DIVISION 100
GENERAL PROVISIONS

SECTION 101
DEFINITIONS AND TERMS

Titles used in these specifications having a masculine gender, such as “workmen” and the pronouns “he” or “his”, are for the sake of brevity and are intended to refer to persons of either gender. The titles or headings of the sections and subsections are intended for convenience of reference and shall not have any bearing on their interpretation.

When the Contract indicates that work is to be “accepted, acceptable, subject to approval, approved, authorized, condemned, considered necessary, contemplated, deemed necessary, designated, determined, directed, disapproved, established, given, indicated, deemed insufficient, subject to interpretation, interpreted, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable, or unsatisfactory,” it shall be understood that these expressions are followed by the words “By the Engineer,” or “To the Engineer.”

When the Contract indicates that something “shall” be done, the action is required and is not discretionary.

Wherever the following abbreviations or terms are used in these specifications, plans, or other contract documents, the intent and meaning shall be interpreted as follows:

101.01 Abbreviations.

	ABBREVIATIONS
AAN	American Association of Nurserymen
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute, Inc.
ARTBA	American Road and Transportation Builders Association
ASA	American Society of Agronomy
ASCE	American Society of Civil Engineers
ASLA	American Society of Landscape Architects
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATSSA	American Traffic Safety Services Association
AWG	American Wire Gauge
AWPA	American Wood Protection Association
AWS	American Welding Society
AWWA	American Water Works Association

ABBREVIATIONS

BLM	Bureau of Land Management
CCA	Colorado Contractors Association
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CP	Colorado Procedure
CP-L	Colorado Procedure – Laboratory
CRS	Colorado Revised Statutes, 1973, as amended
CRSI	Concrete Reinforcing Steel Institute
DBE	Disadvantaged Business Enterprise
EIA	Electronic Industries Association
EPA	Environmental Protection Agency
EEO	Equal Employment Opportunity
FHWA	Federal Highway Administration
FSS	Federal Specifications and Standards
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IMSA	International Municipal Signal Association
IPCEA	Insulated Power Cable Engineers Association
ISEA	International Safety Equipment Association
ITE	Institute of Transportation Engineers
MASH	Manual for Assessing Safety Hardware
MIL	Military Specifications
MS4	Municipal Separate Storm Sewer System
MUTCD	Manual on Uniform Control Devices
NAPT	National Association for Proficiency Testing
NCHRP	National Cooperative Highway Research Program
NEC	National Electrical Code
NEMA	National Electrical Manufacturers' Association
NIST	National Institute of Standards and Technology
NSF	National Sanitation Foundation
NSPS	National Society of Professional Land Surveyors
NTPEP	National Transportation Product Evaluation Program
OSHA	Occupational Health and Safety Administration
PCI	Prestressed Concrete Institute
RCSC	Research Council of Structural Connections
ROW	Right of Way
SWMP	Stormwater Management Plan
SAE	Society of Automotive Engineers
TMECC	Test Method for the Examination of Composting and Compost
USDA, NRCS	US Dept of Agriculture, Natural Resources Conservation Service
UL	Underwriters Laboratories, Inc.

101.02 Definitions, alphabetically.

Advertisement. A public announcement, inviting proposals for work to be performed or materials to be furnished.

Affected Area. As related to mined land reclamation, the total disturbed surface of a pit or quarry such as sand, gravel, topsoil, or borrow, that is being mined or will be mined. The area includes, but is not limited to, the excavation area, plant, and stockpile areas, parking and storage areas, and the haul roads.

Award. The acceptance by the Department of a proposal.

Basis of Payment. The terms under which "work" is paid, as a designated "Pay Item" per the quantity measured and the "Pay Unit."

Bidder. An individual, firm, corporation, or other legal entity submitting a proposal for the advertised work. A contractor intending to contract with the Department for performance of prescribed work.

Bridge. A structure, including supports, erected over a depression or an obstruction, such as water, highway, or railroad, and having a track or passageway for carrying traffic or other moving loads and having a length measured along the center of roadway of more than 20 feet between undercopings of abutments or extreme ends of openings for multiple boxes.

Length. The length of a bridge structure is the over-all length measured along the line of survey stationing back-to-back of backwalls of abutments, if present, otherwise, end-to-end of the bridge floor, but in no case less than the total clear opening of the structure.

Roadway Width. The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom of curbs or guard timbers or in the case of multiple height of curbs, between the bottoms of the lower risers.

Calendar Day. Each and every day shown on the calendar, beginning and ending at midnight. When day is used, it shall mean calendar day unless otherwise defined.

CDOT Resident Engineer. The Resident Engineer is directly responsible for the overall administration of assigned construction projects. Unless the CDOT Project Engineer is a Professional Engineer, the Resident Engineer is CDOT's full time engineer in responsible charge of the project. The Resident Engineer will delegate authority to Project Engineers consistent with their experience and abilities. Only a CDOT Resident Engineer can approve and sign vouchers for interim and final Contractor pay estimates. Only a CDOT Resident Engineer can authorize and sign changes to the Contract if the Project Engineer is a Consultant Employee.

Certificate of Compliance. A certification, including a signature by a person having legal authority to act for the manufacturer, stating that the product or assembly to be incorporated into the project was fabricated per and meets the applicable specifications.

Certified Invoice. Any invoice or billing endorsed by the Contractor, certifying that material, specialty work, subcontract work, rental, lease, and services were acquired for the project and that the invoiced or billed amount represents the actual costs.

Certified Test Report. A test report from the manufacturer or an independent testing laboratory, including a signature by a person having legal authority to act for the manufacturer or the independent testing laboratory stating that the test results show that the product or

assembly to be incorporated into the project has been sampled and tested and the samples have passed all specified tests.

Conformity. Compliance with reasonable and customary manufacturing and construction tolerances where working tolerances are not specified. Where working tolerances are specified, conformity means compliance with such working tolerances.

Construction Material: Includes an article, material, or supply — other than an item of primarily iron or steel — that is or consists primarily of non-ferrous metals; plastic and polymer-based products (including polyvinyl chloride [PVC], composite building materials, and polymers used in fiber optic cables); glass; lumber; or drywall.

Construction Drawings . A complete set of plans, reviewed shop drawings, working drawings, and other submittals kept available on the project site at all times by the Contractor.

Construction Requirements. Specifications covering performance of work required for proper completion and acceptance.

Contract. The written agreement between the State of Colorado through the Department of Transportation and the Contractor, setting forth the obligations of the parties for the performance of the work and the basis of payment.

The Contract includes the invitation for bids, proposal, contract bonds, standard specifications, supplemental specifications, special provisions, general and detailed plans, Notice to Proceed, Contract Modification Orders, and authorized extensions of time, all of which constitute one instrument.

Contract Item (Pay Item). A specifically described unit of work for which a price is provided in the Contract.

Contract Modification Order. A written order issued to the Contractor by the Department covering contingencies, extra work, increases or decreases in contract quantities, and additions or alterations to the plans or specifications, within the scope of the Contract, and establishing the basis of payment and time adjustments for the work affected by the changes. The Contract Modification Order is the only method authorized for changing the Contract. Contract Modification Orders must be approved as established in subsection 105.14.

Contract Payment Bond. The security executed by the Contractor and Surety or Sureties and furnished to the Department to guarantee payment of all legal debts of the Contractor pertaining to the Construction of the project.

Contract Performance Bond. The security executed by the Contractor and Surety or Sureties and furnished to the Department to guarantee completion of the work per the Contract.

Contract Time. The number of workdays or calendar days allowed for completion of the Contract, including authorized time extensions. Where a calendar date of completion is specified, the Contract shall be completed on or before that date.

Contractor. The individual, firm, or corporation contracting with the State of Colorado through the Department of Transportation for performance of prescribed work.

Contractor's Engineer. A professional engineer registered in the State of Colorado who is an employee of either the Contractor, a consulting engineer under contract to the Contractor, or a manufacturer or supplier of materials supplied to the project.

Control Measures for Stormwater Pollution Prevention. Control measures prevent or reduce the pollutants in stormwater discharges from the construction site.

County. The county where the work is to be done.

Culvert. Any structure not classified as a bridge that provides an opening under the roadway.

Day. See "calendar day" and "working day".

Department. State Department of Transportation. A department within the executive branch of the State of Colorado.

Domestic Content Procurement Preference: A phrase meaning that all iron and steel used in the project is produced in the United States; the manufactured products used in the project are produced in the United States; or the construction materials used in the project are produced in the United States.

Engineer. The Chief Engineer of the Department acting directly or through an authorized representative, responsible for engineering and administrative supervision of the project.

Equipment. All machinery, tools, and apparatus together with supplies for upkeep and maintenance, necessary for the proper construction and acceptable completion of the work.

Extra Work. Work not provided for in the Contract as awarded but found by the Engineer to be essential to the satisfactory completion of the Contract within its intended scope.

Falsework. Falsework is temporary construction used to support structural elements of concrete, steel, masonry, or other materials during their construction or erection until they become self-supporting. Falsework may also be used to provide temporary support to elements of a structure during demolition or reconstruction.

Finished Grade. Final grade of the site after excavating or filling for pavement or topsoil that conforms to the approved final grading plan. The finished grade is also the grade at the top of a paved or finished surface.

Force Account Work. Work paid for on the basis of actual costs plus approved additives. See subsection 109.04.

Formwork. Formwork is the temporary structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens.

Highway. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right of way.

Holidays. Holidays recognized by the State of Colorado are:

New Year's Day
Dr. Martin Luther King, Jr.'s Birthday (observed)
President's Day
Cesar Chavez Day
Memorial Day
Juneteenth
Independence Day
Labor Day
Cabrini Day
Veterans' Day
Thanksgiving Day
Christmas Day

When New Year's Day, Cesar Chavez Day, Juneteenth, 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.

Infrastructure: Includes, at a minimum, the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

Inspector. The Engineer's authorized representative assigned to make detailed inspections of contract performance.

Invitation for Bids. All documents, whether attached or incorporated by reference, utilized for soliciting proposals. The advertisement will indicate with reasonable accuracy the quantity and location of the work to be done or the character and quantity of the material to be furnished and the time and place of the opening of proposals.

Laboratory. The testing laboratory of the Department, or any other testing laboratory designated by the Engineer.

Materials. All components required for use in the construction of the project.

Method of Measurement. The manner in which a "Pay Item" is measured to conform with the "Pay Unit."

Notice to Proceed. Written notice to the Contractor to proceed with the contract work including, when applicable, the date of beginning of contract time.

Ordinary High-Water Mark. The term "ordinary high-water mark" means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. This is typically the 2-year storm event elevation.

Original Contract Amount. The sum of the total dollar amounts bid for all the construction pay item quantities. In subsection 626.02 this figure is modified for use in calculating partial payments for mobilization.

Pavement Structure. The combination of one or more of the following courses placed on a subgrade to support and distribute the traffic load to the roadbed.

(1) Subbase. The layer or layers of specified or selected material placed on a subgrade to support a base course, surface course, or both. Subgrade that has been treated with lime, fly ash, cement kiln dust, or combinations thereof for stabilization will be considered subbase.

(2) Base Course. The layer or layers of specified or selected material placed on a subbase or a subgrade to support a surface course.

(3) Surface Course. One or more layers of a pavement structure designed to accommodate the traffic load, the top layer of which resists skidding, traffic abrasion, and the disintegrating effects of climate. The top layer is sometimes called "wearing course."

Planned Force Account . Items of work, included on the plans, which will be paid for per subsection 109.04.

Plans. The drawings, or reproductions, provided by the Department, showing the location, character, dimensions, and details of the work.

Pre-construction Conference. A meeting of CDOT project personnel, Contractor project personnel, and other stakeholders held before the beginning of construction, discussing pertinent topics for the successful completion of the work.

Profile Grade. The trace of a vertical plane usually intersecting the top surface of the proposed wearing surface and usually along the longitudinal centerline of the roadbed. Profile grade means either elevation or gradient of such trace per to the context.

Project. The specific section of the highway where construction is being performed, as described in the Contract.

Project Engineer. The Chief Engineer's duly authorized representative who may be a CDOT employee or an employee of a consulting engineer (consultant) under contract to CDOT as defined below:

(a) CDOT Project Engineer. The CDOT employee, assigned by the Resident Engineer**,** who is the Chief Engineer's duly authorized representative. The CDOT Project Engineer is in direct charge of the work and is responsible for the administration and satisfactory completion of the project under contract.

(b) Consultant Project Engineer. The consultant employee under the responsible charge of the consultant's Professional Engineer who is in direct charge of the work and is responsible for the administration and satisfactory completion of the project. The Consultant Project Engineer's duties are delegated by the CDOT Resident Engineer per the scope of work in the consultant's contract with CDOT. The Consultant Project Engineer is not authorized to sign or approve Contract Modification Orders.

Project Special Provisions. See definition for special provision.

Project Termini. Limits of the Project as shown on the plans.

Proposal. The offer of a bidder, on the prescribed form, to perform the work at the prices quoted. Also called bid.

Proposal Form. A bidder submits their bid on these Department furnished documents. Also called bid proposal.

Proposal Guaranty. The security furnished with a proposal to guarantee that the bidder will enter into the Contract if the proposal is accepted.

Record Set. A reproduction of a drawing or set of drawings, design calculations, or other record of engineering work required to be performed by the Contractor's engineer and Professional Land Surveyor, which is electronically sealed by the Contractor's engineer and Professional Land Surveyor using Adobe Sign software and per the Bylaws and Rules of the State Board of Licensure for Architects, Professional Engineers, and Professional Land Surveyors Rules and Regulations, 4 CCR 730-1.

Region Transportation Director. The Department's representative, responsible for construction, maintenance and safety activities, within the geographical jurisdiction established by the Department. The Region Transportation Director is responsible for acting on written appeals made by the Contractor relating to contract claims for additional compensation or extension of contract time.

Right of Way. A general term denoting land, property, or interest, usually in a strip, acquired for or devoted to a highway.

Road. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right of way.

Roadbed. The graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

Roadside. A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside.

Roadside Development. Those items necessary for the preservation of landscape materials and features. The rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching and the placing of other ground covers. Suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the highway.

Roadway. The portion of a highway within limits of construction.

Roadway Prism. The portion of the roadway defined as the prism of embankment situated beneath the shoulders and pavement structure and inside the lines projected downward and outward on a one-to-one slope from the outside edges of the roadway shoulders to their intersection with the base of the embankment.

Safety Critical Work . Elements of the work that, if performed improperly, could encroach upon and endanger traffic that is following all traffic regulations. Safety critical work may include work elements performed under one or more of the following situations:

- Work that is constructed on, over, or near a traffic route and could become unstable over time if installed improperly.
- Work that requires the use of lifting devices in the vicinity of traffic.
- Elements of work considered safety critical for the project will be as identified in *Section 107 – Performance of Safety Critical Work.*
- "Traffic", as used above, is defined as the vehicles, railroad, pedestrians, aircraft, and watercraft moving along a route. The route may be permanent or temporary, such as a detour.

SafetyEdge$_{SM}$ for Pavement. A pavement edge drop-off treatment which allows drivers who leave the road to return safely.

Salvable Material. Material that can be saved or salvaged. Unless otherwise specified in the Contract, all salvable material shall become the property of the Contractor.

Shop Drawings. A general term that includes drawings, diagrams, illustrations, samples, schedules, calculations, and other data that provide details of the construction of the work and details to be used by the Engineer for inspection. Shop drawings shall be prepared by the Contractor, subcontractors, manufacturers, suppliers, or distributors. Shop Drawings are submitted to the Engineer for formal review and return to the Contractor per subsection 105.02(c). Shop drawings include data that illustrates material, equipment, and items that are incorporated in and become part of the permanent work per the Contract.

Shoring. Shoring is temporary construction that is used to support the earth adjacent to excavation or embankment.

Shoulder. The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Sidewalk. That portion of the roadway constructed for pedestrian use.

Special Provisions. Additions and revisions to the standard and supplemental specifications covering conditions specific to an individual project or group of projects. Special provisions fall within one of the two following categories and take precedence as specified in subsection 105.09.

(a) Project Special Provisions. Additions and revisions to the Standard and Supplemental Specifications, specific to the project.

(b) Standard Special Provisions. Additions and revisions to the Standard and Supplemental Specifications, specific to a selected group of projects or that are intended for temporary use.

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

(a) Standard Specifications: The Department's printed book (including errata) titled *Standard Specifications for Road and Bridge Construction*. The book is divided into three parts namely:

1. General Provisions (Division 100)
2. Construction Details (Divisions 200 thru 600)
3. Material Details (Division 700)

(b) Supplemental Specifications: Additions and revisions to the Standard Specifications that are adopted subsequent to the issuance of the printed book.

The outline for "Work" items in the Construction Details contains the following:

1. Description
2. Materials
3. Construction Requirements
4. Method of Measurement
5. Basis of Payment

Specified Completion Date. The date that the contract work is specified to be completed.

Standard Special Provisions. See definition for Special Provisions.

State. The State of Colorado acting through its authorized representative.

State Waters. State Waters means any and all surface and subsurface waters that are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

Examples of State waters include, but are not limited to, perennial streams, intermittent or ephemeral gulches and arroyos, ponds, lakes, reservoirs, irrigation canals or ditches, wetlands, stormwater conveyances (when they discharge to a surface water), and groundwater.

Note that for the purposes of these specifications "surface waters" means all State waters, except groundwater.

Stormwater Management Plan (SWMP). The Stormwater Management Plan comprises those contract documents containing the requirements necessary to accomplish all the following:

- Protect and identify sensitive environments (state waters, wetlands, habitat, and existing vegetation).
- Minimize the amount of disturbed soil.
- Control and minimize erosion and sedimentation during and after project construction.
- Minimize runoff from offsite areas from flowing across the site.
- Slow down the runoff.
- Reduce pollutants in stormwater runoff.

Street. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right of way.

Structures. Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, storm drains, service pipes, underdrains, foundation drains, fences, guardrail, signs, end sections, traffic signals, light standards, and other features that may be encountered in the work and not otherwise classified.

Subcontractor . An individual, firm, corporation, or other legal entity to whom the Contractor sublets part of the Contract. A subcontractor shall include an individual, firm, or corporation who meets one or both of the following criteria:

(a) Establishes a fabricating process or facility exclusively for the use of the Project, whether on or off the site of work per 29 CFR 5.2(l)(1) and 29 CFR 5.2(l)(2).

(b) Performs work that is incorporated within the Project limits.

Subgrade. The top surface of a roadbed upon which the pavement structure, shoulders, and curbs are constructed. Subgrade that has been treated with lime, fly ash, cement kiln dust, or combinations thereof for stabilization will be considered subbase.

Substructure. All of the structure below the bearings of simple and continuous spans, skewbacks of arches, and tops of footings of rigid frames, together with the backwalls, wingwalls, and wing protection railings.

Superintendent. The Contractor's authorized employee in responsible charge of the work.

Superstructure. The entire structure except the substructure, as defined.

Supplier. An individual, firm, or corporation who meets one or both of the following criteria:
(a) Fabricates or processes a material not on the site of work per 29 CFR 5.2(l)(3).
(b) Delivers material directly to the project.

In both cases, the material shall be intended for permanent incorporation into the worksite.

Supplemental Specifications. See definition for Specifications.

Surety. The corporation, partnership, or individual, other than the Contractor, executing a bond furnished by the Contractor.

Traffic Control Plan (TCP). The parts of the contract documents for each project that contain the requirements for the maintenance of traffic during construction of the project.

Traveled Way. The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

Value Engineering Change Proposal (VECP). A change to contract requirements proposed by the Contractor that will accomplish the project's functional requirements at less cost or improve value or service at no increase or at a minor increase in cost.

Wheel Path. Wheel paths are the two sections of each through-traffic lane that bear the wheel loading. The center of each wheel path is located 3 feet from the center of the lane; each wheel path is 2 feet wide.

Work. The furnishing of all labor, materials, equipment, and incidentals necessary to successfully complete the project according to all duties and obligations imposed by the Contract.

Working Day. Any day, exclusive of Saturdays, Sundays, and holidays, that weather and other conditions not under the control of the Contractor will permit construction operations to proceed with the normal working force engaged in performing those items controlling the completion of the work.

Working Drawings. A general term that includes drawings, diagrams, illustrations, samples, schedules, calculations, and other data that illustrate the construction of the work, material, equipment, methods, and items that are necessary to construct the work per the plans and specifications. Working drawings shall be prepared by the Contractor, subcontractors, manufacturers, suppliers, or distributors. Working drawings are submitted to the Engineer for information only and are not formally reviewed and returned to the Contractor.

Workplace Violence. Workplace violence is conduct in the workplace against employees, employers, or outsiders committed by a person who either has an employment related connection with CDOT or is a contractor working on a CDOT project. This conduct includes:

(1) Physical acts against persons or their property, or against CDOT or Contractor property that are perceived to be harmful or threatening.

(2) Veiled or direct verbal threats, profanity, or vicious statements or gestures that are meant to harm or create a threatening or intimidating work environment.

(3) Written threats, profanity, vicious cartoons or notes that are meant to create a threatening or intimidating environment.

(4) Any other acts that are perceived to be threatening or intended to injure or convey hostility.

SECTION 102
BIDDING REQUIREMENTS
AND CONDITIONS

102.01 Prequalification of Bidders. The bidder shall follow the prequalification and bidding procedures contained in the Rules Governing Construction Bidding for CDOT Public Works Projects, 2 CCR 601-10, ("Rules"), on file with the Colorado Secretary of State. Copies are available upon request in the Contracts and Market Analysis Branch of the Department.

Only prequalified bidders will be allowed to bid on any project. At least 10 days before opening of proposals, the bidder must file an experience questionnaire and a confidential financial statement on standard forms furnished by the Department.

102.02 Contents of Proposal Forms. The Department will publish bidding opportunities to prospective bidders on the CDOT Business Center website. The forms on this website will state the location and description of the contemplated construction and will show the estimate of the various quantities and types of work to be performed or materials to be furnished and will have a schedule of items inviting unit bid prices. The proposal form will state the time that the project must be completed, the amount of the proposal guaranty, and the date, time, and place of the opening of proposals.

All bidders on projects shall submit electronic bids only. Innovative delivery method projects such as Design-Build, CMGC and Best Value, are not subject to this electronic bidding requirement.

The plans, specifications, and other documents designated in the proposal form, will be considered a part of the proposal.

The prospective bidder shall pay the Department the sum stated in the Invitation for Bids for each paper set of plans.

102.03 Interpretation of Quantities in Proposal Form. Except as otherwise provided in this subsection and the method of measurement for individual items, the quantities appearing in the proposal form are estimates prepared for the comparison of proposals. Payment to the Contractor will be made per the following procedures:

(a) Measurement required. When the Contract requires measurement of work performed or material furnished, payment will be made for actual quantities measured and accepted.

(b) Measurement Not Required. When the Contract does not require quantities of work performed or materials furnished to be measured, payment will be made for the quantities appearing in the Contract.

The estimated quantities of work to be performed and materials to be furnished may be increased, decreased or omitted.

102.04 Interpretation of Plans and Specifications Any changes to proposal forms, plans, or specifications before the opening of proposals will be issued by the Department through posting of the changes on the Department's Schedule Bid Openings web page, Business Management System (B2GNow), and the Electronic Bid System. Certain individuals are named in the project specifications who have authority to provide information, clarification or interpretation to bidders before opening of proposals. Information obtained from persons other than those named individuals is invalid and shall not be used for bidding purposes.

102.05 Examination of Plans, Specifications, Special Provisions, and Site of Work. The bidder is expected to examine the site of the proposed work, the proposal, plans, specifications, supplemental specifications, special provisions, and contract forms, before submitting a proposal. The submission of a proposal will be considered conclusive evidence that the bidder has made this examination and is aware of the conditions to be encountered in performing the work according to the Contract.

Boring logs, utility mapping, and other records of subsurface investigations, if they exist, are available for inspection by bidders. These logs and records are made available so that all bidders have access to identical subsurface information that is available to the Department. These items are not intended as a substitute for personal investigation, interpretation, and judgment of the bidders.

The Department does not warrant the adequacy of boring logs, utility mapping, and other records of subsurface investigations, and such information is not considered to be a part of the Contract. When a log of test borings is included in the subsurface investigation record, the data shown in the individual log of each test boring applies only to that particular boring and is not intended to be conclusive as to the character of any material between or around test borings. When utility mapping is included, the information shown will be identified as Quality Level A/B/C/D per the most recent version of the ASCE Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data (CI/ASCE 38-02). Utility location depictions are only valid at the time of collection, and it is the Contractor's sole responsibility to verify all utility locations before beginning the work. If bidders use this information in preparing a proposal, it is used at their own risk, and bidders are responsible for all conclusions, deductions, and inferences drawn from such information.

Bidders may conduct subsurface investigations at the project site at bidder's expense; the Department will afford them this opportunity before public opening of proposals.

If a bidder discovers an apparent error or omission in the proposal form, estimated quantities, plan, or specifications, the bidder shall immediately notify the Engineer to enable the Department to make any necessary revisions. The Department may consider it to be detrimental to the Department for a bidder to submit an obviously unbalanced unit bid price. See subsection 102.07.

102.06 Preparation of Proposal. The bidder shall submit the proposal (bid) upon the forms furnished by the Department per the "Rules" referenced in subsection 102.01.

102.07 Irregular Proposals. Proposals (bids) will be considered irregular and may be rejected for any of the following reasons:

(1) If the proposal is on a form other than that prescribed by the Department, or if the form is altered or any part thereof is detached, or if the form does not contain original signatures.

(2) If there are unauthorized additions, conditional or alternative proposals, or irregularities of any kind that may tend to make the proposal incomplete, indefinite, or ambiguous.

(3) If the bidder fails to acknowledge in the proposal the receipt of all revisions current on the date of opening of proposals.

(4) If the proposal does not contain a unit price for each pay item listed except in the case of authorized alternative pay items, the mathematical products of the respective unit prices and the estimated quantities, and the total amount of the bid obtained by adding such mathematical products.

(5) If the Department determines that any of the unit bid prices are materially unbalanced to the potential detriment of the Department. There are two types of unbalanced bids: (1) mathematically unbalanced and, (2) materially unbalanced. The mathematically unbalanced bid is a bid containing lump sum or unit pay items that do not reflect reasonable actual costs plus a reasonable proportionate share of the bidder's anticipated profit, overhead costs, and other indirect costs, but not necessarily to the detriment of the Department. These costs should all relate to the performance of the items in question. The materially unbalanced bid is a mathematically unbalanced bid that the Department determines leaves reasonable doubt that award will result in the lowest ultimate cost to the Department, or that award is in the public interest.

(6) If the Contractor submitting the bid is affiliated with another bidder that has submitted a bid on the same public project.

(7) If the bidder has been sent a notice of intent to revoke prequalification under Chapter Two of the "Rules."

(8) If the bidder has been asked in writing to show why it should not be found in default on a Department contract.

(9) If the bidder has been sent a notice of intent to debar or of suspension under Chapter Three of the "Rules."

The Department reserves the right to reject any or all bids, to waive technicalities or to advertise for new bids, if in the judgment of the Department its best interests will be promoted thereby.

102.08 Combination or Conditional Proposals. If proposal forms are issued for projects in combination and separately, the bidder may submit proposals either on the combination or on separate units of the combination. The Department reserves the right to make awards on combination or separate proposals to the advantage of the Department. Combination proposals will be considered, only when specified.

102.09 Anti-Collusion Affidavit. Every proposal (bid) submitted to the Department shall contain a statement certifying that the bidder has not participated in any collusion or taken any action in restraint of free competitive bidding. This statement shall be in the form of an affidavit provided by the Department and signed by the bidder.

The original of the signed anti-collusion affidavit, Form 606, shall be submitted with the proposal. The proposal will be rejected if it does not contain the completed Form 606.

102.10 Material Guaranty. The successful bidder may be required to furnish a complete statement of the origin, composition, and manufacture of materials used in the construction of the work together with samples, which will be tested for conformance with Contract provisions.

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SECTION 103
AWARD AND EXECUTION OF CONTRACT

103.01 Consideration of Proposals. After the proposals (bids) are opened and read, they will be evaluated, and the Contract awarded or rejected per the "Rules" referenced in subsection 102.01.

The low responsible bidder shall submit a completed CONTRACTORS PERFORMANCE CAPABILITY STATEMENT, Form 605, and a completed ASSIGNMENT OF ANTITRUST CLAIMS, Form 621, to the Award Officer before 4:30 P.M. on the fifth calendar day after the bid opening.

To be eligible for contracting with CDOT, the apparent low responsible bidder shall have an account in the B2GNow software system.

Failure to submit the Forms 605 and 621 and to have an account in the B2GNow software system may result in the denial of award to the apparent low responsible bidder and forfeiture of the proposal guaranty.

103.02 Award of Contract. If the Contract is awarded, the award will be made within 30 calendar days after the opening of proposals to the lowest bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified in writing of the acceptance of the proposal and the award of the Contract.

103.03 Requirement of Contract Bonds. At the time of the execution of the Contract, the successful bidder shall furnish a Contract Payment Bond and a Contract Performance Bond. Each bond shall be in a penal sum equal to the nearest integral one hundred dollars in excess of the sum of the original bid items plus all force account items specified in the project special provisions to be included in the payment and performance bonds. The Contract Payment Bond and the Contract Performance Bond shall remain in full force and effect for the term of the Contract. The bonds and the security shall be acceptable to the Department.

103.04 Execution and Approval of Contract. The Contract shall be signed and returned by the successful bidder together with the contract bonds, within 15 days after the date of award. If the signed Contract and bonds are returned by the successful bidder within 15 days after award and, if the Contract is not executed by the Department within 30 days from date of award, the bidder shall have the right to withdraw the proposal without penalty. The Contract will not be considered effective until it has been fully executed by all of the parties to the Contract.

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SECTION 104
SCOPE OF WORK

104.01 Intent of Contract. The Contractor shall complete the work described and furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work per the Contract. Alterations of plans or the nature of the work will not involve or require work beyond the termini of the original project, until a Contract Modification Order has been executed.

104.02 Differing Site Conditions, Suspensions of Work, and Significant Changes in the Character of Work.

(a) Differing Site Conditions. During the progress of work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the Contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the site is disturbed and before the affected work is performed.

Upon written notification, the Engineer will investigate the conditions, and if the Engineer determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment, excluding anticipated profits, will be made and the Contract modified in writing accordingly. The Engineer will notify the Contractor of the determination whether or not an adjustment of the Contract is warranted. No Contract adjustment that results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

(b) Suspensions of Work Ordered by the Engineer. If the performance of all or any portion of the work is suspended or delayed by the Engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the Contractor believes that additional compensation, contract time, or both are due as a result of such suspension or delay, the Contractor shall submit to the Engineer in writing a request for adjustment within seven calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

Upon receipt, the Engineer will evaluate the Contractor's request. If the Engineer agrees that the cost, time required, or both for the performance of the Contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the Engineer will make an adjustment (excluding profit) and modify the Contract in writing accordingly. The Engineer will notify the Contractor of the determination whether or not an adjustment of the Contract is warranted. No Contract adjustment will be allowed unless the Contractor has submitted the request for adjustment within the time prescribed.

No Contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other term or condition of this Contract.

(c) Significant Changes in the Character of Work. The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the Contract nor release the surety, and the Contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the Contract, whether such alterations or changes are in themselves significant changes to the character of the work, or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding loss of anticipated profit, will be made to the Contract. The basis for the adjustment shall be agreed upon before the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.

If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the altered work will be paid for as provided elsewhere in the Contract. The term "significant change" shall be construed to apply only to the following circumstances:

(1) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction, or

(2) When a major item of work is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed. A major item is defined to be any item having an original contract value in excess of 10 percent of the original contract amount.

104.03 Extra Work. The Contractor shall perform unforeseen work, for which there is no price included in the Contract, whenever the extra work is necessary or desirable for contract completion. This work shall be performed per the Contract and as directed and will be paid for as provided under subsection 109.04.

104.04 Maintaining Traffic. Unless otherwise provided, the Contractor shall keep the road open to all traffic per the Traffic Control Plan during the progress of the work. The Contractor shall schedule construction operations so that only one side of the existing roadbed is denied to traffic at any time. The Contractor shall also provide and maintain in a safe condition temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages, and farms. The road and the intersections of the access points shall be maintained in a manner that will safely and adequately accommodate traffic.

The Contractor shall not store materials or equipment nor park vehicles on the highway except in designated areas. The Contractor shall not have materials or equipment in the traffic lanes open to traffic at any time unless directed.

Portions of the roadway that are not included in the contract work will be maintained by the Department. Snow removal will be the responsibility of the Department. 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.

(a) *Approved Detours.* The cost of constructing detours and temporary bridges, and the removal of temporary bridges and obliteration of the detour road will be paid for at the appropriate unit bid prices for the items of work involved.

Maintenance requirements, as approved, will be paid for by the appropriate bid item; however, if a bid item does not exist, then payment will be made as provided in subsection 104.03.

(b) *Maintaining Traffic During Suspension of Work.* During any suspension ordered by the Engineer per subsection 105.01, the Contractor shall open to traffic the portions of the project as directed. Before allowing traffic on the project, the Contractor shall prepare the roadbed so that it will safely and adequately accommodate traffic. During the suspension period, the maintenance of the roadway will be the responsibility of the Department. However, when the suspension is the result of a failure by the Contractor, all costs for maintenance of traffic during the suspension period shall be borne by the Contractor. When the suspension is lifted, the Contractor shall renew any work or replace materials lost or damaged on the project and shall remove, as directed, work or materials used during the suspension. The Contractor shall complete the project as though the prosecution of the work had been continuous and without interference. All additional work caused during the suspensions, for reasons beyond the Contractor's control, will be paid for as provided in subsection 104.02 when contract unit prices exist, or as extra work as provided in subsection 104.03 when no unit price exists.

(c) *Maintaining Traffic During Free Time.* During the free time period, if provided for in the Contract, the Contractor shall be responsible for maintaining traffic control items as long as construction operations interfere with traffic. When construction operations that interfere with traffic cease, the Contractor shall notify the Engineer, in writing, and shall adhere to the same procedures as in paragraph (b) above. The Contractor shall notify the Engineer, in writing, when construction operations that interfere with traffic will resume and shall resume responsibility for maintaining traffic.

(d) *Maintenance Directed by the Engineer*. If the Engineer directs special maintenance for the benefit of the traveling public, that is not included in the Contract, the Contractor will be paid per subsection 104.02 when contract unit prices exist, or as extra work, per subsection 104.03, when no contract unit prices exist. The Engineer will determine the work to be classed as special maintenance.

104.05 Rights in and Use of Materials Found on the Work. The Engineer may authorize the Contractor's use of materials found in the excavation for completing pay items other than excavation. Payment will be made for both the excavation of such materials at the corresponding contract unit price, and for the pay item that the excavated material is used. The Contractor shall replace the removed material with acceptable material at no additional cost to the Department. The Department will not charge the Contractor royalty or additional cost of select material for the removed material. The Contractor shall not excavate or remove any material from within the roadway that is not within the grading limits, as indicated by the slope and grade lines, without written authorization from the Engineer.

Unless otherwise provided, the material from structures designated for removal shall be the Contractor's property and may be used temporarily by the Contractor in the erection of the new structure.

104.06 Final Cleaning Up. Before final acceptance, the highway, material pits, and all ground occupied by the Contractor in connection with the project shall be cleaned of all rubbish, excess materials, temporary structures, and equipment; and all parts of the work shall be left in an acceptable condition. The cost of final cleanup will not be paid for separately but shall be included in the work.

104.07 Value Engineering Change Proposals by the Contractor. The Contractor is encouraged to develop and offer proposals for improved construction techniques, alternative materials, and other innovations. Proposals must provide a project comparable to CDOT's original design either at lower cost, improved quality, or both. Proposals that lower the quality of the intended project will be rejected. Bid prices shall not be based on the anticipated approval of a Value Engineering Change Proposal (VECP). Proposals shall be submitted only by the successful bidder after contract award. If a VECP is rejected, the work shall be completed per the Contract at contract bid prices. Any delay to the project due to a VECP submittal and review shall be considered within the Contractor's control and will be nonexcusable with the exception of those delays that are approved as part of the VECP.

Proposals shall be categorized as VECP (Category A) or VECP (Category B).

VECPs (Category A) will be all proposals that involve the design and construction of a structure including but not limited to a bridge, retaining wall, concrete box culvert, or building. A VECP (Category A) will also include any proposal that would result in a change of original bid items that totals over $250,000. Alternatives investigated and not selected in the project Structural Selection Reports may be presented in a VECP if significant benefits can be demonstrated to the Engineer. In addition, design criteria and constraints listed in the Structural Selection Report cannot be modified or relaxed as part of a VECP unless significant and previously unknown benefits can be proven to the Engineer. Experimental or demonstration-type design concepts, products, structures, or elements that have not been pre-approved by CDOT, in writing, for general use will be considered a VECP (Category A). Category A proposals will also result in a realized and shared cost savings to CDOT. Cost savings generated to the Contract as a result of VECP offered by the Contractor and accepted by CDOT shall be shared between the Contractor and CDOT.

All other VECPs that do not meet the previous requirements will be classified as a VECP (Category B).

Net cost savings on VECPs that are less than $25,000 can be kept by the Contractor. Net cost savings greater than $25,000 shall be split equally between the Contractor and CDOT as defined in the Basis of Payment section of this specification.

Both VECP (Category A) and VECP (Category B) will produce savings to CDOT or provide improved project quality without impairing essential functions and characteristics of the facility. Essential functions include but are not limited to service life, requirements for planned future development, prior commitments to governmental agencies or the public, corridor requirements, economy of operation, ease of maintenance, desired appearance, safety, and impacts to the traveling public or to the environment during and after construction.

The Contractor may submit either a full VECP or a preliminary Conceptual VECP, followed by a full proposal. These proposals are subject to rejection at any time if they do not meet the criteria outlined in this subsection.

(a) Submittal of Conceptual Proposal. For a VECP (Category A) that requires a significant amount of design or other development resources, the Contractor may submit an abbreviated Conceptual Proposal for preliminary evaluation. The Engineer will evaluate the information provided. The Contractor will then be advised in writing if any conditions or parameters of the Conceptual Proposal are found to be grounds for rejection. Preliminary review of a conceptual proposal reduces the Contractor's risk of subsequent rejection but does not commit CDOT to eventual approval of the full VECP. The following information shall be submitted for each Conceptual Proposal:

1. Statement that the proposal is submitted as a Conceptual VECP.
2. General description of the difference between the existing Contract and the proposed change, and the advantages and disadvantages of each, including effects on service life, requirements for planned future development, prior commitments to governmental agencies or the public, corridor requirements, economy of operation, ease of maintenance, desired appearance, safety, and impacts to the traveling public or to the environment during and after construction. The Contractor shall request in writing the necessary information from the Engineer.
3. One set of conceptual plans and a description of proposed changes to the Contract specifications.
4. Estimate of the anticipated cost savings or increase.
5. Statement specifying the following:
    A. When a response to the conceptual proposal from the CDOT is required to avoid delays to the existing contract prosecution.
    B. The amount of time necessary to develop the full Proposal.
    C. The date that a Contract Modification Order must be executed to obtain maximum benefit from the Proposal.
    D. The Proposal's impact on time for completing the Contract.

