing equipment. The maximum deviation between the top of the milled pavement and top of the manhole or water valve box shall be no more than three-quarter-inch in areas open to traffic. This condition may be achieved by placing a temporary wedge taper of HBP around the structure. This temporary taper shall be removed prior to placement of paving fabric and new HBP.

202.095

Concrete Pavement Grinding (Planing). (Added Subsection)

This subsection covers diamond grinding of Portland cement concrete pavement to eliminate joint faulting, and restore proper drainage and ride quality. This work shall be accomplished in accordance with these specifications, the details shown on the plans, and as directed by the engineer.

The grinding equipment shall use diamond tipped saw blades mounted on a power driven, self-propelled machine that is specifically designed to smooth and texture PCC pavement. The equipment shall grind the pavement to the specified texture and smoothness tolerances. The equipment shall not damage the underlying surface of the pavement, cause excessive ravels, aggregate fractures, spalls, or otherwise disturb the transverse or longitudinal joint

The plans/specifications will designate areas of pavement surfaces to be ground. Grinding of roadway shoulders and bridge decks will not be required unless indicated on the plans, or is directed by the engineer. Grinding shall be performed in a longitudinal direction and shall begin and end at lines normal to the pavement centerline in any ground section. However, this is not required at the end of each work shift.

The grinding shall produce a uniform finished surface, eliminate joint or crack faults, and provide positive lateral surface drainage. Auxiliary or ramp lane grinding shall transition as required from the mainline edge to maintain or provide positive lateral drainage and an acceptable riding surface.

Grinding will provide a positive lateral drainage by maintaining a constant cross slope across each lane. The entire area designated on the plans shall be textured and surfaces on both sides of the transverse joints or cracks shall be in essentially the same plane, in accordance with smoothness specifications. A 1 by 30-meter (3-foot x 100-foot) test area shall require 95% coverage. However, extra depth grinding to eliminate minor depressions is not required.

The slurry or residue resulting from the grinding operations shall be continuously removed from the pavement. The slurry shall not be allowed to flow across lanes occupied by traffic or to flow into gutters or other drainage facilities. However, in rural areas it may be deposited directly onto adjacent slopes.

The ground pavement surface shall be uniform in appearance with longitudinal corduroy type texture. The grooves shall be between 2 and 4 mm (0.10 and 0.15 inches) wide. The land area between the grooves shall be between 1.5 and 3.5 mm (0.065 and 0.125 inches). The peak of the ridges shall be approximately 1.5 mm (1/16 inch) higher than the bottom of the grooves. Adjusting the blade spacing may be necessary to achieve the specified texture.

The ground pavement shall meet a surface tolerance at least as stringent as the specifying agency's surface tolerance for new pavement. The pavement surface shall be measured for riding quality using a multiple wheel profilograph or a profiler. If a profilograph is used, the pavement is to be evaluated in 1.6 km (0.1 mile) sections. When using a profilograph, the profile index shall not exceed 40 inches per mile for a 0.10 inch blanking band. A unit price adjustment may be used for a profile index of 40 to 50 inches per mile in lieu of re-grinding to meet the 40 inches per mile criterion. No payment will be made for a profile index in excess of 50 inches per mile. The profiler tolerance will be the same as the agency's surface tolerance for new pavement.

A straight-edge requirement may be used to control bumps and/or rides in the pavement surface. Grinding along the inside edge of existing pavement shall conform to the highway agency's straight-edge requirement. Straight-edge requirements do not apply across longitudinal joints or outside the ground areas. The transverse slope of the pavement shall be uniform to a degree that there shall be no depressions or misalignment of slope greater than 1/8 inch between passes of the cutting head when tested by string line or straight-edge placed perpendicular to the centerline. Transverse joints and random cracks shall be visually inspected to insure that adjacent surfaces are in the same plane. Misalignment of the planes of these surfaces shall not exceed 1.5 mm per meter (1/16 inch in 3 feet

202.11

Method of Measurement. Add the following to Subsection 202.11:

The accepted quantities of trees removed with specified diameters measured three (3) feet above the ground surface adjacent to the tree and shrubs removed will be paid for at the Contract unit price for each tree and shrub removed. Multiple tree trunks from one root structure with one trunk being the specified diameter measured three (3) feet above the ground surface adjacent to the tree will be considered one tree for the purpose of the tree removal pay item. When the Bid Schedule does not include removal of trees and shrubs as separate pay items, removal of trees and shrubs shall be included in the bid item for clearing and grubbing.

Asphalt Edge Planing will be measured by the linear foot, completed from the gutter lip to the required distance from the gutter, and accepted. Existing asphalt pavement that may be above the lip of the gutter will not be considered as additional depth at the lip but shall be included in the pay item for Asphalt Edge Planing.

Removal of existing asphalt mat will be measured by the square yard of surface area removed. Sawcutting for patch areas will not be measured but shall be included in the Work.

Temporary HBP wedge tapers will not be measured but shall be included in the Work.

Temporary pavement markings will not be measured but shall be included in the work.

202.12

Basis of Payment. Add the following to Subsection 202.12:

Pay Item	Pay Unit
Removal of Tree (4" or greater)	Each
Removal of Tree (< or > ___")	Each
Removal of Shrub	Each
Asphalt Planing (____')	Square Yard
Asphalt Edge Planing (____')	Linear Feet
Removal of Asphalt Mat (Patching)	Square Yard
Concrete Pavement Grinding (Planing)	Square Yard
Removal of Pavement Markings	Square Foot

Payment for concrete pavement grinding (planing) will be full compensation for furnishing all labor, materials, supplies, tools, equipment, any incidental work, and for doing all work involved in grinding and texturing the pavement and shoulders and cleaning the pavement.

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SECTION 203
EXCAVATION AND EMBANKMENT

203.01 **General.** Add the following to Subsection 203.01:

This Work shall also consist of "roadway excavation and embankment" classification of work.

203.02 **Excavation.** Add the following to Subsection 203.02:

- (g) *Roadway Excavation and Embankment.* Roadway excavation and embankment shall consist of the excavation of all existing materials from the surface of the existing roadway to the depth of the new pavement subgrade as specified in the Bid Schedule and to the lines and grades within the grading limits of the Project. Work also includes filling with suitable excavated materials from the Project and import materials if necessary, within the limits of grading for the Project and compaction of the materials.

203.05 **Excavation.** Replace the second paragraph of Subsection 203.05(f) *Potholing*, with the following:

Potholing consists of locating utilities by removal of pavements, excavation of materials of whatever character required to expose the utilities, replacement and compaction of the excavated material and patching the pavement. The Contractor will coordinate survey activities to document utility locations.

203.05 **Excavation.** Add the following to Subsection 203.05:

- (g) *Roadway Excavation and Embankment.* All materials from the surface of the existing roadway to the depth of the new pavement subgrade shall be removed under this item. Removed materials shall become the property of the Contractor. Suitable material may be re-used on the Project as directed by the Engineer. Unsuitable materials shall be removed from the Project and disposed of by the Contractor. The soil below the designated depth shall conform with subsection 203.07.

203.06 **General Embankment Construction Requirements.** Add the following to Subsection 203.06:

The Contractor shall use material excavated from the Project for embankment to the greatest extent possible. The Director shall approve excavated material for placement as embankment on the Project. Compaction shall be in accordance with AASHTO T99.

Excavated material necessary for Project embankment but rejected by the Director as unsuitable material shall be considered unclassified excavation and replaced with stabilization material.

Embankment material imported to the site for inclusion in a pavement structure shall have a resistance value of at least 8 at 300 psi exudation pressure, as measured by the Hveem Methodology. The Contractor shall submit test results to the Engineer for approval prior to importing embankment material. Earthen material imported to the site for other fill outside the roadway shall be easily compacted, stable material with zero-to-low swell/shrinkage potential.

203.07 **Embankment Placement and Compaction Requirements.** Add the following to Subsection 203.07 (a):

Soil embankments shall be constructed with moisture and density control, and the soil upon which the embankments are to be constructed shall be scarified to a depth of 12 inches and compacted with moisture and density control. The moisture content of the soil at the time of compaction shall be as specified or directed.

The material shall be removed from the full width of roadbed in all cut sections to the designated depth. The soil below the designated depth shall be thoroughly scarified to a depth of 12 inches and the moisture content increased or reduced, as necessary, to obtain the moisture content specified. This scarified layer shall then be compacted to the relative compaction specified.

Equipment used for moisture and density control shall be a bo-mag tiller or an approved equal.

203.11 **Method of Measurement.** Add the following to Subsection 203.11(b) *Embankment*:

When the pay unit is a lump sum, embankment will not be measured but shall be paid by the percentage of all embankment work for the Project, as indicated by the plans and cross sections. Embankment material imported to the site will not be measured but shall be included in the Embankment bid item when the pay unit is a lump sum.

203.11 **Method of Measurement.** Add the following to Subsection 203.11:

- (g) *Roadway Excavation and Embankment.* Roadway Excavation and Embankment shall be measured by the square yard for excavation to a depth of the new pavement subgrade. Pavement saw cutting, disposal of excess materials, grading within the limits of the Work, and moisture and density control will not be measured and paid for separately but shall be included in the Work.
- (h) *Unclassified Excavation (6").* Unclassified Excavation (6") shall be measured by the square yard for excavation to a 6-inch depth below subgrade of the new pavement section. Additional depth of unclassified excavation, in 6-inch increments, will be measured by the square yard area and paid at the same unit bid price.