(b) Submittal of Full Value Engineering Change Proposal. The following materials and information shall be submitted for both Category A and Category B VECPs:

1. A statement that the proposal is submitted as a VECP:
2. A description of the difference between the existing Contract and the proposed change, and the advantages and disadvantages of each, including effects on service life, requirements for planned future development, prior commitments to governmental agencies or the public, corridor requirements, economy of operation, ease and cost of maintenance, desired appearance, safety, and impacts to the traveling public or to the environment during and after construction. The Contractor shall request in writing the necessary information from the Engineer.
3. A complete set of plans and specifications showing the proposed revisions relative to the original Contract. This portion of the submittal shall include design notes and construction details. The Contractor's Engineer shall electronically seal the proposed plans and specifications.

4. A cost comparison, summarizing all of the items that the proposed VECP replaces, reduces, eliminates, adds, or otherwise changes from the original Contract work, including all impacts to traffic control, detours and all other changes. The cost comparison shall not include cost savings resulting from purportedly decreased inspection or testing requirements, or CDOT overhead. All costs and proposed unit prices shall be documented by the Contractor.
5. A statement specifying the date that a Contract Modification Order must be executed to obtain the maximum cost reduction during the remainder of the Contract and the date when a response from CDOT is required to avoid delays to the prosecution of the Contract.
6. A statement detailing the effect the Proposal will have on the time for completing the Contract.
7. A description of any previous use or testing of the proposed changes and the conditions and results. If the Proposal was previously submitted on another CDOT project, the proposal shall indicate the date, Contract number, and the action taken by CDOT.
8. An estimate of any effects the VECP will have on other costs to CDOT.
9. A statement of life cycle costs, when appropriate. Life cycle costs will not be considered as part of cost savings but shall be calculated for additional support of the Proposal. A discount rate of four percent shall be used for life cycle calculations.

(c) Evaluation. VECP will be evaluated by CDOT per the CDOT *Construction Manual*.

Additional information needed to evaluate Proposals shall be provided in a timely manner. Untimely submittal of additional information will result in rejection of the Proposal. Where design changes are proposed, the additional information shall include results of field investigations and surveys, design and computations, and changed plan sheets required to develop the design changes.

1. The Engineer will determine if a Proposal qualifies for consideration and evaluation. The Engineer may reject any Proposal that requires excessive time or costs for review, evaluation, or investigation. The Engineer may reject proposals that are not consistent with CDOT's design criteria for the project.
2. VECPs, whether or not approved by CDOT, apply only to the ongoing Contracts referenced in the Proposal and become the property of CDOT. Proposals shall contain no restrictions imposed by the Contractor on their use or disclosure. CDOT has the right to use, duplicate and disclose in whole or in part any data necessary for the utilization of the Proposal. CDOT retains the right to utilize any accepted.

   Proposal or part thereof on other projects without obligation to the Contractor. This provision is subject to rights provided by law with respect to patented materials or processes.
3. If CDOT is already considering revisions to the Contract or has approved changes in the Contract that are subsequently proposed in a VECP, the Engineer will reject the Proposal and may proceed to implement these changes without obligation to the Contractor.
4. The Contractor shall have no claim against CDOT for additional costs or delays resulting from the rejection or untimely acceptance of a VECP. These costs include but are not limited to development costs, loss of anticipated profits, increased material or labor costs, or untimely response.

5. Proposals will be rejected if equivalent options are already provided in the Contract.
6. Proposals that only reduce or eliminate contract pay items will be rejected.
7. The cost savings and other benefits generated by the Proposal must be sufficient to warrant review and processing, as determined by the Engineer.
8. A proposal changing the type or thickness of the pavement structure will be rejected.
9. No VECP proposal can be used to alter incentive and disincentive rates and maximums on Cost plus Time bid (A+B) projects.
10. Right of way cannot be bought as part of a VECP to eliminate phasing on a project.
11. A VECP changing the design of a structure may be considered by CDOT, if the design meets the following conditions:
    A. The design shall not involve detouring of traffic onto local roads or streets to an extent greater than the original plans, unless previously approved by the affected local agencies.
    B. The design has the same roadway typical section as the original plans.
    C. The design meets or exceeds the benefits of the construction-handling or traffic phasing scheme shown in the original plans.
    D. The design meets or exceeds all environmental commitments and permit requirements of the original Contract.
    E. The design shall not increase environmental impacts beyond those of the original Contract.
    F. The design meets or exceeds the vertical and horizontal clearances and hydraulic requirements shown on the original plans.
    G. The design has the same or greater flexibility as the original design to accommodate future widening.
    H. The design shall not change the location of the centerline of the substructure elements, without demonstrating substantial benefits over the original plans.
    I. The design shall not change the grade or elevation of the final riding surface, without demonstrating substantial benefits over the original plans.
    J. The design shall match corridor future development plans and architectural, aesthetic and pavement requirements, if applicable.
    K. The design shall not adversely impact CDOT's Bridge Inspection, maintenance, or other long-term costs or operations.
    L. The design shall meet all CDOT design standards and policies.
    M. The design shall include all additional costs and coordination necessary to relocate utilities.
    N. Major structure designs provided by the Contractor shall include an independent plan review and design check by a Professional Engineer licensed in the State of Colorado and employed by a firm other than the engineer-of-record. This design review will be performed at the Contractor's expense and shall be included in the Contractor's engineering costs.

O. The Contractor shall provide CDOT with all design calculations, independent design check calculations, a rating package for each bridge prepared per the current CDOT Bridge Rating Manual, and a record set of quantity calculations for each structure.

If a structure design VECP meets these and all other requirements, CDOT may, at its sole option, accept or reject the proposal.

12. The Engineer will reject all or any portion of the design or construction work performed under an approved VECP if unsatisfactory results are obtained. The Engineer will direct the removal of such rejected work and require construction to proceed under the original Contract requirements without reimbursement for work performed under the proposal, or for its removal.

(d) Basis of Payment. If the VECP is accepted, a Contract Modification Order will authorize the changes and payment. Reimbursement will be made as follows:

1. The changes will be incorporated into the Contract by changes in quantities of unit bid items, new agreed unit price items, lump sum or any combination, as appropriate, under the Contract. Unless there is a differing site condition as described in subsection 104.02, the Contractor shall not receive additional compensation for quantity overruns, design errors, supplemental surveys, geotechnical investigations, additional items, or other increases in cost that were not foreseen in the accepted VECP unless otherwise approved by the Engineer.

2. For all VECPs, the incentive payment shall be calculated as follows:

   (gross cost of deleted work) - (gross cost of added work) = (gross savings)

   (gross savings) - (Contractor's engineering costs) - (CDOT's engineering costs) = (net savings)

   Any net savings less than $25,000 can be kept by the Contractor.

   If the net savings are greater than $25,000 then the amount over $25,000 will be shared equally with CDOT and calculated as follows:

   (net savings) - $25,000 = shared savings

   Contractor's total incentive = (shared savings) /2 + $25,000

   The Contractor's engineering costs will be reimbursable only for outside consultant costs that are verified by certified billings. CDOT's engineering costs shall be actual consultant costs billed to CDOT and extraordinary in-house personnel labor costs. These labor costs will be calculated at the fixed amount of $50 per hour per employee. Project personnel assigned to the field office or who work on the project on a regular basis shall not be included in CDOT''s portion of the cost.

3. At the completion of the VECP design work, the Contractor shall furnish CDOT any additional documentation such as surveys, geotechnical reports, documentation, or calculations and shop drawings required to complete the work.

   At the completion of the project, the Contractor shall furnish CDOT with Professional Engineer electronically sealed Record sets, and As-Constructed plans showing the VECP work.

(e) Contractor Appeal Process. Appeals can be made only on VECPs (Category A). The Prime Contractor submitting the VECP may file a one-time appeal to the Region Transportation Director (RTD) on the denial of any VECP (Category A). The Contractor must have a valid reason for the appeal and the decision of the Region Transportation Director will be final.

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SECTION 105
CONTROL OF WORK

105.01 Authority of the Engineer. The Engineer will decide all questions regarding the quality and acceptability of materials furnished, work performed, and the rate of progress of the work; all interpretation of the plans and specifications; and the acceptable fulfillment of the Contract.

The Engineer will, in writing, suspend the work, wholly or in part:

(1) For failure of the Contractor to correct conditions unsafe for the workers or the general public.
(2) For failure to carry out Contract provisions.
(3) For failure to carry out orders.
(4) For periods of unsuitable weather.
(5) For conditions unsuitable for the completion of the work.
(6) For any other condition or reason determined to be in the public interest.

105.02 Plans, Shop Drawings, Working Drawings, Other submittals, and Construction Drawings.

(a) Plans. The Contract plans will show lines, grades, typical cross sections of the roadway, location and design of all structures, and summary of items appearing on the proposal. Only general features will be shown for steel and prestressed concrete bridges.

(b) Shop drawings, Working Drawings, and Other Submittals - General. All work shall be performed per the plans, reviewed shop drawings, working drawings, or other submittals. Specific requirements for the required shop drawings, working drawings, and other submittals for this project are contained in the specifications.

The Contractor shall be responsible for the accuracy of all dimensions and quantities shown on the shop drawings, working drawings, and other submittals. The Contractor shall correlate all information in the Contract, in the submittals, and in all revisions at the project site to ensure that there are no conflicts and that the work can be constructed as shown. The Contractor shall be responsible for all information that pertains to the fabrication processes and methods of construction.

Shop drawings, working drawings, and other submittals shall be delivered to the Engineer. The Contractor shall notify the Engineer, in writing, at the time of submittal of shop drawings, working drawings, and other submittals, of any information submitted that deviates from the requirements of the plans and specifications. In addition, specific notation of the deviations or changes from the plans and specifications shall be placed on the shop drawing, working drawing, or other submittal.

The first sheet or page of each set of shop drawings, working drawings, and other submittals shall be stamped “Approved for Construction” and signed and electronically sealed by the Contractor. Submittals shall be made in complete packages, which will allow the Engineer to properly review them for general compliance with the Contract and to effectively evaluate the proposed methods of construction. The allowed time for review shall not begin until such submittals are complete.

The format of the shop drawings, working drawings, and other submittals shall be as follows:

1. Electronic shop drawings and working drawings are preferred.
2. All manually drafted shop drawings and working drawings shall be 34 inches long by 22 inches wide overall. There shall be a 2-inch margin on the left side of the sheet and a 1/2-inch margin on the other three sides. A blank space, 6 inches long by 3 inches wide, shall be left available near the lower right-hand corner of shop drawings, for the Engineer's review stamp. Computer drafted 11-inch by 17-inch drawings may be submitted.
3. There shall be a title block in the lower right-hand corner of each sheet. The title block shall show the project number, structure number, the location of the structure, the contents of the sheet, designer/engineer, sheet number, and revision number.
4. Design notes, calculations, lists, reports, descriptions, catalog cuts, and other non-drawing submittals shall be submitted on 8 1/2-inch by 11-inch sheets.
5. Unless otherwise specified, seven 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.
6. Unless otherwise specified, two sets of working drawings shall be submitted to the Engineer.
7. The shop drawings, working drawings, other submittals and all revisions shall be signed and electronically sealed for the Contractor, by a professional engineer registered in the state of Colorado when required by the specifications. Submittals without the required signature and seal will not be accepted and will be returned to the Contractor without action.

   Table 105-1 summarizes the minimum required submittals is included at the end of subsection 105.02. Table 105-1 lists submittals in one location for information. The table clarifies the type of submittal and whether the Contractor's Engineer must sign and electronically seal the submittal. Table 105-1 may not be all inclusive. The Contractor shall provide all submittals required by the Contract, including those not listed in the table.

(c) Shop Drawings. The Contractor shall provide shop drawings to adequately control the work. The Contractor shall submit shop drawings to the Engineer for formal review.

The Engineer will review the shop drawings to evaluate that general conformance with the design concept and that general compliance with the information given in the plans and specifications has been achieved. The review does not extend to accuracy of dimensions, means, methods, techniques, sequences, schemes, procedures of construction, or to safety precautions. The review by the Engineer is not a complete check. Review of the shop drawings does not relieve the Contractor of the responsibility for the correctness of the shop drawings. All work done before the Engineer's review of shop drawings shall be at the Contractor's sole risk.

The Engineer may request additional details and require the Contractor to make changes in the shop drawings that are necessary to conform to the provisions and intent of the plans and specifications without additional cost to the Department.

After review, the Engineer will return two sets of shop drawings, for use by the Contractor and the Fabricator or Supplier. Returned shop drawings will be stamped with the Engineer's review stamp to indicate one of the following:

STATUS OF RETURNED SHOP DRAWINGS AND MEANINGS

Reviewed, no exception taken	Shop drawings have been reviewed and do not require additional review.
Reviewed, revise as noted	Shop drawings have been reviewed and the Contractor shall incorporate the comments noted in the shop drawings into the work. The shop drawings do not require additional review.
Resubmit, revise as noted	Shop drawings require correction or redrawing and shall be resubmitted for review. If shop drawings are returned for correction or redrawing, corrections shall be made, and the shop drawings shall be resubmitted by the Contractor in the same manner as the first submittal. Specific notation shall be made on the shop drawings to indicate the revisions.

The time required for the Engineer's review of each submittal will not exceed four weeks after a complete submittal of shop drawings is received by the Engineer. It is the intent of these specifications that no more than two submittals of shop drawings shall be required for any one particular item. If additional submittals are required by actions of the Contractor, resulting delays shall be the responsibility of the Contractor. If additional submittals are required by the Engineer's actions or if shop drawing review is delayed by the Engineer, the Contractor may request an extension of time as provided in subsection 108.08.

All revisions made to the shop drawings after the Engineer's initial review process will require resubmittal.

(d) Working Drawings. The Contractor shall supplement the plans with working drawings to detail the construction or to provide the Engineer with information on the proposed methods of construction.

Unless otherwise specified, the Contractor shall submit two sets of working drawings to the Engineer for information only. These drawings will not be formally reviewed by the Engineer. The Contractor shall submit working drawings to the Engineer10 days before the start of work. Working drawings will not be returned to the Contractor.

(e) Other Submittals. Other submittals shall be prepared and submitted by the Contractor as defined for working drawings. Unless otherwise specified, two copies shall be submitted to the Engineer for information only. The plans or specifications will indicate which submittals require formal review by the Engineer.

One record set of all design work performed by the Contractor's Engineer shall be submitted to the Project Engineer.

(f) *Construction Drawings*. The Contractor shall keep one set of plans, reviewed shop drawings, working drawings, and other submittals available on the project site at all times. This set shall be defined as the "construction drawings." The Contractor shall note on these construction drawings all changes and deviations from the work shown on the plans, shop drawings, working drawings, and other submittals. The construction drawings shall be kept current as the work progresses and notations shall be made within seven days of the change or deviation. The first sheet or page of each set of construction drawings shall be stamped "As Constructed" and signed by the Contractor.

Upon completion of the work and before final payment, the construction drawings shall be submitted to the Engineer.

The Contractor shall provide pile and caisson tip elevations and provide all refusal and restrike information, driving records and PDA information to the Engineer before proceeding with further construction for permanent archiving.

(g) *Furnishing* the shop drawings, working drawings, construction drawings, and other submittals will not be measured and paid for separately, but shall be included in the work.

(h) *Failure of the Contractor* to comply with the requirements for shop drawings, working drawings, other submittals, and construction drawings may be considered unsatisfactory contract progress. Monthly progress payments may be withheld until the requirements are met.

(i) *Except as specifically noted*, all time required for review of shop drawings, working drawings, and other submittals shall be included in the work and shall not be the basis for any claim for a time extension or monetary adjustment except as provided.

Table 105-1
CONTRACTOR SUBMITTALS
(Including Contractor Qualifications)

Section No.	Description	Type	Contractor P.E. Seal Required?	Specialty Unit Review	Review Time (working days)
202	Bridge Removal Plan	Other	Yes	Staff Bridge	10
206	Shoring	Working Drawing	Yes*	Staff Bridge‡	10
502	Piling Equipment Testing	Other	No	No	10
502	Welding	Qualifications	No	No	10
503	Assembly and Placement of Reinforcing Steel	Shop Drawing	Yes	Staff Bridge	30
503	Drilled Shafts	Qualifications	No	No	30
504	Soil Nail Wall	Qualifications	No	No	15
504	Soil Nail Wall (Contractor Alternative & Sacrificial)	Shop Drawing	Yes*†	Geotechnical	10

Table 105-1 (continued)
CONTRACTOR SUBMITTALS
(Including Contractor Qualifications)

Section No.	Description	Type	Contractor P.E. Seal Required?	Specialty Unit Review	Review Time (working days)
504	Hybrid Wall (Contractor Alternative)	Shop Drawing	Yes*	Staff Bridge	10
504	MSE Wall	Qualifications	No	No	10
504	MSE Walls (Contractor Alternative)	Shop Drawing	Yes	Staff Bridge/ Geotechnical	15
504	MSE Walls (Default Design)	Shop Drawing	No	Staff Bridge	15
504	Geomembrane and Joints	Working Drawing	No	No	10
508	Timber Structures	Shop Drawing	No	Staff Bridge	20
509	Steel Structures	Shop Drawing	Yes*	Staff Bridge	20
509 and 618	Erection Plan	Other	Yes	Staff Bridge	5
509	Fracture Critical Plan	Other	No	Staff Bridge	15
512	Bearing Devices Type II	Shop Drawing	No	Staff Bridge	15
512	Bearing Devices Type III	Shop Drawing	Yes	Staff Bridge	15
514	Pedestrian and Bikeway Railing	Working Drawing	No	No	10
518	Elastomeric Expansion Devices	Working Drawing	No	No	10
518	Expansion Devices: 0-4"	Shop Drawing	Yes	Staff Bridge	15
518	Expansion Devices: 0-6", 9", 12"...	Shop Drawing	Yes	Staff Bridge	15
518	Modular Bridge Expansion Joint Design	Other	Yes	Staff Bridge	10
518	PPC End Dam	Qualifications	No	No	15
601 and 618	Precast Panel Deck Forms	Working Drawing	No	Staff Bridge‡	10
601	Permanent Steel Bridge Deck Forms	Shop Drawing	Yes	Staff Bridge	10
601	Falsework	Working Drawing	Yes	Staff Bridge‡	10
602	Reinforcing Steel	Working Drawing	No	No	10

Table 105-1 (continued)
CONTRACTOR SUBMITTALS
(Including Contractor Qualifications)

Section No.	Description	Type	Contractor P.E. Seal Required?	Specialty Unit Review	Review Time (working days)
603	Precast Culvert	Shop Drawing	Yes*	Staff Bridge	20
606	Bridge Railing	Working Drawing	No	Staff Bridge‡	10
607	Noise Barriers (Alternative)	Shop Drawing	Yes	Staff Bridge	15
607	Noise Barriers (Default Design)	Working Drawing	No	Staff Bridge‡	10
613	Light Standards (Low Mast)	Working Drawing	Yes	Traffic	10
613	Light Standards (High Mast)	Working Drawing	Yes	Traffic	10
614	Overhead Sign Structures	Shop Drawing	Yes*	Staff Bridge/ Traffic	15
614	Variable Message Signs (Cabinet and tilting bracket)	Working Drawing	Yes	Traffic	10
614	Traffic Signal Pole (Mast Arm)	Shop Drawing	No	Staff Bridge/ Traffic	15
614	Traffic Signal Pedestal Pole	Working Drawing	Yes	Traffic	10
614	Traffic Signal Equipment	Working Drawing	No	Traffic	10
618	Prestressed Concrete (Pre-tensioned)	Shop Drawing	Yes*	Staff Bridge	20
618	Prestressed Concrete (Post-tensioned)	Shop Drawing	Yes*	Staff Bridge	10
618	Steel Diaphragms between Prestressed Girders	Working Drawing	No	Staff Bridge‡	10
618	PT Grouting	Qualifications	No	No	10
622	Buildings	Shop Drawing	Yes	Staff Bridge	Varies
628	Prefabricated Pedestrian Bridges	Shop Drawing	Yes*†	Staff Bridge	20
641	Shotcrete	Qualifications	No	No	10
641	Shotcrete	Shop Drawing	No	Geotechnical	10
715	Anchor Bolts	Working Drawing	No	Staff Bridge‡	10

Table 105-1 (continued)
CONTRACTOR SUBMITTALS
(Including Contractor Qualifications)

Section No.	Description	Type	Contractor P.E. Seal Required?	Specialty Unit Review	Review Time (working days)
Project Specials	As noted in project specials	Qualifications	No	Varies	Varies, 10 min.
Project Specials	As noted in project specials	Varies	Varies	Varies	Varies

Table 105-1 Notes: *An electronic PE seal is required where the Contractor has provided the design for the item or performed engineering to modify the details shown on the plans. The PE seal is not required where complete details are provided on the plans.

†Independent design check required for rating per Bridge Rating Manual.

‡Submittal only, no review required.

105.03 Conformity to the Contract. All work performed and all materials furnished shall conform to the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown in the Contract.

All hot mix asphalt (HMA) materials or work will be evaluated for conformity to the Contract per subsection 105.05 except HMA that is used for patching and temporary pavement.

For those items of work where working tolerances are not specified, the Contractor shall perform the work in a manner consistent with reasonable and customary manufacturing and construction practices.

When the Engineer finds that the materials furnished, the work performed, or the finished product does not conform with the Contract, but that reasonably acceptable work has been produced, the Engineer will determine the extent the work will be accepted and remain in place. If accepted the Engineer will (1) document the basis for acceptance by Contract Modification Order that will provide for an appropriate reduction in the Contract price for such work or materials not otherwise provided for in this subsection or (2) notify the Contractor in writing that the Contract unit price will be reduced per this subsection when P is 25 or less, or (3) in lieu of a price reduction, permit correction or replacement of the finished product provided the correction or replacement does not adversely affect the work.

When the Engineer finds the materials furnished, work performed, or the finished product are not in conformity with the Contract and has resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

If asphalt cement testing demonstrates that asphalt cement was acid modified or alkaline modified, the supplier will be automatically decertified. In addition, all material placed containing the acid modified or alkaline modified asphalt cement shall be removed and replaced with specification material at no cost to the Department.

Materials will be sampled and tested by the Department per the sampling and testing schedules and procedures contained in the Department's Field Materials Manual. The approximate maximum quantity represented by each sample will be as set forth in the schedules. An additional number of samples in relation to the quantity of material

represented may be selected and tested at the Engineer's discretion. The quantity represented by five consecutive random samples will constitute a lot whenever production schedules and material continuity permit. The Engineer may establish a lot consisting of the quantity represented by any number of consecutive random samples from one to seven inclusive when it is necessary to represent short production runs, significant material changes, or other unusual characteristics of the work. Tests that are determined to have sampling or testing errors will not be used.

Materials or work will be evaluated for price reduction only when deviations from specifications occur on any of the several individual tests for the lot. The several individual test values will be averaged and the percent of price reduction for the lot will be determined by applicable formula.

The formula in (1) and (2) below will be used only when the lot is represented by three to seven tests inclusive.

(1) The formula, $P = (Xn + aR - Tu)F$, will be used if a maximum limit only is specified or when the average of the several test values is above the midpoint of the specification band or above the job-mix formula value.

(2) The formula, $P = (TL + aR - Xn)F$, will be used if a minimum limit only is specified or when the average of the several test values is below the midpoint of the specification band or below the job-mix formula value.

(3) When the lot is represented by fewer than three tests, the materials will be evaluated for price reduction by the following procedure: Lots represented by two tests will be divided into two separate lots represented by one test each, as determined by the Engineer. Each lot that deviates from the specifications will be price reduced by one of the following formulas. When a maximum limit only is specified or the test value is above the maximum specified limit, the formula $P = 0.76(To - Tu)F$ will be used. When a minimum limit only is specified or the test value is below the minimum specified limit, the formula $P = 0.76(TL - To)F$ will be used. When a lot is represented by one test only, the materials will be evaluated for price reduction as described in this paragraph.

Where:

P	is the percent of reduction in contract price,
Xn	is the average of the several test values from samples taken from the lot, with "n" indicating the number of values,
a	is a variable factor to be used in "n" changes according to the following: when n is 3, a = 0.45; n is 4, a = 0.38; n is 5, a = 0.33; n is 6, a = 0.30; and n is 7, a = 0.28.
R	is the difference between the highest and lowest values in the group of several test results from the lot,
Tu	is the upper or maximum tolerance limit permitted by the specifications,
TL	is the lower or minimum tolerance limit permitted by the specifications, and
To	is the test value of the test that deviates from the specifications,
F	is price reduction factor to be applied for each element as shown in the following table:

Table 105-2
PRICE REDUCTION FACTORS

Element	Factor "F"
100 percent size sieve	1
12.5 mm (1/2") sieve and larger	1
150 µm (No. 100) sieve to 9.5 mm (3/8") sieve inclusive (except 100 percent size sieve)	3
75 µm (No. 200) sieve	6
75µm (No. 200) sieve (cover coat material)	25
Liquid Limit	3
Plasticity Index	10
Asphalt penetration	1
Asphalt residue	3
Portland Cement Concrete Pavement Fine Aggregate Sand Equivalent	0.3
Hydrated Lime Gradation	0.3
Toughness, inch-pounds, minimum	0.8
Tenacity, inch-pounds, minimum	0.8
Elastic Recovery, 25 °C, percent minimum	1.25
Ductility, 4 °C (5cm/min) cm, minimum of RTFO Residue	1.25

If P is less than 3, or a negative quantity, the material will be accepted as being in conformity. In cases where one or more elements show a positive P value, such positive values will be added, and the resulting sum will be used to determine whether the material is in conformity. If the total P value is between 3 and 25, the Engineer may require correction or may accept the material at a reduced price. If P is greater than 25, the Engineer may: (1) require complete removal and replacement with specification material at no additional cost to the Department; (2) require corrective action to bring the material into conformity at no additional cost to the Department; or (3) where the finished product is found to be capable of performing the intended purpose and the value of the finished product is not affected, permit the Contractor to leave the material in place with an appropriate price reduction to be based on engineering evaluation but not to be less than that which would have occurred had a reduction been made where P = 25.

If the P for aggregate gradation for Items 206, 304, or the gradation of hydrated lime for item 403 is 3 or greater the reduction will apply to the contract price multiplied by the Multipliers (M) listed in the following table:

Table 105-3

MULTIPLIER FOR PRICE REDUCTIONS

FOR MISCELLANEOUS ITEMS

Item Number-Name	Element	Multiplier (M)
206- Structural Backfill	Gradation	0.60
304-Aggregate Base Course	Gradation	0.60
403-Hot Mix Asphalt*	Hydrated Lime Gradation	0.60

Table 105-3 Notes: * The P value for hydrated lime shall be applied to the price of the HMA item when asphalt cement is not paid for separately. Lime gradation P values will not be combined with Pay Factors for other elements.

Table 105-4

MULTIPLIER FOR HMA
PRICE REDUCTIONS

Where Asphalt Cement is not paid for separately:

Item Number-Name	Element	Multiplier (M)
403-Stone Matrix Asphalt	Gradation, Asphalt Cement Content, or Compaction	0.60
403-Hot Mix Asphalt*	Hydrated Lime Gradation	0.60

Table 105-4 Notes: * The P value for hydrated lime shall be applied to the price of the HMA item. Lime gradation P values will not be combined with Pay Factors for other elements.

The following equation shows how the Multiplier is used to determine the price reduction.

Price reduction = (P/100) • Multiplier • Price per Unit • Quantity.

If no multiplier is listed no adjustment to the computed P is required. This is equivalent to a multiplier of one.

Price reduction for those elements that are not included in the Table of Price Reduction Factors will be determined by the Engineer.

The Contractor will not have the option of accepting a price reduction in lieu of producing specification material. Continued production of non-specification material will not be permitted. Material that is obviously defective may be isolated and rejected without regard to sampling sequence or location within a lot.

(a) *Retroreflectivity of High Build Acrylic Waterborne Paint and Modified Epoxy Pavement Marking*. Retroreflectivity of High Build Acrylic Waterborne Paint and Modified Epoxy Pavement Marking shall be tested as follows:

1. The Contractor shall take retroreflectivity readings on all high build acrylic waterborne paint and modified epoxy pavement marking lines for each day of roadway striping work completed on the project. A test section is defined as each continuous line type (lane lines, centerlines, edge lines, channelizing lines, and others) 500 feet in length at a location that is selected by the Engineer using a Random Number Generator, which will be the representation of the work that has been completed in a single day. The Contractor shall use a Contractor-furnished retroreflectometer conforming to American Society for Testing and Materials (ASTM) E1710 or American Association of State Highway and Transportation Officials (AASHTO) TP111. The retroreflector meter shall be calibrated, tested and operated per manufacturer recommendations. The Contractor shall take 10 retroreflectivity readings within the test section for each stripe. These 10 readings shall be taken approximately 40 feet apart and shall be averaged to determine the retroreflectivity of that test section of striping. In cases where striping is less than 500 feet long, 10 readings shall be taken in 10 equal intervals.

2. The calibration for the retroreflector meter shall be witnessed and verified by the Engineer every day, before the readings being taken. The retroreflectivity readings shall be taken in the presence of the Engineer no sooner than 3 days and no later than 21 days after the marking is tack free. All scheduled readings within this timeline or beyond resulting in a reduced reading or failure will be at the risk of the Contractor. Initial minimum retroreflectivity reading (mcd/m2/lux) in the representative test section of pavement marking paint shall be according to table 105-5. The pay factor for High Build Acrylic Waterborne Paint and Modified Epoxy Pavement Marking that is allowed to remain in place at a reduced price, shall be according to the following table and shall be applied to the unit bid price for Item 627, High Build Acrylic Waterborne Paint and Modified Epoxy Pavement Marking, and applied to the work completed in the respective day.

Table 105-5

PRICE REDUCTIONS FOR RETROREFLECTIVITY

Retroreflectivity Reading (R) in the representative test section (mcd/m^2/lux**)**

Color	Modified Epoxy	High Build Acrylic Waterborne Paint	Pay Factor (%)
White	$R \geq 350$	$R \geq 300$	100
White	$300 \leq R < 350$	$250 \leq R < 300$	75
White	$R < 300$	$R < 250$	Remove and replace
Yellow	$R \geq 200$	$R \geq 150$	100
Yellow	$150 \leq R < 200$	$100 \leq R < 150$	75
Yellow	$R < 150$	$R < 100$	Remove and replace

3. Before taking retroreflectivity readings, the Contractor shall remove at the retroreflectivity reading locations any excess beads placed during marking application.

4. Retroreflectivity readings may be altered by chip seals, rumble strips, wet surfaces, ice treatment, snow conditions, or abnormal pavement conditions. If the Engineer determines that accurate reading cannot be taken within the specified timeline per the manufacturer's recommendations, through no fault of the Contractor, the Engineer may waive the requirements for testing and pay reduction.

5. Any and all work, including traffic control required for retroreflectivity readings, shall be included in the cost of the unit bid price for Item 627.

(b) Violation of Working Time Limitation.

If there is a violation of the working time limitations for traffic control as set forth in the special provisions, a written notice to stop work will be imposed on the Contractor at the start of the next working day. Work shall not resume until the Contractor assures the Engineer, in writing, that there will not be a reoccurrence of the working time violation. If more violations take place, the Engineer will notify the Contractor in writing that there will be a price reduction charge for each incident per this specification. This incident price reduction charge will be deducted from any money due the Contractor. This price reduction will not be considered a penalty but will be a price reduction for failure to perform traffic control in compliance with the Contract.

An incident is any violation up to 30 minutes in duration. Each 30 minutes or increment thereof will be considered as an incident. A price reduction will be assessed for each successive or cumulative 30-minute period in violation of the working time limitations, as determined by the Engineer. The price reduction for each incident will increase at a progressive rate starting with $150 for the second incident and increasing to $1,200 for the fifth and subsequent incidents per the following schedule. A 15-minute grace period will be allowed at the beginning of the second incident on the project before the price reduction is applied. This 15-minute grace period applies only to the second incident.

The number of incident charges will be accumulative throughout the duration of the Contract.

Table 105-6

VIOLATION OF THE WORKING TIME LIMITATIONS

PRICE REDUCTION SCHEDULE

Incident	Incident Rate	Total Price Reduction
First	Notice to Stop Work	----
Second	$150	$150
Third	$300	$450
Fourth	$600	$1,050
Fifth	$1,200	$2,250
Sixth	$1,200	$3,450
> Sixth	$1,200	$4,650

105.04 Conformity to the Contract of Superpave Performance Graded Binders. Asphalt binders will be price reduced according to the following if the requirements of subsection 702.01 are not met:

TABLE 105-7

PERFORMANCE GRADED BINDER LIMITS

Property	Specification	Compliance Limit for Price Reduction of 0%	Rejection Limit, Price Reduction = 25%
G*sin (delta) of RTFO Residue	2.20 Min	1.87 Min	< 1.53
Slope (m-value) of the Creep Curve at Low Grade Temperature + 10° C.	0.300 Min	0.295 Min	< 0.266
Stiffness of the PAV Residue at Low Grade Temperature + 10° C, (Mpa)	300 Max	311 Max	>355

The price reduction will be 25 percent at the rejection limit. Between the compliance limit and the rejection limit, the price reduction will be calculated as follows:

$$PR = 25 \bullet \left[\frac{CL - \text{test value}}{CL - RL} \right]$$

Where: PR = Price Reduction
CL = Compliance Limit
RL = Rejection Limit

(a) The price reductions will be cumulative if more than one PG binder property specified in the Table of Performance Graded Binder Limits is out of specification, resulting in P (total). When binder is included in the contract unit price for HMA, the price reduction will be calculated as follows:
Amount of Reduction = [P (total)] ● [(1/100) ● (Invoice Price for PG Binder)]

When the binder is paid for separately, the total price reduction will be calculated as follows:

Amount of Reduction = [P(total)] ● [(1/100) ● (Contract Unit Price for PG Binder)]

(b) Price reductions based on the "F" factors in the Table of Price Reduction Factors described in subsection 105.03 will be in addition to the PG binder price reductions. Other binder requirements listed in the Table of Performance Graded Binder Limits but not price reduced in subsections 105.03 or 105.04 may be tested but will not be considered for price reduction calculations. However, the Contractor will not be allowed to continue to produce mix with out of specification PG binder. If two consecutive samples fail to meet all requirements

listed in the Table of Performance Graded Binder Limits, the Contractor shall take corrective action before being allowed to continue production of hot mix asphalt. If proper corrective measures cannot be readily determined, the Engineer will suspend the use of such material until the Engineer can determine from laboratory tests that the Contractor can provide material that is in compliance with the Table of Performance Graded Binder Limits.

(c) The Contractor will not have the option of accepting a price reduction in lieu of producing specification material. Continued production of non-specification material will not be permitted. Material that is obviously defective may be isolated and rejected without regard to sampling sequence or location within a lot.

105.05 Conformity to the Contract of Hot Mix Asphalt. Conformity to the Contract of all Hot Mix Asphalt, Item 403, except Hot Mix Asphalt (Patching) and temporary pavement will be determined by tests and evaluations of elements that include asphalt content, gradation, in-place density, and joint density per the following:

All work performed and all materials furnished shall conform to the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown in the Contract.

When the Engineer finds the materials or work furnished, work performed, or the finished product are not in conformity with the Contract and has resulted in an inferior or unsatisfactory product, the work or material shall be removed and replaced or otherwise corrected at the expense of the Contractor.

Materials will be sampled randomly and tested by the Department per subsection 106.05 and with the applicable procedures contained in the Department's Field Materials Manual. The approximate maximum quantity represented by each sample will be as set forth in subsection 106.05. Additional samples may be selected and tested as set forth in subsection 106.05 at the Engineer's discretion.

A process will consist of either a single test value or a series of values resulting from related tests of an element of the Contractor's work and materials. An element is a material or workmanship property that can be tested and evaluated for quality level by the Department approved sampling, testing, and analytical procedures. All materials produced will be assigned to a process. A change in process is defined as a change that affects the element involved. For any element, with the exception of the joint density element, a process normally will include all produced materials associated with that element before a change in the job mix formula (Form 43). For joint density, a new process will be established for each new layer of pavement or for changes in joint construction. Density measurements taken within each compaction test section will be a separate process. The Engineer may separate a process in order to accommodate small quantities or unusual variations.

Evaluation of materials for pay factors (PF) will be done using only the Department's acceptance test results. Each process will have a PF computed per the requirements of this Section. Test results determined to have sampling or testing errors will not be used.

Except for in-place density measurements taken within a compaction test section, any test result for the asphalt content, in-place density or joint density element greater than the distance 2 x V (see Table 105-8) outside the tolerance limits will be designated as a separate process and the quantity it represents will be evaluated per subsection 105.05(a). An element pay factor less than zero shall be zero. The calculated PF will be used to determine

the Incentive/Disincentive Payment (I/DP) for the process per 105.05(e) Evaluation of Work.

In the case of in-place density or joint density, the Contractor will be allowed to core the exact location (or immediately adjacent location for joint density) of a test result more than 2 times V outside the tolerance limit. The core must be taken and furnished to the Engineer within eight hours after notification by the Engineer of the test result. The result of this core will be used in lieu of the previous test result. Cores not taken within eight hours after notification by the Engineer will not be used in lieu of the test result. All costs associated with coring shall be at the Contractor's expense.

(a) Representing Small Quantities. When it is necessary to represent a process by only one or two test results, PF will be the average of PFs resulting from the following:

If the test result is within the tolerance limits, then

PF = 1.00

If the test result is above the maximum specified limit, then

$PF = 1.00 - [0.25(T_O - T_U)/V]$

If the test result is below the minimum specified limit, then

$PF = 1.00 - [0.25(T_L - T_O)/V]$

Where: PF =pay factor.

V = V factor from Table 105-8.

T_O = the individual test result.

T_U = upper specification limit.

T_L = lower specification limit.

The calculated PF will be used to determine the I/DP for the process.

(b) Determining Quality Level. Each process with three or more test results will be evaluated for a quality level (QL) per Colorado Procedure (CP) 71.

(c) Gradation Element. Each specified sieve, with the exception of 100 percent passing sieves, will be evaluated for QL separately. The lowest calculated QL for a sieve will be designated as the QL for gradation element for the process.

(d) Joint Density Element. Joint Density will be tested according to subsection 401.17.