203.12 **Basis of Payment.** Delete the last two paragraphs of Subsection 203.12.

203.12 **Basis of Payment.** Add the following to Subsection 203.12:

Add "Roadway Excavation and Embankment (CIP)" to the fifth from the last paragraph, which begins with "Payment for Unclassified Excavation..." Complete in Place is identified as (CIP) in the Bid Schedule.

Pay Item	Pay Unit
Roadway Excavation and Embankment (CIP)(___")	Square Yard
Unclassified Excavation (CIP)(___")	Square Yard
Embankment (CIP)	Lump Sum

Bid items may be identified on the Bid Schedule as a "contingency" item for subgrade stabilization work that may be required by the Engineer if poor soil conditions are encountered in localized areas.

Scarifying, blading, dozing, and proof rolling will not be measured but shall be included in the Work.

**SECTION 206
EXCAVATION AND BACKFILL FOR STRUCTURES**

206.02 **General.** Add the following to Subsection 206.02:

(d) *Squeegee.* Bedding material known commonly as "Squeegee" shall meet the following gradation:

Sieve Designation	Percent by Weight Passing
3/8-inch	100
No. 4	60-90
No. 8	0-45
No. 16	0-25
No. 50	0-6
No. 200	0-2

206.03 **Structure Excavation and Structure Backfill.** Add the following to Subsection 206.03:

Squeegee material shall only be used as bedding for reinforced concrete pipe. Compactive effort shall be used on squeegee material to consolidate the material around the pipe haunches.

Compaction of Structure Backfill (Flowfill) will not be required except as necessary to ensure complete filling of any voids around structures and pipe.

Bracing, shoring, sheeting, etc., shall be in accordance with all applicable State and Federal Occupational Safety and Health Requirements. Shoring shall be removed as the Work and backfilling operations progress unless ordered by the Engineer to be left in place. The Contractor will be paid for shoring so ordered to be left in place on the basis of invoiced material only. Shoring shall be considered as incidental to construction and all costs incurred, except materials ordered to be left in place will be considered to be included in the unit price bid for the construction of each section of sewer or associated structure.

The decision to brace, shore or sheet the excavation shall be entirely the Contractor's responsibility. However, if the Engineer is of the opinion that at any point the trench walls are not properly supported, they may order the placement of additional supports by and at the expense of the Contractor, and compliance with such order shall not relieve or release the Contractor from his responsibilities for the safety of the Work.

206.06 **Method of Measurement.** Add the following to Subsection 206.06:

Structure Backfill (Flowfill) used at the direction of the Engineer will be measured in accordance with the lesser of that quantity calculated as shown in detail M-206-1 or the actual quantity used. Structure Backfill (Flowfill) not required by the Contract Documents may be used at the Contractor's discretion but will not be measured and paid for.

206.06 **Method of Measurement.** Replace paragraph (b) of Subsection 206.06 as follows:

Excavation, bedding, backfill, compaction, disposal of surplus material, haul, water and all other required work for construction of pipe and structures will not be measured and paid for separately but shall be considered incidental to construction of the pipe and/or structure. Pipe and structures will not be considered for payment until all backfill is completed.

206.07

Basis of Payment. Add the following to Subsection 206.07:

Structure Backfill (Class 1, 2 or Flowfill) will be paid according to the unit prices on the Bid Schedule only when the excavated material is unacceptable for backfill as determined by the Engineer.

Structure Excavation will be paid according to the unit price on the Bid Schedule only when over-excavation is required for removal of unsuitable material and replacement by Structure Backfill (Class 1, 2 or Flowfill).

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**SECTION 208
EROSION CONTROL**

208 **REPLACE SECTION 208.01 – 208.10.** Refer to current "Town of Castle Rock, Grading, Erosion, and Sediment Control (TECS) Manual and Drainage, Erosion and Sediment Control (DESC) Manual".

208.11 **Method of Measurement.** Replace the seventh, eighth, and tenth paragraphs with the following to Subsection 208.11:

Removal of trash, sediment, and maintenance of vehicle tracking pad(s) will not be paid separately, but shall be included in the work.

**SECTION 210
RESET STRUCTURES**

210.02 **General.** Add the following to Subsection 210.02:

Any work performed by the Contractor on a utility facility is subject to inspection and approval by the owning utility company. The Contractor is responsible for coordinating inspection with the owning utility.

The Contractor must give written notice to all customers affected by water service outages at least 24 hours before the water is turned off for this Work. The Contractor shall give a minimum of 24-hour's notice to the owning utility company before any work that will affect their facilities. The Contractor shall not operate any water valves without permission of the owning utility company.

All structures within pavement areas shall be recessed a minimum of a quarter inch to maximum of half inch below finish grade. Structures within sidewalk area shall have a pedestrian lid and flush with finish grade.

Temporary construction plates must be inspected prior to use on the project by the project inspector. All plates shall be sized for the manhole intended to be covered, shall have centering devices, and shall be traffic load rated.

210.021 **Fire Hydrant.** (Added Subsection)

Fire hydrants shall be reset to the location shown on the plans or indicated in the field and raised or lowered to match the finished grade. The new hydrant lead is to be constructed of new pipe and hardware. Prior to commencing work on this item, the Contractor shall contact the owning utility for inspection of the hydrant. Hydrants that are unsatisfactory to the owning utility due to type and/or material may be replaced by the owning entity at its own expense and by its own forces.

"Adjust fire hydrant" shall involve raising or lowering the hydrant, at its existing location, to match the finished grade. All hardware required for this Work shall be new unless otherwise approved by the owning utility.

210.022 **Sewer Service.** (Added Subsection)

Sewer services shall be reset to new locations and/or elevations as shown on the plans or indicated in the field. Work may entail replacement of the service line from the utility main line or may be a lesser portion. All pipe and fittings shall be new and approved by the owning utility for use in the Work.

210.023 **Water Service.** (Added Subsection)

Water services shall be reset to new locations and/or elevations as shown on the plans or indicated in the field. Work may entail replacement of the service line from the utility main or may be a lesser portion. All pipe and fittings shall be new and approved by the owning utility for use in the Work.

210.024 **Water Meter.** (Added Subsection)

Water meters and their associated meter pits and curb stops shall be reset to the location shown on the plans or indicated in the field and raised or lowered to match the finished grade. Service lines shall be modified accordingly. All pipe and fittings shall be new and approved by the owning utility for use in the Work.

"Adjust water meter" shall involve raising or lowering the meter, meter pit, and associated curb stop, at their existing location, to match the finished grade. All materials required for this item shall be new unless otherwise approved by the owning utility.

210.025 **Water Meter Pit.** (Added Subsection)

"Replace water meter pit" shall include removal of the existing meter pit and installation of a new meter pit at the location and elevation shown on the plans or indicated in the field. This item shall also include replacement of the curb stop riser assembly if required. All materials required for this item shall be new unless otherwise approved. The re-use of any existing materials shall be approved by the owning utility.

"Adjust water meter pit" shall involve raising or lowering the meter pit and the frame and cover, at its existing location, to match the finished grade. This item shall also include adjustment of the associated curb stop. Materials used for the adjustment shall be approved by the owning utility for use in the Work.

210.026 Water Meter Pit Frame and Cover. (Added Subsection)

"Replace meter pit frame and cover" shall involve removal of the existing frame and cover and installation of a heavy-duty frame and cover, and raising or lowering the new frame and cover to match the finished grade. Any work required on the associated curb stop shall also be included in this item. Unless otherwise specified, all required materials shall be supplied by the Contractor. All materials used for this item shall be approved by the owning utility for use.

210.027 Sprinkler. (Added Subsection)

Sprinklers shall be reset to the locations shown on the plans or as indicated in the field and adjusted to match finished grade. Sprinkler heads, feed lines, wiring and conduit, control valves and all other items associated with the system needing to be reset as a result of construction shall be included in this item.

210.028 Valve Box Assembly. (Added Subsection)

"Replacement and/or adjustment of valve boxes" shall involve removal of the existing valve box riser assembly, or a portion thereof, and installation of a new valve box assembly, and raising or lowering the new assembly to match construction activity grade (elevation). Unless otherwise specified, all required materials shall be supplied by the Contractor. All materials used for this item shall be approved by the owning utility for use.

Valve Boxes located within overlays will require grade adjustment risers that can be mechanically secured to the existing valve top. "Drop in" adjusting rings will not be allowed. All materials shall be approved by the owning utility.

All utility valve boxes shall be identified, functional and accessible at all times.

When adjusting valve boxes, the box shall be cleaned of all foreign debris such that the operating nut of the valve is fully accessible to operate. The Work shall be subject to inspection by and approval of the owning utility and is incidental to the pay item for adjusting water valves.

210.029 Storm Inlet. (Added Subsection)

Replace inlet top shall involve sawcutting and removal of the existing inlet top and installation of new rebar and concrete to construct a new top. The existing frame and lid may be re-used. All materials used for this item shall be approved by the owning utility for use.

Replace inlet pan shall involve sawcutting and removal of the existing inlet gutter pan and installation of new rebar and concrete to construct a new gutter pan.

Repair inlet shall involve removing all loose material from damaged area, pan or top, with hand tools to straighten and clean edges prior to material application. Material shall be Dayton HD 50 mortar or approved equal.

210.03 Light Standard. Replace "Department's Standard Plans" with "CDOT Standard Plans" in Subsection 210.03.

210.04 Concrete Pavement Patch Repair (Added Subsection)

Concrete pavement patch repair shall involve removing all loose material from damaged area, pan or top, with hand tools to straighten and clean edges prior to material application. Material shall be Dayton HD 50 mortar or approved equal.