(e) Process Pay Factor. Using the calculated QL for the process, compute the PF as follows: The final number of random samples (Pn) in each process will determine the final pay factor. As test values are accumulated for each process, Pn will change accordingly. When the process has been completed, the number of random samples it contains will determine the computation of PF, based on Table 105-9 and formula (1) below. When Pn is from 3 to 9, or greater than 200, PF will be computed using the formulas designated in Table 105-9. Where Pn is equal to or greater than 10 and less than 201, PF will be computed by Formula (1):

$$PF = \frac{PF_1 + PF_2}{2} + \left[\frac{PF_2 + PF_3}{2} - \frac{PF_1 + PF_2}{2}\right] \bullet \frac{(Pn_2 - Pn_X)}{(Pn_2 - Pn_3)}$$

Formula (1)

Where, when referring to Table 105-9:

PF_1=PF determined at the next lowest Pn formula using process QL
PF_2=PF determined using the Pn formula shown for the process QL
PF_3=PF determined at the next highest Pn formula using process QL
Pn_2=the lowest Pn in the spread of values listed for the process Pn formula
Pn_3=the lowest Pn in the spread of values listed for the next highest Pn formula
Pn_x=the actual number of test values in the process

When evaluating the item of Furnish Hot Mix Asphalt, the PF for the element of In-Place Density shall be 1.0.

Regardless of QL, the maximum PF in relation to Pn is limited per Table 105-9.

As test results become available, they will be used to calculate QL and PF numbers for each process. The process I/DPs will then be calculated and accumulated for each element and for the item. The test results and the accumulated calculations will be made available to the Contractor upon request.

Numbers from the calculations will be carried to significant figures and rounded according to AASHTO Standard Recommended Practice R-11, Rounding Method.

(f) Evaluation of Work. When the PF of a process is 0.75 or greater, the finished quantity of work represented by the process will be accepted at the appropriate pay factor. If the PF is less than 0.75, the Engineer may:

(1) Require complete removal and replacement with specification material at the Contractor's expense; or

(2) Where the finished product is found to be capable of performing the intended purpose and the value of the finished product is not affected, permit the Contractor to leave the material in place. If the material is permitted to remain in place, the PF for the process will not be greater than 0.75. The Region Materials Engineer (RME) will be consulted before determining the material will be allowed to remain in place. The RME will also be consulted to assist in determining an appropriate pay factor.

When condition red, as described in subsection 106.05(g), exists for any element, resolution and correction will be per Section 106.05(g). Material that the Engineer determines is defective may be isolated and rejected without regard to sampling sequence or location within a process.

If removal and replacement is required because the joint density PF for a process is below 0.75, the Contractor shall remove and replace the full lane width adjacent to and including at least 6 inches beyond the visible joint line for the entire length of joint representing the process. If the lane removed is adjacent to another joint, that joint shall also be removed to a point 6 inches beyond the visible joint line. When a single joint density core is more than 2V outside the tolerance limits, the removal and replacement limits shall be identified by coring the failing joint at 25-foot intervals until two successive cores are found to be 1V or less below the minimum tolerance limit. If removal and replacement is required, the Contractor shall submit documentation identifying the process to be used to correct the area in question in writing. The process will be approved by the Engineer before commencing the corrective work.

Table 105-8
"W" AND "V" FACTORS FOR VARIOUS ELEMENTS

Hot Mix Asphalt

Element	V Factor	W Factor
2.36 mm (No. 8) mesh and larger sieves	2.8	N/A
600 µm (No. 30) mesh sieve	1.8	N/A
75 µm (No. 200) mesh sieve	0.8	N/A
Gradation	N/A	15
Asphalt Content	0.2	25
In-place Density	1.1	45
Joint Density	1.6	15

Table 105-9
FORMULAS FOR CALCULATING PF BASED ON Pn

Pn	When Pn as shown at left is 3 to 9, or greater than 200, use designated formula below to calculate Pay Factor, PF = ..., when Pn is 10 to 200, use formula (1) above:	Maximum PF
3	$0.31177 + 1.57878 (QL/100) - 0.84862 (QL/100)^2$	1.025
4	$0.27890 + 1.51471 (QL/100) - 0.73553 (QL/100)^2$	1.030
5	$0.25529 + 1.48268 (QL/100) - 0.67759 (QL/100)^2$	1.030
6	$0.19468 + 1.56729 (QL/100) - 0.70239 (QL/100)^2$	1.035
7	$0.16709 + 1.58245 (QL/100) - 0.68705 (QL/100)^2$	1.035
8	$0.16394 + 1.55070 (QL/100) - 0.65270 (QL/100)^2$	1.040
9	$0.11412 + 1.63532 (QL/100) - 0.68786 (QL/100)^2$	1.040
10 to 11	$0.15344 + 1.50104 (QL/100) - 0.58896 (QL/100)^2$	1.045
12 to 14	$0.07278 + 1.64285 (QL/100) - 0.65033 (QL/100)^2$	1.045
15 to 18	$0.07826 + 1.55649 (QL/100) - 0.56616 (QL/100)^2$	1.050
19 to 25	$0.09907 + 1.43088 (QL/100) - 0.45550 (QL/100)^2$	1.050
26 to 37	$0.07373 + 1.41851 (QL/100) - 0.41777 (QL/100)^2$	1.055
38 to 69	$0.10586 + 1.26473 (QL/100) - 0.29660 (QL/100)^2$	1.055
70 to 200	$0.21611 + 0.86111 (QL/100)$	1.060
$\geq$ 201	$0.15221 + 0.92171 (QL/100)$	1.060

(g) Process I/DP Computation.

I/DP = (PF - 1)(QR)(UP)(W/100)

Where: I/DP=Incentive or Disincentive Payment

PF = Pay Factor

QR = Quantity in Tons of HMA Represented by the Process

UP = Unit Bid Price of Asphalt Mix

W = Element factor from Table 105-8

When AC is paid for separately UP shall be:

$UP = [(Ton_{HMA})(UP_{HMA}) + (Ton_{AC})(UP_{AC})] / Ton_{HMA}$

Where: Ton_{HMA}=Tons of Asphalt Mix

UP_{HMA} = Unit Bid Price of Asphalt Mix

Ton_{AC} = Tons of Asphalt Cement

UP_{AC} = Unit Bid Price of Asphalt Cement

For the joint density element:

$UP = UP_{HMA}$

Where: UP_{HMA} is as defined above

When AC is paid for separately UP shall be:

$UP=[(BTon_{HMA})(BUP_{HMA})+(BTon_{AC})(BUP_{AC})] / (BTon_{HMA})$

Where: $BTon_{HMA}$=Bid Tons of Asphalt Mix

BUP_{HMA} = Unit Bid Price of Asphalt Mix

$BTon_{AC}$ = Bid Tons of Asphalt Cement

BUP_{AC} = Unit Bid Price of Asphalt Cement

(h) Element I/DP. The I/DP for an element shall be computed by accumulating the process I/DPs for that element.

(i) I/DP for a Mix Design. The I/DP for a mix design shall be computed by accumulating the process I/DPs for the asphalt content, in-place density, and gradation elements for that mix design. The accumulated quantities of materials for each element must be the same at the end of I/DP calculations for a mix design.

(j) Project I/DP. The I/DP for the project shall be computed by accumulating the mix design I/DPs and the joint density I/DPs. The accumulated quantities of materials for each element must be the same at the end of I/DP calculations for the project.

105.06 Conformity to the Contract of Portland Cement Concrete Pavement. Conformity to the Contract of all Portland Cement Concrete Pavement, Item 412, will be determined per the following:

When the Engineer finds that the materials furnished, the work performed, or the finished product does not conform to the Contract, or the Pay Factor (PF) for an element's process is less than 0.75 but that reasonably acceptable work has been produced, the Engineer will

determine the extent of the work that will be accepted and remain in place. The Engineer will use a Contract Modification Order to document the justification for allowing the work to remain in place and the price adjustment that will be applied.

When the Engineer finds the materials furnished, work performed, or the finished product is not in conformity with the Contract, or the PF for an element's process is less than 0.75 and has resulted in an inferior or unsatisfactory product, the work or material shall be removed and replaced or otherwise corrected by and at the expense of the Contractor. When the PF for any process is 0.75 or greater, the finished quantity of work represented by the process will be accepted at the calculated pay factor.

Materials will be sampled and tested by the Contractor and the Department per subsection 106.06 and with procedures contained in the Department's Field Materials Manual. The approximate quantity represented by each sample will be as set forth in subsection 106.06, Tables 106-2 and 106-3. Additional samples may be selected and tested at the Engineer's discretion.

(a) Incentive and Disincentive Payments (I/DP) will be made based on a statistical analysis that yields Pay Factors (PF) and Quality Levels (QL). The PF and QL will be made based on test results for the elements of compressive strength and pavement thickness (compressive strength criteria) or the elements of flexural strength and pavement thickness (flexural strength criteria). The Department will indicate in the plans whether compressive strength or flexural strength criteria will be used. If the acceptance criteria are not indicated, flexural strength criteria shall be used.

Incentive or Disincentive payment will not be made for thickness of concrete pavement furnished by the Contractor and placed by others.

When compressive strength criteria are indicated, then the QL will be calculated for the elements of compressive strength and pavement thickness on a process basis. When flexural strength criteria are indicated, then the QL will be calculated for the elements of flexural strength and pavement thickness on a process basis. A process will consist of the test results from a series of random samples. Test results determined to have sampling or testing errors will not be used. All materials produced will be assigned to a process. Changes in mix design, design pavement thickness, or a break of more than 120 working days between placements will create a new process. The following is provided to clarify changes in processes for each element:

1. Construction of mainline pavement, including the shoulders if placed with the mainline, is a single process for the compressive or flexural strength element, when the mix design does not change and there is not a break of more than 120 days between placements.
2. Construction of mainline pavement, including the shoulders if placed with the mainline, is a single process for the thickness element, when the planned thickness does not change and there is not a break of more than 120 days between placements.
3. Construction of ramps, acceleration and deceleration lanes and shoulders placed separately are considered separate processes.
4. Changes in paving equipment, changes in placement method, changes in hauling equipment, adjustments to mix designs that do not require a new mix design, changes in weather conditions, and changes in production rate shall not create a new process in the strength or thickness elements.

The Contractor and Engineer will determine element processes and what distinguishes them as processes during the Pre-pave meeting before concrete placement.

(b) When it is necessary to represent material by one or two tests, each individual test shall have a PF computed per the following:

If the value of the test is at or above the lower tolerance limit, then PF = 1.000. If the value of the test is below the lower tolerance limit, then:

$PF = 1.00 - [0.25(T_L - T_0)/V]$

where: PF = pay factor.

V = V factor from Tables 105-4 or 105-5.

T_0 = the individual test value.

T_L = lower tolerance limit.

(c) The following procedures will be used to compute Incentive and Disincentive Payments (I/DP), quality levels (QL), and pay factors (PF) for processes represented by three or more tests:

1. Quality Level (QL) will be calculated according to CP-71.
2. Compute the PF for the process. When the process has been completed, the number of tests (Pn) it includes shall determine the formula to be used to compute the final pay factor per the following:

   A. For pavement thickness:

   When $3 \le Pn \le 5$

   If $QL \ge 85$, then $PF = 1.00 + (QL - 85)0.001333$

   If $QL < 85$, then $PF = 1.00 + (QL - 85)0.005208$

   When $6 \le Pn \le 9$

   If $QL \ge 90$, then $PF = 1.00 + (QL - 90)0.002000$

   If $QL < 90$, then $PF = 1.00 + (QL - 90)0.005682$

   When $10 \le Pn \le 25$

   If $QL \ge 93$, then $PF = 1.00 + (QL - 93)0.002857$

   If $QL < 93$, then $PF = 1.00 + (QL - 93)0.006098$

   When $Pn \ge 26$

   If $QL \ge 95$, then $PF = 1.00 + (QL - 95)0.004000$

   If $QL < 95$, then $PF = 1.00 + (QL - 95)0.006757$

   B. For compressive strength and flexural strength:

   When $3 \le Pn \le 5$

   If $QL \ge 85$, then $PF = 1.00 + (QL - 85)0.002000$

   If $QL < 85$, then $PF = 1.00 + (QL - 85)0.005208$

When $6 \le Pn \le 9$

If $QL \ge 90$, then $PF = 1.00 + (QL - 90)0.003000$

If $QL < 90$, then $PF = 1.00 + (QL - 90)0.005682$

When $10 \le Pn \le 25$

If $QL \ge 93$, then $PF = 1.00 + (QL - 93)0.004286$

If $QL < 93$, then $PF = 1.00 + (QL - 93)0.006098$

When $Pn \ge 26$

If $QL \ge 95$, then $PF = 1.00 + (QL - 95)0.006000$

If $QL < 95$, then $PF = 1.00 + (QL - 95)0.006757$

3. Compute the I/DP for the process:

   I/DP = (PF-1)(QR)(UP)

   where: QR = Quantity Represented by the process.
   UP = Unit Price bid for the Item.

   The total I/DP for an element shall be computed by accumulating the individual I/DP for each process of that element.

(d) As acceptance test results become available, they will be used to calculate accumulated QL and Incentive and Disincentive Payments (I/DP) for each element and for the item. The Contractor's test results, and the accumulated calculations shall be made available to the Engineer upon request. The Engineer's test results, and the calculations will be made available to the Contractor as early as reasonably practical. Numbers from the calculations shall be carried to significant figures and rounded according to AASHTO Standard Recommended Practice R-11, Rounding Method.

I/DP will be made to the Contractor per subsection 412.24(a). During production, interim I/DP will be computed for information only. The Pn will change as production continues and test results accumulate. The Pn at the time and I/DP is computed shall determine the formula to be used.

(e) The Contractor shall not have the option of accepting a price reduction or disincentive in lieu of producing specification material. Continued production of non-specification material will not be permitted. Material that is obviously defective may be isolated and rejected without regard to sampling sequence or location within a process.

(f) When compressive strength is indicated, the Contractor may take cores at his own expense and per Colorado Procedure 65 to provide an alternative determination of strength to replace acceptance test results with a compressive strength less than 4,500 psi. The higher value of the 28-day compressive strength of acceptance cylinders or the corresponding core's compressive strength will be used for I/DP.

When flexural strength is indicated in the Contract, the Contractor shall, in the presence of the Engineer, develop a correlation curve during the first week of concrete placement per AASHTO T198 (ASTM C496) Splitting Tensile Strength of Cylindrical Concrete Specimens. At least three splitting tensile strength specimens and four flexural strength specimens will be tested at 3, 7, 14, and 28 days. The splitting tensile strength and flexural strength specimens for each age used to develop the correlation curve shall be cast from the same batch of concrete being placed on the project.

When flexural strength is indicated, the Contractor may take cores at his own expense and per Colorado Procedure 65 to provide an alternative determination of strength to replace PC/OA test results with a flexural strength less than 570 psi. The cores for the alternate flexural strength evaluation shall be obtained after 28 days, but before 45 days following placement. The higher value of the 28-day flexural strength of PC/OA beams or the corresponding core's flexural strength will be used for I/DP.

At any time during production, the Engineer may request a verification of the correlation curve developed during the first week of production. Verification of the curve shall be done by casting three splitting tensile specimens by the Department and testing them at the Region or Central Lab. The flexural strength of the correlated splitting tensile samples shall be compared to the Contractor PC flexural strength results cast from the same batch. For verification, both flexural strength specimens and splitting tensile specimens will be tested at 28 days. If the correlated flexural strength of the splitting tensile sample is not within 50 psi of the verification beam specimen's flexural strength, a new correlation curve shall be developed within 3 days for future low strength evaluations. The new correlation curve will be used for any future low flexural strength evaluations that result from concrete placed on or after the date the new correlation curve specimens are cast.

Table 105-10
"V" FACTORS AND INCENTIVE PAYMENTS
COMPRESSIVE STRENGTH CRITERIA

Element	V factor	Maximum Incentive Payment	Lower Tolerance Limit, T_L	Plan Value
Compressive Strength	400 psi	3.00 %	4500 psi	4500 psi
Pavement Thickness	0.4 inch	2.00 %	Plan Thickness -0.4 inch	Plan Thickness

Table 105-11
"V" FACTORS AND INCENTIVE PAYMENTS
FLEXURAL STRENGTH CRITERIA

Element	V factor	Maximum Incentive Payment	Lower Tolerance Limit, T_L	Plan Value
Flexural Strength	50 psi	3.00 %	570 psi	650 psi
Pavement Thickness	0.4 inch	2.00 %	Plan Thickness -0.4"	Plan Thickness

(g) *Sand Equivalence*. The sand equivalence (SE) as determined by CP 37 will be considered acceptable when the running average of three consecutive tests is greater than 80 percent and no individual test result is less than 75 percent. When the running average of three consecutive SE tests falls below 80 percent or an individual SE test result falls below 75 percent, paving operations shall be suspended. The Contractor shall submit a written plan to correct the low SE test results to the Engineer for approval. The Contractor shall not continue paving operations until the Engineer approves the plan in writing and three SE test results from random samples in the stockpile are above 80 percent.

(h) *Pavement Surface Texture.* The Contractor shall perform process control (PC) testing for the pavement surface texture depth per CP 77 Method B. All PC results for surface texture depth measurements shall be included in the Contractor's QC notebook. The start of PC testing for texturing depth shall be completed within 24 hours after the first 500 linear feet of textured pavement is placed for each lane. Paving shall not proceed until results are accepted by the Engineer.

Surface texture will be considered acceptable when the average texture depth (ATD) of the panel is greater than 0.05 inch. When the ATD is less than 0.05 inches, the Contractor shall determine the area represented by this test. The area shall be determined by taking additional tests at 15-foot intervals parallel to the centerline in each direction from the affected location until two consecutive tests are found to be within the specified limits. Any surface with unacceptable texturing exceeding 25 linear feet in any lane or shoulder greater than 8 feet wide shall be diamond ground full width of the lane. Upon the second unacceptable test result, the Contractor shall notify the Engineer, in writing, of the action taken to provide an acceptable surface texture.

The Department will perform surface texture acceptance testing per CP 77 Method B. The Department will determine the panel locations where acceptance test measurements are to be taken. One stratified random acceptance test per 2,500 linear feet or fraction thereof in each lane and shoulder wider than 8 feet shall be taken with a minimum of one test per day when the Contractor is paving.

When the Department locates areas of surface texture that do not meet the minimum ATD, the Contractor will be notified, and the Contractor shall identify the limits of the deficient texture depth. After the Engineer approves the limits, the Contractor shall correct the deficient surface texture by diamond grinding full lane width to provide an ATD greater than 0.05 inch at no additional cost to the project. The Contractor shall correct surface texture deficiencies before pavement smoothness testing and pavement thickness determinations.

105.07 Conformity to Roadway Smoothness Criteria. Roadway smoothness testing and corrective work shall be performed as described below. The pavement smoothness category shall be MRI Category II unless shown otherwise on the plans.

At least two weeks before the Pre-paving Conference the Contractor may request a change to the pavement smoothness category based on the CDOT's Design Bulletin guidelines for assigning pavement smoothness categories . The Contractor shall not assume a change will be granted and shall be prepared to build the pavement according to the assigned smoothness category. Once paving operations have been started, a change in pavement smoothness category will not be made.

(a) Smoothness Process Control Testing.

1. The Contractor shall perform Smoothness Process Control (SPC) testing. The test results shall be submitted to the Engineer within 48 hours of completion. SPC test results shall show the Mean Roughness Index (MRI) for each 0.10 mile.

   All traffic control costs associated with SPC testing will be paid for per Section 630.

   SPC testing shall be performed on the first 2,000 tons for the final layer of HMA or each day's paving within 24 hours after the concrete has achieved sufficient strength for PCCP. SPC testing on SMA will be tested after the sheen has been worn off. The Contractor may continue paving at his own risk. The Contractor shall not perform the SQC testing until after the concrete has attained a compressive strength of 1,000 psi if a lightweight profiler is used or 2,000 psi if a high-speed profiler is used.

   SPC testing shall be performed using the Contractor's inertial profiler, pursuant to the methods described in subsection 105.07(b). The Contractor's Inertial Profiler and Operator shall be certified according to CP 78. This link has a list of certified profilers and operators.

   Production shall be suspended if SPC testing indicates that corrective work is required per subsection 105.07(e). If the SPC data becomes available after production has started for the day, suspension will begin at the end of that production day for HMA. Production will remain suspended until the problem is identified and corrected. Each time production is suspended, corrective actions shall be proposed in writing by the Contractor. Production shall not resume until the proposed corrective actions have been accepted by the Engineer in writing.

   When production resumes, the Contractor shall profile the first 2,000 tons of HMA or each day's paving within 24 hours after the concrete has achieved sufficient strength for PCCP. The conditions described above for suspension of work will apply.

2. The finished transverse and longitudinal surface elevation of the pavement shall be measured using a 10-foot straightedge. Areas to be measured will be directed by the Engineer. The Contractor shall furnish an approved 10-foot straightedge, depth gauge, and operator to aid the Engineer in testing the pavement surface. Areas showing high spots of more than 3/16 inch in 10 feet shall be marked and diamond ground until the high spot does not exceed 3/16 inch in 10 feet.

(b) Initial Smoothness Acceptance Testing. The Contractor shall perform Smoothness Acceptance Testing (SA) that will be used for acceptance and calculation of incentive adjustments.

The Contractor shall submit a Method for Handling Traffic (MHT) to the Engineer for approval at least five days in advance of SA testing. The MHT shall detail the methods for traffic control that will allow for continuous non-stop profiling of each lane to be profiled at a minimum speed of 15 mph and for the placement of triggers. The Contractor shall provide the traffic control per the approved MHT. SA testing shall not be performed without traffic control using the approved MHT.

All traffic control costs associated with SA testing will be paid for per Section 630.

Pavement surfaces shall be tested and accepted for longitudinal smoothness as described.

1. Testing Procedure (General). The longitudinal surface smoothness of the final pavement surface shall be tested by the Contractor per CP 74 and using the Contractor's inertial profiler (profiler). The Contractor's Profiler and Operator shall be certified according to CP 78. This link has a list of certified profilers and operators.

   The profiler's instrumentation shall be verified per CP 74 before measurements. The Contractor shall lay out a distance calibration site. The distance calibration site shall be located no more than 10 miles from the project limits. The distance calibration site shall be 1056.0 feet long and shall be on a relatively flat, straight section of pavement as approved by the Engineer. The site shall have a speed limit equal to the project's highest speed limit that allows for the profiler to operate uninterrupted. The limits of the site shall be clearly marked, and the distance shall be measured to an accuracy of +/- 1 inch. The Contractor shall provide in writing the site location to the Engineer. The cost of the distance calibration site will not be measured and paid for separately but shall be included in the work.

   The entire length of each through lane, climbing lane and passing lane including bridge approaches, bridge decks and intersections from the beginning to the end of the project shall be profiled in their planned final configuration and direction. Shoulders with a width of 12 feet or greater, ramps, tapers, turn slots, acceleration lanes and deceleration lanes will be profiled, but will not be subject to incentive adjustments. Shoulders with a width of 12 feet or more, ramps, tapers, turn slots, acceleration lanes and deceleration lanes will be evaluated for MRI and shall require corrective work if a 0.10 mile or fraction thereof section exceeds an MRI greater than 100.0 in/mile. The profile of the entire length of a lane shall be taken at one time. However, a lane profile may be broken into sections to accommodate project phasing. At the Pre-paving Conference, the Contractor shall submit a plan for breaking the project profiling into phases for approval by the Engineer.

   Shoulders less than 12 feet in width and medians will not be profiled and will not be subject to incentive adjustments. Shoulders less than 12 feet in width and medians constructed as part of the project shall be measured per subsection 105.07(a).

   Pavement 25 feet outside of a traffic circle and traffic circles will not be profiled and will not be subject to incentive adjustments. Traffic circles shall be measured per subsection 105.07(a).

   A sufficient distance shall be deleted from the profile to allow the profiler to obtain the testing speed, plus a 300-foot distance to stop and start when required. The distance deleted from a profile shall be minimized by reducing testing speed as necessary. Incentive adjustments will not be made for this area. The final surface of these areas shall be tested per subsection 105.07(a).

The profile shall include transverse joints when pavement is placed on both sides of the joint. When pavement is placed on only one side of the joint, the profile shall start and stop at project paving limits.

The section of pavement 25 feet outside the paving limits to 5 feet inside the paving limits will be evaluated per subsection 105.07(a).

The profile of the area 25 feet each side of every railroad crossing, cattle guard, bus pad, manhole, gutter pan and intersection (where there is a planned breakpoint in the profile grade line in the direction of traffic) shall be deleted from the profile before the MRI is determined. Incentive adjustments will not be made for these areas. Areas deleted from the profile shall be tested per subsection 105.07(a).

The profile of the area 25 feet each side of the bridge deck shall be deleted from the profile before the MRI is determined. Incentive adjustments will not be made for this area. When both pavement and a bridge or bridge pavement are being constructed on the project, areas deleted from the profile shall be tested per subsection 105.07(a). Corrective work required in these areas will not be measured and paid for separately but shall be included in the work. For all other projects, the profile of the area 25 feet each side of the bridge deck shall be deleted from the profile before the MRI is determined. If the Engineer determines that corrective work is required in this area, payment will be made per subsection 109.04.

The Contractor shall notify the Engineer in writing and the Department by email at DOT_Profiles@state.co.us at least five working days in advance of his intention to perform SA testing. The Contractor shall profile the project within 14 days after the completion of paving operations. The Department will determine if Smoothness Verification Testing (SV) will be performed. If SV testing will be performed, it will be performed at the same time as the SA testing.

The Engineer will witness the SA profiling. Within 24 hours after each profile is collected, the Contractor shall submit the data electronically along with an SA data submittal form to the Department at DOT_Profiles@state.co.us, and to the Engineer.

2. Smoothness Testing Procedures. The Contractor shall mark the profiling limits and excluded areas. The Engineer will verify that the Contractor's marks are located properly. The Contractor shall use traffic cones with reflective tape or reflective tape on the pavement at the beginning and end of each lane for triggering the start and stop locations on the profiler and at any other location, where portions of the profile are being excluded. These locations shall be marked with temporary paint so that the final SA testing uses the same triggering locations.

   The ambient temperature shall be at least 34 °F for the profiler to operate.

   The Contractor shall clear the lanes to be tested of all debris before profiling.

   Each lane shall be profiled at least once. Profiling shall be at a constant speed (+/- 5 mph of the distance calibration speed) with a minimum speed of 15 mph and a maximum speed of 70 mph. Shoulders with a width of 12 feet or more, ramps, tapers, turn slots, acceleration lanes and deceleration lanes shall be profiled once**.** The profile shall be taken in the planned direction of travel. The left and right wheel paths shall be profiled simultaneously.

Triggers for the start of the profile, the end of the profile and the locations of each exclusion shall be collected during each run. The collected profiles shall be electronically submitted to the Department and Engineer to be analyzed using CP 74.

The Department will determine an MRI for each 0.1-mile section or fraction thereof of completed pavement. Sections will terminate at the beginning of an exclusion and a new section starts at the end of exclusion. The MRI consists of the left and right wheel path's profile passed through the International Roughness Index (IRI) filter. The IRI for the left and right wheel paths are averaged to determine MRI.

The Contractor's SA test results will be available within10 working days of the completion of SA testing. The Engineer will give the Contractor a report that will include the lane profiled, the MRI in 0.1-mile increments and a summary of areas requiring corrective work. The Engineer may determine that it is necessary for the Contractor to re-profile a lane.

Areas requiring corrective work will be determined according to subsection 105.07(e).

Sections less than 0.005 miles in length shall not be subject to corrective work as specified by Table 105-14. Sections less than 0.005 miles in length shall be evaluated per subsection 105.07(a).

(c) *MRI Category IV.* For MRI Category IV pavements, the following shall be used for acceptance:

An MRI for each 0.1-mile section shall be determined on the original pavement surface before beginning the work per subsection 105.07(b) without exclusions.

An MRI for each 0.1-mile section shall be determined on the pavement surface after the work is complete per subsection 105.07(b) without exclusions.

The original and final profile lengths shall have a difference in the length of each lane less than 0.2 percent. When the profile length difference exceeds 0.2 percent, the final testing shall be repeated.

When a 0.1-mile section has a final MRI greater than 92.0 in/mile and the final MRI is greater than the MRI before performing the work, that 0.1-mile section shall be corrected by a method approved in writing by the Engineer. Corrective work shall be such that the resulting final MRI is equal to or less than the initial MRI or 92.0 in/mile, whichever is greater. All costs associated with corrective work shall be at the Contractor's expense, including but not limited to traffic control, additional hot mix asphalt, grinding and milling.

When the Contractor fails to collect the profile of the original pavement surface before beginning the work, the final pavement surface will be evaluated for corrective work per the criteria for Category III pavement smoothness.

Incentive adjustments for smoothness will not be made for Category IV.

Pavements evaluated for Category IV that will be overlaid with a surface seal shall be evaluated for pavement smoothness before application of the surface seal (chip seal).

(d) *Acceptance and Incentive Adjustments.* Acceptance and incentive adjustments for pavement smoothness will be made on a square yard basis per the following:

Incentive adjustments will be based on the MRI for each 0.1-mile section or fraction thereof. Incentive adjustments for Pavement Smoothness will be made per Table 105-12 or 105-13**.** Incentive payments will not be made until all sections requiring corrective work have been corrected.

Final acceptance and incentive adjustments for pavement smoothness will be made on a square yard basis based on the MRI for each 0.1-mile section or fraction thereof from the Contractor's initial SA testing. Those sections requiring corrective work indicated by the initial SA testing will be re-evaluated. However, incentives will not be earned in these areas, regardless of the final smoothness.

Table 105-12
HMA PAVEMENT SMOOTHNESS (INCHES/MILE)
MEAN ROUGHNESS INDEX

Pavement Smoothness Category	Maximum Incentive Payment ($/sq yd)	Incentive Payment ($/sq yd)	No Incentive	Corrective Work Required (0.10-mile sections)
I	MRI ≤ 46.0 I = $1.28	MRI > 46.0 and < 73.0 I= 3.46-0.0474 MRI	MRI ≥ 73.0 and ≤ 88.0	MRI > 88.0
II	MRI ≤ 40.0 I = $1.28	MRI > 40.0 and < 67.0 I= 3.18 – 0.0474 MRI	MRI ≥ 67.0 and ≤ 82.0	MRI > 82.0
III	MRI ≤ 52.0 I = $1.28	MRI > 52.0 and < 80.0 I= 3.66 – 0.0457 MRI	MRI ≥ 80.0 and ≤ 97.0	MRI > 97.0

Table 105-13
PCCP SMOOTHNESS (INCHES/MILE)
MEAN ROUGHNESS INDEX

Pavement Smoothness Category	Maximum Incentive Payment ($/sq yd)	Incentive Payment ($/sq yd)	No Incentive	Corrective Work Required (0.10-mile sections)
I	MRI ≤ 46.0 I = $2.80	MRI > 46.0 and < 73.0 I = 7.57 – 0.1037 MRI	MRI ≥ 73.0 and ≤ 88.0	MRI > 88.0
II	MRI ≤ 40.0 I = $2.80	MRI > 40.0 and < 67.0 I = 6.948 – 0.1037 MRI	MRI ≥ 67.0 and ≤ 82.0	MRI > 82.0
III	MRI ≤ 52.0 I = $2.80	MRI > 52.0 and < 80.0 I= 8.00 – 0.100 MRI	MRI ≥ 80.0 and ≤ 97.0	MRI > 97.0

Table 105-14
CORRECTIVE WORK CRITERA (INCHES/MILE)
0.005 TO 0.10 MILE SECTIONS
MEAN ROUGHNESS INDEX

Pavement Smoothness Category	Corrective Work Required D = Section Length (miles)
I	MRI >134.32 – 463.16 D
II	MRI > 125.16 – 431.58 D
III	MRI > 148.05 – 510.53 D

(e) Corrective Work. The Department will analyze the SA testing for acceptance and indicate areas requiring corrective work per subsection 105.07(b). Corrective work shall be proposed in writing by the Contractor. Corrective work shall not be performed until approved in writing by the Engineer. The Contractor shall perform corrective work in the areas indicated by the SA testing.

The criteria for determining if a 0.1-mile section requires corrective work is specified in Table 105-12or 105-13. The criteria for determining if a section less than 0.10 miles in length and greater than 0.005 miles in length requires corrective work is specified in Table 105-14.

Corrective work shall consist of diamond grinding, an approved overlay, or removal and replacement. Corrective work shall conform to of one of the following conditions:

1. HMA Removal and Replacement. The pavement requiring corrective work shall be removed, full width of the lane and the full thickness of the layer per subsection 202.09.

The removal area shall begin and end with a transverse butt joint, which shall be constructed with a transverse saw cut perpendicular to centerline. Replacement material shall be placed in sufficient quantity, so the finished surface conforms to grade and smoothness requirements. Sections removed and replaced shall be at least 0.20 miles in length.

2. HMA Overlay. The overlay shall cover the full width of the pavement including shoulders. The area overlaid shall begin and end with a transverse butt joint, which shall be constructed with a transverse saw cut and asphalt removal. All material shall be approved hot bituminous mixtures that meet all contract requirements. The overlay shall be placed so that the finished surface conforms to grade and smoothness requirements. The overlay area shall be compacted to the specified density. The overlay thickness shall be equivalent to that of the final layer per the Contract. Sections overlaid shall be at least 0.20 miles in length.

3. Diamond Grinding. Grinding shall not reduce planned pavement thickness by more than 0.3 inches. Diamond grinding shall be the full width of a wheel path. The wheel path is from the stripe to the center of the lane. The grinding process shall produce a pavement surface that is true to grade and uniform in appearance. The grooves shall be evenly spaced. Any ridges on the outside edge next to the shoulder, auxiliary, ramps or adjacent lanes greater than 3/16-inch-high shall be feathered out to the satisfaction of the Engineer in a separate, feather pass operation.

   The pavement surface after grinding shall have no depressions or misalignment of slope in the longitudinal direction exceeding 1/8 inch in 12 feet when measured with a 12-foot straightedge placed parallel to the centerline. All areas of deviation shall be reground at no additional cost.

   The slurry and residue resulting from the grinding operation shall not be allowed to flow across lanes occupied by the traffic and shall be continuously removed during the grinding operation, leaving the pavement in a clean condition. The Contractor shall haul the grinding residue to an approved location at no additional cost.

   Cores shall be taken to verify that minimum pavement thicknesses have been maintained. A minimum of one core shall be taken every 100 cumulative feet or fraction thereof per lane of diamond grinding, as directed by the Engineer. Coring shall be at the Contractor's expense.

   For HMA pavements, the entire ground area of the final pavement surface shall be covered with a Tack Coat conforming to Section 407 (CSS-1h at 0.1 gallons per square yard of diluted emulsion; the emulsion shall be diluted with water at the rate of 50 percent water and 50 percent emulsion) when grinding is complete after final SA testing is complete.

   When any grinding on concrete pavement occurs where a core for determining pavement thickness has been previously taken, another core shall be taken after the grinding has been completed and shall replace the original core in the calculation of pavement thickness incentive and disincentive. Joint sealant that has been damaged by grinding on concrete pavement shall be repaired or replaced at the Contractor's expense per Standard Plan M-412-1 and subsection 412.18.

For PCCP, diamond ground surface texture will be considered acceptable when the average texture depth (ATD) of the panel is greater than 0.05 inch. The Contractor will perform surface texture testing per CP 77 Method B. Each area in a lane that required diamond grinding will be tested at least once. Areas in a lane with more than 500 continuous feet of grinding will be tested at a frequency of one test per 500 linear feet. Areas with deficient surface texture shall be diamond ground and retested.

(f) Final Smoothness Acceptance Testing. After the Contractor has completed the required corrective work, the Contractor shall retest the pavement per subsection 105.07(b). Final SA testing shall only be required on lanes with sections requiring corrective work. Final SA testing shall start and stop at the same locations as the Initial SA testing. If additional corrective work is required, the Contractor shall perform the corrective work and perform additional Final SA Testing. Time count will be charged pursuant to contract requirements during the time period required for all Final SA Testing. Delays associated with additional Final SA Testing will be considered nonexcusable and noncompensable.

The Contractor shall notify the Engineer and the Department by email at DOT_Profiles@state.co.us at least 5 working days in advance of his intention to perform final SA testing. The Department will determine if Smoothness Verification Testing (SV) will be performed. If SV testing will be performed, it will be performed at the same time as the SA testing.

The Initial SA and Final SA profile lengths shall have a difference in the length of each lane less than 0.2 percent. When the profile length difference exceeds 0.2 percent, the Final SA testing shall be repeated.

(g) Department Smoothness Verification Testing (SV). The Department may elect to perform smoothness verification testing using the Department's inertial profiler, with the methods described in subsection 105.07(b). The Engineer will notify the Contractor of the Department's intention to perform SV testing. The Contractor shall coordinate with the Department and his profiler to schedule SA and SV to occur at the same time.

The Department will randomly select scheduled Contractor Smoothness Acceptance Testing to verify. A minimum of 25 percent of each scheduled Contractor Smoothness Acceptance Testing by an individual profiler will be verified. The Engineer may also request verification for any Smoothness Acceptance Testing.

The Contractor's SA test results will be compared to the Department's SV test results. The Contractor's SA test results will be considered acceptable and will be used for incentive payment if the following criteria are met:

(1) The difference in MRI for a 1/10-mile section is less than 6.1 inches/mile for a minimum of 90 percent of the 1/10-mile sections for each lane.

(2) The difference in average MRI for each lane is less than 6.1 inches/mile.

(3) The difference in the length of each lane is less than 0.2 percent.

When the Contractor's SA test results are not considered acceptable, the Department's SV test results will be used for incentive payment and the Contractor's profiler certification will be suspended and evaluated pursuant to CP 78. The Contractor shall schedule with the Department within 10 working days to perform this evaluation or the profiler will be required to be re-certified per CP 78.

105.08 Document Management and Professional Engineer and Professional Land Surveyor Electronic Seals. Where the specifications require the Contractor to submit or return documents either in writing or the format is not specified, an electronic file is preferred. The Contractor shall submit the schedule native file, video recordings, photographs, image files, and other media formats in their native file formats. When the document format is not specified, the contractor shall submit electronic documents in PDF. When a submittal requires multiple copies, one electronic document shall satisfy the requirement.

Where a signature is needed, an electronic signature is acceptable. An original signature is a signature signed in ink. Where original signatures or original documents are required a scanned shall satisfy the requirement.

The Department and Contractor shall use Adobe Sign software to route and sign Contract Modification Orders and change orders for signature.

An electronic seal is when a Contractor's Engineer, a Professional Engineer or a Professional Land Surveyor affix their electronic signature and seal to plans or documents prepared under their responsible charge or control. Adobe Sign software shall be used for electronic seals on documents and electronic seals shall comply with the requirements of the Architects, Professional Engineers, and Professional Land Surveyors Rules and Regulations, 4 CCR 730-1.

The Contractor shall submit as-built plans using the template provided by the Project Engineer.

105.09 Coordination of Plans, Specifications, Supplemental Specifications, and Special Provisions. These specifications, the supplemental specifications, the plans, special provisions, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work.

In case of discrepancy the order of precedence is as follows:

(a) Special Provisions

1. Project Special Provisions.
2. Standard Special Provisions.

(b) Plans

1. Detailed Plans
2. Standard Plans
3. Calculated dimensions will govern over scaled dimensions.

(c) Supplemental Specifications

(d) Standard Specifications

The Contractor shall not take advantage of any apparent error or omission in the Contract. If the Contractor discovers an error or omission, the Engineer shall immediately be notified. The Engineer will make corrections and interpretations as necessary to fulfill the intent of the Contract.