210.05 Guard Rail. Replace "Department's Standard Plans" with "CDOT Standard Plans" in Subsection 210.05.

210.06 Mailbox. Replace "Department's Standard Plans" with "CDOT Standard Plans" in Subsection 210.06.

210.07 Chase Drain Reset (Added Subsection)

Remove existing chase drain structure from existing concrete, remove all remain concrete from structure, and reset in existing location or approval location by Town Inspector.

210.10 Adjust Structure. Add the following to Subsection 210.10:

Structures within the roadway surface shall be adjusted prior to placement of the final lift of asphalt. Manhole ring and cover assemblies shall be adjusted to finish grade on reconstructs (includes up to 18" from top of cone section to finish grade). Manholes located within overlays will require grade adjustment rings that can be mechanically secured to the existing manhole ring. All materials shall be approved by the owning utility.

When adjusting structures, the structures shall be free of all foreign debris. The contractor shall remove all debris within 2 hours of notification. If contractor is unable to remove debris within 2 hours, Town resources will be utilized at contractor's expense. The Work shall be subject to inspection by and approval of the owning utility and is incidental to the pay item for adjusting water valves.

210.12 Method of Measurement. Replace "Department's Standard Plans" with "CDOT Standard Plans" in Subsection 210.12.

210.12 Method of Measurement. Add the following to Subsection 210.12:

When an item is to be **reset**, the adjustment to match finished grade will not be paid for separately but shall be included in the Work. Materials required to accomplish the Work will not be measured and paid for separately but shall be included in the Work.

Adjustment of items shall include everything necessary to complete the Work. Materials required to accomplish the Work will not be measured and paid for separately but shall be included in the Work.

210.13 Basis of Payment. Add the following to Subsection 210.13:

Pay items shall include, unless otherwise specified, all new hardware and installation materials.

PAY ITEM	Pay Unit
Replace Water Meter Pit	Each
Replace Water Meter Pit Frame and Cover	Each
Replace Inlet Top	SF
Replace Inlet Pan	LF
Repair Inlet	LB
Concrete Pavement Patch Repair	LB
Chase Drain Reset	EA

**SECTION 304
AGGREGATE BASE COURSE**

304.01 **Description.** Add the following to Subsection 304.01:

This Work also includes furnishing and placing recycled (reclaimed) asphalt and concrete, Stabilization Material and Trench Foundation Material.

Also included in this Section is hauling and placing materials supplied by the Owner.

304.02 **Aggregate.** Add the following to Subsection 304.02:

The source of aggregate for Aggregate Base Course is not designated. Approval of the aggregate as a source for the Class(es) of aggregate specified will be contingent on material meeting the appropriate gradation requirements and having a resistance value of at least fifty (50) when tested the Hveem Stabilometer Method. Aggregate for aggregate base course shall have a specific gravity greater than 2.4 (at the source).

304.025 **Stabilization Material.** (Added Subsection)

Stabilization Material may be crushed stone, crushed slag, crushed gravel, crusher waste, recycled asphalt pavement or recycled Portland cement concrete that closely meets the specified Aggregate Base Course Classification from Table 703-3. When the Stabilization Material bid item does not specify an Aggregate Base Course Class, Class 4, 5 or 6 is acceptable. The Contractor shall provide gradation specifications from the supplier for materials to be used as Stabilization Material. The Director shall determine if the material is within acceptable tolerances of Class 4, 5 or 6 specifications for the purpose of the material.

Stabilization Material shall be compactable with minimal effort and shall be clean and free from contaminating materials such as clay or clay lumps and organic matter. The material shall not be cross-mixed with other types of materials such as milled asphalt, nonspecific gravel materials, rock, etc. Presence of contaminating materials, clay or clay lumps or organic matter will be grounds for rejection by the Inspector.

Recycled Asphalt shall be made from bituminous pavement and Recycled Concrete shall be made from Portland cement concrete. Recycled Asphalt and Recycled Concrete shall closely meet the specifications of Aggregate Base Course, Class 6.

304.026 **Trench Foundation Material.** (Added Subsection)

Trench Foundation Material shall be used when unsuitable or unstable native trench material is encountered during pipe construction. The material shall consist of 1½- to 2-inch crushed stone, crushed slag, crushed gravel, natural gravel, crusher waste, pit run gravel, recycled asphalt pavement or recycled Portland cement concrete that generally meets the specifications of Aggregate Base Course Classes 4 or 5.

Trench Foundation Material shall be compactable with minimal effort and shall be clean and free from contaminating materials such as clay or clay lumps and organic matter. The material shall not be cross-mixed with other types of materials such as milled asphalt, nonspecific gravel materials, rock, etc. Presence of contaminating materials, clay or clay lumps or organic matter will be grounds for rejection by the Inspector.

304.04 **Placing.** Add the following to Subsection 304.04:

When stabilization material is placed on a geogrid material the Contractor shall minimize the amount of rubber tired equipment allowed on the stabilization material and shall preferentially use a small tracked dozer or loader to spread the material. After placement and rough shaping of the material, the surface may be shaped to final cross-section with a motor grader. Water for compaction shall be sparingly applied as

required. The use of vibratory equipment may be used unless the subgrade shows evidence of failure by deflection of the aggregate surface.

304.07 Method of Measurement. Add the following to Subsection 304.07:

Stabilization Material (Class 6) (6") will be measured by the square yard of 6-inch layer placed and compacted in place as directed by the Director for stabilization in areas of pavement patching. When directed by the Director, a second layer will be placed for additional subgrade stabilization and paid at the bid price of the first layer.

Stabilization Material will be measured by the ton of material compacted in place.

Recycled asphalt and concrete will be measured by the ton of material compacted in place as directed by the Director.

Trench Foundation Material will be measured by the ton of material compacted in place.

304.08 Basis of Payment. Add the following to Subsection 304.08:

The accepted quantities of Stabilization Material will be paid for at the Contract bid price per square yard of 6-inch depth or ton of material, as shown in the Bid Schedule.

The accepted quantities of Trench Foundation Material, recycled asphalt and recycled concrete will be paid for at the Contract bid prices per ton of material.

Bid items in the Bid Schedule may be identified as "contingency" items for subgrade stabilization work that may be required by the Director if poor soil conditions are encountered in localized areas.

Bid items in the Bid Schedule may be identified as "haul and place" items for materials to be supplied by the Owner.

Pay Item	Pay Unit
Stabilization Material (Class 6)(6 ")	Square Yard
Stabilization Material	Ton
Recycled Asphalt (Class 6)	Ton
Recycled Concrete (Class 6)	Ton
Trench Foundation Material	Ton

304.08 Basis of Payment. Delete the last paragraph in Subsection 304.08.

**SECTION 401
PLANT MIX PAVEMENTS-GENERAL**

Replace Section 401 with the following:

HOT MIX ASPHALT PAVEMENTS

DESCRIPTION

401.01

These specifications cover the requirements for the construction of Superpave Hot Mix Asphalt pavements. They include the general requirements for the construction of one or more lifts of Hot Mix Asphalt Pavement on a prepared surface. The Work shall consist of the preparation of the Hot Mix Asphalt (HMA) meeting the requirements herein and the placement of the HMA to the lines, grades, thicknesses and typical cross-sections shown on the plans or established by the Engineer. When more than one lift is required, each lift shall be compacted to the required density and approved prior to the placement of the succeeding lift.

Warm mix asphalt (WMA) is allowed as an alternate to hot mix asphalt provided that all material requirements and specification standards are met and as approved by the Agency.

The volume and loading levels for the various designations are listed in Table 401-1 and shall be used for these specifications.

Table 401-1

Designation	Volume and Loading Level
Low	≤ 300,000 ESALs
Moderate	> 300,000 and ≤ 10,000,000 ESALs
High	> 10,000,000 ESALs
Trails and Pathways	< 100,000 ESALs – able to accommodate a 4000 lb vehicle for safety and maintenance purposes
Parking Lots	25% of volume used for entrance roadways

MATERIALS

401.02

General. The HMA shall be composed of a mixture of aggregates, approved filler or additives, asphalt binder, and reclaimed asphalt pavement (RAP), when permitted.

401.03

Aggregates. Aggregates shall be of uniform quality, clean, hard, durable particles of crushed stone, crushed gravel or crushed slag free from clay balls, vegetable matter or other deleterious materials meeting the requirements of Table 401-2.

Table 401-2

Aggregate Properties

Property	Test Procedure	Coarse Retained on #4 Sieve	Fine Passing the #4 Sieve
Fine Aggregate Angularity Traffic Level Low, Moderate, Trails and Pathways	CP-L5113 Method A		40% Minimum
Traffic Level 3 to 5 Moderate, High, Parking Lots			45% Minimum

Fractured Faces (Minimum of 2)	CP-45	80% Minimum	
LA Abrasion	AASHTO T96	45% Minimum	
Flat and Elongated Pieces	AASHTO M283	10% Maximum	
Sodium Sulfate Soundness	AASHTO T104	12% Maximum Combined Coarse and Fine	
Adherent Coating (Dry Sieve)	ASTM D5711	0.5%	45% Minimum
Sand Equivalent	AASHTO T176		45% Minimum

Aggregates meeting the requirements of Table 401-2 shall be used to develop the Job Mix Formula (JMF) for the HMA mixture. The aggregate should be composed of angular, coarse textured, cube-shaped particles. Excess of fine material shall be wasted before crushing. Sand may be used to obtain gradation of the blended aggregate mixture but should not exceed more than 15%. If the percent of aggregate passing the #4 sieve is greater than 10% by weight of the individual aggregate sample, Plasticity will be determined in accordance with AASHTO T90. The gradation of the aggregates used in the mixture shall meet the criteria shown in Table 703-4 and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be well-graded from coarse to fine. The nominal size aggregate used in the HMA mixture shall not be more than one-third the thickness of the HMA lift being constructed.