105.10 Cooperation by Contractor. The Contractor shall give the work the constant attention necessary to facilitate progress and shall cooperate with the Engineer, inspectors, and other contractors.

The Contractor shall have on the project, at all times that work is being performed, a competent superintendent capable of reading and understanding the contract documents and experienced in the type of work being performed. The superintendent will receive instructions from the Engineer and shall be authorized to act for the Contractor on the project and to execute orders or directions of the Engineer without delay. The superintendent shall promptly supply, irrespective of the amount of work sublet, materials, equipment, tools, labor, and incidentals to complete the Contract.

PROJECT FIRST PROGRAM. Project First is required on all projects with an Engineer's Estimate of over one million dollars and is optional and highly recommended for all other projects. The Project First Program shall not take precedent over any other Contract requirement and shall only apply to contracts with the Department.

The Project First Program is structured to draw on the strengths of the Contractor and the Department to identify and achieve mutual goals. Project First is a scalable program that supports effective and efficient contract performance and is performed with reciprocal cooperation. The goal is a project completed within budget, on schedule, and per the Contract. The Department Engineer and the Superintendent are the lead representatives to address the issues promptly and at the appropriate level. Executives from both organizations are encouraged to be active supporters and to visit with the Project Teams. The Project First Program includes the Project Team, consisting of the Department and the Contractor, developing tools to identify and manage project risks and facilitate communication. The tools are developed and updated for the project's duration in formal Workshops and project meetings.

Project First Workshops.

(a) Workshop Facilitation. All costs related to Project First are incidental to the project except for the actual costs for the use of a workshop third-party facilitator. The cost for a workshop facilitator shall be agreed upon before engagement. The Project Team shall equally share the facilitation costs. Either the Department or the Contractor may contract directly with the third party.

(b) Initial Workshop. The Project Team shall conduct an initial workshop before the Preconstruction Conference. The Engineer and the Superintendent shall jointly agree on the individuals to invite to the initial workshop. They shall invite the members from their respective teams. The Region Transportation Director or the Program Engineer, the Resident Engineer, the Engineer, and other project personnel shall attend the initial workshop. The Contractor owner, executive or a representative, the Superintendent, project supervision personnel, and key subcontractors shall attend the initial workshop. The Engineer and the Superintendent shall jointly determine if other stakeholders shall attend. At the initial workshop, the parties each will discuss their planned approach to the project and develop the Project First Tools.

(c) *Follow-up and Closeout Workshops*. Project Team shall conduct follow-up workshops at least once every two months, unless the Engineer and the Superintendent jointly determine the frequency of these meetings can be reduced, and one final closeout workshop. When there are open items on the Project Risk Assessment Tool, workshops shall continue during no-work periods. Workshops are not required during landscape establishment periods. The Project Team shall conduct the closeout workshop before Final Acceptance**.**

The Resident Engineer, the Engineer, the Superintendent, and project supervision personnel shall attend the follow-up and Closeout Workshops. The Region Transportation Director or Program Engineer, the Contractor owner, executive, or representatives are not required to attend the follow-up and closeout workshops. The subcontractors or stakeholders with open risk items and incomplete work, shall attend the follow-up and closeout workshops. The Engineer and the Superintendent shall jointly determine if other stakeholders shall attend.

In the follow-up workshops the parties will update Risk Assessment Tool risks, including adding any new risks and closing completed risks. The parties shall resolve all remaining risks and document lessons learned before or by the closeout workshop. The Project Team should also celebrate the project successes.

Project First Tools.

(a) *Project Risk Assessment Tool*. The Project Team shall develop and update a Project Risk Assessment Tool. This Tool shall support risk identification, analysis, response strategy, monitoring, and control. All parties shall use the Project Risk Assessment Tool to document and manage the project risks. A risk for the purpose of Project First is an unexpected known event or potential future event that may positively or negatively affect the project costs, schedule, scope, or relationship. The Project Team may modify the Project Risk Assessment Tool to suit the project.

(b) *Project First Escalation Ladder*. Use the Escalation Ladder to escalate major or repeated performance concerns to the next person in the supervisory chain. The Escalation Ladder is a list that includes the name, title, and contact information of the individuals in the supervisory chain for the Contractor's project organization and for the Department's project organization. The Contractor and the Department shall keep the Escalation Ladder up to date. The Project Team shall use the Escalation Ladder when the following types of concerns occur:

- Bad Faith: When an individual is knowingly or willingly dishonest, not fulfilling legal or contractual obligations, misleads others, enters into an agreement without the intention or means to fulfill it, or violates basic standards of honesty in dealing with others.
- Administration Performance: When an individual is not responsive in administrative performance such as resolving requests for information, developing partial payments, submitting required documentation, delays in progressing issues, and in negotiations. When an individual is unable to or is not competent in performing construction administration duties.

- Defiance: When an individual disregards Contract requirements or the direction of the Engineer.
- Professionalism: When an individual acts in an unprofessional manner, including disrespectful, vulgar, or aggressive behavior.

Although these concerns may contribute to the issues described in subsection 105.22, they are different. Subsection 105.22 is the Contract escalation process for issues related to items in subsections 104.02, 104.03, 106.05, 106.06, 108.08(a), and 108.08(d) for merit and quantum.

(c) Project First Charter. The establishment of a Project First charter is optional. A Charter shall not change the legal relationship of the parties to the Contract nor act as a waiver of, nor supersede the terms of the Contract. If a Charter is developed, the Project Team shall develop the Charter jointly.

105.11 Cooperation with Utilities. The Department will notify all utility companies, pipe line owners, or other parties affected, and have all necessary adjustments of the public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction made as soon as practicable.

Water lines, gas lines, wire lines, service connections, meter and valve boxes, light standards, cableways, signals, and all other utility facilities within the limits of the proposed construction are to be relocated or adjusted at the owner's expense unless otherwise provided in the Contract. The Contractor shall cooperate with the utility owners in their removal and relocation operations, so that progress is expedited, duplication of work is minimized and service interruptions are avoided.

Per C.R.S. 9-1.5-103 et seq. (Excavation Requirements – Plans and Specifications), the Department will certify in the project plans and specifications which Quality Level (A-D) the depicted existing known utilities are, pursuant to the most recent version of the ASCE Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data (CI/ASCE 38-02). The Contractor shall not be relieved of its responsibility to comply with the requirements set forth and shall not rely solely on the Department's plans and specifications when completing its work with respect to existing buried utilities. The Contract will indicate those utility items that are to be relocated or adjusted by the utility owner or those to be relocated or adjusted by the Contractor. The Contractor shall consider in the bid proposal all of the permanent and temporary utility facilities in their present or relocated positions as shown in the Contract and as revealed by site investigation. Utility delays due to changes that are the responsibility of the Contractor will be considered nonexcusable delays. Utility delays beyond the Contractor's control and not due to the fault or negligence of the Contractor shall be documented by the Contractor and tied to the project's critical path schedule, so as to demonstrate a timeline of events leading up to the utility owner's failure to perform and subsequent delay to the project. Delays will be determined to be compensable or noncompensable per subsection 108.08. The Contractor and the Engineer shall meet with the utility owners as often as necessary to coordinate and schedule relocations or adjustments. Additional compensation will not be allowed for foreseeable coordination, inconvenience, or damage sustained due to interference from the utility facilities or the removal or relocation operations as indicated in the Contract.

If utility facilities or appurtenances are found that are neither identified in the Contract, nor revealed by site investigation, the Engineer will determine whether adjustment or relocation of the utility is necessary. The Engineer will make arrangements with either the utility owner

or the Contractor to accomplish necessary adjustments or relocations when not otherwise provided for in the Contract. Extra work will be considered for payment per subsection 104.03. Consideration for delays shall be per subsection 108.08(d).

Where the Contractor's operations are adjacent to properties of railroad, telegraph, telephone, power, or other utility companies, that damage might result in considerable expense, loss, or inconvenience, work shall not commence until arrangements for the protection of the utilities have been made.

If water or utility services are interrupted, the Contractor shall promptly notify the owner and shall cooperate in the restoration of service. Repair work shall be continuous until the service is restored. Work shall not be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

105.12 Cooperation Between Contractors. The Department reserves the right to contract for and perform other or additional work on or near the work covered by the Contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct the work without interfering or hindering the progress or completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with the Contract and shall protect and save harmless the Department from any and all damages or claims that may arise because of inconvenience, delay, or loss because of the presence and operations of Contractors working within the limits of the same or adjacent project.

105.13 Construction Stakes, Lines and Grades. Construction work shall not be performed until adequate lines and grades have been established by the Department or by the Contractor.

(a) Contractor Surveying. When the bid schedule contains pay item 625, Construction Surveying, the Department will provide control points and benchmarks as described in the Contract. The Contractor shall furnish and set construction stakes establishing lines and grades per the provisions of Section 625. The Engineer may order extra surveying, which will be paid for at a negotiated rate not to exceed $150 per hour.

(b) Department Surveying. When the bid schedule does not contain pay item 625, Construction Surveying, the Engineer will furnish one set of construction stakes and marks establishing lines and grades as described below for proper completion of the work.

Roadway staking will include stakes for; fence, centerline, slopes, grades (bluetops), curb and gutter, sidewalk, and median barrier. Grade stakes for finished subgrade will not be set until the grade established by the slope stakes is constructed to within 0.3 foot of the finished subgrade elevation.

Minor structures and retaining wall staking will be limited to stakes establishing line and grade by using offset line and grade stakes.

Major structures staking and references will be limited to centerlines (or work lines or control lines) as shown on the plans, appropriate offset lines and grades; and elevations set for footings, piers, pier caps, abutments, bottom of deck grades and finish deck screed grades.

It will be the responsibility of the Contractor to use these references and marks and establish any additional control and layout necessary for the proper completion of the work in its final location. The Contractor shall be responsible for the accuracy of all the vertical and horizontal control it transfers and establishes. The Contractor shall, when required, provide access to abutments, piers or other locations, and shall furnish working platforms that meet applicable safety requirements so the Engineer's duties can be performed.

The Contractor shall preserve all stakes and marks. If any stakes or marks are destroyed, disturbed or removed by the Contractor, subcontractors, or suppliers, the cost of replacing them will be charged against the Contractor and will be deducted from the payment for the work at a negotiated rate not to exceed $150 per hour.

It is the responsibility of the Contractor to perform all required layout work, which shall include, but will not be limited to the following:

1. Piling locations and cut off elevation.
2. Girder seats on piers and abutments.
3. Bolt locations and patterns.
4. Construction sign locations.
5. Guardrail.

The Engineer reserves the right to inspect all staking and work in place to ensure conformance with the Contract. A minimum of two workdays will be required as advance notice to the Engineer to provide project control staking.

105.14 Authority and Duties of the Project Engineer. The Project Engineer has immediate charge of the administration and engineering details of each construction project. The Project Engineer has the authority to exercise all duties and responsibilities of the Engineer contained in the Contract, except those specifically retained by the Chief Engineer. The CDOT Project Engineer and the CDOT Resident Engineer are the only representatives of the Chief Engineer authorized to sign Contract Modification Orders. The Project Engineer is responsible for initial decisions relating to Contractor disputes pursuant to subsection 105.22.

105.15 Duties of the Inspector. Inspectors employed by the Department are authorized to inspect all work done, and materials furnished. This inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. The inspector is not authorized to alter or waive the provisions of the Contract. The inspector is not authorized to issue instructions contrary to the provisions of the Contract or to act as foreman for the Contractor.

105.16 Inspection and Testing of Work. All materials and each part or detail of the work shall be subject to inspection by the Engineer. The Engineer shall be allowed access to all parts of the work and shall be furnished with information and assistance by the Contractor as required to make a complete and detailed inspection.

Before final acceptance of the work, the Contractor shall remove or uncover such portions of the finished work, as directed. After examination, by the Engineer, the Contractor shall restore the work to the standard required by the Contract. If the work thus exposed or examined proves acceptable, the uncovering, removing, or restoring the work will be paid for as extra work. If the work exposed or examined proves unacceptable, the uncovering, removing, or restoring the work shall be at the Contractor's expense.

Any work done or materials used without inspection by an authorized Department representative may be ordered uncovered, removed, or restored at the Contractor's expense.

When any unit of government or political subdivision, utility, or railroad corporation is to pay a portion of the cost of the work covered by a highway Contract, its respective representatives shall have the right to inspect the work. This inspection shall not make any unit of government or political subdivision, utility, or railroad corporation a party to the Contract, and shall not interfere with the rights of either party.

All inspections and all tests conducted by the Department are for the convenience and benefit of the Department. These inspections and tests do not constitute acceptance of the materials or work tested or inspected, and the Department may reject or accept any work or materials at any time before the inspection pursuant to subsection 105.21(b) whether or not previous inspections or tests were conducted by the Engineer or authorized representative.

105.17 Removal of Unacceptable Work and Unauthorized Work. Unacceptable work is work that does not conform to the requirements of the Contract.

Unacceptable work, resulting from any cause, found to exist before the final acceptance of the work, shall be removed and replaced in an acceptable manner at the Contractor's expense. The fact that the Engineer or an inspector may have overlooked the unacceptable work shall not constitute an acceptance of any part of the work.

Unauthorized work is work that was done without adequate lines and grades having been established by the Engineer or by the Contractor, work done contrary to the instructions of the Engineer, work done beyond the lines shown on the plans, or extra work done without the Engineer's authorization. Unauthorized work will not be paid for under the provisions of the Contract and may be ordered removed or replaced at the Contractor's expense.

If the Contractor fails to comply with any order of the Engineer made under the provisions of this subsection, the Engineer will have authority to cause unacceptable work to be remedied or removed and replaced, and unauthorized work to be removed. The Engineer will deduct the costs from any monies due or to become due the Contractor.

105.18 Load Restrictions. The Contractor shall comply with all legal load restrictions in the hauling of equipment or materials on public roads beyond the limits of the project. A special permit will not relieve the Contractor of liability for damage resulting from the moving of equipment or material.

The operation of equipment or hauling loads that cause damage to structures, the roadway or any other construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited by the Contractor to methods and equipment that will prevent damage to the pavement structure. Loads will not be permitted on a concrete pavement or structure before the expiration of the curing period. The Contractor shall be responsible for the repair of all damage and related expense resulting from hauling equipment and construction operations.

If a vehicle's gross weight exceeds the legal limit, and the material transported by the vehicle is delivered to the project, the material and the scale ticket (certificate of correct weight) will not be accepted.

If a scale ticket from an overweight vehicle is inadvertently accepted and the material incorporated into the project, the Engineer will adjust the price for the overweight load as follows:

(1) The pay item quantity represented by the amount of material in excess of the legal weight will not be paid for.

(2) A price reduction will be assessed for the overweight portion of the load based on the following schedule.

Overweight (Pounds)	Price Reduction (Dollars)
0 - 3000	20
3001 - 4000	40
4001 - 5000	82
5001 - 6,000	130
6001 - 7000	226
7001 - 8000	376
8001 - 9000	582
9,001 - 10,000	842
Over 10,000	$870 plus $164 for each 1,000 lbs. over 10,000 lbs.

105.19 Maintenance During Construction. The Contractor shall maintain all work that is included in the Contract during construction and until final written acceptance, except as otherwise specified in subsection 107.17. This maintenance shall constitute continuous and effective work prosecuted with adequate equipment and forces, so the roadway or structures are kept in satisfactory condition at all times.

If the Contract involves the placement of material on or utilization of, a previously constructed subgrade, pavement structure or structure, the Contractor shall maintain the previously constructed work during all construction operations. All cost of maintaining the contract work during construction and before final written acceptance will not be paid for separately, but shall be included in the work, except as otherwise specified in subsection 107.17.

105.20 Failure to Maintain Roadway or Structure. If the Contractor fails to comply with the provisions of subsection 105.19, the Engineer will immediately notify the Contractor of such noncompliance. Except in the case of traffic signal maintenance, the Contractor shall respond and remedy unsatisfactory maintenance within 24 hours after receipt of such notice. If the Contractor fails to remedy unsatisfactory maintenance in the allotted time, the Engineer may immediately proceed to maintain the project, and the entire cost of this maintenance will be deducted from the monies due or to become due to the Contractor on the Contract.

In the case of traffic signal maintenance, the Contractor shall respond and remedy unsatisfactory maintenance within one hour of receipt of notice on urban highways, and within four hours of receipt of notice on rural highways.

Traffic signal maintenance shall include all approved traffic control items and work that are required to maintain traffic through the affected area while the traffic signal is being repaired

or replaced. If the Department performs traffic signal maintenance, the Department shall be held harmless for all subsequent occurrences of maintenance to the signals that the Department maintained.

If damage occurs to an existing structure through improper maintenance per 105.19, the Contractor shall submit a repair procedure to the Engineer to repair the defect(s).

The repair categories and requirements are defined as follows:

a) "In-kind" repairs. In-kind repairs are repairs where the As-Built or Advertised plans are utilized to replace or repair damaged components with identical dimensions and materials used plans and where no plan modifications are made. In-kind repair procedures shall be reviewed and accepted by the Engineer before any repair. The use of approved repair grouts or doweled reinforcing with epoxy adhesive is permitted in in-kind repairs. Doweled reinforcing shall meet or exceed the strength requirements of the original design.

b) "*Modified repairs*". Modified repairs are those which deviate in dimensions and/or materials from the As-Built or Advertised plans or where plans are not available. Modified repair procedure submittals shall include calculations, independent design calculations, shop drawings, and/or working drawings per 105.02, and any other applicable section of the specifications for the needed repair. The Contractor's Engineer shall electronically seal Modified repair submittals.

Damage to new structures or modified structures, shall be repaired per the contract documents.

The Engineer of Record shall be notified and review all corresponding submittals before any repairs.

105.21 Acceptance.

(a) Partial Acceptance. If, during the prosecution of the project, the Contractor satisfactorily completes a unit or portion of the project, such as a structure, an interchange, or a section of road or pavement that can be used advantageously for traffic, the Engineer may make final inspection of that unit. If the Engineer finds that the unit has been satisfactorily completed in compliance with the Contract, the Contractor may be relieved of further responsibility for that unit except as otherwise provided in subsection 107.16. Partial acceptance shall not void or alter any of the terms of the Contract.

(b) Final Acceptance. Upon notice from the Contractor of presumptive completion of the entire project, the Engineer will make an inspection. If the work provided for by the Contract has been satisfactorily completed, that inspection shall constitute the final inspection and the Engineer will notify the Contractor in writing of final acceptance indicating the date the project was inspected and accepted.

If the inspection discloses any unsatisfactory work, the Engineer will give the Contractor a written list of the work needing correction. Upon correction of the work, another inspection will be made. If the work has been satisfactorily completed, the Engineer will notify the Contractor in writing of the date of final inspection and acceptance. Final acceptance under this subsection does not waive any legal rights contained in subsection 107.21.

If not included in the Partial or Final Acceptance letter, no later than 3 working days after the acceptance letter is provided to the Contractor, the Engineer will provide in writing a detailed list of all remaining documentation required by the Contract. Upon reviewing and accepting the remaining documentation, and with no other outstanding issue(s), the Engineer will release retainage as follows:

1. 65% of the current retainage shall be released.
2. If the release of retainage is less than $10,000, no retainage will be released.
3. Retainage will be released only to the extent that the remaining retainage shall not be less than $20,000.

105.22 Dispute Resolution. Subsections 105.22, 105.23, and 105.24 detail the process through which the parties (CDOT and the Contractor) agree to resolve any issue that may result in a dispute. The intent of the process is to resolve issues early, efficiently, and as close to the project level as possible. Figure 105-1 outlines the process. Specified time frames may be extended by mutual agreement of the Engineer and the Contractor. In these subsections, when a time frame ends on a Saturday, Sunday or holiday, the time frame shall be extended to the next scheduled workday.

An issue is a disagreement concerning contract price, time, interpretation of the Contract, or all three between the parties at the project level regarding or relating to the Contract. Issues include, but are not limited to, a disagreement resulting from a delay, a change order, another written order, or an oral order from the Project Engineer, including any direction, instruction, interpretation, or determination by the Project Engineer, interpretations of the Contract provisions, plans, or specifications or the existence of alleged differing site conditions.

The Contractor shall bring all issue(s) to the Project Engineer's attention, in writing, within 30 days of the Contractor being aware of the issue(s). Written notice must take the form of a stand-alone, non-chain e-mail or letter, addressed and delivered to the Project Engineer. If a Contractor provides written notice outside of the 30-day deadline, it shall be presumed that CDOT suffered prejudice. Where the Contractor failed to provide the required notice, the failure to provide notice may be treated as a separate and threshold dispute to be resolved before other related disputes(s) are submitted, addressed, or resolved.

A dispute is an issue which the Contractor and CDOT have not been able to resolve and for which the Contractor submits a written formal notice of dispute per subsection 105.22(b).

A claim is a dispute not resolved at the Resident Engineer level or resolved after a DRB recommendation.

The term "merit" refers to the right of a party to recover on a claim or dispute, irrespective of quantum, based on the substance, elements, and grounds of that claim or dispute. The term "quantum" refers to the quantity or amount of compensation or time deserved when a claim or dispute is found to have merit.

Disputes from subcontractors, material suppliers, or any other entity not party to the Contract shall be submitted through the Contractor. Review of a pass-through dispute does not create privity of Contract between CDOT and the subcontractor.

An audit may be performed by the Department for any dispute or claim. All audits will be completed within 90 days of the request for an audit, provided the Contractor allows the auditors reasonable and timely access to the contractor's books and records.

If CDOT does not respond within the specified timelines, the Contractor may advance the dispute to the next level.

When the Project Engineer is a Consultant Project Engineer, actions, decisions, and determinations specified as made by the Project Engineer shall be made by the Resident Engineer.

The dispute resolution process set forth in this subsection shall be exhausted in its entirety before initiation of litigation. Failure to comply with the requirements set forth in this subsection, including notice requirements, shall bar either party from any further administrative, equitable, or legal remedies. Subject to the rebuttable presumption of prejudice to CDOT set forth above, if a deadline is missed that does not prejudice either party, further relief shall be allowed.

All written notices of dispute shall be submitted within 30 days of date of the Project Engineer's Final Acceptance letter; see subsection 105.21(b).

When a project has a landscape maintenance period, the Project Engineer will grant partial acceptance per subsection 105.21(a). This partial acceptance will be project acceptance of all the construction work performed before this partial acceptance.

All disputes and claims related to the work in which this partial acceptance is granted shall be submitted within 30 days of the Project Engineer's partial acceptance.

Should the Contractor's dispute use the Total Cost approach for calculating damages, damages will be determined by subtracting the contract amount from the total cost of performance. Should the Contractor's dispute use the Modified Total Cost approach for calculating damages, if the Contractor's bid was unrealistic in part, or some of its costs were unreasonable or some of its damages were caused by its own errors, those costs and damages will be deducted from the total cost of performance to arrive at the Modified Total Cost. The Total Cost or Modified Total Cost basis for calculating damages shall not be available for any disputes or claims seeking damages where the Contractor could have kept separate cost records at the time the dispute arose as described in subsection 105.22(a).

(a) Document Retention. The Contractor shall keep full and complete records of the costs and additional time incurred for each dispute for a period of at least three years after the date of final payment or until dispute is resolved, whichever is more. The Contractor, subcontractors, and lower tier subcontractors shall provide adequate facilities, acceptable to the Engineer, for an audit during normal business hours. The Contractor shall permit the Engineer or Department auditor to examine and copy those records and all other records required by the Engineer to determine the facts or contentions involved in the dispute. The Contractor shall identify and segregate any documents or information that the Contractor considers particularly sensitive, such as confidential or proprietary information.

Throughout the dispute, the Contractor and the Project Engineer shall keep complete daily records of extra costs and time incurred, per the following procedures:

1. Daily records shall identify each operation affected, the specific locations where work is affected, and the potential effect to the project's schedule. Such records shall also reflect all labor, material, and equipment applicable to the affected operations.

2. On the first workday of each week following the date of the written notice of dispute, the Contractor shall provide the Project Engineer with the daily records for the preceding week. If the Contractor's records indicate costs greater than those kept by the Department, the Project Engineer will meet with the Contractor and present his records to the Contractor at the meeting. The Contractor shall notify the Engineer in writing within three workdays of any inaccuracies noted in, or disagreements with, the Department's records.

(b) Initial Dispute Resolution Process. To initiate the dispute resolution process, the Contractor shall provide a written notice of dispute to the Project Engineer upon the failure of the Parties to resolve the issue through negotiation. Disputes will not be considered unless the Contractor has first complied with specified issue resolution processes such as those specified in subsections 104.02, 106.05, 108.08(a), and 108.08(d).

The Contractor shall supplement the written notice of dispute within 15 days with a written Request for Equitable Adjustment (REA) providing the following:

(1) The date of the dispute.

(2) The nature of the circumstances that caused the dispute.

(3) A detailed explanation of the dispute citing specific provisions of the Contract and any basis, legal or factual, that support the dispute.

(4) If any, the estimated quantum, calculated per methods set forth in subsection 105.24(b)12., with supporting documentation.

(5) An analysis of the progress schedule showing the schedule change or disruption if the Contractor is asserting a schedule change or disruption. This analysis shall meet the requirements of subsection 108.08(d).

The Contractor shall submit as much information on the quantum and impacts to the Contract time as is reasonably available with the REA and then supplement the REA as additional information becomes available. If the dispute escalates to the DRB process, neither party shall provide or present to the DRB any issue or any information that was not contained in the REA and fully submitted in writing to the Project Engineer and Resident Engineer during the subsection 105.22 process.

(c) Project Engineer Review. Within 15 days after receipt of the REA, the Project Engineer will meet with the Contractor to discuss the merits of the dispute. Within seven days after this meeting, the Project Engineer will issue a written decision on the merits of the dispute.

The Project Engineer will either deny the merits of the dispute or notify the Contractor that the dispute has merit. This determination will include a summary of the relevant facts, Contract provisions supporting the determination, and an evaluation of all scheduling issues that may be involved.

If the dispute is determined to have merit, the Contractor and the Project Engineer will determine the adjustment in payment, schedule, or both within 30 days. When a satisfactory adjustment is determined, it shall be implemented per subsections 106.05, 108.08, 109.04, 109.05 or 109.10 and the dispute is resolved.

If the Contractor accepts the Project Engineer's denial of the merits of the dispute, the dispute is resolved, and no further action will be taken. If the Contractor does not respond in seven days, it will be assumed he has accepted the denial. If the Contractor rejects the Project Engineer's denial of the merits of the dispute or a satisfactory adjustment of payment or schedule cannot be agreed upon within 30 days, the Contractor may further pursue resolution of the dispute by providing written notice to the Resident Engineer within seven days, according to subsection 105.22(d).

(d) Resident Engineer Review. Within seven days after receipt of the Contractor's written notice to the Resident Engineer of unsatisfactory resolution of the dispute, the Project Engineer and Resident Engineer will meet with the Contractor to discuss the dispute.

Meetings shall continue weekly for a period of up to 30 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 per subsections 108.08, 109.04, 109.05, or 109.10 and the dispute is resolved.

If these meetings do not result in a resolution or the participants mutually agree that they have reached an impasse, the dispute shall be presented to the Dispute Review Board per subsection 105.23.

105.23 Dispute Review Board. A Dispute Review Board (DRB) is an independent third party that will provide specialized expertise in technical areas and administration of construction contracts. The DRB will assist in and facilitate the timely and equitable resolution of disputes between CDOT and the Contractor in an effort to avoid animosity and construction delays, and to resolve disputes as close to the project level as possible. The DRB shall be established and operate as provided and shall serve as an independent and impartial board. A DRB member shall not be called as witness for future litigation.

There are two types of DRBs: the "On Demand DRB" and the "Standing DRB". The DRB shall be an "On Demand DRB" unless a "Standing DRB" is specified in the Contract. An On Demand DRB shall be established only when the Project Engineer initiates a DRB review per subsection 105.23(a). A Standing DRB, when specified in the Contract, shall be established at the beginning of the project.

(a) Initiation of Dispute Review Board Review. When a dispute has not been resolved per subsection 105.22, the Project Engineer will initiate the DRB review process within five days after the period described in subsection 105.22(d).

(b) Formation of Dispute Review Board. DRBs will be established per the following procedures:

1. CDOT, in conjunction with the Colorado Contractors Association (CCA), will maintain a statewide list of pre-approved DRB candidates experienced in construction processes and the interpretation of contract documents and the resolution of construction disputes. Only individuals who have completed training (currently titled DRB Administration and Practice Training) through the Dispute Resolution Board Foundation or otherwise approved by CDOT can be a DRB member. DRB nominees shall be selected from the list of pre-approved candidates. When a DRB is formed, the parties shall execute the agreement set forth in subsection 105.23(l).

2. If the dispute has a value of $250,000 or less, the On Demand DRB shall have one member. The Contractor and CDOT shall select the DRB member and execute the Three-Party Agreement within 30 days of initiating the DRB process. If the parties do not agree on the DRB member, each shall select five candidates. Each party shall numerically rank their list using a scale of one to five with one being their first choice and five being their last choice. If common candidates are listed, but the parties cannot agree, that common candidate with the lowest combined numerical ranking shall be selected. If there is no common candidate, the lists shall be combined, and each party shall eliminate three candidates from the list. Each party shall then numerically rank the remaining candidates, with Number 1 being the first choice. The candidate with the lowest combined numerical ranking shall be the DRB member. The CDOT Project Engineer will be responsible for having all parties execute the agreement.

3. If the dispute has a value over $250,000, the On Demand DRB shall have three members. The Contractor and CDOT shall each select a member and those two members shall select a third. Once the third member is approved, the three members will nominate one of them to be the Chair and execute the Three-Party Agreement within 45 days of initiating the DRB process.
4. The Standing DRB shall always have three members. The Contractor and CDOT shall each select a member and those two members shall select a third member. Once the third member is approved the three members will nominate one of them to be the Chair. The Contractor and CDOT shall submit their proposed Standing DRB members within five days of execution of the Contract. The third member shall be approved before the Pre-construction Conference. The third member shall be selected within 15 days of execution of the Contract. Before construction starting, the parties shall execute the Three-Party Agreement. The CDOT Project Engineer will be responsible for having all parties execute the agreement. The Project Engineer will invite the Standing DRB members to the Pre-construction and any Project First conferences.
5. DRB members shall not have been involved in the administration of the project under consideration. CDOT and the Contractor shall inform its selected DRB member who the major firms/people are on the project and request its selected DRB member to review the CDOT disclosure requirements and Canon of Ethics and then submit a disclosure statement which shall also be submitted to the other party. DRB candidates shall complete the DRB Disclosure Requirements and DRB Nominee Disclosure Form and disclose to the parties the following relationships:

   (1) Prior employment with either party

   (2) Prior or current financial interests or ties to either party

   (3) Prior or current professional relationships with either party

   (4) Anything else that might bring into question the impartiality or independence of the DRB member.

   (5) Before agreeing to serve on a DRB, members shall notify all parties of any other CDOT DRB's they are serving or that they will be participating in another DRB.

   If either party objects to the selection of the chair or other DRB members based on the disclosures, or based on information not disclosed, which might bring into question the impartiality, independence, or performance of the potential member, that potential member shall not be placed on the Board.
6. There shall be no ex parte communications with the DRB at any time.
7. The service of a Board member may be terminated only by written agreement of both parties.

(c) If a Board member resigns, is unable to serve, or is terminated, a new Board member shall be selected within four weeks in the same manner as the Board member who was removed was originally selected.

(d) Additional Responsibilities of the Standing Disputes Review Board

1. General. No later than 10 days after the Three-Party Agreement has been signed by the Chief Engineer, the DRB will coordinate with the parties on the date and location of the initial DRB meeting.

(1) Obtain copies of the Contract documents and Contractor's schedules for each of the Board members.

(2) Agree on the location of future meetings, which shall be reasonably close to the project site.

(3) Establish an address and telephone number for each Board member for the purposes of Board business.

2. Regular meetings. Regular meetings of the Board shall be held approximately every 120 to 180 days throughout the life of the Contract, except that this schedule may be modified to suit developments on the job as the work progresses. Regular meetings shall be attended by representatives of the Contractor and the Department.

3. The Board shall establish an agenda for each meeting which will cover all items that the Board considers necessary to keep it abreast of the project such as construction status, schedule, potential problems and solutions, status of past claims and disputes, and potential claims and disputes. Copies of each agenda shall be submitted to the Contractor and the Department at least seven days before the meeting date. Oral or written presentations or both shall be made by the Contractor and the Department as necessary to give the Board all the data the Board requires to perform its functions. The Board will prepare minutes of each meeting, circulate them to all participants for comments and approval, and issue revised minutes before the next meeting. As a part of each regular meeting, a field inspection trip of all active segments of the work at the project site may be made by the Board, the Contractor, and the Department.

4. Advisory Opinions

(1) Advisory opinions are typically used soon after the parties find they have a potential dispute and have conducted preliminary negotiations but before expenditure of additional resources and hardening their positions. Advisory opinions provide quick insight into the DRB's likely assessment of the dispute. This process is quick and may be entirely oral and does not prejudice the opportunity for a DRB hearing.

(2) Both parties must agree to seek an advisory opinion and so notify the chairperson. The procedure for requesting and issuing advisory opinions should be discussed with the DRB at the first meeting with the parties.

(3) The DRB shall issue a one-page written opinion within 5 days of the hearing.

(4) The opinion is only advisory and does not require an acceptance or rejection by either party. If the dispute is not resolved and a hearing is held, the oral presentations and advisory opinion are completely disregarded and the DRB hearing procedure is followed.

(5) Advisory opinions should be limited to merit issues only.

(e) Arranging a Dispute Review Board Hearing. When the Project Engineer initiates the DRB review process, the Project Engineer will:

1. Contact the Contractor and the DRB to coordinate an acceptable hearing date and time. The hearing shall be held at the Resident Engineer's office unless an alternative location is agreed to by both parties. Unless otherwise agreed to by both parties an On Demand DRB hearing will be held within 30 days after the Three-Party Agreement is signed by the CDOT Chief Engineer. Unless otherwise agreed to by both parties, a Standing DRB hearing will be held within 30 days after the DRB has been requested per subsection 105.23(a).

2. Ensure DRB members have copies of all documents previously prepared by the Contractor and CDOT pertaining to the dispute, the DRB request, the Contract documents, and the special provisions at least two weeks before the hearing.

(f) Pre-Hearing Submittal. All Pre-hearing Submittals shall include only arguments, supporting documentation, quantum, and other information as previously submitted in writing and as previously disputed in the formal dispute process covered in subsection 105.22(b), (c), and (d). All Pre-hearing Submittals planned to be used at the hearing, shall be submitted to the other party 35 days before the hearing for review for compliance with this requirement. If either party contends there are new arguments, supporting documents, new quantum, or any new information in a pre-hearing Submittal, and the other party objects to this information being presented to the DRB, the objecting party shall submit its objections in writing to the other party within 10 days. The parties shall meet within five days to reconcile the objection before the submittal is submitted to the DRB. If the parties cannot reconcile the objection, but the new argument, supporting documentation, new quantum, or new information does not change either party's position on merit or quantum, the information shall be allowed in the Pre-hearing submittal and presented to the DRB. If the parties cannot reconcile the objections within the five days allowed, each party shall submit a one-page brief on their objections, but not the actual information objected to, to the DRB for a decision on the use of the documents. The DRB shall not approve any information simply because it is relevant to the dispute or referenced during the dispute. Neither party shall attempt to present anything to the DRB which they did not present to the other party during the dispute process. The dispute process shall be delayed while this determination is being made and a new hearing date set, if necessary. Pre-hearing Submittals to the DRB are as follows:

1. Joint Statement: At least 20 days before the hearing the Joint Statement(s) shall be submitted to the DRB. The parties shall make every attempt to agree upon a Joint Statement of the dispute. If the parties cannot agree on the Joint Statement, each party's independent statement shall be submitted to the DRB. The Joint Statement shall summarize, in a few sentences, the nature of the dispute(s) and the scope of the desired decision.

2. Position Paper: At least 15 days before the hearing, CDOT and the Contractor shall submit by email to the DRB Chairperson their party's Position Paper. The DRB Chairperson shall simultaneously distribute by email the Position Papers to all parties and other DRB members, if any. The Position Paper shall contain the following:

   (1) The basis and justification for the party's position, with reference to specific contract language and the supporting documents of each element of the disputes.

   (2) A list of proposed attendees for the hearing. In the event of any objection by a party, the DRB shall make a final determination as to who attends the hearing.

   (3) When the scope of the hearing includes quantum, full cost details will be calculated per methods set forth in subsection 105.24(b)12. The Scope of the hearing will not include quantum if CDOT has requested an audit that has not been completed.

3. Supporting Documents: At least 15 days before the hearing, each party shall submit a copy of all its supporting documents to the DRB and the other party. Supporting documents include any presentations, visuals, or handouts planned to be used at the hearing. To minimize duplication and repetitiveness, the parties are encouraged to identify a common set of documents that will be referred to by both parties and submit them in a separate package to the DRB at least 20 days before the hearing. Common documents are communications between parties, speed memos, change orders, schedules, request for equitable adjustment, and correspondence, and any document used in the subsection 105.22 process. CDOT shall submit the common set of documents to the Board and Contractor.
4. If relevant to the dispute and requested by the Board, the Engineer shall provide to the DRB either website links, electronic PDFs, or hard copies of pertinent contract documents such as plans, specifications, and M and S Standards.

(g) Pre-Hearing Phone Conference. A pre-hearing phone conference with all Board members and the parties shall be conducted as soon as a hearing date is established, but no later than 10 days before the hearing. The DRB Chairperson shall explain the specifics of how the hearing will be conducted including how the two parties will present their information. (Ex. Each party makes a full presentation of their positions or presentations will be made on a "point by point" basis with each party making a presentation only on the individual dispute issue before moving onto the next issue.)

If the pre-hearing position papers and documents have been received by the DRB before the conference call, the Chairperson shall discuss the estimated hours of review and activities for the disputes (such as time spent evaluating and preparing recommendation on specific issues presented to the DRB). If the pre-hearing position papers and documents have not been received by the Board before the conference call, another conference call will be scheduled during the initial conference call to discuss the estimated hours of review. The Engineer shall coordinate the conference call.

(h) Dispute Review Board Hearing. The DRB shall preside over a hearing. The chairperson shall control the hearing and conduct it as follows:

1. An employee of CDOT presents a brief description of the project and the status of construction on the project.
2. The party that requested the DRB presents the dispute in detail as supported by previously submitted information and documentation in the pre-hearing position paper. No new information or disputes will be heard or addressed by the DRB. Rebuttals of the other party's arguments shall not be presented at this time.
3. The other party presents its position in detail as supported by previously submitted information and documentation.
4. The party that requested the DRB presents their rebuttals followed by the other party's rebuttals.
5. Upon completion of their presentations and rebuttals, both parties and the DRB will be provided the opportunity to exchange questions and answers. Questions from the parties shall be directed to the Chairperson. Attendees may respond only when board members request a response.
6. Employees of each party are responsible for leading presentations at the DRB hearing.