- 401.04 **Mineral Filler.** If mineral filler is required to meet the JMF it shall conform to the requirements of Section 703.06.
- 401.05 **Additives.** Additives to the mineral aggregate shall be used if the asphalt binder will not coat or stick to the aggregates. Additives shall be in the form of hydrated lime and shall conform to ASTM C207, Type N. The residue retained on a #200 sieve shall not exceed 10% when determined in accordance with ASTM C110. Hydrated lime shall be added at the rate of 1% by dry weight of the aggregate.
- 401.06 **Reclaimed Asphalt Pavement.** Reclaimed Asphalt Pavement (RAP) shall be allowed in the HMA mixture. It shall be of uniform quality and gradation with a maximum size no greater the nominal size of the HMA mixture. HMA mixtures containing RAP shall meet the same gradation requirements as a virgin HMA mix.
- 401.07 **Asphalt Binder.** Performance Grade asphalt binders shall meet the requirements of Table 702-2. Any asphalt binder supplied must be from an approved source. An approved source for asphalt binders has to be certified by the Colorado Department of Transportation. The Contractor shall provide to the Owner acceptable "Certification of Compliance" for each applicable asphalt binder grade that will be used on the Project. Binder grades other than those shown in Table 702-2 will not be allowed unless the proposed binder and mix design are approved by the Engineer.

- (a) *Mixture Binder Selection.* The binder to be used in the HMA mixture will depend on the local traffic level and traffic conditions. Binder grade selection for the HMA mixture for different traffic levels is shown in Table 401-3.

**Table 401-3
Binder Grades for HMA Mixtures**

Traffic Levels	Binder Grades
Low (<300,000 ESALs)	PG 58-28
Moderate (300,000 to ≤10,000,000 ESALs)	PG 64-22
High (>10,000,000 ESALs)	PG 76-28
Trails and Pathways (100,000 ESALs)	PG 58-28
Parking Lots (25% of entrance roadway)	PG 64-22

- (b) *Prime Coat Material.* Prime coat material shall either be an emulsified asphalt prime coat conforming to the requirements of Table 702-4 or a penetrating priming stabilizer conforming to the requirements of Table 702-5.

- (c) *Tack Coat Material.* Tack coat material shall be an emulsified asphalt conforming to AASHTO M140 or M208 for the designated grades. When grade CSS-1h or SS-1h emulsified asphalt is used, residue penetration test values shall be between 40 and 120.

401.08 Material Acceptance. Prior to the delivery of materials to the job site, the Contractor shall submit certification tests to the Engineer, for his approval, showing all materials to be used on the Project. The certification shall show appropriate test(s) for each material, the test results, and a statement that the materials meet the appropriate specification. If the Engineer requests samples of the materials for verification testing prior to and/or during the production of the HMA mixture, the Contractor shall deliver the requested materials to the Owner's designated representative within two (2) days of the initial request.

CONSTRUCTION REQUIREMENTS

401.09 General. The Contractor shall submit his JMF to the Engineer for approval fourteen (14) calendar days prior to the beginning of paving operations. The JMF for each mixture to be used on the Project shall be approved prior to the start of any paving operation. The mix design(s) shall be developed using the Superpave Mix Design Procedures and shall be prepared under the direct supervision of an engineer licensed in the State of Colorado practicing in this field.

The Contractor shall submit the following as part of each mix design:

1. Source(s) of materials.
2. Aggregate gradation, specific gravity, source and description of individual aggregates in the final mixture blend.
3. Aggregate physical properties.
4. Source and grade of performance graded binder along with certification of binder.
5. Proposed JMF: aggregate and additive blending, final gradation shown on a 0.45 power graph, optimum binder content.
6. Mixing and compaction temperatures.
7. N_{ini} , N_{des} , and N_{max} .
8. Mixture properties determined at the minimum of four binder contents and interpolated at optimum and graphs showing mixture properties versus binder content.
9. Percent of RAP if used in the mixture.

The mix design(s) shall meet the requirements of Table 703-4, Table 401-3, Table 401-4, and Table 401-5. The HMA mixture(s) will be designed for each item listed in Section 403.05 as shown in the Bid Schedule.

**Table 401-4
Superpave Mixture Properties**

Test Property	Traffic Levels		
	Trails and Pathways	Low, Moderate, Parking Lots	High
Traffic Level – Design period ESALs		< 3 million	> 3 million
Initial gyrations, N_{ini}	6	7	8
Air voids @ N_{ini}	> 8.5	> 9.5	> 11.0
Design gyrations, N_{des}	50	75	100
Hveem stability, CP-L 5106	NA	28 min.	30 min.
Voids filled with asphalt, VFA, MS-2	70 – 80	65 – 78	65 – 75
Lottman, Tensile strength ration, % retained CP-L 5109	80 min.	80 min.	80 min.
Lottman, Dry tensile strength, psi, CP-L 5109	30 min.	30 min.	30 min.

**Table 401-5
Voids in Mineral Aggregate**

Nominal Maximum Particle Size ¹	Minimum VMA - %		
	Design Air Voids - %		
	3.0	4.0	5.0
½"	13	14	15
¾"	12	13	14
1"	11	12	13

¹The nominal maximum particle size is one sieve larger than the first sieve to retain more than 10%

If the Contractor proposes to use RAP in the HMA mixture(s), the resulting mixture(s) must meet the same requirements as the mixture(s) that do not contain RAP. The RAP shall meet the requirements of Subsection 401.06. Maximum of 20% RAP in the mixtures(s).

Mixture(s) shall be verified prior to the start of placement. Verification of the volumetric properties of the mixture(s) shall be performed by a **LabCAT Level C** certified technician(s). If the mixture(s) has (have) been produced for another Project within the last 90 days, verification results from that Project may be submitted for this verification. Superpave mix design volumetric tolerances for the approved HMA mixture(s) shall be within the limits shown in Table 401-6.

**Table 401-6
HMA Mixture Design Verification Tolerances**

Property	Tolerance
Air Voids	± 1.2%
VMA	± 1.2%
Binder Content	± 0.3%
Stability	Applicable minimum

401.10 Pre-paving Meeting. Prior to the start of the paving operation, all key parties involved in the supply, haul, placement, compaction, inspection and quality control and quality acceptance (QC/QA) of the HMA pavement shall attend a pre-paving meeting to go over procedures and acceptance of the HMA placement. The meeting will be scheduled by the Engineer. Areas of responsibility and contact names and phone numbers will be shared.

401.11 Weather Restrictions. The HMA mixture shall be placed only on properly constructed surfaces that are dry and unfrozen, and only when weather conditions allow for the proper handling and compaction of the mixture. The HAM shall be placed in accordance with the temperature limitations shown in Table 401-7 and only when weather conditions permit the pavement to be properly placed and compacted as determined by the Engineer.

Table 401-7

HMA Placement Temperature Limitations

Paving Course	Thickness	Air Temperature ¹	Surface Temperature ¹
Surface	All	50 °F	55 °F
Subsurface	≤ 3"	40 °F	44 °F
Subsurface	> 3"	32 °F	36 °F

¹Temperatures shall be taken in the shade. Temperatures shall be stable or rising in order for work to progress.

401.12 HMA Production Facilities. The HMA plant used to produce the asphalt aggregate mixture shall meet the requirements of AASHTO M156 and shall have adequate capacity and be maintained in good mechanical condition. The plant shall control dust, smoke, and/or other contaminants such that it meets the *Colorado Air*

Quality Control Act, Title 25, Article 7, CRS and all regulations promulgated thereunder. The Engineer or his authorized representative shall have access, at all times, to all areas of the plant for checking: the adequacy of the equipment; inspecting the operation of the plant, verifying weights, proportions and material properties, and checking the temperatures maintained in the preparation of the mixtures.

- (a) *Truck Scales.* The HMA mixture shall be weighed on approved scales furnished by the Contractor or on public scales at the Contractor's expense. Such scales shall be inspected and sealed as often as the Engineer deems necessary to assure accuracy.
- (b) *Storage and Surge Bins.* Use of surge bins or storage bins for temporary storage of HMA mixtures will be permitted as follows:
 - 1. The HMA mixture may be stored in surge bins for a period of time not to exceed three (3) hours.
 - 2. The HMA mixture may be stored in insulated storage bins for a period of time not to exceed nine (9) hours, unless otherwise approved.
 - 3. The mix drawn from the bins shall meet the same requirements as the mix loaded directly into trucks. If the Engineer determines that there is excessive amount of heat loss, segregation or oxidation of the mixture, or other adverse effects on the quality of the finished product due to the temporary storage, corrective action shall be taken. Unsuitable material shall be disposed of at the Contractor's expense.

401.13 Hauling Equipment. Trucks used for hauling HMA mixtures shall have tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Each truck shall have a suitable cover to protect the mixture from adverse weather and to maintain temperature of the mixture. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401.14 Placement Equipment. Pavers shall be self-propelled, with activated screed assemblies and heated as necessary to spread and finish the HMA mixture to the specified width, thickness, smoothness, and grade shown. The pavers shall have sufficient power to propel themselves and the hauling equipment without adversely affecting the finished pavement surface.

The receiving hopper of the paver shall have sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging of the mixture.

The paver shall be capable of operating at consistent speeds to apply the mixture in an even, continuous layer avoiding stop and go operations. If an automatic grade and slope control device is used, the paver shall be equipped with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from a reference line or through a system of mechanical sensors or sensor-directed mechanisms, which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within $\pm 0.1\%$.

If the Contractor fails to obtain and maintain the specified surface tolerances, the paving operations shall be suspended until satisfactory corrections, repairs, or equipment replacements are made.

401.15 Compaction Equipment. All compaction equipment used on the Project for obtaining the required density of the HMA pavement shall be self-propelled vibratory, steel wheel or pneumatic tire type capable of obtaining 92-to-96 percent of the maximum theoretical density without crushing the aggregate. They shall be in good condition and capable of operating at slow speeds to avoid displacement and tearing of the HMA mixture.

Vibratory rollers shall have separate energy and propulsion controls. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. The use of equipment, which causes excessive crushing of the aggregate will not be permitted.

401.16

HMA Mixture Production. The HMA mixture shall be produced in a plant meeting the requirements of Subsection 401.12. The dried aggregates and asphalt binder shall be combined in the plant in the quantities required to meet the JMF.

- (a) *Asphalt Binder.* The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the HMA material to the plant at a uniform temperature. The temperature of the asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles but shall not exceed the maximum temperature prescribed by the asphalt refiner.
- (b) *Aggregate.* The aggregate for the mixture shall be dried and heated prior to induction into the mixer. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F when the asphalt is added. Particular care should be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

When hydrated lime is required to achieve complete and uniform coating of the aggregate by the asphalt binder, it shall be added to the aggregate in the form of a slurry and then thoroughly mixed in an approved pug mill. The slurry shall contain a minimum of 70% water by weight. If dry hydrated lime is used, it shall be added to the wet aggregate at a minimum of 3% above saturated surface dry and then mixed thoroughly in an approved pug mill.

- (c) *HMA Mixture.* The heated and dried aggregates and the asphalt binder shall be combined by weight in the mixer in the amount specified by the JMF. The materials shall be mixed until the aggregate is completely and uniformly coated and the asphalt cement is uniformly distributed throughout the aggregate. Baghouse fines shall be fed back to the mixing plant in a uniform and continuous manner to maintain uniformity in the mixture. The baghouse, fines feeder, auger, and related equipment shall be in good working condition and operated in accordance with the manufacturer's recommendation. If the Engineer determines that nonuniform operation of the equipment is detrimental to the mixture, he may suspend all paving operations until the Contractor takes appropriate action.

The temperature of the HMA mixture for different asphalt binder grades when discharged from the plant shall be within the limits shown in Table 401-8. The HMA mixture shall be produced at the lowest temperature within the specified range that produces a workable mix and provides for uniform coating of aggregates (95% minimum in accordance with AASHTO T195), and allows the required compaction to be achieved.

**Table 401-8
HMA Mixing Temperature Limits**

Asphalt Binder Grade	Minimum Discharge Temperature	Maximum Discharge Temperature
PG 58-28	275°F	305°F
PG 64-22	290°F	320°F
PG 76-28	320°F	350°F

HMA mix may be stored provided that any and all characteristics of the mixture are not altered by such storage. If storing or holding of the mixture causes segregation, excessive heat loss, or adversely affects the quality of the finished product, corrective action shall be taken. Unsuitable

mixture shall be disposed of at the Contractor's expense.

- (d) *Underlying Surface.* The HMA mixture shall be placed on a prepared surface. Prior to placement of the mixture, irregularities in the underlying surface shall be brought to uniform grade and cross-section. The surface shall be cleaned of dust and debris. A prime or tack coat shall be applied if required.

Surfaces of curbing, gutters, manholes, valve boxes and other structures coming into contact with the HMA mixture shall be coated with a uniform coating of asphaltic material prior to the placement of the HMA mixture against them.

1. *Prime Coat.* Prime coat materials shall meet the requirements of Subsection 401.07(b).

Prime coats shall not be applied when the surface to receive the prime coat is wet or when weather conditions would prevent the proper construction of the prime coat.

The Contractor shall provide equipment for heating and uniformly applying the prime coat material. The distributor shall be capable of uniformly spraying the material at even temperature and uniform pressure on variable widths of surface up to fifteen (15) feet in width at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard at an allowable variation from any specified rate of ± 0.02 gallons per square yard.

The prime coat shall be applied in a uniform and continuous spread. Excess material shall be removed or distributed as directed. Prime coat material shall not be placed on any surface where traffic will be allowed to travel on the freshly applied material.

The rate of application, temperatures, and areas to be treated shall be as stated in the Contract documents or as directed by the Engineer and shall be approved prior to the application of the prime coat.

2. *Tack Coat.* Tack coat materials shall meet the requirements of Subsection 401-07(c). The emulsified asphalt shall be diluted 1:1 with water and applied at 0.10 ± 0.01 gallons per square yard of diluted material.

Tack coats shall not be applied when the surface to receive the prime coat is wet or when weather conditions would prevent the proper construction of the prime coat.

The Contractor shall provide equipment for heating and uniformly applying the tack coat material. The distributor shall be capable of uniformly spraying the material at even temperature and uniform pressure on variable widths of surface up to fifteen (15) feet in width at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard.

The tack coat shall be applied in a uniform and continuous spread. Excess material shall be removed or distributed as directed. Tack coat material shall not be placed on any surface where traffic will be allowed to travel on the freshly applied material.

The rate of application, temperatures, and areas to be treated shall be as stated in the Contract documents or as directed by the Engineer and shall be approved prior to the application of the tack coat.

401.17

Hauling of HMA Mixture. Transporting the HMA mixture from the plant to the job site shall be done in vehicles meeting the requirements of Subsection 401.13. The Contractor shall have an adequate number of vehicles so delivery of the HMA mixture can be continuous with a minimum of interruptions of materials to the paving equipment in order for a continued nonstop paving operation and before the temperature of the HMA material falls below 250°F or satisfactory compaction temperature. Deliveries shall be planned so the placing and compaction of all of the mixture prepared for one day's operation can be completed during daylight unless adequate artificial lighting is provided by the Contractor and approved by the Engineer. Hauling over

newly placed mixture shall not be permitted until the mixture has been compacted as specified and allowed to cool to atmospheric temperature.

401.18

Placing of HMA Mixture. The HMA mixture shall be placed, using equipment meeting the requirements of Subsection 401.14, to the established grade and required thickness over the entire width or partial width as is practicable.

The mixture shall be placed on an approved surface, spread and struck off to obtain the required grade and elevation after compaction. The mixture placed directly behind the paver shall be 25% thicker than desired to account for compaction. Raking is discouraged and will not be allowed except to correct major problems of grade and elevation, casting or raking that causes any segregation will not be permitted.

On areas where the use of mechanical spreading and finishing equipment is impracticable, the mixture shall be carefully dumped, spread, raked, screeded, and luted by hand tools to the required compacted thickness plus 25%. Carefully move or minimally work the HMA mixture with rakes, lutes, or shovels to avoid segregation. Mixtures made with modified asphalt binders require more rapid completion of the handwork.

Hauling and placement sequences shall be coordinated so that the paver is in constant motion. Excessive starting and stopping will not be allowed. A construction joint shall be placed any time the paver stops and the screed drops enough to cause a surface dip in violation of Subsection 401.19 or the mat temperature falls below that which is allowed in Subsection 401.18(d).

When echelon paving is permitted and approved by the Engineer, production of the mixture shall be maintained so that pavers can be used in echelon to place the wearing course in adjacent lanes.

(a) *Segregation.* The bituminous material shall be transported and placed on the roadway without segregation. All segregated areas behind the paver shall be removed immediately upon discovery. The segregated material shall be replaced with specification material before the initial rolling has taken place. If more than 50 square feet of segregated pavement is ordered removed and replaced in any continuous 500 linear feet of paver width, laydown, operations shall be discontinued until the source of segregation has been found and corrected. The Engineer will determine the extent of the segregated areas. Segregated areas shall be corrected at the Contractor's expense.

(b) *Lift Thickness.* Each lift of compacted bituminous pavement shall be of uniform thickness. The minimum compacted lift thickness shall be three times the nominal aggregate size of the HMA mixture. The maximum lift thickness shall be three (3) inches unless the Contractor can demonstrate his ability to achieve the required compaction of thicker lifts.

The final lift, when placed adjacent to guttering, shall extend ¼" to ½" above the lip of the gutter when compacted.

(c) *Joint Construction.* The formation of all joints shall be made in such a manner as to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture, density and smoothness as other sections of the mat, and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid mixture except when necessary to form a transverse joint. When a transverse joint is necessary, it shall be made by means of placing a bulkhead or by tapering the course.

The free edge of the paved pass shall be laid as straight as possible and to the satisfaction of the Engineer. This joint, if cold, shall be tack coated prior to placement of the adjoining mat.

The new compacted mat shall overlap the adjacent previously placed mat no more than 1.5 inches. Excess overlap or thickness shall not be raked or cast onto the new mat but shall be wasted by

pulling back and removing. The hot edge shall be blocked or bumped in a smooth line consistent with the previous longitudinal edge. Minor raking will only be allowed to correct major grade problems or provide mix around manholes and valve boxes.