7. Attorneys shall not participate in the hearing unless the DRB specifically addresses an issue to them or unless agreed to by both parties. Should the parties disagree on attorney participation, the DRB shall decide on what, if any, participation will be permitted. Attorneys representing the parties are permitted to attend the hearing, provided their presence has been noted in the pre-hearing submittal.
8. Either party may use experts only if the expert has previously presented to the other party before the DRB process. A party intending to offer an outside expert's analysis at the hearing shall disclose such intention in the pre-hearing position paper. The expert's name and a general statement of the area of the dispute that will be covered by his presentation shall be included in the disclosure. The other party may present an outside expert to address or respond to those issues that may be raised by the disclosing party's outside expert.
9. If both parties approve, the DRB may retain an outside expert. The DRB chairperson shall include the cost of the outside expert in the DRB's regular invoice. CDOT and the Contractor shall equally bear the cost of the services of the outside expert employed by the DRB.
10. If either party attempts to present an argument, documentation, quantum, or new information which the other party feels was not in the Pre-hearing submittals, the chairperson shall require the party to demonstrate where in the Pre-hearing submittal the information in question resides.
11. If either party fails to timely deliver a position paper, the DRB may reschedule the hearing one time. On the final date and time established for the hearing, the DRB shall proceed with the hearing using the information that has been submitted.
12. If a party fails to appear at the hearing, the DRB shall proceed as if all parties were in attendance.

(i) Dispute Review Board Recommendation. The DRB shall issue a Recommendation per the following procedures:

1. The DRB shall not make a recommendation on the dispute at the meeting. Before the closure of the hearing, the DRB members and the Contractor and CDOT together will discuss the time needed for analysis and review of the dispute and the issuance of the DRB's recommendation. The maximum time shall be 30 days unless otherwise agreed to by both parties.
2. After the meeting has been closed, the DRB shall prepare a written Recommendation signed by each member of the DRB. In the case of a three member DRB where one member dissents, that member shall prepare a written dissent and sign it. The DRB's recommendation shall include the following:
   A. A summary of the issues and factual evidence presented by the Contractor and CDOT concerning the dispute.
   B. Recommendations concerning the validity of the dispute.
   C. Recommendations concerning the value of the dispute as to cost impacts if the dispute is determined to be valid.
   D. The contractual and factual bases supporting the recommendation(s) made including an explanation as to why each and every position was accepted or rejected.
   E. Detailed and supportable calculations which support any recommendation(s).

3. The chairperson shall transmit the signed Recommendation and any supporting documents to both parties.

(j) *Clarification and Reconsideration of Recommendation.* Either party may request in writing clarification or reconsideration of a decision within 10 days following receipt of the Recommendation. Within 10 days after receiving the request, the DRB shall provide written clarification or reconsideration to both parties.

Requests for clarification or reconsideration shall be submitted in writing simultaneously to the DRB and to the other party.

The Board shall not accept requests for reconsideration that amount to a renewal of a prior argument or additional argument based on facts available at the time of the hearing. The Board shall not consider any documents orarguments which have not been made a part of the pre-hearing submittal other than clarification and data supporting previously submitted documentation.

Only one request for clarification or reconsideration per dispute from each party will be allowed.

(k) *Acceptance or Rejection of Recommendation.* CDOT and the Contractor shall submit their written acceptance or rejection of the Recommendation, in whole or in part, concurrently to the other party and to the DRB within 14 days after receipt of the Recommendation or following receipt of responses to requests for clarification or reconsideration.

If the parties accept the Recommendation or a discreet part thereof, it will be implemented per subsections 108.08, 109.04, 109.05, or 109.10 and the dispute is resolved.

If either party rejects the Recommendation in whole or in part, it shall give written explanation to the other party and the DRB within 14 days after receiving the Recommendation. When the Recommendation is rejected in whole or in part by either party, the other party may either abandon the dispute or pursue a formal claim per subsection 105.24.

If either party fails to submit its written acceptance or rejection of the Dispute Board's recommendation, according to these specifications, such failure shall constitute that party's acceptance of the Board's recommendation.

(l) *Admissibility of Recommendation*. Recommendations of a DRB issued per subsection 105.23 are admissible in subsequent proceedings but shall be prefaced with the following paragraph:

This Recommendation may be taken under consideration with the understanding that:

1. The DRB Recommendation was a proceeding based on presentations by the parties.
2. No fact or expert witnesses presented sworn testimony or were subject to cross-examination.
3. The parties to the DRB were not provided with the right to any discovery, such as production of documents or depositions.
4. There is no record of the DRB hearing other than the Recommendation.

(m) Cost and Payments.

1. General Administrative Costs. The Contractor and the Department shall equally share the entire cost of the following to support the Board's operation:

   (1) Copies of Contract and other relevant documentation
   (2) Meeting space and facilities
   (3) Secretarial services
   (4) Telephone
   (5) Mail
   (6) Reproduction
   (7) Filing

2. The Department and the Contractor shall bear the costs and expenses of the DRB equally. Each DRB board member shall be compensated at an agreed rate of $1,200 per day if time spent on-site per meeting is greater than four hours. Each DRB board member shall be compensated at an agreed rate of $800 per day if time spent on-site per meeting is less than or equal to four hours. The time spent traveling to and from each meeting shall be reimbursed at $50 per hour if the travel distance is more than 50 miles. The agreed daily and travel time rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel of more than 50 miles and incidentals for each day, or portion thereof that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time, (such as time spent evaluating and preparing recommendations on specific issues presented to the DRB), has been specifically agreed to in advance by the Department and Contractor. Time away from the project that has been specifically agreed to in advance by the parties will be compensated at an agreed rate of $125 per hour. The agreed amount of $125 per hour shall include all incidentals. Members serving on more than one DRB, regardless of the number of meetings per day, shall not be paid more than the all-inclusive rate per day or rate per hour for an individual project.

3. Payments to Board Members and General Administrative Costs. Each Board member shall submit an invoice to the Contractor for fees and applicable expenses incurred each month following a month in which the Board members participated in Board functions. Such invoices shall be in the format established by the Contractor and the Department. The Contractor shall submit to the Department copies of all invoices. No markups by the Contractor will be allowed on any DRB costs. The Department will split the cost by authorizing 50 percent payment on the next progress payment. The Contractor shall make all payments in full to Board members within seven calendar days after receiving payment from the Department for this work.

(n) Dispute Review Board Three Party Agreement.

DISPUTE REVIEW BOARD
THREE PARTY AGREEMENT
COLORADO PROJECT NUMBER

THIS THREE-PARTY AGREEMENT, made as of the date signed by the Chief Engineer below, by and between: the Colorado Department of Transportation, hereinafter called the "Department"; and

___,
hereinafter called the "Contractor"; and

__,

__,

__, and

__,
hereinafter called the "Dispute Review Board" or "Board".

WHEREAS, the Department is now engaged in the construction of the

[Project Name]

and

WHEREAS, the Contract provides for the establishment of a Board in accordance with subsections 105.22 and 105.23 of the specifications.

NOW, THEREFORE, it is hereby agreed:

ARTICLE I
DESCRIPTION OF WORK AND SERVICES

The Department and the Contractor shall form a Board in accordance with this agreement and the provisions of subsection 105.23.

ARTICLE II
COMMITMENT ON PART OF THE PARTIES HERETO

The parties hereto shall faithfully fulfill the requirements of subsection 105.23 and the requirements of this agreement.

ARTICLE III
COMPENSATION

The parties shall share equally in the cost of the Board, including general administrative costs (meeting space and facilities, secretarial services, telephone, mail, reproduction, filing) and the member's individual fees. Reimbursement of the Contractor's share of the Board expenses for any reason is prohibited.

The Contractor shall make all payments in full to Board members. The Contractor shall submit to the Department an itemized statement for all such payments, and the Department will split the cost by including 50 percent payment on the next progress payment. The Contractor and the Department will agree to accept invoiced costs prior to payment by the Contractor.

Board members shall keep all fee records pertaining to this agreement available for inspection by representatives of the Department and the Contractor for a period of three years after the termination of the Board members' services.

Payment to each Board member shall be at the fee rates established in subsection 105.23 and agreed to by each Board member, the Contractor, and the Department. In addition, reimbursement will be made for applicable expenses.

Each Board member shall submit an invoice to the Contractor for fees incurred each month following a month in which the members participated in Board functions. Such invoices shall be in the format established by the

Contractor and the Department.

Payments shall be made to each Board member within 60 days after the Contractor and Department have received all the applicable billing data and verified the data submitted by that member. The Contractor shall make payment to the Board member within seven calendar days of receipt of payment from the Department.

DISPUTE REVIEW BOARD
THREE PARTY AGREEMENT PAGE 2
COLORADO PROJECT NUMBER

ARTICLE IV
ASSIGNMENT

Board members shall not assign any of the work to be performed by them under this agreement. Board members shall disclose any conflicts of interest including but not limited to any dealings with either party in the previous five years other than serving as a Board member under other contracts.

ARTICLE V
COMMENCEMENT AND TERMINATION OF SERVICES

The commencement of the services of the Board shall be in accordance with subsection 105.23 of the specifications and shall continue until all assigned disputes under the Contract which may require the Board's services have been heard and a Recommendation has been issued by the Board as specified in subsection 105.23. If a Board member is unable to fulfill his responsibilities for reasons specified in subsection 105.23(b)7, he shall be replaced as provided therein, and the Board shall fulfill its responsibilities as though there had been no change.

ARTICLE VI
LEGAL RELATIONS

The parties hereto mutually agree that each Board member in performance of his duties on the Board is acting as an independent contractor and not as an employee of either the Department or the Contractor. Board members will guard their independence and avoid any communication about the substance of the dispute without both parties being present.

The Board members are absolved of any personal liability arising from the Recommendations of the Board. The parties agree that members of the dispute review board panel are acting as mediators for purposes of C.R.S. § 13-22-302(4) and, as such, the liability of any dispute review board member shall be limited to willful and wanton misconduct as provided for in C.R.S. § 13-22-305(6).

Board members shall not be called as witness for future litigation.

IN WITNESS HEREOF, the parties hereto have caused this agreement to be executed the day and year written below.

BOARD MEMBER:__.

BY:___.

BOARD MEMBER: __.

BY: ___.

BOARD MEMBER:__.

BY:___.

CONTRACTOR:__.

BY:___.

TITLE: __

COLORADO DEPARTMENT OF TRANSPORTATION

BY:__. DATE:_____,

TITLE: CHIEF ENGINEER

105.24 Claims for Unresolved Disputes. The Contractor may file a claim only if the disputes resolution process described in subsections 105.22 and 105.23 has been exhausted without resolution of the dispute. Other methods of nonbinding dispute resolution, exclusive of litigation, can be used if agreed to by both parties.

This subsection applies to any unresolved dispute or set of disputes between CDOT and the Contractor with an aggregate value of more than $15,000. Unresolved disputes with an aggregate value of more than $15,000 from subcontractors, materials suppliers or any other entity not a party to the Contract shall be submitted through the Contractor per this subsection as a pass-through claim. Review of a pass-through claim does not create privity of Contract between CDOT and any other entity.

Subsections 105.22, 105.23 and 105.24 provide both contractual alternative dispute resolution processes and constitute remedy-granting provisions pursuant to Colorado Revised Statutes (CRS) which must be exhausted in their entirety.

Litigation proceedings must commence within 180-calendar days of the Chief Engineer's decision, absent written agreement otherwise by both parties.

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

Non-binding Forms of alternative dispute resolution such as Mediation are available upon mutual agreement of the parties for all claims submitted per this subsection.

The cost of the non-binding ADR process shall be shared equally by both parties with each party bearing its own preparation costs. The type of nonbinding ADR process shall be agreed upon by the parties and shall be conducted within the State of Colorado at a mutually acceptable location. Participation in a nonbinding ADR process does not in any way waive the requirement that litigation proceedings must commence within 180-calendar days of the Chief Engineer's decision, absent written agreement otherwise by both parties.

(a) Notice of Intent to File a Claim. Within 30 days after rejection of the Dispute Resolution Board's Recommendation issued per subsection 105.23, the Contractor shall provide the Region Transportation Director (RTD) with a written notice of intent to file a claim. The Contractor shall also send a copy of this notice to the Resident Engineer. For the purpose of this subsection, Region Transportation Director shall mean the Region Transportation Director or the Region Transportation Director's designated representative. CDOT will acknowledge in writing receipt of Notice of Intent within seven days.

(b) Claim Package Submission. Within 60 days after submitting the notice of intent to file a claim, the Contractor shall submit, to the RTD, five copies of a complete claim package representing the final position the Contractor wishes to have considered. All claims shall be in writing and in sufficient detail to enable the RTD to ascertain the basis and amount of claim. The claim package shall include all documents supporting the claim, regardless of whether such documents were provided previously to CDOT.

If requested by the Contractor, the 60-day period may be extended by the RTD in writing before final acceptance. At a minimum, the following information shall accompany each claim:

1. A claim certification containing the following language, as appropriate:

A. For a direct claim by the Contractor:

CONTRACTOR'S CLAIM CERTIFICATION

Under penalty of law for perjury or falsification, the undersigned,_____(name)
, (title)_____,_____of _____(company)_____, hereby certifies that the claim of $_____for extra compensation and ____Days additional time, made for work on this Contract is true to the best of my knowledge and belief and supported under the Contract between the parties.

This claim package contains all available documents that support the claims made and I understand that no additional information, other than for clarification and data supporting previously submitted documentation, may be presented by me.

Dated _____/s/___

Subscribed and sworn before me this _ day of_.

_

NOTARY PUBLIC

My Commission Expires: _____

B. For a pass-through claim:

PASS-THROUGH CLAIM CERTIFICATION

Under penalty of law for perjury or falsification, the undersigned,_____(name)
, (title)_____,_____, of _____(company)_____, hereby certifies that the claim of $_____ for extra compensation and_____ Days additional time, made for work on this Project is true to the best of my knowledge and belief and supported under the Contract between the parties.

This claim package contains all available documents that support the claims made and I understand that no additional information, other than for clarification and data supporting previously submitted documentation, may be presented by me.

Dated _____/s/___

Subscribed and sworn before me this _day of _____ .

_

NOTARY PUBLIC

My Commission Expires: _____

Dated _____/s_

The Contractor certifies that the claim being passed through to CDOT is passed through in good faith and is accurate and complete to the best of my knowledge and belief.

Dated _____/s/___

Subscribed and sworn before me this . day of _.

_

NOTARY PUBLIC

My Commission Expires: _____

2. A detailed factual statement of the claim for additional compensation, time, or both, providing all necessary dates, locations, and items of work affected by the claim. The Contractor's detailed factual statement shall expressly describe the basis of the claim and factual evidence supporting the claim. This requirement is not satisfied by simply incorporating into the claim package other documents that describe the basis of the claim and supporting factual evidence.

3. The date on which facts were discovered which gave rise to the claim.
4. The name, title, and activity of all known CDOT, Consultant, and other individuals who may be knowledgeable about facts giving rise to such claim.
5. The name, title, and activity of all known Contractor, subcontractor, supplier and other individuals who may be knowledgeable about facts giving rise to such claim.
6. The specific provisions of the Contract, which support the claim and a statement of the reasons why such provisions support the claim.
7. If the claim relates to a decision of the Project Engineer, which the Contract leaves to the Project Engineer's discretion, the Contractor shall set out in detail all facts supporting its position relating to the decision of the Project Engineer.
8. The identification of any documents and the substance of all oral communications that support the claim.
9. Copies of all known documents that support the claim.
10. The Dispute Review Board Recommendation.
11. If an extension of contract time is sought, the documents required by subsection 108.08(d).
12. If additional compensation is sought, the exact amount sought and a breakdown of that amount into the following categories:

    A. These categories represent the only costs that, if applicable, are recoverable by the Contractor. All other costs or categories of costs are not recoverable:

        (1) Actual wages and benefits, including FICA, paid for additional labor.

        (2) Costs for additional bond, insurance, and tax.

        (3) Increased costs for materials.

        (4) Equipment costs calculated per subsection 109.04(c) for Contractor owned equipment and based on certified invoice costs for rented equipment.

        (5) Costs of extended job site overhead (only applies if the dispute also includes a time extension).

        (6) Salaried employees assigned to the project (only applies if the dispute also includes a time extension or if the dispute required salaried employee(s) to be added to the Project).

        (7) Claims from subcontractors and suppliers at any level (the same level of detail as specified is required for all such claims).

        (8) An additional 16 percent will be added to the total of items (1) through (7) as compensation for items for which no specific allowance is provided, including profit and home office overhead.

        (9) Interest shall be paid per CRS 5-12-102 beginning from the date of the Notice of Intent to File Claim.

    B. In adjustment for the costs as allowed above, the Department will have no liability for the following items of damages or expense:

(1) Profit in excess of that provided in 12.A.(8) above.

(2) Loss of Profit.

(3) Additional cost of labor inefficiencies in excess of that provided in A. above.

(4) Home office overhead in excess of that provided in A. above.

(5) Consequential damages, including but not limited to loss of bonding capacity, loss of bidding opportunities, and insolvency.

(6) Indirect costs or expenses of any nature in excess of that provided in A. above.

(7) Attorney's fees, claim preparation fees, and expert fees.

(c) Region Transportation Director Decision. When the Contractor properly files a claim, the RTD will review the claim and render a written decision to the Contractor to either affirm or deny the claim, in whole or in part, per the following procedure.

The RTD may consolidate all related claims on a project and issue one decision, provided that consolidation does not extend the time period within which the RTD is to render a decision. Consolidation of unrelated claims will not be made.

The RTD will render a written decision to the Contractor within 90 days after the receipt of the claim package or receipt of the audit whichever is later. In rendering the decision, the RTD: (1) will review the information in the Contractor's claim; (2) will conduct a hearing if requested by either party; and (3) may consider any other information available in rendering a decision.

The RTD will assemble and maintain a claim record comprised of all information physically submitted by the Contractor in support of the claim and all other discoverable information considered by the RTD in reaching a decision. Once the RTD assembles the claim record, the submission and consideration of additional information, other than for clarification and data supporting previously submitted documentation, at any subsequent level of review by anyone, will not be permitted.

The RTD will provide a copy of the claim record and the written decision to the Contractor describing the information considered by the RTD in reaching a decision and the basis for that decision. If the RTD fails to render a written decision within the 60-day period, or within any extended time period as agreed to by both parties, the Contractor shall either: (1) accept this as a denial of the claim, or (2) appeal the claim to the Chief Engineer, as described in this subsection.

If the Contractor accepts the RTD decision, the provisions of the decision shall be implemented per subsections 108.08, 109.04, 109.05, or 109.10 and the claim is resolved.

If the Contractor disagrees with the RTD decision, the Contractor shall either: (1) accept the RTD decision as final, or (2) file a written appeal to the Chief Engineer within 30 days from the receipt of the RTD decision. The Contractor hereby agrees that if a written appeal is not properly filed, the RTD decision is final.

(d) Chief Engineer Decision. When a claim is appealed, the RTD will provide the claim record to the Chief Engineer. Within 15 days of the appeal either party may submit a written request for a hearing with the Chief Engineer or duly authorized Headquarters delegates. The Chief Engineer or a duly authorized Headquarters delegate will review the claim and render a decision to affirm, overrule, or modify the RTD decision per the following.

The Chief Engineer will render a written decision within 60 days after receiving the written appeal. The Chief Engineer will not consider any information that was not previously made a part of the claim record, other than clarification and data supporting previously submitted documentation.

The Contractor shall have 30 days to accept or reject the Chief Engineer's decision. The Contractor shall notify the Chief Engineer of its acceptance or rejection in writing.

If the Contractor accepts the Chief Engineer's decision, the provisions of the decision will be implemented per subsections 108.08, 109.04, 109.05, or 109.10 and the claim is resolved.

If the Contractor disagrees with the Chief Engineer's decision, the Contractor shall either (1) pursue an alternative dispute resolution process per this specification or (2) initiate litigation per subsection 105.24(f).

If the Chief Engineer does not issue a decision as required, the Contractor may immediately initiate litigation per subsection 105.24(f).

For the convenience of the parties to the Contract it is mutually agreed by the parties that any merit binding or De Novo litigation shall be brought within 180-calendar days from the date of the Chief Engineer's decision. The parties understand and agree that the Contractor's failure to bring suit within the time period provided, shall be a complete bar to any such claims or causes of action.

(e) De Novo Litigation. If the Contractor disagrees with the Chief Engineer's decision, the Contractor may initiate de novo litigation to finally resolve the claim that the Contractor submitted to CDOT. Such litigation shall be strictly limited to those claims that were previously submitted and decided in the contractual dispute and claims processes outlined. This does not preclude the joining in one litigation of multiple claims from the same project provided that each claim has gone through the dispute and claim process specified in subsections 105.22 through 105.24. The parties may agree, in writing, at any time, to pursue some other form of alternative dispute resolution.

Any offer made by the Contractor or the Department at any stage of the claims process, as set forth in this subsection, shall be deemed an offer of settlement pursuant to Colorado Rule of Evidence 408 and therefore inadmissible in any litigation.

If the Contractor selected litigation, then de novo litigation shall proceed per the Colorado Rules of Civil Procedure and the proper venue is the Colorado State District Court in and for the City and County of Denver.

Figure 105-1 provides a summary of the disputes and claims process described in subsections 105.22, 105.23, and 105.24.

Figure 105-1 DISPUTES AND CLAIMS FLOW CHART
(Note: If an audit is to be performed, durations in this flow chart are extended accordingly)

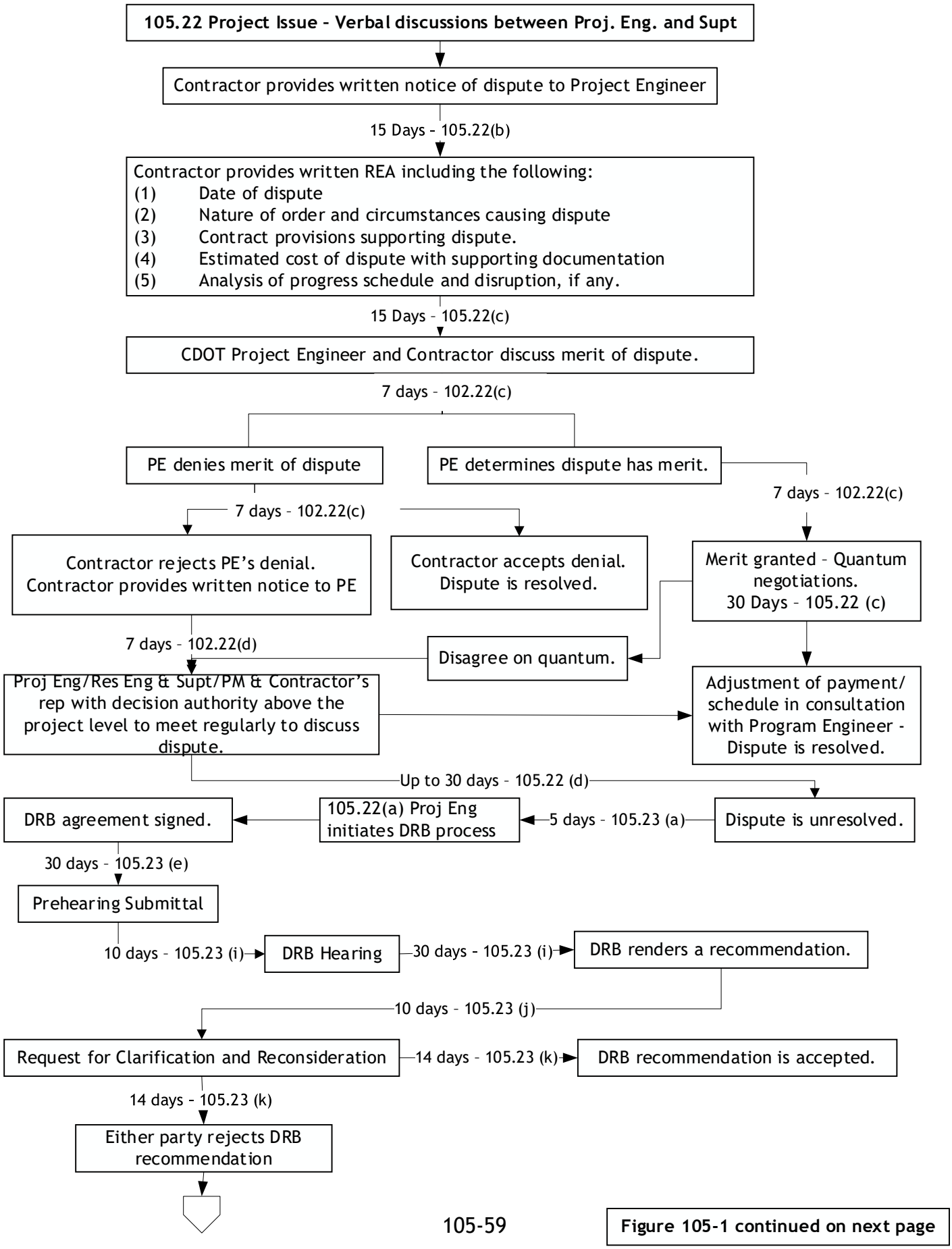
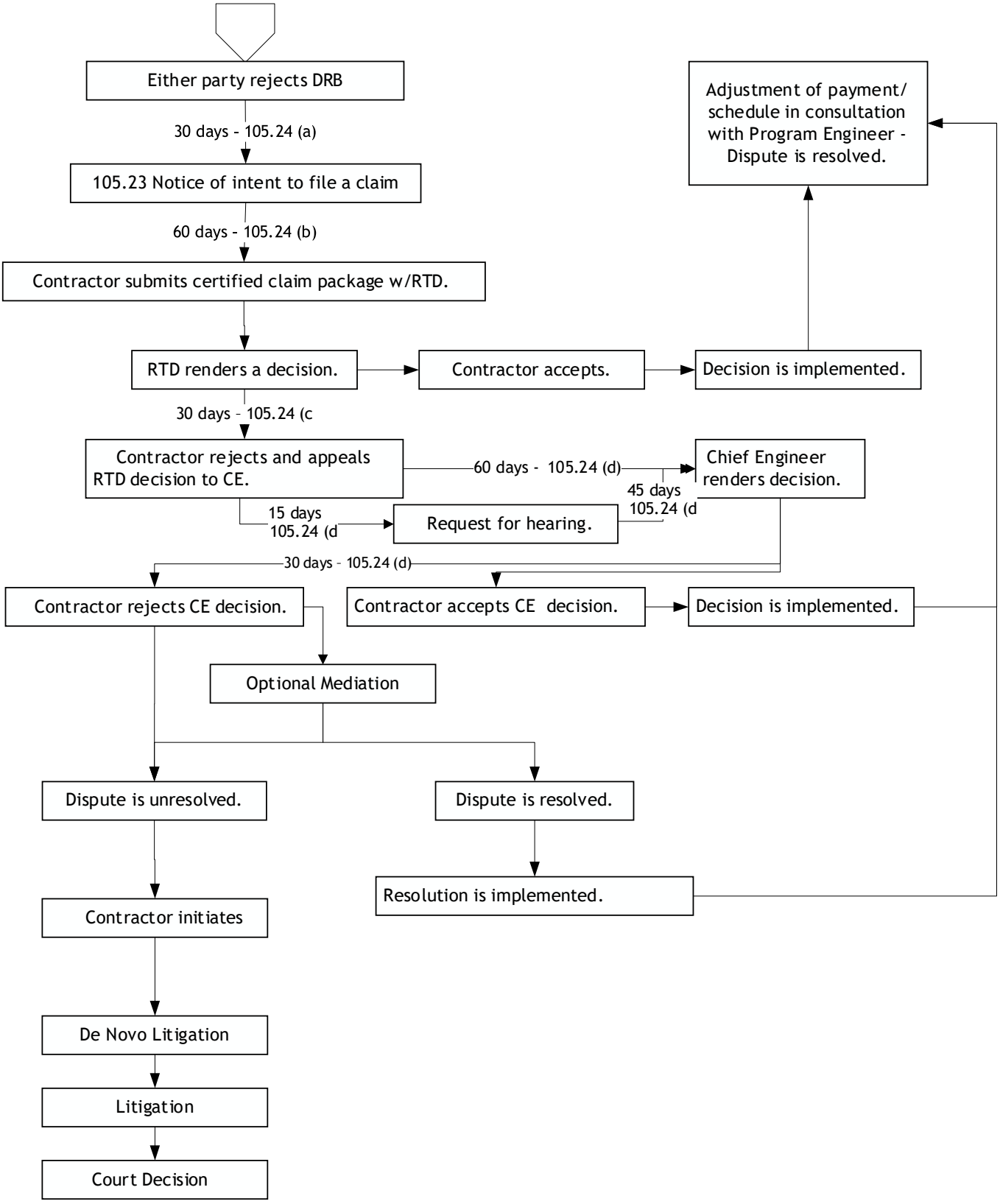


Figure 105-1 continued on next page

Figure 105 - 1 continued



SECTION 106

CONTROL OF MATERIALS

106.01 Source of Supply and Quality Requirements. All materials used shall meet all quality requirements of the Contract. The Contractor shall comply with the requirements of the special notice to contractors contained in the Department's Field Materials Manual, including notifying the Engineer of the proposed sources of materials at least two weeks before delivery.

When alternative materials are permitted for an item in the Contract, the Contractor shall state at the Pre-construction Conference the material that will be furnished for that item.

Reference in the Contract to a particular product or to the product of a specific manufacturer, followed by the phrase "or approved equal", is intended only to establish a standard of quality, durability, and design, and shall not be construed as limiting competition. Products of other manufacturers will be acceptable provided such products are equal to that specified.

All suppliers who provide one or more of the following elements in which the cost exceeds $10,000 shall create an account in the B2GNow software system.

(a) Fabrication of material

(b) Processing of materials

(c) Delivery service cost of the material delivered to the project.

If the supplier does not have an account created, approval of the Form 1425 may be withheld.

The Contractor shall submit a completed Form 1425 for each direct supplier that meets the $10,000 criteria outlined above via the B2GNow software system. The Form 1425 shall be submitted to the Engineer before beginning work on the project, incorporating materials into the project or at such time that the $10,000 amount is known to be exceeded.

If an individual, firm, or corporation is responsible for the installation of supplies, a Form 205 shall be required for the subcontractor. The supplier shall notify the Contractor if an individual spends more than 20percent of their workweek performing actual construction work such as installation, repair or warranty work, on the site of work as that would require the submission of a Form 205 and certified payrolls. During the performance of the project, the Contractor shall submit an updated Form 1425 if information changes.

Each subcontractor or supplier at any tier meeting the $10,000 requirement above shall submit a Form 1425 to the Contractor, who will then submit it to the Department. The Contractor shall submit the subcontractor's Form(s) 1425 with Form 205 (if any) to the Engineer before the subcontractor/supplier beginning any work on the project, incorporating materials into the project, or at such time the $10,000 amount is known to be exceeded.

Failure to comply with the requirements of this subsection shall be grounds for withholding of progress payments.

106.02 Material Sources. Where practicable, borrow pits, gravel pits, and quarry sites shall be located so that they will not be visible from the highway.

(a) *Available Source.* When the Contract shows a location that may be used by the Contractor as a source of sand, gravel, or borrow material, the location will be known as an available source. The Department will have an agreement with the property owner that allows removal of material under certain conditions and for a stated price.

Conditions of this agreement that concern use of this material on the project and pit construction and reclamation requirements for the available source will be included in the Contract.

The Contract will indicate whether the Department has or has not obtained the necessary County or City Zoning Clearance and the required permit from Colorado Department of Natural Resources needed to explore and remove materials from the available source. If the Department did not obtain the necessary clearances or permits, the Contractor shall obtain them. Any delays to the project or additional expenses that are incurred while these clearances or permits are being obtained shall be the responsibility of the Contractor. The Contractor shall ensure that the requirements of the permits do not conflict with the pit construction and reclamation requirements shown in the Contract for the available source.

The Department will investigate and obtain samples from the various available sources. These samples are not intended to indicate the full extent and composition of an entire deposit. These samples will be tested by the Department and may be combined with various materials such as mineral fillers and additives for further testing, especially for testing aggregate sources to obtain a satisfactory design mix. The Contract will show the location of the test holes where samples were obtained, test results, and amounts and kinds of any added materials utilized in the testing to obtain a satisfactory product. If the Contractor uses an available source, all material shall meet contract specifications. The Department will not be responsible for the material as produced by the Contractor.

All costs of producing specification material shall be borne by the Contractor.

(b) *Contractor Source.* Sources of sand, gravel, or borrow other than available sources will be known as contractor sources. The contractor source will be tested by the Department and approved by the Engineer before incorporation of the material into the project. If the submitted materials do not meet the contract specifications it will become the Contractor's responsibility to re-sample and test the material. The Contractor shall supply the Department with passing test results from an AASHTO accredited laboratory electronically sealed by a Professional Engineer. If requested by the Engineer, the Department will then re-sample and re-test the material for compliance to the contract specifications. The Contractor shall produce material that meets contract specifications throughout construction of the project.

The cost of sampling, testing, and corrective action by the Contractor will not be paid for separately but shall be included in the work.

The Contractor shall obtain all permits and agreements necessary to explore and remove material from a contractor source. The Contractor shall also be responsible for any costs or delays associated with obtaining these permits and agreements.

For each source of imported embankment or topsoil the Contractor shall provide the following certification. The Contractor shall assure and certify that unacceptable levels of hazardous waste and substances; including but not limited to those defined in the Code of Federal Regulations (CFR), 40 CFR Part 261 Subparts C and D, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 101(14) as amended; are not incorporated into the project as a result of

importing embankment or topsoil materials. For each contractor source outside of the project limits, the Contractor shall submit such certification to the Engineer, signed by either a Certified Industrial Hygienist (CIH), Certified Hazardous Materials Manager (CHMM), Certified Safety Professional (CSP), or Registered Environmental Manager (REM) or electronically sealed by a registered Professional Engineer (PE).

If contractor source material for embankment or topsoil, originating outside of the project limits, is placed on the project and is at any time found to be contaminated with unacceptable levels of hazardous waste or substances, the Contractor shall remove the contaminated material from the Department's right of way, dispose of it per applicable laws and regulations, and make necessary restoration.
The cost of complying with these requirements, including sampling, testing, and corrective action by the Contractor, shall be included in the work.

106.03 Samples, Tests, Cited Specifications. All materials or the finished product where the materials are used, will be inspected and tested by the Engineer, or by others if specified in the Contract. The Engineer will furnish copies of test results that indicate out of specification material, to the Contractor, promptly as the test results become available. Acceptance will be based on the applicable requirements of Section 105. Any work where untested and uninspected materials are used shall be performed at the Contractor's risk and may be considered as unacceptable and unauthorized work.

Unless otherwise designated, when AASHTO, ASTM, or other specifications, standards, or policies are cited, the reference shall be to the latest edition as revised or updated by approved supplements or interim editions published and issued before the date of advertisement for bids.

Sampling and testing will be done per the Department's minimum sampling, testing, and inspection schedule; the special notice to contractors; and the Colorado procedures; all contained in the Department's Field Materials Manual.

Where the method of test is not cited, the applicable procedure shall be per the Standard AASHTO Method that was current on the date of advertisement for bids.

Samples will be taken by the Department except that the Contractor shall take samples of Portland Cement Concrete per CP 61; asphalt cement, per AASHTO T 40; hot mix asphalt per CP 41; and a composite of aggregates for hot asphalt mixtures per CP 30. The Engineer will determine the sampling locations, and the samples shall be taken in the presence of the Engineer. The Contractor may retain a split of each sample.

All materials being used are subject to inspection and testing at any time before or during incorporation into the work. Tests will be made by and at the expense of the Department.

106.04 Qualification of Testing Personnel and Laboratories. Personnel performing tests used in mix design or the acceptance, rejection, or price adjustment decision, and the laboratories where those tests are performed, shall be qualified per Colorado Procedure 10.

106.05 Sampling and Testing of Hot Mix Asphalt. All HMA, Item 403, except HMA (Patching) and temporary pavement shall be tested per the following program of process control testing and acceptance testing:

(a) *Process Control Testing*. The Contractor shall be responsible for process control testing on all elements listed in Table 106-1. Process control testing shall be performed at the expense of the Contractor. The Contractor shall develop a process control plan (PCP) per the following:

1. Process Control Plan. For each element listed in Table 106-1, the PCP must provide adequate details to ensure that the Contractor will perform process control. The Contractor shall submit the PCP to the Engineer at the Pre-construction Conference. The Contractor shall not start any work on the project until the Engineer has approved the PCP in writing.

   A. Frequency of Tests or Measurements. The PCP shall indicate a random sampling frequency, which shall not be less than that shown in Table 106-1. The process control tests shall be independent of acceptance tests.

   B. Worksheets, Forms, and Charts. The Contractor shall submit examples of worksheets, test result forms, and test results charts per CP 12 as part of the PCP.

   C. Test Result Chart. Each process control test result, the appropriate tonnage and the tolerance limits shall be plotted. For in place density tests, only results after final compaction shall be shown. The chart shall be posted daily at a location convenient for viewing by the Engineer.

   D. Quality Level Chart. The Quality Level (QL) for each element used to calculate incentive or disincentive in Table 106-1 and each required sieve size shall be plotted. The QL will be calculated per the procedure in CP 71 for Determining Quality Level (QL). The QL will be calculated on tests 1 through 3, then tests 1 through 4, then tests 1 through 5, then thereafter the last five consecutive test results. The tonnage of material represented by the last test result shall correspond to the QL. For in place density tests, only results after final compaction shall be shown. The chart shall be posted daily at a location convenient for viewing by the Engineer.

2. Elements Not Conforming to Process Control. The QL of each discrete group of five test results, beginning with the first group of five test results, shall be a standard for evaluating material not conforming to process control. When the group QL is below 65, the process shall be considered as not conforming to the PCP. In this case, the Contractor shall take immediate action to bring the process back into control. Except where the cause of the problem is readily apparent and corrected without delay, production shall be suspended until the source of the problem is determined and corrected. A written explanation of actions taken to correct control problems shall accompany the test data and be submitted to the Engineer on the day the actions are taken.

3. Point of Sampling. The material for process control testing shall be sampled by the Contractor using approved procedures. Acceptable procedures are Colorado Procedures, AASHTO and ASTM. The order of precedence is Colorado Procedures, AASHTO procedures and then ASTM procedures. The location where material samples will be taken shall be indicated in the PCP.

4. Testing Standards. The PCP shall indicate which testing standards will be followed. Acceptable standards are Colorado Procedures, AASHTO and ASTM. The order of precedence is Colorado Procedures, AASHTO procedures and then ASTM procedures.