1. *Longitudinal Joints.* The longitudinal joint in both a new pavement structure and an overlay pavement layer shall offset the joint in the layer immediately below by six (6) inches. The joints in any pavement layer shall not fall in a wheel path. The Contractor shall submit a longitudinal joint and pavement-marking plan three (3) days prior to the Pre-Paving meeting. The plan shall show the location and configuration of the proposed longitudinal joints and pavement marking materials and shall detail the methods to be used in the field to establish a control line. The Contractor shall use a continuous string line to delineate every longitudinal joint during paving operations. All exposed string line shall be picked up and disposed of at the end of each day's paving. Paving shall not commence until the plan has been approved in writing by the Engineer.

The joints in the top layer of pavement shall be located as follows unless otherwise approved by the Engineer:

- A. For two-lane roadways, offset 6-to-12 inches from the center of pavement and from the outside edge of the travel lanes.
- B. For roadways of more than two lanes, offset 6-to-12 inches from lanes lines and the outside edge of travel lanes.

Longitudinal joints shall not cross the centerline, lane lines, or edge lines unless approved by the Engineer.

Where paving operations are on the present traveled roadway, the Contractor shall arrange paving operations so there will be no exposed longitudinal joints between adjacent travel lanes longer than twenty-five (25) feet at the end of a day's run. With the approval of the Engineer, the Contractor may be permitted to:

- A. Leave a vertical exposed longitudinal joint when the thickness of the pavement course being placed is 1.5 inches or less.
- B. Leave an exposed longitudinal joint when the thickness of the pavement course being placed is greater than 1.5 inches provided that the top 1.5 inches of the joint is vertical and the remainder of the joint is tapered. The minimum width of the taper shall be three times the thickness of the remaining pavement course.

The tapered portion of the joint shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent mat. In both methods, all contact surfaces shall be given a tack coat of bituminous material before placing any fresh mixture against the joint.

2. *Transverse Joints.* Along with the longitudinal joint plan, the Contractor shall submit a transverse joint plan showing the locations and the methods to be used to construct transverse joints. The Engineer must approve such plans prior to paving. Placing of the HMA mixture shall be continuous with a minimum of transverse joints.

Rollers shall not pass over the unprotected end of a freshly laid mixture.

Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. Tack coat material shall be applied to contact surfaces of all joints prior to placement of fresh mixture against the joint.

The end of transverse joints shall be located so they will be constructed with a full head of mix in front of the screed. When butt joints are constructed, runoff boards shall be used to support the roller on the downstream side of the joint. All tapered sections, rounded edges, and segregated areas shall be removed to achieve a vertical face at the butt joint before paving is restarted.

When a tapered joint is required for traffic access, the taper shall be removed back to a full depth before paving is restarted.

When restarting paving operations, the paver screed shall be placed on starter blocks on the completed side of the transverse joint. The starter blocks should be approximately 25% of the thickness of the existing completed mat so that adequate grade and compaction can be achieved on starting the paving operation. Raking of this joint shall not be allowed except to correct major grade problems.

- (d) *Compaction.* The plant mix bituminous pavement shall be compacted by rolling. Both steel wheel and pneumatic tire rollers will be required. The number, weight, and type of rollers required shall be sufficient to obtain the required density while the mixture is in a workable condition.

The Contractor shall construct a control strip with production materials and equipment and shall determine the roll pattern necessary to meet the specified density. This roll pattern shall be used throughout the paving operation unless conditions change.

Compaction shall begin immediately after the mixture is placed and shall be continuous until the required density is obtained. When the temperature of the mixture's surface falls below 185°F, no further compaction effort will be permitted unless approved by the Engineer.

The Contractor shall prevent the HMA material from adhering to the rollers by using a very small quantity of detergent or other approved material.

The longitudinal joint shall be rolled from the hot side and overlap the joint by approximately 6 inches on the cold side.

The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller or from any other causes shall be corrected immediately.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with hand tampers or small mechanical hand compactors.

Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way is defective shall be removed and replaced with fresh material and immediately compacted to conform to the surrounding area at the Contractor's expense. Skin patching will not be allowed.

While the surface is being compacted and finished, the Contractor shall carefully trim the outside edges of the pavement to the proper alignment. Edges so formed shall be beveled while still hot and thoroughly compacted by tampers or by other satisfactory methods.

All roller marks shall be removed with the finish rolling. The use of vibratory rollers with the vibrator on will not be permitted during the final rolling of any pavement course.

The pavement shall be compacted to a density of 92-to-96 percent of the maximum theoretical density, determined according to AASHTO T209.

the requirements of Section 720. Failing results on two (2) consecutive tests shall be cause for suspension of the paving operation until corrective measures have been implemented.

Surface smoothness testing of the final riding surface of all pavements is subject to testing by the 10-foot straightedge method. The Contractor shall furnish an approved 10-foot straightedge and depth gauge and provide an operator to assist the Engineer in testing the finished pavement surface. Areas to be tested shall be determined by the Engineer. The variation between any two contacts with the surface shall not exceed 3/16-inch in 10 feet. Areas showing deviation of more than 3/16-inch shall be marked and corrected at the Contractor's expense.

Inspection shall be provided by the Town. The Contractor shall notify the Town a minimum of 48 hours in advance of his intent to commence paving operations so that adequate inspection can be scheduled. Failure on the part of the Contractor to provide proper notification shall be grounds for suspending the paving operation. Any pavement surface placed without proper inspection or authorization shall be subject to immediate rejection and shall be removed at the Contractor's expense.

Acceptance of the pavement(s) shall be based on: conformity with the lines, grades, cross-sections, and thicknesses shown in the Contract; surface smoothness in accordance with this specification; passing test results in accordance with Section 720; and a visual appearance that is consistent for the HMA mixture used.

Nonconformity shall be determined in accordance with the *MGPEC Pavement Design Standards & Construction Specifications Manual*, latest edition thereof.

METHOD OF MEASUREMENT

- 401.20 The accepted quantities of hot mix asphalt pavements will be measured by the square yard for the compacted thickness of pavement specified for each pay item in the Bid Schedule. Batch weights will not be permitted as a method of measurement.

BASIS OF PAYMENT

- 401.21 All work performed and measured as described above will be paid for as provided in the respective Sections for each type specified.

Water used in the mixing plant for lime slurry will not be measured and paid for separately but shall be included in the Work.

Prime coat and/or tack coat will not be measured and paid for separately but shall be included in the Work.

**SECTION 403
HOT MIX ASPHALT (HMA)**

403.01 **Description.** Add the following to Subsection 403.01

Placement of HMA shall commence within 72 hours after milling operations have been completed or as approved by the Project Manager.

Add to second paragraph of Subsection 403.01

The asphalt pavement shall have a homogeneous and harmonious appearance with adjacent asphalt pavement placed during project paving operations. Unharmonious pavement may be subject to removal.

403.02 **Materials.** Replace Subsection 403.02 with the following:

The materials shall conform to the requirements of Subsections 401.02 through 401.08.

403.03 **Construction Requirements.** Replace the first sentence of Subsection 403.03 with the following:

The construction requirements shall be as prescribed in Subsections 401.09 through 401.19.

403.04 **Method of measurement.** Replace Section 403.04 with the following:

Hot Mix Asphalt will be measured as prescribed in Subsection 401.20.

403.05 **Basis of Payment.** Replace Subsection 403.05 with the following:

The accepted quantities of Hot Mix Asphalt will be paid for at the unit bid price for each pay unit type and thickness listed in the Bid Schedule. Complete in Place (CIP) shall include saw cutting, removal and placement of material.

The price shall be full compensation for furnishing all materials; for preparation, mixing, placing, and compacting these materials; and for all labor, equipment, tools, and incidentals necessary to complete the Work.

Payment will be made under:

Pay Item	Pay Unit
Hot Mix Asphalt (Grading) (Asphalt) (___")	Square Yard
Hot Mix Asphalt (Patching) (Grading) (Asphalt) (___")	Square Yard
Hot Mix Asphalt (Patching) (Grading) (Asphalt)(CIP)	Ton

**SECTION 412
PORTLAND CEMENT CONCRETE PAVEMENT**

- 412.03 Classification.** Add the following to Subsection 412.03:

Concrete for crossspan and fillet pavement shall be Class B or D.

High Early Concrete shall reach a compressive strength of 3000 psi in twenty-four (24) hours to allow the new concrete pavement to be opened to traffic. Admixtures to decrease curing time shall be nonreactive to steel reinforcement and shall not include calcium chloride unless approved by the Director. All other requirements for the class of concrete specified shall be met.

When not specified or required at the direction of the Director, High Early Concrete may be used at the option and expense of the Contractor.
- 412.14 Curing.** Replace the first sentence of the first paragraph of Subsection 412.14 as follows:

Immediately after the finishing operations have been completed, the entire surface, including exposed sides of the newly placed concrete, shall be sprayed uniformly with an impervious membrane-curing compound.
- 412.17 Surface Smoothness Test.** Replace Subsection 412.17 as follows:

Surface testing will be performed with a ten-foot straight edge as described in the Ten-Foot Straight Edge Method.
- 412.18 Sealing Joints.** Add the following to Subsection 412.18:

Mastic joint sealer is not considered suitable for joint material in concrete pavement. Joint material will be silicone based and shall be recommended for this usage by the manufacturer.
- 412.18 Sealing Joints.** Add the following to Subsection 412.18:

The Contractor shall remove all debris from the pavement within 24 hours of joint sealing installation. Removal shall be completed using a pick-up-type sweeper(s). Sweeper(s) having only negative air pressure at the road surface capable of removing excess aggregate and debris material shall be used on this project. Sweepers shall meet applicable U.S. Environmental Protection Agency Standards. No mechanical pick-up brooms will be allowed on the project.
- 412.22 Opening to Traffic.** Delete Subsection 412.22 and refer to Section 720.
- 412.23 Method of Measurement.** Delete the first paragraph in Subsection 412.23.
- 412.23 Method of Measurement.** Add the following as the first paragraph in Subsection 412.23:

The quantities of Concrete Pavement and Concrete Pavement (High Early) to be paid will be the number of square yards completed and accepted. Concrete Pavement (High Early) will be paid at the same price as Concrete Pavement unless it is required by the Contract Documents or its' use is directed by the Director.
- 412.24 Basis of Payment.** Add the following to Subsection 412.24:

Joint sealing on new concrete pavement construction will not be measured and paid separately but shall be included in the work.

Pay Item	Pay Unit
Concrete Pavement (10")(Crossspan)	Square Yard
Concrete Pavement Joint Sealing	Linear Foot

**SECTION 604
MANHOLES, INLETS AND METER VAULTS**

604.02 **Materials.** Add the following to Subsection 604.02:

Manholes and base sections shall be cast-in-place or pre-cast concrete units. Joints and bases shall be watertight.

Mortar. Mortar shall conform to the requirements of ASTM C378, or be proportioned one (1) part Portland Cement to two (2) parts clean, well-graded sand which will pass a 1/8-inch screen. Admixtures may be used not exceeding the following percentages of weight of cement: hydrated lime: 10% diatomaceous earth, or other inert materials, 5%. Consistency of mortar shall be such that it will readily adhere to the pre-cast concrete if using the standard tongue and groove-type joint. If the keylock-type joint is used, the consistency shall be such that the excess mortar will be forced out of the groove, and support is not provided for the next manhole section to be placed. Mortar mixed for longer than 30 minutes shall not be used.

Preformed plastic gaskets. When approved, preformed plastic gaskets may be used in lieu of mortar-type joints and shall meet all the requirements of Federal Specification SS-S-00210.

604.04 **Manholes, Inlets, and Meter Vaults.** Replace the second paragraph in Subsection 604.04(b) as follows:

When a manhole is located in the pavement area, the ring and lid casting shall be adjusted to 1/4" below finished grade prior to or during placement of the final lift of asphalt. The intent of this specification is to compact the freshly placed pavement material during rolling of the remainder of the roadway. Rim elevations shown on the plan are approximate. Final elevations will be determined in the field.

604.06 **Method of Measurement.** Replace Subsection 604.06 with the following:

Manholes and inlets will be measured by each unit complete in place, including ring, cover, grating, frame, and all connecting devices.

Meter vaults will be measured by the complete unit, including ring and cover.

Structure excavation and backfill for manholes, inlets and meter vaults will not be measured and paid for separately but shall be included in the Work.

604.07 **Basis of Payment.** Replace Subsection 604.07 with the following:

The accepted quantities will be paid for at the Contract unit bid price for each of the items below that appear in the Bid Schedule. Except as otherwise indicated on the plans or in the special provisions, all connecting devices will not be measured and paid for separately but shall be included in the Work.

Payment will be made under:

Pay Item	Pay Unit
Manhole, Type	Each
Inlet, Type (depth)	Each
Meter Vault	Each

**SECTION 608
SIDEWALKS AND BIKEWAYS**

- 608.01 **Description.** Add the following to Subsection 608.01:
This Work shall include the construction of sidewalk chases in accordance with the Contract Documents.

- 608.02 **Materials.** Add the following to Subsection 608.02:
Frame for sidewalk chase shall meet the requirements of ASTM A36 for Carbon Steel, or ASTM B209, B211, B221, or B241 for Aluminum Alloy 6061-T6 or 6063-T6. Top shall be hot-dipped galvanized steel.

- 608.03 **Concrete Sidewalks and Bikeways.** Replace Subsection 608.03(a) with the following:
Excavation. Excavation shall be made to the required depth and to a width that will permit the installation and bracing of the forms. The Contractor will be responsible for the top six (6) inches of the subgrade, including removal and replacement with suitable material. Any additional excavation beyond the first six (6) inches shall be paid under sections 203 and 304.

- 608.03 **Concrete Sidewalks and Bikeways.** Add the following to Subsection 608.03(b):
All sidewalk faces shall be formed. The terminal ends of all Work shall be formed to maintain a true vertical edge.

- 608.03 **Concrete Sidewalks and Bikeways.** Add the following to Subsection 608.03(e):
The depth of open joints shall be 1/3 the depth of the concrete except at the expansion joints. All upper edges of each section shall be tooled. Sidewalk joints shall line up with curb and gutter joints when contiguous. Expansion joint material, when required, shall be placed for the full depth of the concrete.

- 608.03 **Concrete Sidewalks and Bikeways.** Add Subsection 608.03(g):
Structures. Meter pits and manholes shall be installed or adjusted such that the frame and cover rest flush with the sidewalk. Cover shall not move within the frame and shall be reinforced as necessary to prevent deflection under light vehicle wheel loads (pick-up truck).

- 608.05 **Method of Measurement.** Replace Subsection 608.05 with the following:
Concrete sidewalks, bikeways, and curb ramps will be measured by the square yard of finished surface. Bituminous sidewalks, bikeways, and curb ramps will be measured by the square yard of bituminous mixture placed. Sidewalk chase will be measured by each chase installed.

- 608.06 **Basis of Payment.** Add the following to Subsection 608.06:

Pay Item	Pay Unit
Concrete Sidewalk (___ Inch)	Square Yard
Concrete Curb Ramp (Type)	Square Yard
Sidewalk Chase (Curb Type)	Each
Bituminous Sidewalk (___ Inch)	Square Yard
Bituminous Curb Ramp (Type)	Square Yard

**SECTION 609
CURB AND GUTTER**

609.03 **Cast-in-Place Concrete Curb.** Add the following to Subsection 609.03(b):

All curb and gutter faces shall be formed. The terminal ends of all Work shall be formed to maintain a true vertical edge. Forms shall be straight, true and in good condition. The Director reserves the right to order forms, which he deems unsatisfactory, removed from use in the Work.

In the event curbs, gutters, and sidewalks are to be contiguous but not monolithic, and the sidewalk slopes to the curb head, the top of the curb head shall be finished to slope to the street side of the curb.

609.03 **Cast-in-Place Concrete Curb.** Add the following to Subsection 609.03(d):

The depth of the open joints shall be 1/3 the depth of the concrete except at expansion joints. All upper edges of each section shall be tooled. Sidewalk joints shall line up with curb and gutter joints when contiguous. Tooled contraction joints shall be placed where form joint templates are placed. In the event the tooled joint and the form joint template do not coincide and a random crack appears outside the tooled joint, the Contractor will be required to remove the improperly cracked joint. Removal limits will be 1/3 the distance to the next joint on either side of the unsatisfactory joint. In the event contiguous joints are unsatisfactory, the entire section between the joints will be removed to the outside of the unsatisfactory joint. Concrete sawing will be required to provide a clean joint.

609.03 **Cast-in-Place Concrete Curb.** Add the following to Subsection 609.03(e):

Expansion material or approved bond breaker material shall be installed between curb and gutter Type 2 and abutting sidewalk for the full depth and length if the placement is not monolithic.

**SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

630.10 **Transportation Management Plan.** Add the following to the first paragraph of Subsection 630.10:

If the Contract Documents do not include a Traffic Control Plan (TCP), the Contractor shall submit a TCP for approval. Applicant request must be made (7) days prior to lane closure and (21) days prior to street closure.

630.10 **Transportation Management Plan.** Add the following to the first paragraph of Subsection 630.10(a):

If the Contract Documents do not include a Traffic Control Plan (TCP), the Contractor shall submit a TCP for approval. Applicant request must be made (7) days prior to lane closure and (21) days prior to street closure.

630.10 **Transportation Management Plan.** Add the following to the third paragraph of Subsection 630.10(a):

Approval of the MHT does not relieve the Contractor of traffic control liability specifically assigned to him under this Contract. A copy of the approved MHT shall be available at the Project site in order that Town personnel may verify compliance with the specified traffic control requirements.

630.11 **Traffic Control Management.** Add the following to the first paragraph of Subsection 630.11:

The Contractor shall provide a traffic control supervisor for the duration of the Project.

630.11 **Traffic Control Management.** Add the following to Subsection 630.11:

The Traffic Control Supervisor's duties shall NOT include traffic control signal operations. Any changes required for traffic signals operations shall be completed by Town of Castle Rock or CDOT personnel. All traffic shall be directed by a Licensed Law Enforcement Office when working within a signalized intersection when the traffic signal has been put to flash, disabled, modified or left unchanged.

630.12 **Temporary Masking Signs.** Add the following to Subsection 630.12:

The standard of quality for work zone devices shall be the *Quality Standards For Work Zone Traffic Control Devices*, as published by the American Traffic Safety Service Association (ATSSA). Devices in the "Unacceptable" category shall not be delivered to the jobsite and when found in the work zone, shall be replaced or repaired within twelve (12) hours of notification.

All warning and construction zone traffic control devices shall bear the name, address and phone number of the barricade company that owns them. The phone number shall be a 24-hour-a-day dispatched hotline in the event an emergency situation occurs where additional devices are needed or existing devices must be removed.