5. Testing Supervisor Qualifications. The person responsible for the process control sampling and testing shall be identified in the PCP and be qualified according to the requirements of CP 10
6. Technician Qualifications. Technicians taking samples and performing tests must be qualified according to the requirements of CP 10.
7. Testing Equipment. All of the testing equipment used to conduct process control testing shall conform to the standards specified in the test procedures and be in good working order. Nuclear testing devices used for process control testing of in-place density do not have to be calibrated on the Department's calibration blocks.
8. Reporting and Record Keeping. The Contractor shall report the results of the process control tests to the Engineer in writing at least once per day. The Contractor shall assemble a process control (PC) notebook and update it daily. This notebook shall contain all worksheets, test results forms, test results charts and quality level charts for each of the elements listed in Table 106-1. The Contractor shall submit the PC notebook to the Engineer for review once a month on the date agreed to at the Pre-Paving Conference. The PC notebook will be returned to the Contractor within one working day after submittal. The Engineer will notify the Contractor in writing of any deficiencies in the PC notebook, including the failure to submit the notebook on time or an absence of the required reports. Upon the second failure to submit the complete PC notebook on time or with an absence of the required reports, the Engineer will notify the Contractor, and the pay estimate will be withheld until the Contractor submits, in writing, a report detailing the cause for the failure to submit the complete PC notebook on time or the cause for the absence of required reports. The report shall include how the Contractor plans to resolve the failures. Additional failures to submit the PC notebook on time or absent the required reports will result in a delay of the pay estimate until the Contractor has identified and resolved the failure along with revising and resubmitting his PCP to address these issues. Once the Engineer has reviewed and approved the revised PCP the estimate may be paid. Upon submittal of the PC notebook for the semi-final estimate, the PC notebook shall become the property of the Department. The Contractor shall make provisions such that the Engineer can inspect process control work in progress, including PC notebook, sampling, testing, plants, and the Contractor's testing facilities at any time.

(b) Acceptance Testing. Acceptance testing is the responsibility of the Department and shall not be addressed in the PCP. The Department will determine the locations where samples or measurements are to be taken. The maximum quantity of material represented by each test result and the minimum number of test results will be per Table 106-1. The location or time of sampling will be based on a stratified random procedure as described in CP 75. Acceptance sampling and testing procedures will be per the Schedule for Minimum Materials Sampling, Testing and Inspection in the Department's Field Materials Manual. Samples for project acceptance testing shall be taken by the Contractor per the designated method. The samples shall be taken in the presence of the Engineer. Where appropriate, the Contractor shall reduce each sample to the size designated by the Engineer. The Contractor may retain a split of each sample which cannot be included as part of the PCP.

If the Contractor elects to question the Hot Mix Asphalt (HMA) acceptance test results, the steps outlined in CP 17 shall be followed. The results from the CP 17 resolution process shall be binding on both the Department and the Contractor. Requests for CP 17

process for all elements except density shall be submitted in writing to the Engineer within 5 workdays from the date the Contractor receives acceptance test data from the Engineer. The specific element questioned shall be identified in writing. All requests for the CP 17 process for the density element shall be submitted in writing to the Engineer within 24 hours of receiving test data from the Engineer.

The Contractor shall choose either the CDOT Materials and Geotechnical Branch or a consultant laboratory not associated with the project to perform the third-party testing. The Contractor shall document his choice in writing at the Pre-Paving Conference. If a consultant laboratory is chosen, the CDOT Materials and Geotechnical Branch will determine the consultant that will be used from a pre-established list and ensure there is no conflict of interest.

If third party testing is required, the responsibility for the testing expenses shall be assigned per CP 17. The costs for testing are shown in CP 17, Table 17-2.

All materials being used are subject to inspection and testing at any time prior to, during, or after incorporation into work. Acceptance tests will be made by and at the expense of the Department, except when otherwise provided.

(c) *Check Testing Program (CTP).* Prior to, or in conjunction with, placing the first 500 tons of asphalt pavement, under the direction of the Engineer, a CTP will be conducted between acceptance testing and process control testing programs. The CTP will consist of testing for asphalt content, theoretical maximum specific gravity, HMA 4.75 mm (#4) sieve, HMA 2.36 mm (#8) sieve, HMA 0.075 mm (#200) sieve, in-place density, and joint density per CP 13. If the Contractor intends to test to determine air voids and VMA, check testing for these tests is recommended. The CTP will be continued until the acceptance and process control tests are within the acceptable limits shown in Table 13-1 of CP 13. For joint density, the initial check test will be a comparison of the seven cores tested by CDOT and the seven cores tested by the Contractor. These are the cores from the compaction test section used for nuclear gauge calibration and test section payment.

During production, a split sample check will be conducted at the frequency shown in Table 106-1. Except for joint density, the split samples will be from an acceptance sample obtained per subsection 106.05(b). The acceptance test result will be compared to the process control test result obtained by the Contractor using the acceptable limits shown in Table 13-1 of CP 13. For joint density, the comparison sample for testing by the Contractor will be obtained by taking a second core adjacent to the joint density acceptance core. The acceptance test result will be compared to the process control test result obtained by the Contractor using the acceptable limits as shown in Table 13-1 of CP 13 and following the check testing procedure given in CP 13.

If production has been suspended and then resumed, the Engineer may order a CTP between process control and acceptance testing persons to assure the test results are within the acceptable limits shown in Table 13-1 of CP 13. Check test results shall not be included in process control testing. The Region Materials Engineer shall be called upon to resolve differences if a CTP shows unresolved differences beyond the values shown in Table 13-1 of CP 13.

(d) *Stability Verification Testing.* After the mix design has been approved and production commences, the Department will perform a minimum of three stability verification tests to verify that the field produced HMA conforms to the approved mix design:

The test frequency shall be one per day unless otherwise directed by the Engineer.

The test results will be evaluated, and the Contractor shall make adjustments if required per the following:

1. The minimum value for stability will be the minimum specified in Table 403-1 of the specifications. There will be no tolerance limit.
2. Quality Level. Calculate a QL for stability.

   If the QL for stability is less than 65, then production shall be halted, and the Contractor shall submit a written proposal for a mix design revision to the Engineer. The Engineer shall give written approval to the proposed mix design revision before production continues.

   After a new or revised mix design is approved, three additional stability tests will be performed on asphalt produced with the new or revised mix design. The test frequency shall be one per day unless altered by the Engineer.

   If the stability QL is less than 65, then production shall be halted until a new mix design has been completed and approved using plant produced material or the Contractor shall submit a written proposal for a mix design revision to the Engineer. The Engineer shall give written approval to the proposed mix design revision before production continues.
3. New or Revised Mix Design. Whenever a new or revised mix design is used and production resumes, three additional stability field verification tests shall be performed, and the test results evaluated per the above requirements. The test frequency shall be one per day unless altered by the Engineer.
4. Field Verification Process Complete. When the field verification process described above is complete and production continues, the sample frequency will revert back to 1 per 10,000 tons.

(e) Mix Verification Testing. After the mix design has been approved and production commences, the Department will perform a minimum of three volumetric verification tests for each of the following elements to verify that the field produced Hot Mix Asphalt (HMA) conforms to the approved mix design:
(1) Air Voids.
(2) Voids in Mineral Aggregate (VMA).
(3) Asphalt Content (AC).

The test frequency shall be one per day unless altered by the Engineer.

The test results will be evaluated, and the Contractor shall make adjustments if required per the following:

1. Target Values. The target value for VMA will be the average of the first three volumetric field test results on project produced hot mix asphalt or the target value specified in Table 403-1 and Table 403-2 of the specifications, whichever is higher. The target value for VMA will be set no lower than 0.5 percent below the VMA target on Form 43 prior to production. The target values for the test element of air voids and AC shall be the mix design air voids and mix design AC as shown on Form 43.
2. Tolerance Limits. The tolerance limits for each test element shall be:

   AC ± 0.3 percent

   Air Voids ± 1.2 percent

   VMA ± 1.2 percent

3. Quality Levels. Calculate an individual QL for each of the elements using the volumetric field verification test results. If the QL for VMA or AC is less than 65 or if the QL for air voids is less than 70, the production shall be halted, and the Contractor shall submit a written proposal for a mix design revision to the Engineer. Production shall only commence upon receipt of written approval from the Engineer of the proposed mix design revision.

   After a new or revised mix design is approved, three additional volumetric field verification tests will be performed on asphalt produced with the new or revised mix design. The test frequency shall be one per day unless altered by the Engineer.

   If the QL for VMA or AC is less than 65 or the QL for the test element of air voids is less than 70, then production shall be halted until a new mix design has been completed per CP 52 or CP 54, a new Form 43 issued, and the Contractor demonstrates that he is capable of producing a mixture meeting the verification requirements per A or B below:

   A. The Contractor shall produce test material at a site other than a CDOT project. The Contractor shall notify the Engineer a minimum of 48 hours' notice prior to the requested test. The location and time of the test are subject to the approval of the Engineer, prior to placement. Three samples will be tested for volumetric properties. If the QL for VMA or AC is equal or greater than 65 and the QL for the element of air voids is equal or greater than 70, full production may resume; or

   B. The Contractor may construct a 500-ton test strip on the project. Three samples in the last 200 tons will be tested for volumetric properties. After construction of the test section, production shall be halted until the testing is complete and element QLs are calculated. If the QL for VMA or AC is equal to or greater than 65 or the QL for the element of air voids is equal to or greater than 70, full production may resume. If the QL for VMA or AC is less than 65 or the QL for the element of air voids is less than 70, the material shall be removed and replaced at no cost to the Department. The time count will continue, and any delay to the project will be considered to have been caused by the Contractor and will not be compensable.

      The costs associated with mix designs shall be solely at the Contractor's expense.

      If the Contractor fails to verify the new mix design per A or B, then production shall be halted until a new mix design has been completed per CP 52 or CP 54, a new Form 43 issued, and the Contractor demonstrates they are capable of producing a mixture meeting the verification requirements per A or B.

4. New or Revised Mix Design. Whenever a new or revised mix design is used and production resumes, three additional volumetric field verification tests shall be performed, and the test results evaluated per the above requirements. The test frequency shall be one per day unless altered by the Engineer.

5. Field Verification Process Complete. When the field verification process described above is complete and production continues, the sample frequency will revert back to a minimum of 1/10,000 tons. The Engineer has the discretion to conduct additional verification tests at any time.

*(f) Testing Schedule***.** Process control and project acceptance testing frequency shall be per Table 106-1.

(g) Reference Conditions. Three reference conditions can exist determined by the Moving Quality Level (MQL). The MQL will be calculated per the procedure in CP 71 for Determining Quality Level (QL). The MQL will be calculated using only acceptance tests. The MQL will be calculated on tests 1 through 3, then tests 1 through 4, then tests 1 through 5, then thereafter on the last five consecutive test results. The MQL will not be used to determine pay factors. The three reference conditions and actions that will be taken are described as follows:

1. Condition green will exist for an element when an MQL of 90 or greater is reached, or maintained, and the past five consecutive test results are within the specification limits.
2. Condition yellow will exist for all elements at the beginning of production or when a new process is established because of changes in materials or the job-mix formula, following an extended suspension of work, or when the MQL is less than 90 and equal to or greater than 65. Once an element is at condition green, if the MQL falls below 90 or a test result falls outside the specification limits, the condition will revert to yellow or red as appropriate.
3. Condition red will exist for any element when the MQL is less than 65. The Contractor shall be notified immediately in writing and the process control sampling and testing frequency increased to a minimum rate of 1 per 250 tons for that element. The process control sampling and testing frequency shall remain at 1 per 250 tons until the process control QL reaches or exceeds 78. If the QL for the next five process control tests is below 65, production will be suspended.

   If gradation is the element with MQL less than 65, the Department will test one randomly selected sample in the first 1250 tons produced in condition red. If this test result is outside the tolerance limits, production will be suspended. (This test result will not be included as an acceptance test.)

   After condition red exists, a new MQL will be started. Acceptance testing will stay at the frequency shown in Table 106-1. After three acceptance tests, if the MQL is less than 65, production will be suspended.

   Production will remain suspended until the source of the problem is identified and corrected. Each time production is suspended, corrective actions shall be proposed in writing by the Contractor and approved in writing by the Engineer before production may resume.

   Upon resuming production, the process control sampling and testing frequency for the elements causing the condition red shall remain at 1 per 250 tons. If the QL for the next five process control tests is below 65, production will be suspended again. If gradation is the element with MQL less than 65, the Department will test one randomly selected sample in the first 1,250 tons produced in condition red. If this test result is outside the tolerance limits, production will be suspended.

Table 106-1
SCHEDULE FOR MINIMUM
SAMPLING AND TESTING FOR HMA

Element	Process Control	Acceptance*, #	Check (CTP)
Asphalt Content	1/500 tons	1/1000 tons	1/10,000 tons
Gradation	1/Day	1/2000 tons	1/20,000 tons
Theoretical Maximum Specific Gravity	1/1000 tons, minimum 1/Day	1/1000 tons, minimum 1/Day	1/10,000 tons
In-place Density	1/500 tons	1/500 tons	1/5000 tons
Joint Density	1 core/2500 linear feet of joint	1 core/5000 linear feet of joint	1 core/50,000 linear feet of joint
Aggregate Percent Moisture ^	1/2000 tons, minimum 1/Day	1/2000 tons	Not applicable
Percent Lime ^,+	1/Day	Not applicable	Not applicable

Table 106-1 Notes: * The minimum number of acceptance tests will be: 5 asphalt content, 3 gradation, 10 in-place density and 5 joint density tests, for all projects.

When unscheduled job mix formula changes are made (Form 43) acceptance of the elements, except for in-place density, will be based on the actual number of samples that have been selected up to that time, even if the number is below the minimum listed in the schedule. At the Engineer's discretion, additional random in-place density tests may be taken in order to meet scheduled minimums, provided the applicable pavement layer is available for testing under safe conditions. Beginning with the new job mix formula, the quantity it will represent shall be estimated. A revised schedule of acceptance tests will be based on that estimate.

^ Not to be used for incentive or disincentive pay. Test according to CP-33 and report results from Form 106 or Form 565 on Form 6.

+ Verified per Contractor's PC Plan

106.06 Sampling and Testing of Portland Cement Concrete Paving. All Portland Cement Concrete Pavement, Item 412, shall be tested per the following process control and acceptance testing procedures:

(a) Process Control Testing. The Contractor shall be responsible for process control testing of all elements listed in Table 106-2 or 106-3. Process control testing shall be performed at the expense of the Contractor. The Contractor shall develop a process control plan (PCP) per the following:

1. Process Control Plan. For each element listed in Tables 106-2 or 106-3, the PCP must provide adequate details to ensure that the Contractor will perform process control. The Contractor shall submit the PCP to the Engineer at the Pre-construction Conference. The Contractor shall not start any work on the project until the Engineer has approved the PCP in writing.

A. Frequency of Tests or Measurements. The PCP shall indicate a random sampling frequency, which shall be equal to or more frequent than that shown in Table 106-2 or 106-3. The process control tests shall be independent of acceptance tests.

B. Test Result Chart. Each process control test result, the appropriate area, volume, and the tolerance limits shall be plotted. The chart shall be posted daily at a location convenient for viewing by the Engineer.

C. Quality Level Chart. The QL for each element in Table 106-2 or 106-3 shall be plotted. The QL shall be calculated per the procedure in CP 71 for Determining Quality Level. The QL shall be calculated on tests 1 through 3, then tests 1 through 4, then tests 1 through 5, then thereafter the last five consecutive test results. The area of material represented by the last test result shall correspond to the QL.

D. F-test and t-test Charts. If flexural strength criteria is indicated, then the results of F-test and t-test analysis between the Department's verification tests of flexural strength and the Contractor's process control tests of flexural strength shall be shown on charts. The F-test and t-test shall be calculated per standard statistical procedures using all verification tests and process control tests completed to date. Only results from cast beams shall be used in the F & t analysis, flexural strengths from splitting tensile correlations shall not be included in the F & t analysis. When a verification test is completed, the F- test and t-test calculations shall be redone. The area of material represented by the last test result shall correspond to the F-test and t-test. A warning value of 5 percent and an alert value of 1 percent shall be shown on each chart. The chart shall be submitted to the Engineer electronically daily, as results become available.

2. Point of Sampling. The material for process control testing shall be sampled by the Contractor using CP 61. The location where material samples will be taken shall be indicated in the PCP.

3. Testing Standards. The PCP shall indicate which testing standards will be followed. Acceptable standards are Colorado Procedures, AASHTO and ASTM. The order of precedence is Colorado Procedures, AASHTO procedures and then ASTM procedures.

   The compressive strength test for process control will be the average strength of two test cylinders cast in plastic molds from a single sample of concrete, cured under standard laboratory conditions, and tested three to seven days after molding.

4. Testing Supervisor Qualifications. The person in charge of and responsible for the process control testing shall be identified in the PCP. This person shall be present on the project and possess one or more of the following qualifications:

   A. Registration as a Professional Engineer in the State of Colorado.

   B. Registration as an Engineer in Training in the State of Colorado with two years of paving experience.

   C. A Bachelor of Science in Civil Engineering or Civil Engineering Technology with three years of paving experience.

   D. National Institute for Certification in Engineering (NICET) certification at level III or higher in the subfields of Transportation Engineering Technology, Highway Materials, or Construction Materials Testing Engineering Technology, Concrete and four years of paving experience.

5. Technician Qualifications. Technicians performing tests shall meet the requirements of Colorado Procedure 10.

6. Testing Equipment. All of the testing equipment used to conduct process control testing shall conform to the standards specified in the test procedures and be in good working order. If flexural strength criteria is indicated, then the Contractor shall provide the following equipment and supplies, which will not be paid for separately but shall be included in the work:

   A. A separate, temperature-controlled facility of at least 300 square feet usable space. This facility shall be used exclusively for the molding, storage and testing of concrete test specimens as required. This facility shall be provided in addition to other facilities required in Section 620. The storage facility shall have sufficient water storage capacity for curing all required test specimens. The storage facility shall provide separate storage tanks for each type of required testing. Each storage tank shall have a continuously recording thermometer and sufficient blank charts for the project. Temperatures of each storage tank shall be recorded for the duration of the project.

   B. A machine for testing flexural, compressive and splitting tensile strength of concrete specimens. The machine shall have an opening size capable of housing the flexural strength apparatus, splitting tensile apparatus and compression heads. The machine shall have a square or rectangular bottom platen at least 2 inches thick. The machine shall have a minimum capacity of 300,000 lbs. The machine shall have a digital monitor capable of displaying load rate and total load. The following or an approved equal may be used:

      (1) Forney model number FHS-300 with a Co-Pilot digital monitor.

      (2) Humboldt model number HCM-3000 with an iD Digital Indicator.

      (3) Gilson model number MC-400 with Pro Controller.

      (4) Test Mark Industries CM-3000 with i720 Digital Indicator.

      Both the Contractor and the Engineer will use this machine for testing concrete specimens. The machine shall meet the requirements of AASHTO T 97 and T 22. After the machine has been certified and accepted by the Engineer it shall not be moved until all portland cement concrete paving and flexural strength acceptance tests have been completed. A weekly check of the planeness of all bearing surfaces on the flexural strength apparatus shall be made and recorded in the Contractor's PC notebook for each week that flexural strength testing occurs.

      Swapping flexural strength apparatus, splitting tensile strength apparatus and compressive strength head will not require recertification of the test machine.

   C. Beam molds for molding all test specimens required. Beam molds shall have a cross section of approximately 6 inches by 6 inches. All beam molds shall be checked by the Contractor before being placed in service and monthly. The checks of each beam mold shall be recorded in the Contractor's PC notebook. This shall include all testing described in subsection 106.06.

   D. The Contractor shall supply an MIT Scan T2 or MIT Scan T3 and the associated test plates when pavement thick acceptance is based on magnetic pulse induction (MPI).

7. Reporting and Record Keeping. The Contractor shall report the results of the tests to the Engineer electronically at least once per day.

   The Contractor shall assemble a process control (PC) notebook and update it daily. This notebook shall contain all worksheets, test results forms, test results charts and quality level charts for each of the elements listed in Table 106-2 or 106-3. The Contractor shall submit examples of worksheets, test result forms and test results charts per CP 12B as part of the Contractor's Process Control Plan (PCP). The Contractor shall submit the PC notebook electronically to the Engineer for review once a month on the date agreed to at the Pre-construction Conference.

   A list of recognized deficiencies will be returned to the Contractor within two workdays after submittal. Deficiencies may include, but are not limited to, the failure to submit the notebook on time or an absence of the required reports. For any month that deficiencies are identified, the PC notebook will be submitted for review two weeks after the PC notebook is returned. Upon the second recognized deficiency the Engineer will notify the Contractor, and the pay estimate shall be withheld until the Contractor submits, in writing, a report detailing the cause for the recognized deficiency. The report shall include how the Contractor plans to resolve the deficiencies. Additional recognized deficiencies will result in a delay of the pay estimate until the Contractor has identified and resolved the deficiency along with revising and resubmitting his PCP to address these issues. Once the Engineer has reviewed and approved the revised PCP the estimate may be paid. Upon submittal of the PC notebook for the semi-final estimate, the PC notebook shall become the property of the Department. The Contractor shall make provisions such that the Engineer can inspect process control work in progress, including PC notebook, sampling, testing, plants, and the Contractor's testing facilities at any time.

8. Optimized Gradation. The Contractor shall perform process control testing of the combined aggregate gradation (CAG) when an Optimized Gradation (OG) is used for Class P Concrete. The combined aggregate gradation testing frequency shall be three per day. Test one shall be sampled and tested after full production begins but before production reaches 100 cubic yards. Test two shall be sampled and tested after four hours of continuous production or production reaches 1,000 cubic yards, whichever comes first. Test three shall be sampled and tested after seven hours of continuous production or production reaches 1750 cubic yards, whichever comes first. The frequency shall be a minimum of one per day if production is less than 750 cubic yards.

   The Department will perform one gradation test each day that may be a split of one of the three daily PC samples. This data will not be used to determine acceptability of the material but as information only.

   The Contractor's gradation test data will be used to evaluate the gradation optimization.

   When the Contractor's gradation test results fail to meet their optimization range, the Contractor shall immediately make corrections to bring the aggregate gradation optimization range and notify the Engineer. If two or more consecutive test results for any single day or two successive days are found to fall outside the optimization range, the Contractor shall immediately suspend production and provide a written corrective plan to the Engineer for approval before resuming production.

Upon being allowed to resume production, the Contractor shall follow the daily sampling frequency. If the next two consecutive gradation tests indicate that they meet the optimization range, the Contractor may continue production. If the first two aggregate samples do not meet the optimization range, production shall be suspended.

Before resuming production, the Contractor shall sample the individual aggregate stockpiles at two or more locations to determine the range of variability within each stockpile, make appropriate adjustments to the percentages for each aggregate component, and discharge and sample the combined aggregates. The combined aggregate gradation shall be tested to determine if the optimization range is met. Production can resume if the CF and WF plot within the workability box. Production will continue to be suspended for additional evaluation of stockpiles and aggregate feed rates until gradation sampling and testing indicate the optimization range is met.

All gradation test information during production shall be provided to the Engineer daily. The Contractor shall immediately report all gradation test data to the Engineer for evaluation during periods when production is suspended or upon resuming production. The Contractor will be notified in writing in all cases when production may resume or shall remain suspended.

9. Concrete Test Reports. The Contractor shall distribute electronically to the concrete supplier all compressive-strength process control (PC) data for the concrete supplied to the project. The Contractor shall distribute the PC compressive strength data within two business days of the 7-day and 28-day compressive strength testing. The data shall include the compressive strength and batch ticket number at a minimum.

(b) Acceptance Testing. Acceptance testing frequencies shall be per the Schedule (Owner Acceptance) in the Department's Field Materials Manual. Except for flexural strength, acceptance tests will be conducted by and at the expense of the Department. Acceptance sampling and testing procedures will be per the Department's Field Materials Manual with the following exceptions and inclusions:

A split sample from an acceptance test shall not be used for a process control test. The Engineer will designate the location where samples are to be taken. Samples shall be taken by the Contractor per CP 61. The Engineer will be present during the sampling and take possession of all acceptance samples. Samples transported in different containers will be combined and mixed before molding specimens. All materials are subject to inspection and testing at all times.

Pavement thickness acceptance will be determined by cores or magnetic pulse induction (MPI).

Acceptance tests for thickness using MPI shall be the Contractor's process control tests. MPI testing shall be per AASHTO T359.

When compressive strength testing is specified, the Engineer will distribute electronically to the concrete supplier all compressive-strength Owner Acceptance (OA) data for the concrete supplied to the project. The Engineer will distribute the OA compressive strength data within two business days of the 7-day and 28-day compressive strength testing. The data will include the compressive strength and batch ticket number at a minimum. The Contractor shall not have a valid dispute or claim as a result of any action or inaction by the Department related to the distribution of test results.

The compressive strength test for acceptance will be the average compressive strength of three test cylinders cast in plastic molds from a single sample of concrete and cured under standard laboratory conditions before testing. If the compressive strength of any one specimen differs from the average by more than 10 percent, that specimen will be deleted, and the average strength will be determined using the remaining two specimens. If the compressive strength of more than one specimen differs from the average by more than 10 percent, the average strength will be determined using all three specimens. Each set of three cylinders will be tested at 28 days after molding.

Acceptance tests for flexural strength shall be the Contractor's process control tests. The flexural strength tests shall be the average flexural strength of four test beams. The test beams shall be prepared according to AASHTO T23. The flexural strength of each specimen shall be measured according to AASHTO T97 with the following additional requirements: If the flexural strength of only one specimen differs from the average by more than 10 percent, that specimen shall be deleted, and the average strength shall be determined using the remaining three specimens. If the flexural strength of more than one specimen differs from the average by more than 10 percent, the test value shall be the average of all four specimens. Each set of four beams shall be tested at 28 days after molding.

(c) Verification Testing. Verification testing will be used only when flexural strength criteria is indicated and is the responsibility of the Department. The Department will determine the locations where samples or measurements are to be taken. The location of sampling shall be based on a stratified random procedure.

Verification sampling and testing procedures will be per Sections 105, 106, 412, the Schedule for Minimum Materials Sampling, Testing and Inspection in the Department's Field Materials Manual, and CP 13. Samples for verification testing shall be taken by the Contractor per CP 61 in the presence of the Engineer.

An analysis of test results will be performed after all test results are known using the t-test and F-test statistical methods with an alpha value set at 0.05. If either the above t-test and F-test analysis shows a significant difference, then the following items shall be checked: comparison of beam fracture locations and types, computations and flexural testing machine outputs, curing tank temperature charts, slump and air contents, plant batch tickets for major changes, review of sampling, molding, testing procedures, along with IAT check tests and any other investigations that may clarify the significant differences. If after a review of the data no reasons can be determined for the significant difference, the Department's test data shall be used for determining Quality Levels and Incentive or Disincentive according to the methods in this Section.

(d) Check Testing. The Contractor and the Engineer shall conduct a check testing program (CTP) before the placement of any concrete pavement. The check testing program will include a conference directed by the Region Materials Engineer, the Contractor's testers, and the Department's testers concerning methods, procedures and equipment for compressive or flexural strength testing. Check testing shall be completed before any portland cement concrete pavement (PCCP) is placed. A set of three cylinders or four beams will be molded by both the Contractor and the Department's project testers from a split sample. The specimens will be sampled, molded and cured for seven days and tested for compressive or flexural strength according to the procedures of Section 106. The Department's Independent Assurance Tester will also mold, cure and test a set of three cylinders or four beams, but the Independent Assurance Test results will not be entered in

the check testing analysis. If the results of the check tests do not meet the following criteria, then the check testing will be repeated until the following criteria are met:

(1) The average of the Contractor's test results, and the average of the Department's test results shall be within 10 percent of the average of all test results.

(2) Each specimen test result shall be within 15 percent of the average of all test results.

When compressive strength criteria is indicated, a check test must also be conducted on the sand equivalent test. A set of 5 sand equivalents will be run by both the Contractor's and the Department's project tester, from a split sample. The average of the absolute differences between tests taken by the process control personnel and the acceptance testing personnel will be compared to the acceptable limits shown in Table 13-1 of CP 13. The CTP will be continued until the acceptance and process control test results are within the permissible ranges shown in Table 13-1 of CP 13.

During production, split samples of randomly selected acceptance tests will be compared to the permissible ranges shown in Table 13-1 of CP 13. The minimum frequency will be as shown in Table 106-3.

If production has been suspended and then resumed, the Engineer may order a CTP between tests taken by process control and acceptance testing persons to assure the test results are within the permissible ranges shown in Table 13-1 of CP 13. Check test results shall not be included in process control testing. The Region Materials Engineer shall be called upon to resolve differences if a CTP shows unresolved differences beyond the ranges shown in Table 13-1 of CP 13.

(e) Independent Assurance Testing. The sample for the IAT will be a split sample of the Contractor's process control test. The Department's representative performing verification tests shall also use a split sample of the Contractor's process control test and participate in the IAT. The IAT for flexural strength will be the average flexural strength of four test beams prepared according to the requirements of Section 106 and cured for seven days in the field before being transferred to the IAT lab. IAT specimens will be tested at 28 days.

(f) Testing Schedule. All samples used to determine Incentive or Disincentive payment by quality level formulas per Section 105, will be selected by a stratified random process.

Table 106-2
TESTING SCHEDULE - ITEM 412
PORTLAND CEMENT CONCRETE
PAVEMENT, FLEXURAL STRENGTH CRITERIA

Element	Minimum Testing Frequency Contractor's Process Control
Aggregate Gradation and Sand Equivalent	For the first five days, minimum of 1/day, then 1/10,000 sq. yds. After 5 days, 1/40,000 sq. yds.
Slump	First three loads each day, then as needed for control.
Water Cement Ratio	First three loads each day, then 1/500 cu. yds.
Air Content and Yield	Minimum of 1/day, then 1/2500 sq. yds.
Flexural Strength	Minimum of 1/day, then 1/2500 sq. yds.
Compressive Strength	1/10,000 sq. yds.
Pavement Thickness	Per subsection 412.21.
Pull Test Joints	Minimum of six transverse and six longitudinal joint locations for the first 2500 linear feet, then three transverse and three longitudinal joints thereafter
Load Transfer Dowel Bar Placement	Per subsection 412.13(b)2
Average Texture Depth	1 per 528 linear feet in each lane and shoulder wider than 8 feet.

Table 106-3
TESTING SCHEDULE - ITEM 412
PORTLAND CEMENT CONCRETE
PAVEMENT, COMPRESSIVE STRENGTH CRITERIA

Element	Minimum Testing Frequency Contractor's Process Control
Aggregate Gradation	Minimum of 1/day, then 1/10,000 sq. yds.
Slump	First three loads each day, then as needed for control
Compressive Strength, Air Content, Yield, and Sand Equivalent	Minimum of 1/day, then 1/2500 sq. yds.
Pavement Thickness	Per subsection 412.21
Pull Test Joints	Minimum of six transverse and six longitudinal joint locations for the first 2500 linear feet, then three transverse and three longitudinal joints thereafter
Load Transfer Dowel Bar Placement	Per subsection 412.13(b)2
Average Texture Depth	1 per 528 linear feet in each lane and shoulder wider than 8 feet
Water Cement Ratio	First three loads each day, then 1/500 cu. yds.

106.07 Material Inspection at Plant. If the Engineer inspects the materials at the source, the following conditions shall be met:

(1) The Engineer shall have the cooperation and assistance of the Contractor and the materials producer.
(2) The Engineer shall have full entry to all parts of the plant necessary for the manufacture or production of the materials being furnished.
(3) Adequate safety measures shall be provided and maintained.

The Department reserves the right to retest all materials that have been previously tested or inspected. The retesting may be before or after incorporation of the materials into the work. Those materials inspected and tested after delivery on the project or after incorporation into the work, that do not meet the requirements of the Contract will be rejected or accepted with an adjustment in price per the requirements of subsection 105.03.

106.08 Storage of Materials. Materials shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though conditionally approved before storage, will be subject to inspection and testing before incorporation into the work.

Stored materials shall be located to facilitate prompt inspection. With prior approval, portions of the right of way may be used for storage of materials and equipment, and for the Contractor's plant. Any additional space required shall be provided at the Contractor's expense. Stored materials will be paid for per subsection 109.07. Private property shall not be used for storage purposes without written permission of the owner or lessee. If requested, copies of such written permission shall be furnished to the Engineer. All storage sites shall be restored to their original condition at the Contractor's expense.

106.09 Handling Materials. All materials shall be handled so their quality and fitness for the work is preserved. Aggregates shall be transported to the work in vehicles constructed to prevent loss or segregation of materials.

106.10 Department Furnished Materials. Material furnished by the Department will be made available to the Contractor at the points specified in the Contract.

The cost of handling and placing materials after they are made available to the Contractor shall be included in the contract price for the item.

The Contractor will be held responsible for all material received until it is incorporated into the work and accepted.

Demurrage charges resulting from the Contractor's failure to accept the material at the designated time and point of delivery will be deducted from monies due the Contractor.

106.11 Buy America Requirements.

(a) *Steel and Iron.* All manufacturing processes, including the application of a coating, for all steel and iron products permanently incorporated in the work shall have occurred in the United States of America. All manufacturing processes include the processes that change the raw ore or scrap metal into a finished steel or iron product. This requirement will not prevent a minimal use of foreign steel or iron, provided the total cost, including delivery to the project, of all such steel and iron products does not exceed one-tenth of one percent of the total contract cost or $2,500, whichever is greater. When there is foreign steel or iron permanently incorporated into the project, the Contractor shall provide documentation of the project delivered cost of that foreign steel or iron.

The Contractor shall maintain on file Buy America certifications that every process from either the original smelting or melting operation, including the application of a coating, performed on steel or iron products either has or has not been carried out in the United States of America. These Buy America certifications apply to every steel and iron product that requires pre- inspection, pretesting, certified test results, or a certificate of compliance. Shipping invoices, bar lists, and mill test reports shall accompany the Buy America certifications. The Contractor shall obtain a Buy America certification from each supplier, distributor, fabricator, and manufacturer that has handled each steel or iron product. These Buy America certifications shall create a chain of custody trail for every supplier, distributor, fabricator, and manufacturer that handled the steel or iron product and shall include certified mill test reports with heat numbers from either the original smelting or melting operation. Upon request, the Contractor shall allow the State, FHWA, and their representatives access to the Buy America certifications including supporting documentation. When the Contractor does not provide the Buy America certifications at the Engineer's request, the Engineer will reject the steel or iron product.

Before the permanent incorporation into the project and before payment for steel or iron products, the Contractor shall provide an assurance document. The assurance document shall certify in writing that the steel or iron products comply with Buy America requirements; the Buy America certifications and supporting documentation are on file; and when requested, the Contractor has submitted the required documentation to CDOT. The Contractor shall also maintain an assurance document that summarizes the date and quantity of all steel and iron material delivered to the project. This assurance document shall include the pay item, quantity of material delivered to the project, mill test reports with heat numbers, and the quantity of material installed by the monthly progress payment cutoff date. The assurance document shall reconcile the pay item quantities and certified mill test reports, for the material delivered to the project to the Buy America certifications and supporting documentation. The assurance documentation shall include the cost of all foreign steel or iron delivered and permanently incorporated into the project. The Contractor shall also submit a summary for each month that no steel or iron products are incorporated into or delivered to the project. The Contractor shall submit the assurance documentation to the Engineer by the monthly progress payment cutoff date. The assurance documentation does not relieve the Contractor of providing the necessary Buy America certifications and supporting documentation for steel or iron products.

(b) *Manufactured Products.* Regulations require the use of domestic steel and iron in Federally funded construction projects. Buy America applies to construction components which are "predominantly steel or iron products," defined by CDOT as products which are manufactured with at least 90% steel or iron content by weight when delivered to the job site for installation. FHWA provides waivers for manufactured products and products that are not predominantly steel or iron. The FHWA's 1983 final Buy America regulations waive the application of Buy America to manufactured products that do not include steel and iron components. However, Buy America applies to the steel wire mesh or steel reinforcing components of manufactured products (precast reinforced concrete elements).

(c) *Glass Beads for Pavement Marking.* All post-consumer and industrial glass beads for pavement marking shall have been manufactured from North American glass waste streams in the United States of America. The bead manufacturer shall submit a COC in accordance with subsection 106.12 confirming that North American glass waste streams were used in the manufacture of the glass beads.

(d) *Construction Materials.* All manufacturing processes for eligible construction materials permanently incorporated into the work shall have been manufactured in the United States of America. All manufacturing processes for construction materials consist of at least the final manufacturing process and the immediately preceding manufacturing stage for the construction material. Buy America requirements shall apply to the following eligible construction materials:

1. Non-ferrous metals.
2. Plastic and polymer-based products (including, but not limited to polyvinylchloride [PVC]).
3. Glass.
4. Lumber; or 5. Drywall

Note 1: Raw materials such as cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives are excluded from Buy America requirements.

Items that consist of two or more of the listed materials that have been combined together through a manufacturing process, and items that include at least one of the listed materials combined with a material that is not listed through a manufacturing process, should be treated as manufactured products, rather than as construction materials.

Before the permanent incorporation into the project for all eligible construction materials, the Contractor shall obtain a certification from each supplier. This certification must identify where the construction material was manufactured and attest specifically to Buy America compliance.

The Contractor shall maintain and submit on a monthly basis, CDOT Form #1600, Contractor's Certificate of Compliance summarizing the Item Description, CDOT Bid Item #, Manufacturer Name Identifier, Date and Quantity Received, Date and Quantity Installed, and Bid Item Unit of all eligible construction materials.

The COC does not relieve the Contractor of providing the necessary Buy America supplier certifications prior to permanent incorporation into the project. Upon request, the Contractor shall allow the State, FHWA, and their representatives access to the Buy America certifications. The lack of these certifications will be justification for rejection of the construction material.

(e) *Waivers.* The Federal Highway Administration is responsible for processing and approving all waivers, including waivers requested by recipients and on behalf of subrecipients. More information on Buy America waivers can be found in Section 5.2 of the Field Materials Manual Special Notice to Contractors.

If a Contractor desires to pursue a waiver they shall notify the CDOT Project Engineer in writing who will then submit it to the CDOT Materials & Geotechnical Services Unit, Pavement Design and Documentation Services Program. The Pavement Design and Documentation Services Program will review it and forward it to the FHWA Division Office for consideration.

A Contractor's decision to pursue any waivers on the project shall not waive or otherwise nullify any provisions of the Contract. In addition, the time to obtain a waiver shall be considered a non-excusable, non-compensable delay and Liquidated Damages (per Subsection 108.09) will be enforced should the Contract Time (original or as-amended) expire due to the approval or non-approval of a waiver.

The Contractor will not be entitled to an extension of contract time due to the approval or non-approval of a waiver and no such claim will be considered.

106.12 Certificates of Compliance. The Contract will designate products and assemblies that can be incorporated in the work, if accompanied by Certificates of Compliance. The Certificate of Compliance shall be a legible copy or an original document from the manufacturer, and shall include, under penalty of perjury, the original or electronic signature (including corporate title) of a person having legal authority to act for the manufacturer. It shall state that the product or assembly to be incorporated into the project has been sampled and passed all specified tests in conformity to the plans and specifications for the project.

The Contractor's original signature and certification shall be added to the manufacturer's document, as directed below.

Each certificate shall include:

(1) Manufacturer's name.

(2) Address of manufacturing facility.

(3) Laboratory name and address.