The Contractor shall install construction zone traffic control devices in locations where they do not block or impede sidewalks for pedestrians, disabled persons, bicyclists or other existing traffic control devices. This strategy shall include, but not be limited to, strapping signs to street light poles or utility poles where available and clamping signs posts to guard rails. A minimum four-foot wide, unobstructed sidewalk area is to be maintained where possible. In the event that a minimum four-foot wide sidewalk area with a minimum overhead clearance of 7 feet, 6 inches cannot be maintained, a pedestrian/bicycle detour plan shall be submitted in conjunction with the traffic control plan.

All existing traffic control devices including traffic signals, signs, and pavement markings that are compatible with the construction zone traffic control shall remain visible and fully operational. If these devices are

incompatible with the temporary construction, they shall be covered, relocated or removed.

Whenever the Contractor removes, obliterates or covers in any way, any pavement markings including lane lines and crosswalks, he shall replace them on a daily basis. Prior to opening affected areas to traffic, all pavement marking shall be placed in accordance with the Plans and Specifications or as directed by the Director.

The Contractor shall equip all vehicles operating within the moving lanes with flashing amber lights visible from all directions.

630.13 General. Add the following to Subsection 630.13:

Contractor shall provide Variable Message Sign (VMS) with the minimum screen dimensions of 8' (w) x 5' (h).

630.14 Flagging and Pilot Car Operation. Add the following to Subsection 630.14(d):

The flagger's STOP/SLOW sign paddle shall be at least 18 inches wide with letters 6 inches high.

630.17 Method of Measurement. Replace Subsection 630.17 with the following:

Traffic channelizing devices and flashing beacons (portable) will not be measured by the unit but will be included in the lump sum price for traffic control management.

When Traffic Control Management and flagging are not separate pay items, they will not be measured and paid separately but will be included in the pay item for traffic control management.

When there is a pay item for Traffic Control Management, "on call" and Project inspections on all days other than an authorized 24-hour day will not be measured but will be included in the pay item for traffic control management.

Signs, barricades, traffic channelizing devices, flashing beacons (portable), method of handling traffic, traffic control supervisor, flagging and all other requirements of Section 630 are included in the pay item for traffic control management unless they are identified in the Bid Schedule as separate pay items.

No payment will be made under Section 630 until the method of handling traffic (MHT) has been submitted and accepted.

Traffic control management, as determined by the method of handling traffic (MHT), will be paid as follows: 50% of the Contract item amount upon first utilization, an additional 40% of the Contract item amount when 75% of the original Contract amount has been earned, and the final 10% when the Project has been completed, in accordance with Subsection 105.21, exclusive of any maintenance periods.

630.18 Basis of Payment. Add the following to Subsection 630.18:

PAY ITEM	PAY UNIT
Traffic Control Management	Lump Sum
Traffic Control Management	Day
Variable Message Sign (VMS) (2 EA per day)	Day

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**SECTION 713
TRAFFIC CONTROL MATERIALS**

713.08 Glass Beads for Traffic Markings. Replace subsection 713.08 with the following:

Glass beads for all pavement marking shall be Ennis Flint Colorado WB Blend / AASHTO Type 2 HR; or Town approved equal.

SECTION 720
MATERIALS SAMPLING AND TESTING (Added Section)

DESCRIPTION

720.01 Materials sampling and testing shall be performed under the Contract by an independent materials testing company. This Work shall include all necessary labor, equipment and material required for sampling and testing materials or finished products in accordance with the specifications of this Section. Unless otherwise designated, all referenced specifications, standards or policies shall be the latest edition as revised or updated by approved supplements published and issued prior to the date of the advertisement for bids.

CONSTRUCTION REQUIREMENTS

720.02 All materials sampling and testing shall be performed by certified, experienced and qualified materials testing technicians who work under the supervision of a registered professional engineer in the State of Colorado. At the request of the Engineer, the Contractor shall require the materials testing company to replace any technician who cannot satisfactorily perform the testing duties.

All materials sampling and testing equipment shall be serviceable and calibrated. At the request of the Engineer, the Contractor shall require the materials testing company to replace any testing equipment that is not satisfactory.

Soil classifications and moisture-density curves shall be provided to the Engineer prior to in-place density testing. Materials testing technicians shall furnish copies of failed test results to the Engineer promptly as the results become available. On a weekly basis, the Contractor shall furnish the Engineer with copies of all test results taken during the prior week and a cover letter signed by the supervising registered professional engineer, which summarizes the results and discusses any failed tests or inconsistencies.

Retesting the density of subgrade and base course materials shall be required at the Contractor's expense if they are reworked or weather causes the materials to become wet, dry or frozen.

In place densities for Hot Bituminous Pavement shall be determined using a nuclear density gauge. Nuclear densities shall be taken in accordance with CP 81-01. The nuclear density gauge shall be calibrated to a minimum of six (6) cores taken from the same material.

Core samples shall be neatly cut with a core drill and have a minimum diameter of three (3) inches. Samples that are clearly defective as a result of sampling shall be discarded and another sample taken. Cored holes shall be filled in a manner acceptable to the Town within 24 hours.

The Town materials testing requirements are provided in Table 720-1. All testing procedures, point of verification and central lab requirements shall be as specified in the *Frequency Guide Schedule* of the Colorado Department of Transportation Field Materials Manual. Without increasing the total number of tests or samples required, the Engineer or Inspector may change the test locations from the frequency spacing shown in Table 720-1. One (1) test is required for any fraction of the specified frequency.

Concrete testing shall be performed each day on the first truck delivered for each mix design and continue per Table 720-1. If the first truck or consecutive trucks delivered fail the initial required concrete field tests for air content and slump, additional concrete field tests shall be performed on the next two (2) trucks delivered for each day, and for each mix design. If a truck cannot be corrected onsite to meet the required project specifications the following will occur.

- (1) Concrete will be rejected based on project noncompliance
- (2) The contractor shall notify the concrete supplier of the problem(s) and correct as necessary.
- (3) The next two consecutive trucks will be tested.

Table 720-1
Town of Castle Rock Materials Testing Requirements

Type of Test	Frequency	Remarks
Soil Survey (Classification), AASHTO M145	1 per 1000 feet of roadway, sidewalk or pipe trench	Surveys for roadway, sidewalk and trench may be combined
Moisture-Density Curve, AASHTO T99 or T180	1 per on-site soil type 1 per import material source	AASHTO method determined by soil or materials type
Gradation Analysis, aggregate for base course	1 per 1500 ton	Within specifications, Section 304.02.
Gradation Analysis, aggregate for stabilization material	1 per 1500 ton	Within specifications, Section 304.02.
Gradation Analysis, aggregate for trench foundation material	1 per 1500 ton	Within specifications, Section 304.02.
Gradation Analysis, aggregate for bedding material	1 per 1500 ton	Within specifications, Section 206.02.
Gradation Analysis, aggregate for seal coat.	1 per 10,000 square yard	Within specifications, Section 409.03.
Gradation Analysis, aggregate for slurry seal.	1 per 10,000 square yard	Within specifications, Section 410.03.
In-place density, Embankment, Colorado Procedures.	1 per 300 feet per lane per 8 inch loose lift	Minimum density per soil classification, Section 203.07
In-place density, Roadway subgrade, Colorado Procedures.	1 per 300 feet per lane	Minimum density per soil classification, Section 203.07
In-place density, Sidewalk subgrade, Colorado Procedures.	1 per 300 feet of sidewalk	Minimum density per soil classification, Section 203.07
In-place density, Pipe trench, Colorado Procedures.	1 per 200 feet of trench per 1 foot vertical interval	Minimum density per soil classification, Section 203.07
In-place density, Aggregate base course, Colorado Procedures.	1 per 300 feet per lane	Minimum 95% of maximum density, T180
In-place density, Lime treated subgrade, Colorado Procedures.	1 per 300 feet per lane	No less than 95% of std. dry density and opt. moisture, T99
In place density, Cement treated base, Colorado Procedures.	1 per 300 feet per lane	Density in accordance with Contract documents, T134
In-place density, Hot Bituminous Pavement, Colorado Procedures.	1 per 250 feet per lane per lift	92-96% of maximum theoretical density
Asphalt content, gradation, and RICE, Hot Bituminous Pavement.	1 per ea HBP grade/binder grade specified/1000 ton	Within specifications of approved mix design
Temperature, Hot Bituminous Pavement	2 per day minimum	Dryer, Binder in storage tank, Mixture at plant and job site
Core for thickness, Hot Bituminous Pavement	1 per 500 feet, alternating lanes	Thickness as indicated in Contract documents.
Compressive strength, Concrete, AASHTO Procedures	1 per 50 cubic yards/mix design	PCC pavement, structural concrete, sidewalks and curbing
Air content and slump, Concrete, AASHTO Procedures	1 per 50 cubic yards/mix design	PCC pavement, structural concrete, sidewalks and curbing

BASIS OF PAYMENT

720.03 Partial payments for materials sampling and testing will be made once each month as the sampling and testing work progresses and in proportion to the bid price. Contingency items shall be paid when additional services are required by the Engineer.

Payment will be made under:

Pay Item
Materials Sampling and Testing

Pay Unit
Lump Sum

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PROJECT SPECIAL PROVISIONS

The following special provisions supplement or modify the standard special provisions and/or the Standard Specifications and take precedence over the standard special provisions and/or the Standard Specifications and plans.