(4) Name of product or assembly.

(5) Complete description of the material.

(6) Model, catalog, stock number (if applicable).

(7) Lot, heat, or batch number identifying the material delivered (if applicable).

(8) Date(s) of the laboratory testing.

(9) Listing of all applicable specifications required by the Department for this particular product or assembly. Certificates shall reference the actual tests conducted on samples taken from the same lot, heat, or batch, and shall include a statement that the product or assembly to be incorporated into the project was fabricated per and meets the applicable specifications.

The Contractor shall certify and sign the manufacturer's original Certificate of Compliance as directed below. The quantity certified by the Contractor shall be that which has been delivered to the project at that time and is represented by that COC. For products with multiple delivery dates, multiple Certificates of Compliance will be required. One legible copy of the fully signed Certificate of Compliance shall be furnished to the Engineer before installation of material. The original shall be provided to the Engineer before payment for the represented item will be made. Both the legible copy and the fully signed Certificate of Compliance shall include the Contractor's certification and signature. Each product or assembly delivered to the project must contain the lot, heat, or batch number identical to that on the accompanying Certificate of Compliance.

The following certification, signed by a person having legal authority to act for the Contractor:

> I hereby certify under penalty of perjury that the material listed in this Certificate of Compliance represents _____ (quantity and units) of pay item _____ (pay item number and Description) that will be installed on project number _____.
>
> _____ _____ Contractor and Date

Failure to comply with the above requirements may result in delays to the project or rejection of the materials. Products or assemblies furnished on the basis of Certificates of Compliance may be sampled and tested by the Department, and if determined not to meet the applicable specifications will be rejected or accepted according to subsection 105.03.

106.13 Certified Test Report. The Contract will designate products and assemblies that can be incorporated in the work if accompanied by Certified Test Reports. The Certified Test Report shall be a legible copy or an original document from the manufacturer, and shall include, under penalty of perjury, the original or electronic signature (including corporate title) of a person having legal authority to act for the manufacturer or the independent testing laboratory. It shall state that the test results show that the product or assembly to be incorporated into the project has been sampled and passed all specified tests in conformity to the plans and specifications for this project. Each report shall include:

Each certificate shall include:

(1) Manufacturer's name.

(2) Address of manufacturing facility.

(3) Laboratory name and address.

(4) Name of product or assembly.

(5) Complete description of the material.

(6) Model, catalog, stock number (if applicable).

(7) Lot, heat, or batch number identifying the material delivered (if applicable).

(8) Date(s) of the laboratory testing.

(9) All test results are required to verify that the material furnished conforms to all applicable Department specifications. Test results shall be from tests conducted on samples taken from the same lot, heat, or batch.

The Contractor shall certify and sign the manufacturer's original Certified Test Report as directed below. The quantity certified by the Contractor shall be that which has been delivered to the project at that time and is represented by that Certified Test Report. For products with multiple delivery dates, multiple Certified Test Reports will be required. One legible copy of the fully signed Certified Test Report shall be furnished to the Engineer before installation of material. The original shall be provided to the Engineer before payment for the represented item will be made. Both the legible copy and the fully signed Certified Test Report shall include the Contractor's certification and signature. Each product or assembly delivered to the project must contain the lot, heat, or batch number identical to that on the accompanying Certified Test Report.

The following certification, signed by a person having legal authority to act for the Contractor:

> I hereby certify under penalty of perjury that the material listed in this Certified Test Report represents _____ (quantity and units) of pay item _____ (pay item number and Description) that will be installed on project number _____.
>
> _____ _____ Contractor, Date

Failure to comply may result in delays to the project or rejection of the materials. Products or assemblies furnished on the basis of Certified Test Reports may be sampled and tested by the Department, and if determined not to meet the applicable specifications will be rejected or accepted according to subsection 105.03.

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SECTION 107

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.01 Laws to be Observed. The Contractor shall keep fully informed and comply with all Federal, State and local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which may affect those engaged or employed on the work or affect the conduct of the work. The Contractor shall protect and indemnify the Department and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by the Contractor, the subcontractors, suppliers of materials or services, or their employees.

Failure to comply with all contractual obligations may lead to the suspension, debarment, or both of the Contractor as stipulated in the "Rules".

107.02 Permits, Licenses, and Taxes. The Contractor shall procure all permits and licenses, pay all charges, fees, and applicable taxes, and give all notices necessary and incidental to the due and lawful prosecution of the Contract.

Before beginning work, the Contractor shall furnish the Engineer a written list of all permits required for the proper completion of the Contract. The list shall clearly identify the type of permit or permits that must be obtained before work on any particular phase or phases of work can be started. Copies of the fully executed permits shall be furnished to the Engineer upon request.

107.03 Patented Devices, Materials, and Processes. If the Contractor employs any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for their use by suitable legal agreement with the patentee or owner. The Contractor and the Surety shall indemnify and save harmless the Department, any affected third party, or political subdivision from any and all claims for infringement resulting from the use of any patented design, device, material or process, or any trademark or copyright, and shall indemnify the Department for any costs, expenses, and damages that they may be obliged to pay by reason of any infringement, during the prosecution or after the completion of the Contract.

107.04 Restoration of Surfaces Opened by Permit. An individual, firm, or corporation may be issued a permit to construct or reconstruct a utility service. The Contractor shall allow permit holders to perform permitted work. The Contractor shall make necessary repairs resulting from this work, as directed. The repairs will be paid for as extra work per subsection 109.04.

The repairs will be subject to the same requirements as the original work performed.

107.05 Federal Aid Provisions. When the United States Government participates in the cost of a project, the Federal laws and the rules and regulations made pursuant to such laws must be observed by the Contractor, and the work shall be subject to the inspection of the appropriate Federal agency.

Such inspection shall not make the United States Government a party to the Contract and shall not interfere with the rights of the parties to the Contract.

107.06 Safety, Health, and Sanitation and Performance of Safety Critical Work.

(a) Project Safety Management Plan. Before the start of construction, the Contractor's Project Safety Manager shall prepare a written Project Safety Management Plan (Plan), which shall be specific to the project. The Plan shall include:

(1) Designation of a Project Safety Manager and an alternate, including names and contact information, and competent persons for each construction activity as described below.

(2) A list of all significant or high-risk construction activities and safety considerations as described below, and a hazard assessment for each.

(3) Direction as to whether engineering, administrative, personal protection measures, training, or a combination thereof, shall be implemented to address the hazards identified in (2) above.

(4) Provisions for field safety meetings. The Contractor shall conduct field safety meetings (also known as Toolbox or Tailgate meetings) at the frequency specified in the Plan, which shall be at least once per week. The Contractor shall encourage participation by all persons working at the project site. Participants at these meetings shall discuss specific construction activities for that work period, results from safety inspections, required personal protective equipment, and all other necessary safety precautions.

(5) Provisions for project safety meetings. In the event of a safety stand-down, the Contractor shall conduct a project safety meeting to discuss the circumstances leading to the stand-down, and the measures that shall be taken to prevent a recurrence. The Contractor shall notify the Engineer of the time, date, and location of these meetings, shall require participation by all persons (including Department personnel and consultants) working at the project site, and shall track attendance through sign-up lists.

(6) At the Contractor's option, portions of the Plan may be prepared by the subcontractors that will be performing that subcontracted work. The Contractor shall remain responsible for the overall project Plan, and for incorporating portions prepared by subcontractors. Portions of the Plan prepared by subcontractors shall be as stringent as the Contractor's overall Plan.

(7) Procedures for assuring compliance by subcontractors, suppliers, and authorized visitors to the project. In addition, the Plan shall specify the measures that will be taken to discourage unauthorized personnel from entering the site.

(8) Procedures to be followed in cases where workers are suspected of drug or alcohol impairment.

(9) Provisions for project safety inspections. The Project Safety Manager shall conduct regular project safety inspections at the frequency specified in the Plan, at least once per month. The Contractor shall notify the Engineer in advance of these inspections. Documentation of the inspections shall include the date of the inspection, the participants, the findings, and the corrective measures taken to address the findings. Within one week after these inspections, the Contractor shall provide a copy of the documentation to the Engineer and shall maintain a copy on the project site.

(10) Procedures to be followed to correct violations of the Plan by any personnel.

(11) The notification, investigation, and implementation procedures that the Contractor shall follow in the case of a safety stand down. The procedures shall include immediately

reporting the reason for safety standdown and reporting the results of the investigation and implementation procedures.

(12) The safety plan should address issues including, but not limited to the following:

Protocols for requiring symptomatic individuals to stay away from the project site.

Protocols for identifying and protecting vulnerable individuals.

Protocols on reporting of potential and confirmed infections to project and CDOT staff.

Cleaning and sanitizing of devices and materials brought to the site for installation.

Cleaning and sanitizing practices for equipment, workspaces, and sanitation facilities both for everyday situations and for a situation where a worker is found to have been infected by the pandemic virus. Provisions and protocols for washing hands or other means of hand sanitizing.

The planned use of shift work to minimize interpersonal contact between crews.

Task specific protocols that ensure people minimize contact and maximize social distancing while performing particular jobs. For example, rules for laborers to follow when forced to work in close quarters like tying steel on a structure, or installing pipe in a trench, or other similar operations.

Protocols to ensure materials testers, inspectors and other project staff can perform their work while maintaining proper social distancing from contractor staff. This includes the exchange of necessary documents like load tickets, COC's, payroll information etc.

Meeting arrangements, including techniques for remote meetings, and maintaining 6 feet minimum spacing if face-to-face meetings are unavoidable, and when trying to verbally communicate around loud machinery and operations. Protocol and plan for enforcement on who may access Field office and Material testing trailers to ensure social distancing is maintained. Protocols to ensure staff maintain social distancing while taking breaks from work activities, including the use of temporary lodging on remote jobs.

Supplemental PPE to be used during the pandemic.

(13) The Contractor's certification shall be as follows:

By authorized signature below, (Contractor name), hereinafter referred to as "the Contractor," hereby certifies that this Project Safety Management Plan (Plan) complies with and meets applicable Federal, State, and local laws, rules, regulations and guidelines governing safety, health and sanitation, including but not limited to the Occupational Safety and Health Act, 29 CFR 1910, 29 CFR 1926, 23 CFR 634, Mine Safety and Health Administration (MSHA), Title 30 CFR, the "Colorado Work Zone Best Practices Safety Guide", CFR 49,

national consensus standards, and the Drug-Free Workplace Act (Public Law 100-690 Title V, subtitle D, 41 USC 701 et seq.), and subsection 107.06 of the Standard Specifications. All operations and work practices of the Contractor shall comply with this Plan. The Contractor requires that all subcontractors, suppliers, Department personnel, and consultants comply with this Plan.

_____

(Signature of Contractor's Project Safety Manager or alternate)

_____

Title

_____

Date

Before the start of construction, the Contractor shall submit the Plan to the Engineer for the project records, and shall provide updates to the Plan as necessary, and as work conditions or personnel change. The Contractor shall review the Plan for sufficiency and accuracy at least once per twelve months of contract time. The Engineer will review the Plan for general compliance with subsection 107.06 and notify the Contractor in writing that the Plan has been received and addresses items 1 thru 13 above. An up-to-date copy of the Plan shall be on the project site in the Contractor's possession at all times.

(b) Contractor Responsibilities. The Contractor shall ensure compliance with applicable Federal, State, and local laws, rules, regulations, and guidelines governing safety, health and sanitation, including but not limited to the Plan, the Occupational Safety and Health Act, 29 CFR 1910, 29 CFR 1926, 23 CFR 634, Mine Safety and Health Administration (MSHA), Title 30 CFR, the "Colorado Work Zone Best Practices Safety Guide", CFR 49, national consensus standards, and the Drug-Free Workplace Act (Public Law 100-690 Title V, subtitle D, 41 USC 701 et seq.). The Contractor shall provide all safeguards, safety devices, and protective equipment, and shall take all other actions necessary to protect the life, safety, and health of persons working at or visiting the project site, and of the public and property in connection with the performance of the work covered by the Contract. In the case of conflicting requirements, the more stringent of the requirements shall apply. The Contractor shall require that all operations and work practices by Contractor, subcontractor, supplier, and Department personnel and consultants comply with the provisions of the Plan. The Contractor shall respond in writing to all safety issues raised by the Engineer.

All work vehicles and mobile equipment shall be equipped with one or more functioning warning lights mounted as high as practicable, which shall be capable of displaying in all directions one or more flashing, oscillating, or rotating lights for warning roadway traffic. The lights shall be amber in color. The warning lights shall be activated when the work vehicle or mobile equipment is operating within the roadway, the right of way, or both. All supplemental lights shall be Society of Automotive Engineers (SAE) Class 1 certified.

(c) *Project Safety Manager.* Before the start of construction, the Contractor shall designate a Project Safety Manager and an alternate, who shall be responsible for the coordination of safety activities, and preparation, certification, and implementation of the Plan.

(d) *Competent Persons.* Before the start of construction, the Contractor shall designate at least one competent person for each of the construction activities being completed. A competent person is an individual who, by way of training, experience, or combination thereof, is knowledgeable of applicable standards, is capable of identifying existing and predictable workplace hazards relating to a specific construction activity, is designated by the employer, and has authority to take prompt, appropriate actions. Construction activities and safety considerations that must be addressed by the Plan and by designation of a competent person shall include, but are not limited to (if applicable to the project):

(1) Rotomilling and paving operations.
(2) Concrete paving.
(3) Concrete placement.
(4) Lead abatement.
(5) Hearing protection.
(6) Respiratory protection.
(7) Rigging.
(8) Assured grounding.
(9) Scaffolding.
(10) Fall protection.
(11) Use of cranes.
(12) Trenching and excavating.
(13) Steel erection.
(14) Underground construction (including caissons and cofferdams).
(15) Demolition.
(16) Blasting and the use of explosives.
(17) Stairways and ladders.
(18) Asbestos.
(19) Confined space.

The appropriate competent persons shall be present on the project site at all times during the specific construction activities that require those competent persons.

(e) *Project Safety and Health Requirements.* All personnel on the project site shall wear the following personal protective equipment (PPE) at all times when in the highway right of way, except when in their vehicles:

(1) Head protection and high visibility apparel, reflectorized for night use conforming to American National Standards Institute, Inc. (ANSI)/ International Safety Equipment Association (ISEA) 107 – 2004, and appropriate, sturdy footwear, all of which shall comply with the latest appropriate national consensus standards.

(2) All other PPE that is stipulated by the Plan. All PPE shall comply with the latest appropriate national consensus standards.

(f) *Safety Stand-Down.* The Engineer may immediately suspend all or part of any work in the case of an accident (including property damage), or catastrophe (one or more persons hospitalized in a single incident), or other situation presenting an imminent danger to life or health, such as a near miss, violation of the Plan, or presence of a hazardous situation. In the case of a worksite fatality directly related to the Contractor's or any subcontractor's

work operations, the safety stand-down shall be mandatory. In the case of a traffic fatality unrelated to a work-zone incident in the opinion of the Engineer, the safety stand-down will not be mandatory. During any mandatory safety stand-down due to a fatality, all work on the project shall cease, except that work deemed immediately necessary by the Engineer to make the project safe. The Contractor will be allowed to resume operations only after providing written documentation, certified by the Project Safety Manager or alternate, regarding the corrective actions taken to prevent recurrence.

(g) Regulatory Enforcement Actions. The Contractor shall provide written notifications of all Regulatory agency actions relating to safety to the Engineer.

(h) Failure to Comply. Failure to comply with the requirements of subsection 107.06 shall be grounds for withholding of progress payments, project suspension, or both.

(i) Costs. All costs associated with the preparation and implementation of the Plan and compliance with all safety, health, and sanitation provisions and requirements will not be measured and paid for separately but shall be included in the work.

Performance of Safety Critical Work. Consider the following work elements safety critical work.

(1) Overhead girder erection, location and structure number as shown on the plans.

(2) Overhead structure(s) construction or repair, location and structure number as shown on the plans.

(3) Removal of bridge, location and structure number as shown on the plans.

(4) Removal of portion of bridge(s), location and structure number as shown on the plans.

(5) Temporary work: falsework, shoring that exceeds 5 feet in height, cofferdams, and temporary bridges.

(6) Work requiring the use of cranes or other heavy lifting equipment to set girders, sound walls, make overhead repairs; also, when construction materials are being lifted that may fall onto active traffic lanes.

(7) Blasting.

(8) Excavation and embankment adjacent to the roadway, especially if it requires shoring. The Engineer will specify the depth or proximity of the earthwork considered safety critical work.

(9) Tunneling.

(10) Work operations such as pile driving and jack hammering which may create vibration and cause debris to fall onto traffic.

(11) Rockfall mitigation.

(12) Work within 50 feet of active railroad track centerline.

(13)Caissons and/or directional boring in high density utility corridor. This includes open holes for new drilled shafts within two existing shaft diameters of existing drilled shafts and structures.

(14) Work over or adjacent to river, stream, or other protected water way.

(15) Urban work near and/or where pedestrian or bicycle pathways must be maintained during construction.

The Contractor shall submit, for review, an initial, detailed construction plan that addresses safe construction methods for each of the safety critical elements applicable. The Engineer will submit bridge removal and girder erection plans to Engineer of Record and the corresponding CDOT Bridge Unit Leader for a concurrent review. The Engineer's review will be for general conformance with the plans, specifications, best management practices regarding safety of the operation and industry standards. When the specifications already require an erection plan, a bridge removal plan, or a removal of portion of bridge plan, it shall be included as a part of this plan. Submit the detailed construction plan two weeks prior to the safety critical element conference described below.

The Contractor shall stamp and sign the construction plan "Approved for Construction". The Engineer will review the construction plan for acceptance. CDOT review of this information shall not relieve the Contractor of liability. Certifications that are expired are invalid and not in compliance with this specification.
The Construction Plan shall include the following:

(1) Safety Critical Element for which the plan is being prepared and submitted.

(2) Contractor or subcontractor responsible for the plan preparation and the work.

(3) Schedule, procedures, equipment, and sequence of operations, that comply with the working hour limitations.

(4) Temporary work required: falsework, bracing, shoring, etc.

(5) Underground, above grade, and overhead utilities identification and protective steps taken.

(6) Communication plan as necessary with stakeholders, media, and the public.

(7) Additional actions that will be taken to ensure that the work will be performed safely.

(8) Names and qualifications of workers who will be in responsible charge of the work:
A. Years of experience performing similar work
B. Training taken in performing similar work.
C. Certifications earned in performing similar work.

(9) Names and qualifications of workers operating cranes or other lifting equipment
A. Years of experience performing similar work
B. Training taken in performing similar work.
C. Certifications earned in performing similar work.

(10) The construction plan shall address how the Contractor will handle contingencies such as:
   A. Unplanned events (storms, traffic accidents, work accidents, etc.)
   B. Structural elements that don't fit or line up.
   C. Work that cannot be completed in time for the roadway to be reopened to traffic.
   D. Replacement of workers who don't perform the work safely.
   E. Unexpected absence of critical management team
   F. Equipment failure
   G. Other potential difficulties inherent in the type of work being performed.

(11) Name and qualifications of Contractor's person designated to determine and notify the Engineer in writing when it is safe to open a route to traffic after it has been closed for safety critical work.

(12) Erection plan or bridge removal plan when submitted as required elsewhere by the specifications. Submit plan requirements that overlap with above requirements only once.

The Contractor shall hold a Safety Critical Element Conference two weeks prior to beginning construction on each safety critical element. The Engineer, the Contractor, the safety critical element subcontractors, and the Contractor's Engineer shall attend the conference.

Required pre-erection conferences or bridge removal conferences may be included as a part of this conference. Communications staff (Contractor or CDOT) shall also attend in order to address any public/media needs.

After the safety critical element conference, and prior to beginning work on the safety critical element, the Contractor shall submit a final construction plan to the Engineer for record purposes only except for bridge removal and girder erection plans. Submit safety critical construction plans related to bridge removal and girder erection per the corresponding standard specification, 202-Removal of Bridge, 509-Structural Steel or 618-Prestressed Concrete as appropriate. The Contractor's Engineer shall seal temporary works, such as falsework, shoring etc., related to construction plans for the safety critical elements, (3) Removal of Bridge, (4) Removal of Portion of Bridge and (5) Temporary Work. The Contractor shall stamp and sign the final construction plan "Approved for Construction", if the elements Removal of Portion of Bridge and Temporary Works are safety critical work elements for this project.

The Contractor shall perform safety critical work only when the Engineer, or an authorized representative, is on the project site. The Contractor's Engineer shall be onsite to inspect and provide written approval of safety critical work for which they provided signed and sealed construction details. Unless otherwise directed or approved, the Contractor's Engineer need not be onsite during the actual performance of safety critical work but shall be present to conduct inspection for written approval of the safety critical work.

When ordered by the Engineer, the Contractor shall immediately stop safety critical work that is being performed in an unsafe manner or which will result in an unsafe situation for the traveling public. Prior to stopping work, the Contractor shall make the situation safe for work stoppage. The Contractor shall submit an acceptable plan to correct the unsafe process before the Engineer will authorize resumption of the work.

When ordered by the Engineer, the Contractor shall remove workers from the project that are performing the safety critical work in a manner that creates an unsafe situation for the public per subsection 108.06.

If an unplanned event occurs or the safety critical operation deviate from the submitted plan, the Contractor shall immediately cease operations on the safety critical element. Perform all necessary work to ensure worksite safety and provide proper protection of the work and the traveling public. If the Contractor intends to modify the submitted plan, he shall submit a revised plan to the Engineer prior to resuming operations.

All costs associated with the preparation and implementation of each safety critical element construction plan will not be measured and paid for separately but shall be included in the work.

The Contractor shall not be relieved from ultimate liability for unsafe or negligent acts or receive a waiver of the Colorado Governmental Immunity Act on behalf of the Department.

107.07 Public Convenience and Safety. The Contractor shall conduct the work to minimize obstruction to traffic. The safety and convenience of the general public and the residents along the highway and the protection of persons and property shall be provided for by the Contractor as specified under subsection 104.04.

107.08 Railroad-Highway Provisions. If the Contract requires materials to be hauled across railroad tracks, the Department will make arrangements with the railroad company for any new crossings required or for the use of any existing crossings. The Contractor shall make arrangements for the use of crossings not provided in the Contract.

Work performed by the Contractor on the railroad right of way shall be performed to avoid interference with the movement of trains or traffic on the railroad tracks. The Contractor shall use care and precaution in order to avoid accidents, damage, or unnecessary delay or interference with the railroad company's trains or property.

107.09 Construction Over and Adjacent to Navigable Waters. Work on navigable waters shall be conducted to avoid interference with free navigation of the waterways and so the existing navigable depths will not be impaired except as allowed by permit issued by the U.S. Coast Guard or the U.S. Army Corps of Engineers, as applicable.

107.10 Barricades and Signs. The Contractor shall provide, erect, and maintain barricades, suitable and sufficient lights, pavement markings, signs, and other traffic control devices, and shall protect the work and safety of the public per the Contract. Highways closed to traffic shall be protected by barricades, and obstructions shall be illuminated during hours of darkness. Signs shall be provided to control and direct traffic.

The Contractor shall erect signs at locations where operations may interfere with the use of the road by traffic, and at all intermediate points where the new work crosses or coincides with an existing road, bike path, or sidewalk. Signs shall be constructed, erected, and maintained per the Contract.

Barricades, warning signs, lights, temporary signals, and other protective devices shall conform with the latest revision of the "Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways" published by the FHWA and adopted by the Department, the latest revision of the Colorado Supplement thereto, and the required traffic control plan.

107.11 Use of Explosives. When explosives are utilized in the prosecution of the work, the Contractor shall not endanger life, property, or new work. The Contractor shall be responsible for all damage resulting from the use of explosives.

The Contractor's explosives shall be stored in a secure manner in compliance with laws and ordinances, and storage places shall be clearly marked. When electric blasting caps are used, stored or moved in the vicinity of the work, warning signs prohibiting the use of radio transmitters and mobile telephones shall be posted on all roads within 350 feet of the blasting operation.

The Contractor shall notify property owners and public utility companies having structures in the proximity of the work of the intention to use explosives. Notice shall be given sufficiently in advance to enable them to protect their property.

In advance of doing any blasting work involving the use of electric blasting caps within 200 feet of any railroad's track or structures, the Contractor shall notify the proper authority of the railroad company as to the location, date, time and approximate duration of such blasting operations.

At the conclusion of each day of blasting, all spent surface blasting components shall be removed. At the conclusion of blasting and excavation work, the Contractor shall properly dispose of all spent blasting components. At the completion of final grading, the Contractor shall inspect the project and remove all exposed blasting components.

107.12 Protection and Restoration of Property and Landscape. The Contractor shall preserve private and public property and protect it from damage. Land monuments and property marks shall not be disturbed or moved until their location has been witnessed or referenced per Section 629 and their removal approved.

The Contractor shall be responsible for the damage or injury to property resulting from:

1. The Contractor's neglect, misconduct, or omission in the manner or method of execution or non-execution of the work, or
2. The Contractor's defective work or the use of unacceptable materials.

The Contractor's responsibility shall not be released until the work has been completed in compliance with the Contract. The Contractor shall restore damaged or injured property, at the Contractor's expense, to a condition similar or equal to that existing before the damage or injury occurred, by repairing, rebuilding, or restoring the property.

Existing trees, shrubs, bushes or grass, outside the designated work areas but inside project limits that are damaged due to the Contractor's operations shall be replaced in kind at the Contractor's expense.

107.13 Forest Protection. The Contractor shall comply with all regulations of the State Department of Natural Resources, the National Forest Supervisor, or other authority having jurisdiction, governing the protection of forests, and shall observe all sanitary laws and regulations with respect to the performance of work within or adjacent to state or National Forests. The Contractor shall keep the areas in an orderly condition, dispose of all refuse, obtain permits for the construction and maintenance of all construction camps, stores, warehouses, residences, latrines, cesspools, septic tanks, and other structures per the regulations and instructions issued by the Forest Supervisor.

The Contractor shall take all reasonable precaution to prevent forest fires and shall make every possible effort to notify a forest official at the earliest possible moment of the location and extent of any fire seen by them. The Contractor, subcontractors, and their employees shall prevent and suppress forest fires and provide assistance in this effort as directed by forest officials.

107.14 Interruption of Irrigation Water Flow. The Contractor shall arrange the work to avoid interference with the flow of irrigation water. If it is impractical to install the structure during the time the ditches are not flowing, the Contractor shall make arrangements with the ditch owners regarding temporary interruption of flow or temporary diversion of water. This will require construction of new ditches with appurtenant structures before old ditches or canals are altered. The Contractor shall provide any temporary ditches, canals or structures necessary for the uninterrupted flow of irrigation water. Temporary construction and removal shall be at the expense of the Contractor.

107.15 Responsibility for Damage Claims, Insurance Types and Coverage Limits. The Contractor shall indemnify and save harmless the Department, its officers, and employees, from suits, actions, or claims of any type or character brought because of any and all injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or failure to comply with the provisions of the Contract; or on account of or in consequence of neglect of the Contractor in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of the Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright, unless the design, device, material or process involved is specifically required by the Contract; or from any claims or amounts arising or recovered under the Worker's Compensation Act, or other law, ordinance, order, or decree. The Department may retain as much of any moneys due the Contractor under any Contract as may be determined by the Department to be in the public interest.

(a) The Contractor shall obtain, and maintain at all times during the term of this Contract, insurance in the following kinds and amounts:

1. Workers' Compensation Insurance as required by state statute, and Employer's Liability Insurance covering all of Contractor's employees acting within the course and scope of their employment.
2. Commercial General Liability Insurance written on ISO Occurrence Form CG 00 01 10/93 or equivalent, covering premises operations, fire damage, independent Contractors, products and completed operations, blanket contractual liability, personal injury, and advertising liability with minimum limits as follows:

   (1) $1,000,000 each occurrence.

   (2) $2,000,000 general aggregate.

   (3) $2,000,000 products and completed operations aggregate: and

   (4) $50,000 any one fire.

   (5) Completed Operations coverage shall be provided for a minimum period of one year following final acceptance of work.

   If any aggregate limit is reduced below $1,000,000 because of claims made or paid, the Contractor shall immediately obtain additional insurance to restore the full aggregate limit and furnish to CDOT a certificate or other document satisfactory to CDOT showing compliance with this provision.

3. Automobile Liability Insurance covering any auto (including owned, hired, and non-owned autos) with a minimum limit as follows: $1,000,000 each accident combined single limit.

4. Professional liability insurance with minimum limits of liability of not less than $1,000,000 Each Claim and $1,000,000 Annual Aggregate for both the Contractor or any subcontractors when:

   (1) Contract items 625, 629, or both are included in the Contract.

   (2) The Contractor's Engineer, shall electronically seal plans, specifications and submittals, including but not limited to:

      A. Shop drawings and working drawings as described in subsection 105.02.

      B. Mix Designs.

      C. Contractor performed design work as required by the plans and specifications.

      D. Change Orders.

      E. Approved Value Engineering Change Proposals.

   (3) The Contractor and any included subcontractor shall renew and maintain Professional Liability Insurance as outlined above for a minimum of one year following final acceptance of work.

5. Umbrella or Excess Liability Insurance with minimum limits of $1,000,000. This policy shall become primary (drop down) in the event the primary Liability Policy limits are impaired or exhausted. The Policy shall be written on an Occurrence Form and shall be following form of the primary. The following form Excess Liability shall include CDOT as an additional insured.

(b) CDOT shall be named as additional insured on the Commercial General Liability and Automobile Liability Insurance policies. Completed operations additional insured coverage shall be on endorsements CG 2010 11/85, CG 2037, or equivalent. Coverage required of the Contract will be primary over any insurance or self-insurance program carried by the State of Colorado.

(c) Each insurance policy shall include provisions preventing cancellation or non-renewal without at least 30 days' prior notice to Contractor. The Contractor shall forward to the Engineer any such notice received within seven days of the Contractor's receipt of such notice.

(d) The Contractor shall require all insurance policies in any way related to the Contract and secured and maintained by the Contractor to include clauses stating that each carrier will waive all rights of recovery, under subrogation or otherwise, against CDOT, its agencies, institutions, organizations, officers, agents, employees and volunteers.

(e) All policies evidencing the insurance coverages required hereunder shall be issued by insurance companies satisfactory to CDOT.

(f) The Contractor shall provide certificates showing insurance coverage required by this contract to CDOT before execution of the contract. No later than 15 days before the expiration date of any such coverage, the Contractor shall deliver CDOT certificates of insurance evidencing renewals thereof. At any time during the term of this Contract, CDOT may request in writing, and the Contractor shall thereupon within 10 days supply to CDOT, evidence satisfactory to CDOT of compliance with the provisions of this section.

(g) Notwithstanding subsection 107.15(a), if the Contractor is a "public entity" within the meaning of the Colorado Governmental Immunity Act CRS 24-10-101, et seq., as amended ("Act"), the Contractor shall at all times during the term of this Contract maintain only such liability insurance, by commercial policy or self-insurance, as is necessary to meet its liabilities under the Act. Upon request by CDOT, the Contractor shall show proof of such insurance satisfactory to CDOT. Public entity Contractors are not required to name CDOT as an Additional Insured.

(h) When the Contractor requires a subcontractor to obtain insurance coverage, the types and minimum limits of this coverage may be different than those required, as stated above, for the Contractor, except for the Commercial General Liability Additional Insured endorsement and those that qualify as needing Professional Liability Insurance.

107.16 Opening Sections of Project to Traffic. Opening certain sections of the work for traffic use shall not constitute acceptance of the work or provide a waiver of any provision of the Contract.

The Contract will designate the sections to be opened and specify the method of compensation for signing and traffic control. The Contractor shall maintain the roadway in a condition equal to or better than the condition of the roadway when it was initially opened to traffic. Where applicable, the Contract may specify the time or date that certain portions of the work shall be completed to provide for the accommodation of traffic.

The Engineer may order certain portions of the work opened for traffic, other than specified in the Contract. If the Engineer has not ordered the roadway opened because of unnecessary delay by the Contractor, and if no damage occurs other than that can be attributed to traffic, the Contractor will be relieved of all responsibility for maintenance of traffic control devices and damage due to traffic. Any expense resulting from opening such sections shall be borne by the Department or the Contractor will be compensated for the added expense per subsection 109.04. If the opening causes changed working conditions or delays the completion of other items of work on the project, compensation for the added expense and recommendations for additional time will be set forth by a Contract Modification Order.

If the Contractor is dilatory in completing the work, the Engineer may order all or a portion of the project to be opened to traffic. In such event, the Contractor will not be relieved of the liability and responsibility during the period the work is so opened before final acceptance. The Contractor shall conduct the remainder of the construction operations to cause the least obstruction to or interference with traffic. Damage attributed to traffic shall be paid for at the Contractor's expense.

Damages not attributable to traffic that might occur on sections opened to traffic shall be repaired at the Contractor's expense. The removal of slides that are not caused by the Contractor's operations shall be done by the Contractor on a basis agreed to before the slide removal.

107.17 Contractor's Responsibility for Work. The Contractor shall be responsible for and protect the contract work against injury or damage from all causes whether arising from the execution or nonexecution of the work, including but not limited to action of the elements, traffic, fire, theft, vandalism, or third party negligence, until final written acceptance of the project by the Engineer. The Contractor shall rebuild, repair, restore, or replace all contract work that is injured or damaged before final written acceptance at no cost to the Department.

The Engineer may, in writing, relieve the Contractor of expenses for damage to certain portions

of the contract work caused by traffic or the action of the elements. The following conditions must be met before the Engineer will consider any relief:

(1) All work on the portion of contract work being considered must be complete under terms of the Contract except for seeding, mulching, landscape items, final clean-up, and bridge painting or structural coating.

(2) Traffic shall be in its final configuration and location.

Portions of contract work that may be considered are described below:

(1) A minimum of 0.5 mile of roadway, or a minimum of 0.5 mile of one direction of a divided highway.

(2) A complete bridge. This includes all approach roadway safety features that protect traffic from such items as: bridge railing and median barrier ends, piers, and abutments.

(3) A complete intersection traffic signal system.

(4) A complete highway lighting system.

Loss, injury, or damage to the contract work due to unforeseeable causes beyond the control of the Contractor, including but not limited to acts of God, such as earthquake, flood, tornado, high winds, or other cataclysmic phenomenon of nature, or acts of the public enemy or of governmental authorities, shall be restored by the Contractor under the provisions of subsection 104.02 or 104.03, as applicable.

During periods that work is suspended, the Contractor shall be responsible for the work under the Contract and shall prevent damage to the project, provide for drainage, and shall erect necessary temporary structures, signs, or other facilities required to maintain the project. During the suspension period, the Contractor shall maintain in a growing condition all newly established plantings, seedings, and soddings furnished under the Contract, and shall protect new tree growth and other vegetative growth against injury.

107.18 Unused.

107.19 Furnishing Right of Way. The Department will be responsible for the securing of all necessary rights of way in advance of construction. Any exceptions will be indicated in the Contract.

107.20 Personal Liability of Public Employees. The Engineer or authorized representatives are acting solely as agents and representatives of the Department when carrying out and exercising the power or authority granted to them under the Contract. There shall not be any liability on them either personally or as employees of the Department.

107.21 No Waiver of Legal Rights. Upon completion of the Contract, the Department will make final inspection and notify the Contractor of acceptance. Final acceptance shall not preclude the Department from correcting any measurement, estimate, or certificate made before or after completion of the Contract, nor from recovering from the Contractor or surety or both, overpayments sustained because the Contractor failed to fulfill the obligations under the Contract. A waiver on the part of the Department of any breach of any part of the Contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor without prejudice to the terms of the Contract, shall be liable to the Department, for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Department's rights under any warranty or guaranty.

107.22 Third Party Beneficiary. It is specifically agreed between the parties executing this Contract that it is not intended by any of the provisions of any part of the Contract to create

in the public or any member thereof a third party beneficiary hereunder, or to authorize any one not a party to this Contract to maintain a suit for personal injuries or property damage

pursuant to the terms or provisions of this Contract. The duties, obligations and responsibilities of the parties to this Contract with respect to third parties shall remain as imposed by law.

107.23 Archaeological and Paleontological Discoveries. When the Contractor's operations, including materials pits and quarries, encounter plant or animal fossils, remains of prehistoric or historic structures, prehistoric or historic artifacts (bottle dumps, charcoal from subsurface hearths, old pottery, potsherds, stone tools, arrowheads, etc.), the Contractor's affected operations shall immediately cease. The Contractor shall immediately notify the Engineer, or other appropriate agency for contractor source pits or quarries, of the discovery of these materials. When ordered to proceed, the Contractor shall conduct affected operations as directed. Additional work, except that in contractor source materials pits or quarries under subsection 106.02(b), will be paid for by the Department as provided in subsection 104.02 when contract unit prices exist, or as extra work as provided in subsection 104.03 when no unit prices exist. Delays to the Contractor, not associated with work in contractor sources, because of the materials encountered may be cause for extension of contract time per subsection 108.08. If fossils, prehistoric or historic structures, or prehistoric or historic artifacts are encountered in a contractor source materials pit or quarry, all costs and time delays shall be the responsibility of the Contractor.

107.24 Air Quality Control. The Contractor shall comply with the "Colorado Air Quality Control Act," Title 25, Article 7, CRS and regulations promulgated thereunder.

107.25 Water Quality Control. The project work shall be performed using practices that minimize water pollution during construction. All the practices listed in (b) below shall be followed to minimize the pollution of any State waters, including wetlands.

(a) Definitions.

1. Areas of Disturbance (AD). Locations where any activity has altered the existing soil cover or topography, including vegetative and non-vegetative activities during construction.
2. Construction Site Boundary/Limits of Construction (LOC). The project area defined by the Stormwater Construction Permit.
3. Discharge of Pollutants. One or more pollutants leaving the LOC or entering State waters or other conveyances.
4. Limits of Disturbed Area (LDA). Proposed limits of ground disturbance as shown on the Plans.
5. Pollutant. Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal, or agricultural waste, as defined in the Colorado Code of Regulations (CCR) [5 CCR 1002-61, 2(76)]
6. Pollution. Man-made, man-induced, or natural alteration of the physical, chemical, biological, and radiological integrity of water. [25-8-103 (16), CRS]
7. State waters. Defined in section 101.
8. Owner. The party that has overall control of the activities and that has funded the

implementation of the construction plans and specifications. This is the party with ownership of, a long-term lease of, or easements on the property where the construction activity is occurring (CDOT).

9. Operator. The party that has operational control over day-to-day activities at a project site that are necessary to ensure compliance with the permit. This party is authorized to direct individuals at a site to carry out activities required by the permit (the general contractor).

(b) Construction Requirements.

1. The Contractor shall comply with the "Colorado Water Quality Control Act" (Title 25, article 8, CRS), the "Protection of Fishing Streams" (Title 33, Article 5, CRS), the "Clean Water Act" (33 USC 1344), regulations promulgated, certifications or permits issued, and to the requirements listed below. In the event of conflicts between these requirements and water quality control laws, rules, or regulations of other Federal, or State agencies, the more restrictive laws, rules, or regulations shall apply.
2. If the Contractor determines construction of the project will result in a change to the permitted activities or LDA, the Contractor shall detail the changes in a written report to the Engineer. Within five days after receipt of the report, the Engineer, after coordination with Region Planning and Environmental Manager (RPEM), will approve or reject in writing the request for change, or detail a course of action including revision of existing permits or obtaining new permits.
3. If construction activities result in noncompliance of any permit requirement, the project will be suspended and the permitting agency notified, if required. The project will remain suspended until the Engineer receives written approval by the permitting agency.

   The Contractor is legally required to obtain all permits associated with specific activities within, or off the right of way, such as borrow pits, concrete or asphalt plant sites, waste disposal sites, or other facilities. It is the Contractor's responsibility to obtain these permits. The Contractor shall consult with the Engineer and contact the Colorado Department of Public Health and Environment (CDPHE) or other appropriate federal, state, or local agency to determine the need for any permit.
4. The Contractor shall conduct the work in a manner that prevents pollution of any adjacent State waters. Erosion control work shall be performed per Section 208, this subsection, and all other applicable parts of the Contract.
5. Before the Environmental Pre-construction Conference, the SWMP Administrator, identified in subsection 208.03(c), shall identify and describe all potential pollutant sources, including materials and activities, and evaluate them for the potential to contribute pollutants to stormwater discharges associated with construction activities. The list of potential pollutants shall be continuously updated during construction. At a minimum, each of the following shall be evaluated for the potential for contributing pollutants to stormwater discharges and identified in the SWMP, if found to have such potential:

   (1) All exposed and stored soils.

   (2) Vehicle tracking of sediments.

   (3) Management of contaminated soils.

   (4) Vehicle and equipment maintenance and fueling.

   (5) Outdoor storage activities (building materials, fertilizers, chemicals, etc.).

   (6) Significant dust or particle generating processes.

(7) Routine maintenance involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.

(8) On-site waste management practices (waste piles, dumpsters, etc.).

(9) Dedicated asphalt and concrete batch plants.

(10) Concrete truck and equipment washing, including the concrete truck chute and associated fixtures and equipment.

(11) Concrete placement and finishing tool cleaning.

(12) Non-industrial waste sources that may be significant, such as worker trash and portable toilets.

(13) Loading and unloading operations.

(14) Other areas or procedures where spills could occur.

The SWMP Administrator shall record the location of potential pollutants on the site map. Descriptions of the potential pollutants shall be added to the SWMP.

At or before the Environmental Pre-construction Conference the Contractor shall submit a Spill Response Plan for any petroleum products, chemicals, solvents, or other hazardous materials in use, or in storage, at the work site. See subsection 208.06(c) for Spill Response Plan requirements. Work shall not be started until the plan has been submitted to and approved by the Engineer.

On-site above ground bulk storage containers with a cumulative storage shell capacity greater than 1,320 U.S. gallons, or storage containers having a "reasonable expectation of an oil discharge" to State waters, are subject to the Spill Prevention, Control and Countermeasure Plan (SPCC) Rule. Oil of any type and in any form is covered, including, but not limited to petroleum; fuel oil; sludge; oil refuse; oil mixed with wastes other than dredged spoil. EPA Region 8 is responsible for administering and enforcing the SPCC plan requirements in Colorado. Before start of work, the Contractor shall submit an SPCC Form that has been approved by the EPA for the project.

6. The Contractor shall obtain a Construction Dewatering (CDW) permit from CDPHE anytime uncontaminated groundwater, including groundwater that is commingled with stormwater or surface water, is encountered during construction activities and the groundwater or commingled water needs to be discharged to State waters. If contaminated groundwater is encountered, a Remediation permit may be needed from CDPHE per Section 250.

7. Water from dewatering operations shall not be directly discharged into any State waters, unless allowed by a permit. Water from dewatering shall not be discharged into a ditch unless:

(1) Written permission is obtained from the owner of the ditch.
(2) It is covered in the approved CDW or Remediation Permit that allows the discharge.
(3) A copy of this approval is submitted to the Engineer. A copy of the Permit shall be submitted to the Engineer before dewatering operations commencing.

Construction Dewatering may be discharged to the ground on projects where CDPHE's Low Risk Guidance Document for Discharges of Uncontaminated Groundwater to Land are met. The conditions of this guidance are:

(1) The source of the discharge is solely uncontaminated groundwater or uncontaminated groundwater combined with stormwater and does not contain

pollutants in concentrations that exceed water quality standards for groundwater referenced above.

(2) Discharges from vaults or similar structures shall not be contaminated. Potential sources of contamination include process materials used, stored, or conveyed in the structures or introduced surface water runoff from outside environments that may contain oil, grease, and corrosives.

(3) The groundwater discharge does not leave the project boundary limits where construction is occurring.

(4) Land application is conducted at a rate and location that does not allow for any runoff into State waters or other drainage conveyance systems, including but not limited to streets, curb and gutter, inlets, borrow ditches, open channels, etc.

(5) Land application is conducted at a rate that does not allow for any ponding of the groundwater on the surface, unless the ponding is a result of implementing control measures that are designed to reduce velocity flow. If the control measures used result in ponding, the land application shall be done in an area with a constructed containment, such as an excavation or berm area with no outfall. The constructed containment shall prevent the discharge of the ponding water offsite as runoff.

(6) A visible sheen is not evident in the discharge.

(7) Control measures are implemented to prevent any sediment deposited during land application from being transported by stormwater runoff to surface waters or other conveyances.

(8) All control measures used shall be selected, installed, implemented, and maintained according to good engineering, hydrologic, and pollution control practices. The selected control measures shall provide control for all potential pollutant sources associated with the discharge of uncontaminated groundwater to land. The discharge shall be routed in such a way that it will not cause erosion to land surface. Energy dissipation devices designed to protect downstream areas from erosion by reducing the velocity of flow (such as hose attachments, sediment and erosion controls) shall be used when necessary to prevent erosion.

All dewatering operations shall be recorded in the SWMP as follows:

(1) The source is identified in the SWMP and updated by the SWMP Administrator.

(2) The SWMP describes and locates the practices implemented at the site to control stormwater pollution from the dewatering of groundwater or stormwater.

(3) The SWMP describes and locates the practices to be used that will ensure that no groundwater from construction dewatering is discharged from the LOC as surface runoff or to surface waters or storm sewers.

(4) Groundwater and groundwater combined with stormwater do not contain pollutants in concentrations exceeding the State groundwater standards in Regulations 5 CCR 1002-41 and 42.

If surface waters are diverted around a construction area and no pollutants are introduced during the diversion, a CDW Permit is not required. If the diverted water enters the construction area and contacts pollutant sources (e.g., disturbed soil, concrete washout, etc.), the Contractor shall obtain a CDW permit for the discharge of this water to State waters or to the ground.

8. At least 15 days before commencing dredging or fill operations in a watercourse, the Contractor shall provide written notification to owners or operators of domestic or public water supply intakes or diversion facilities, if these facilities are within 20 miles downstream from the dredging or fill operations. Notification shall also be given to

Owners or operators of other intakes or diversions that are located within five miles downstream from the site of the project. Identities of downstream owners and operators can be obtained from Colorado Division of Water Resources, Office of the State Engineer.

9. Temporary fill into wetlands or streams will not be allowed, except as specified in the Contract and permits. If such work is allowed, upon completion of the work all temporary fills shall be removed in their entirety and disposed of in an upland location outside of flood plains unless otherwise specified in the Contract.

10. Construction operations in waters of the United States as defined in 33 CFR Part 328.3, including wetlands, shall be restricted to areas and activities authorized by the U.S. Army Corps of Engineers as shown in the Contract. Fording waters will be allowed only as authorized by the U.S. Army Corps of Engineers 404 Permit.

11. Wetland areas outside of the permitted limits of disturbance shall not be used for storage, parking, waste disposal, access, borrow material, or any other construction support activity.

12. Pollutant byproducts of highway construction, such as concrete, asphalt, solids, sludges, pollutants removed in the course of treatment of wastewater, excavation or excess fill material, and material from sediment traps shall be handled, stockpiled, and disposed of in a manner that prevents entry into State waters, including wetlands. Removal of concrete waste and washout water from mixer trucks, concrete finishing tools, concrete saw, and all concrete material removed in the course of construction operations or cleaning shall be performed in a manner that prevents waste material from entering State waters and shall not leave the site as surface runoff. A minimum of 10 days before the start of the construction activity, the Contractor shall submit in writing a Method Statement for Containing Pollutant Byproducts to the Engineer for approval.

    The use of chemicals such as soil stabilizers, dust palliatives, herbicides, growth inhibitors, fertilizers, deicing salts, etc., shall be per the manufacturer's recommended application rates, frequency, and instructions.

13. All materials stored on-site shall be stored in a neat, orderly manner, in their original containers, with the original manufacturer's label. Materials shall not be stored in a location where they may be carried into State waters at any time.

14. Spill prevention and containment measures conforming to subsection 208.06 shall be used at storage, and equipment fueling and servicing areas to prevent the pollution of any State waters, including wetlands. All spills shall be cleaned up immediately after discovery or contained until appropriate cleanup methods can be employed. Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods. When required by the Colorado Water Quality Control Act, Regulation 5 CCR 1002-61, spills shall be reported to the Engineer and CDPHE in writing.

15. The Contractor shall prevent construction activities from causing grass or brush fires.

16. The construction activities shall not impair Indian tribal rights, including, but not limited to, water rights, and treaty fishing and hunting rights.

17. Before start of work, the Contractor shall certify in writing to the Engineer that construction equipment has been cleaned before initial site arrival. Vehicles and equipment shall be free of soil and debris capable of transporting noxious weed seeds or invasive species onto the site. Additional equipment required for construction shall also be certified before being brought onto the project site.

18. Vehicles that have been certified by the Contractor as having been cleaned before arrival on site may be cleaned on site at an approved area where wash water can be properly contained. Vehicles leaving and reentering the project site shall be recertified.

19. At the end of each day, the Contractor shall collect all trash and dispose of it in appropriate containers.

20. Construction waste that is considered a pollutant or contaminant shall be collected and disposed of in appropriate containers. This material may be stockpiled on the project when it is contained or protected by an appropriate control measure.

21. If the project area is covered by a CDPS-SCP, permittees are authorized to discharge stormwater associated with construction activity and specified non-stormwater associated with construction activity to State waters.

    A. Allowable Stormwater Discharges:

        (1) Stormwater discharges associated with construction activity.

        (2) Stormwater discharges associated with producing earthen materials, such as soils, sand, and gravel dedicated to providing material to a single contiguous site, or within 1/4 mile of a construction site (i.e., borrow or fill areas).

        (3) Stormwater discharges associated with dedicated asphalt, concrete batch plants and masonry mixing stations. (Coverage under the CDPS-SCP is not required if alternative coverage has been obtained.)

        (4) Discharges resulting from emergency firefighting activities.

    B. Allowable Non-Stormwater Discharges if identified in the SWMP with appropriate control measures:

        (1) Discharges from uncontaminated springs that do not originate from an area of land disturbance.

        (2) Discharges to the ground of concrete washout water associated with the washing of concrete tools and concrete mixer chutes. Discharges of concrete washout water shall not leave the site as surface runoff or reach receiving waters.

        (3) Discharges of landscape irrigation return flow.

        Discharges authorized by the CDPS-SCP shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard, including narrative standards for water quality.

        All construction site wastes shall be properly managed to prevent potential pollution of State waters. The CDPS-SCP does not authorize on-site waste disposal.

(c) Stormwater Construction Permit. A Colorado Discharge Permit System Stormwater Construction Permit (CDPS-SCP) will be obtained from CDPHE by CDOT. The Contractor and CDOT will be co-permittees. The Contractor shall coordinate with CDOT to become

the Operator permittee of the respective permit upon award of the Contract. The Contractor shall provide a copy of permit certification as the Operator to the Engineer before or at the Pre-construction Conference. No work shall begin until the CDPS-SCP permit with Owner and Operator has been approved by CDPHE. A copy of the permit shall be placed in the project SWMP.

The Contractor is legally required to obtain all other permits associated with specific activities within or outside of the right of way, such as borrow pits, concrete or asphalt plant sites, waste disposal sites, or other facilities. Staging areas within a quarter mile, but not within CDOT right of way shall be considered a common plan of development and permits for these facilities require permitting in the Contractor's name as Owner and Operator. These permits include local agency, federal, or other stormwater permits. The Contractor shall consult with the Engineer and contact the CDPHE or other appropriate federal, state, or local agency to determine the need for any permit.

When a Utility Company has obtained a CDPS-SCP within a CDOT project area, before the Contractor being on-site, the Contractor shall coordinate with the Engineer and the Utility Company to transfer or reassign the permit area within the project's Limits of Construction to the Contractor and CDOT before work commencing. The Contractor shall not commence construction until CDPHE issues a new CDPS-SCP identifying the Contractor as the Operator, and the permit is put in the SWMP.

To initiate acceptance of the stormwater construction work (including seeding and planting required for erosion control), the Contractor shall request in writing a Stormwater Completion Walkthrough. The Engineer will set up the walkthrough. It will include the Engineer or designated representative, Superintendent or designated representative, Stormwater Management Plan (SWMP) Administrator, Region Water Pollution Control Manager (RWPCM), Landscape Architect, and a Regional Maintenance representative. Unsatisfactory and incomplete stormwater and sediment/erosion control work will be identified in this walkthrough and will be summarized by the Engineer in a punch list.

The completed action items associated with the corrective work will be shown as completed on the punch list. Upon completion of all items shown, the Contractor shall notify the Engineer. Upon written agreement that the punch list is completed from the Engineer, the Contractor shall submit the appropriate form to the CDPHE such that CDOT Maintenance becomes the Operator permittee of the CDPS-SCP.

Until the transfer of the permit has been approved by the CDPHE, the Contractor shall continue to adhere to all permit requirements. Requirements shall include erosion control inspections, control measure installation, control measure maintenance, control measure repair including seeded areas, and temporary control measure removal. All documentation shall be submitted to the Engineer and placed in the SWMP.

All costs associated with the Contractor applying for, holding, and transferring the CDPS-SCP permit between parties will not be measured and paid for separately, but shall be included in the work per subsection 107.02.

(d) Measurement and Payment.

1. All the work listed in (b) above, including but not limited to dewatering, erosion control for dewatering, and disposal of water resulting from dewatering operations, including all costs for CDPHE concurrences and permits, will not be measured and paid for separately, but shall be included in the work.
2. The Contractor shall be liable for any penalty (including monetary fines) applied to the Department caused by the Contractor's noncompliance with any water quality permit or

certification. Monetary fines shall be deducted from any money due to the Contractor. If the monetary fine is in excess of all the money due to the Contractor, then the Contractor shall pay to the Department the amount of such excess.

3. The Contractor will not receive additional compensation, or time extensions, for any disruption of work or loss of time caused by any actions brought against the Contractor for failure to comply with good Engineering, hydrologic and pollution control practices.
4. If a spill occurs as a direct result of the Contractor's actions or negligence, the cleanup of such spill shall be performed by the Contractor at the Contractor's expense.
5. Areas exposed to erosion by fire resulting from the Contractor's operations shall be stabilized per Section 208 by the Contractor and at the Contractor's expense.

SECTION 108

PROSECUTION AND PROGRESS

108.01 Subletting of Contract. The Contractor shall not sublet, sell, transfer, assign, or dispose of the Contract or Contracts, or any portion thereof without written permission of the Engineer. Before beginning any work by the subcontractor, the Contractor shall request permission from the Engineer by submitting a completed Sublet Permit Application, CDOT Form. 205, via the B2GNow software system. The subcontracted work shall not begin until the Contractor has received the Engineer's written permission. The Contractor shall make all project-related written subcontracts, agreements, and purchase orders available to the Engineer for viewing, upon request, and at a location convenient to the Engineer.

The Contractor will be permitted to sublet a portion of the Contract. However, the Contractor's organization shall perform work amounting to 30 percent or more of the total original contract amount. Any items designated in the Contract as "specialty items" may be performed by subcontract. The cost of "specialty items" so performed by subcontract may be deducted from the total original contract amount before computing the amount of work required to be performed by the Contractor's own organization. The original contract amount includes the cost of material and manufactured products that are to be purchased or produced by the Contractor and the actual agreement amounts between the Contractor and a subcontractor. The proportional value of a subcontracted partial contract item will be verified by the Engineer. When a firm both sells material to a prime contractor and performs the work of incorporating the materials into the project, these two phases shall be considered in combination and as constituting a single subcontract.

The calculation of the percentage of subcontracted work shall be based on subcontract unit prices.

Subcontracts or transfer of Contract shall not release the Contractor of liability under the Contract and Bond.

Failure to comply with all contractual obligations may lead to the suspension, debarment, or both of the subcontractor, and if necessary, the Contractor as stipulated in the "Rules".

All firms that the contractor will be subletting a portion of the contract shall have an account created in the B2GNow software system. If the firm does not have an account created approval of the form 205 may be withheld.

108.02 Notice to Proceed. The Contractor shall not commence work before the issuance of a Notice to Proceed. The "Notice to Proceed" will stipulate the date that contract time commences. When the Contractor proceeds with work before that date, contract time will commence on the date work actually begins. The Contractor shall commence work under the Contract on or before the 15th day following Contract execution or the 30th day following the date of award, whichever comes later, or per the selected start date allowed in the special provisions.

108.03 Project Schedule.

(a) Definitions.

Activity (Task). A portion of the project that requires time or resources to complete. An activity has a description, start date, finish date, duration, and one or more logic ties. A critical activity is an activity on the critical path.

Activity ID. A unique, alphanumeric, identification code assigned to an activity that remains constant throughout the project.

Baseline Schedule. The original, approved project schedule before the project begins with no progress.

Calendar. Defined work periods and no work periods that determine when project activities can occur. Multiple calendars may be used.

Constraint. A restriction imposed in a schedule, which fixes a value that would otherwise be calculated within the schedule. Examples of values that can be fixed by a constraint include start date, end date, and completion date.

Critical Path Method (CPM) Scheduling. CPM Scheduling is a logic-based planning technique using activity durations and relationships between activities to calculate a schedule determining the minimum total project duration and the interdependencies of all activities.

Critical Path. The longest logical path through the CPM network driven by calendars, constraints, and activity logic. It consists of activities that determine the shortest time for project completion and the sequence of activities such that a delay to any of the activities on the critical path will prolong contractual project milestones, such as project completion.

Data Date. The starting point from which to schedule all remaining work. It can also be considered the cut-off date wherein all work before this date has actual starts, actual finishes, or both.

Duration. The estimated amount of time needed to complete an activity.

Free Float (Free Slack). The amount of time an activity can be delayed without delaying the Early Start or Early Finish of its successor activity or activities.

Gantt Chart. A time-scaled graphical display of the project's schedule.

Lag. A time-value assigned to a relationship.

Logic. Relationships between activities defining the sequence of work (See also predecessor activity and successor activity).

Milestone. An activity, with zero duration used to represent an event.

Near Critical Activity. An activity with a total float of five days or fewer, or as defined by the Engineer.

Open-Ended Activity. An activity that does not have a predecessor activity and a successor activity, or only has a start-to-start as a predecessor or finish-to-finish as a successor.

Planned Completion Date. The date that the schedule shows work is planned to be completed.

Predecessor Activity. An activity that is defined by schedule logic to precede another activity.

Relationship. The interdependence between activities.

Successor Activity. An activity that is defined by schedule logic to follow another activity.

Time-Scaled Logic Diagram. Gantt chart that illustrates logic links depicting both schedule logic and the time that activities are performed.

Total Float (Total Slack). The amount of time between the earliest date an activity can start and the latest date when an activity must start, or the earliest date an activity can finish and latest date when an activity can finish before the activity causes a delay to the time specified in the *Commencement and Completion of Work* special provision.

(b) Project Schedule - General

The Contractor shall use either Microsoft Project or Primavera Scheduling software to develop and manage a CPM Project Schedule to plan, schedule, and report the progress of the work. Before, or at the Pre-construction Conference, the Contractor shall notify the Engineer in writing, the scheduling software the Contractor shall use to manage the project. The Contractor's selection and use of particular scheduling software cannot be changed after the first schedule submittal. If the Contractor selects Primavera, the Contractor shall calculate the schedule using the Retained Logic scheduling option.

The Contractor shall submit schedules for approval by the Engineer. The Contractor's schedule shall be an accurate plan to complete the work so that the Department can use the schedule to evaluate progress, schedule CDOT resources, inform the project stakeholders, and evaluate the effect of changes to the schedule. A schedule review meeting shall be held to discuss each schedule submittal.

The Contractor shall submit a monthly update as either a Project Schedule Update or Revised Schedule as determined by the Engineer. When the project has a maintenance or landscape establishment period, the Engineer may waive the monthly update requirement during that period. The Contractor shall submit a final update that shows all work through the final acceptance date.

The Engineer will not issue a monthly progress payment if the Engineer has not received an update. The Engineer may not make monthly progress payments for the months following the update submission until the Engineer either approves or approves-as-noted the Project Schedule Update or Revised Schedule.

The Contractor shall use activity descriptions that ensure the work is easily identifiable. Activity description shall start with an action verb when practicable to clearly communicate what is being performed. The Contractor shall show the no-workdays in the schedule calendars. The contract completion date shall be included as an activity.

The Contractor shall use durations for individual construction activities that do not exceed 15 days of work unless approved by the Engineer. The Contractor may group a series of activities with an aggregate duration of five workdays or less into a single activity. Non-construction activities may have durations exceeding 15 days of work, as approved by the Engineer.

The Contractor may include summary bars in the schedule as long as the detailed activities to complete the work are displayed.

The Contractor shall not use the following unless approved by the Engineer:

(1) Negative lags.

(2) Lags in excess of 10 workdays.

(3) Start-to-finish relationships.

(4) Open-ended activities.

(5) Constraints.

The Project Schedule shall show all activities required by all parties to complete the work. The Contractor, its subcontractors, suppliers, and engineers, at any tier, shall perform the work according to the approved Project Schedule.

Float within the Baseline Schedule or any other Project Schedule is not for the exclusive use or benefit of either party but is a project resource available to both parties as needed until it is depleted.

The Engineer's review of the schedule will not exceed 10 days. The Engineer will provide the Contractor with one of the following responses within 10 days after receipt of the Project Schedule:

(1) Approved, no exceptions taken.

(2) Approved-as-Noted; or

(3) Revise and Resubmit within 10 days.

Approval of the Project Schedule shall not relieve the Contractor of any contract requirement including the requirement to complete all work within the Contract Time. Contractual requirements shall not change by submission or approval of a schedule, unless specifically amended by a Change Order.

(c) Schedule Submittals. The Contractor shall include a time-scaled logic diagram with all schedule submittals that:

1. Is plotted on a horizontal timescale per the project calendar.
2. Uses color to clearly identify the critical path.
3. Is based on early start and early finish dates of activities.
4. For Project Schedule Updates and Revised Schedules, shows actual completion dates up to but not including the data date.
5. Clearly shows the sequence and relationships of all activities necessary to complete the contract work.
6. Includes an activity block for each activity with the following information:

TABLE 108-1

DETAILS OF AN ACTIVITY BLOCK

Activity ID	Activity Description	Original Duration
Total Float	Early start date	Early finish date
Late start date *	Late finish date *	Actual Start date ^
Actual Finish date ^	Calendar used on the activity	Activity Responsibility#
Remaining Duration ^	Duration Percent Complete ^	Gantt chart

Table 108-1 Notes: * Required with the Preliminary and Baseline Schedule.
^ Required with the Project Schedule Update and Revised Schedule.
# Specify subcontractors, vendors, and all stakeholders.

The Contractor shall include the following with all schedule submittals:

A. A Job Progress Narrative Report that includes the following:

(1) Baseline, Preliminary, and Revised Schedules:

(i) A narrative of the critical and near critical work activities. This narrative shall include real or perceived risks and assumptions, including production

rates. Particular emphasis shall be made on activities that are the Contractor's and Department's responsibilities, third party activities, or long lead procurement items.

(ii) A narrative, including attachments if appropriate, of all of the project's calendars. This narrative shall explain work and non-work periods as well as special weather dependent calendars. A list of the calendars used in the schedule, a description of each calendar's work and non-workdays, a list of the activities using each calendar, and an explanation of how the calendar applies to that work.

(iii) A narrative of planned work on night shifts or planned work that will require approval from the Department or other agencies.

(iv) A list of all added and deleted activities along with a brief explanation for the change.

(v) All logic and duration changes to any activity along with an explanation for changes to any critical and near critical activities.

(vi) A description of site mobilization (such as dates of expected material shipments, planned dates for equipment arrivals, office setup, material laboratory arrival and setup, and anticipated portable crusher or batch plant setup).

(vii) A list of the fabrication and delivery of key and long-lead procurement activities.

(2) Project Schedule Update:

(i) A description of the work performed since the previous month's schedule update.

(ii) A description of changes to any items in the baseline, preliminary, and revised schedules.

(iii) A description of problems encountered or anticipated since the previous month's schedule submission.

(iv) A description of unusual labor, shift, equipment, or material conditions or restrictions encountered or anticipated.

(v) The status of all pending items that could affect the schedule.

(vi) Explanations for milestones forecasted to occur late.

(vii) Scheduled completion date status and any change from the previous month's submission.

(viii) An explanation for a scheduled completion date forecasted to occur before or after the contract completion date or contract time.

(ix) Schedule Delays:

(a) A description of current and anticipated delays including identification of the delayed activity or activities by Activity ID(s) and description(s).

(b) Effect of the delay on other activities, milestones, and completion dates.

(c) Identification of the actions needed to avoid a potential or mitigate an actual delay.

(d) A description of the critical path impact and effect on the scheduled completion date in the previous month's schedule update.

(x) An explanation of any critical and near critical work that is not progressing

as planned.

(xi) A list of all added and deleted activities along with a brief explanation for the change.

(xii) Any logic and duration changes to a critical or near critical activity along with an explanation for the change.

(xiii) For working day contracts, a list of planned non-working days with actual work.

B. A Predecessor Activity and Successor Activity report that defines all schedule logic and clearly indicates all logical relationships and constraints.

C. An Early Start report listing all activities, sorted by actual start/early start date.

D. A Float report listing all activities sorted in ascending order of available float.

E. A Critical Path report listing all activities not yet complete with the percent complete, sorted by float and then by early start.

F. A listing of all non-workdays.

For all required schedule submittals, the Contractor shall submit two USB flash drives or other media as directed by the Engineer with electronic copies of the schedule submittals. Electronic copies of the CPM schedules shall be submitted both in the native file format and in Portable Document Format (PDF).

Each schedule submittal shall be appropriately labeled as a Preliminary Schedule, Baseline Schedule, Project Schedule Update, or Revised Schedule. The title bar shall include the CDOT project number, subaccount, project name, Contractor name, and schedule data date. If an originally submitted schedule is revised during review, the title bar shall also include a revision number (REV1, REV2, etc.) revision date, and submission date.

(d) Preliminary Schedule. Within 14 days of Award of the Contract, the Contractor may submit a Preliminary Schedule showing all planned activities from the Notice to Proceed through the first 60 days of the project. If the Contractor elects not to submit a Preliminary Schedule, then the Contractor shall submit a complete Baseline Schedule within 14 days of award of the Contract, which will be subject to all requirements of a Baseline submittal. The Preliminary Schedule shall not show any progress and it will be approved by the Engineer before work can commence. The Preliminary Schedule shall be used as the basis for the Baseline Schedule.

(e) Baseline Schedule. If the Contractor elects to submit a Preliminary Schedule, within 45 days of the award of Contract, the Contractor shall submit a Baseline Schedule that includes all work activities completed within Contract Time. The Contractor shall not show progress in the Baseline Schedule. Further partial payments will not be made beyond 60 days after the start of Contract Time unless the Baseline Schedule is approved. When approved, the Baseline Schedule shall become the Project Schedule. The Contractor shall use all information known by the Contractor at the time of bid submittal to develop the Baseline Schedule. If the Contractor elects to submit a Baseline Schedule in lieu of a Preliminary Schedule, the Baseline Schedule shall be approved before work can commence.

(f) Project Schedule Update. The Contractor shall submit a monthly update of the Project Schedule updated through the cut-off date for the monthly progress pay estimate, and a

projection for completing all remaining activities. A schedule update may show a completion date that is different than the Contract completion date. Approval of this schedule shall not relieve the Contractor of its obligation to complete the work within the Contract Time. When approved, the Project Schedule Update will become the Project Schedule.

(g) Weekly Planning Schedule. The Contractor shall submit, in writing, a Weekly Planning Schedule that shows the Contractor's and all Subcontractor's planned activities for a minimum of two weeks immediately following the date of submittal and actual days worked versus planned for the week before the date of submittal. This schedule shall include the description, duration and sequence of work activities and anticipated lane closures for the upcoming two weeks. The Weekly Planning Schedule shall be based on the Project Schedule and may be a time-scaled logic diagram or other standard format as approved by the Engineer. Schedule Submittal requirements for reports do not apply to the Weekly Planning Schedule.

(h) Revised Schedule. A Revised Schedule is required in the event of any major change to the work. Examples of major changes are:

(1) Significant changes in logic or methods of construction or changes to the critical path.

(2) Addition, deletion, or revision of activities required by Contract Modification Order.

(3) Approval of a Contractor submitted Value Engineering Change Proposal.

(4) Delays in milestones or project completion.

(5) Phasing revisions.

(6) When the Engineer determines that the schedule has a fatal flaw; or

(7) When the work cannot be constructed as scheduled.

The Contractor shall provide a Revised Schedule within 10 days of the Engineer's written notification and shall include the diagrams and reports as described in subsections 108.03(b) and 108.03(c). Once approved, the Revised Schedule becomes the Project Schedule.

(i) Payment. All costs relating to the requirements of this subsection will not be paid for separately but shall be included in the work.

108.04 Payment Schedule. The Contractor shall prepare a payment schedule that shall show the dollar amount of work the Contractor expects to complete, including Force Accounts, retainage and expected incentive payments, by the progress estimate date each month for the duration of construction. The payment schedule shall be signed by the Contractor's authorized agent. The payment schedule shall show the dollar amount of work the Contractor expects to complete for every month on the Contract from commencement of work to Project Acceptance. The fiscal year (July 1 to June 30) totals shall also be shown on the payment schedule. The payment schedule may be prepared using standard spreadsheet software such as MS Excel and submitted in electronic format.

(a) Initial Payment Schedule. The Contractor shall submit the certified initial payment schedule within 15 days of the award of the Contract.

(b) Payment Schedule Updates. Once each month the Contractor shall submit an update to the Engineer. The update shall be in the same format as the initial payment schedule and shall be submitted to the Engineer by the first day of each month. In each update, estimated monthly dollar amounts shall be revised to show the dollar amount for actual work accomplished that includes actual progress payments made to the Contractor to date and

work accomplished but not paid. Each update shall show corrected dollar amounts of work to be completed each month through the Specified Completion Date as shown on the Contractor's Project Schedule Update.

If the update has any State Fiscal Year (July 1 to June 30) payment in excess of the encumbrance amount, the Department may, in its sole discretion, approve the update. If the Department does not approve the update the Contractor shall either revise the payment schedule or proceed at his own risk. The risk is either not being paid in a timely manner, or not being paid at all for any amounts over the encumbrance amount. If the Contractor proceeds at his own risk, then payment for the at-risk work will be dependent upon ratification of this work by the State Controller's Office.

If the update exceeds the encumbrance amount because of additional compensable work, and the Department does not approve this update, any delay to critical path work related to this additional compensable work will be considered excusable and compensable per subsection 108.08(c), if the Contractor does not proceed at his own risk.

If the update exceeds the encumbrance amount because of the Contractor's accelerated schedule, and the Department does not approve the update, the delay for not performing the work associated with the Contractor's accelerated schedule in the scheduled Fiscal Year will be noncompensable per subsection 108.08(c), if the Contractor does not proceed at his own risk.

(c) *Failure to Submit Payment Schedule.* If the Contractor fails to submit the initial payment schedule, the Contract will not be executed. If a payment schedule update is not submitted by the required date, the Engineer will withhold progress payments until such time as the Contractor has submitted a current payment schedule.

108.05 Limitation of Operations. The Contractor shall conduct the work in a manner and sequence to assure the least interference with traffic. The Contractor shall not open up work to the prejudice or detriment of work already started. The Engineer may require the Contractor to finish a section of work before starting any additional sections if the opening of a section is essential to public convenience.

108.06 Character of Workers; Methods and Equipment. The Contractor shall employ resources for completing work to full completion in the manner and time required by the Contract.

All workers shall have skill and experience to perform the work assigned to them.

Any person employed by the Contractor or by any subcontractor who does not perform the work in a proper and skillful manner shall, at the written request of the Engineer, be removed by the Contractor or subcontractor and shall not be employed on the project without the approval of the Engineer.

Should the Contractor fail to remove this person or persons or fail to furnish skilled and experienced personnel for the proper prosecution of the work, the Engineer may suspend the work by written notice until compliance is achieved.

All equipment used on the project shall be of size and mechanical condition to meet requirements of the work and to produce a satisfactory quality of work. Equipment used shall not cause injury to the roadway, adjacent property, or other highways.

When the methods and equipment to be used are not prescribed in the Contract, the Contractor shall use any methods or equipment that will accomplish the contract work in

conformity with the contract requirements.

When the methods and equipment to be used are specified in the Contract, other methods and equipment shall not be used in the performance of the work unless the Contractor receives written authorization from the Engineer.

If the Contractor desires to use a method or equipment other than specified in the Contract, the Contractor may request approval from the Engineer. The request shall include a full description of the methods and equipment proposed to be used and the Contractor's explanation for the proposed change. The Contractor will be fully responsible for producing work in conformity with contract requirements. If the substituted methods or equipment do not produce results conforming to contract requirements, the Contractor shall complete the remaining construction with the originally specified methods and equipment. Deficient work shall be removed, repaired, or replaced to conform with the specified quality by and at the Contractor's expense. No increase will be made in the basis of payment for the construction items involved nor in contract time when a change in methods or equipment is authorized.

108.07 Workplace Violence. If a representative or employee of the Contractor, or a subcontractor, commits an act of workplace violence on the project, they shall be sanctioned as provided by the Contractor's employment policies and, where appropriate, shall be reported to law enforcement authorities. At the request of either the Contractor or the Engineer, the Engineer and the Contractor shall meet to discuss appropriate actions to be taken against the representative or employee. Appropriate action may include removing the representative or employee from the project. If removal is warranted and the Contractor fails to remove the representative or employee, the Engineer may suspend the work by written notice until compliance is achieved.

108.08 Determination and Extension of Contract Time. The contract time is stated in the Commencement and Completion of Work special provision. The contract time will be used to determine the contract completion date.

The Contractor shall not perform construction operations on Saturdays, Sundays, or holidays unless previously arranged and approved. The Contractor shall not perform work on any day of a three-day holiday weekend when the holiday is New Year's Day, Memorial Day, Independence Day, Labor Day, or Christmas Day. The Contractor shall not perform work on any day of a four-day holiday weekend when the holiday is Thanksgiving Day. Construction operations shall stop at 12 P.M. the day before the start of the holiday weekend and shall commence the day after the three or four days have passed. When the holiday is New Year's Day, Independence Day, or Christmas Day and falls on a Tuesday, Wednesday, or Thursday, construction operations shall stop at 12 P.M. the day before the holiday and shall commence the next Working Day. The Contractor shall only make emergency repairs and provide proper protection of the work and traveling public on these days.

(a) Time Count Contract. When the contract time is on a working day or calendar day basis, the Engineer will furnish the Contractor a weekly statement showing the number of days assessed for the preceding week and the number of days remaining for completion of the Contract. If the Contractor is in disagreement with the current weekly statement, the Contractor shall submit a request for review of the current weekly statement. Such request shall be made within 30 calendar days of the receipt of the statement and shall detail the reasons the statement is believed to be incorrect.

When final acceptance has been made by the Engineer as prescribed in subsection 105.21, the daily time charges will cease on working day and calendar day projects.

1. *Working Day Contract.* When the work is on a working day basis, one whole day of contract time will be assessed for each working day that the work can be effectively prosecuted during six hours or more of the day. One-half day will be assessed for each working day that the work can be effectively prosecuted for at least two hours but less than six hours of the day. Contract time will not be assessed when the work can be effectively prosecuted for less than two hours. Saturdays, Sundays, and holidays will be assessed as workdays when the Contractor utilizes such days for prosecuting the work.

2. *Calendar Day Contract.* When the work is on a calendar day basis, one calendar day of contract time will be assessed for each calendar day from the date that Contract time starts including Saturdays, Sundays, and holidays. Less than full time charges may be made on those days when conditions, which are beyond the control of and unknown to the Contractor, make it impossible to prosecute the work on items controlling the completion of the work with full, normal efficiency. Less than full time charges may be allowed for inclement weather only when the Engineer directs the Contractor not to work for the safety of the traveling public. When less than full time charges are to be assessed, the following procedures will be followed: One whole day of contract time will be assessed for each calendar day that the work is prosecuted during six hours or more of the Contractor's daily working schedule; one-half day will be assessed for each calendar day that the work is prosecuted for at least two hours but less than six hours of the day; contract time will not be assessed when the work is prosecuted for less than two hours.

(b) Completion Date Contract. When the Contract specifies a completion date, all work under the Contract shall be completed on or before that date. No extension of the completion date will be allowed for inclement weather, foreseeable causes, or conditions under the control of the Contractor.

If all work under the Contract is not completed on or before the specified completion date, contract time will be assessed for each additional calendar day per subsection 108.08(a)2.

(c) Delay. Any event, action or factor that extends the performance period of the Contract.

1. Excusable Delay: A delay that was beyond the Contractor's control and was not due to the Contractor's fault or negligence. The Department may grant a contract time extension for an excusable delay.

   A. Compensable Delay: A delay that the Department, not the Contractor, is responsible for entitling the Contractor to a time extension and monetary compensation. Monetary compensation for compensable delays will be made per subsection 109.10.

   B. Noncompensable Delay: An excusable delay that neither the Contractor nor the Department is responsible for that may entitle the Contractor to a contract time extension but no additional monetary compensation. Contract time allowed for the performance of the work may be extended for delays due to force majeure (acts of God, acts of the public enemy, terrorist acts, fires, floods, area wide strikes, embargoes, or unusually severe weather).

2. Nonexcusable Delay: A delay that was reasonably foreseeable or within the control of the Contractor that the Department will not grant monetary compensation or a contract time extension.

3. Concurrent Delay. Independent delays to critical activities occurring at the same time.

   A. The Department will not grant a time extension or additional compensation for the period of time that a nonexcusable delay is concurrent with an excusable delay.

   B. The Department may grant time but no compensation for the period of time that a noncompensable delay is concurrent with a compensable delay.

   Delays in delivery of materials or fabrication scheduling resulting from late ordering, financial considerations, or other causes that could have been foreseen or prevented will be considered nonexcusable delays. However, delays caused by fuel shortage or delay in delivery of materials to the Contractor due to some unusual market condition caused by industry-wide strike, national disaster, area-wide shortage, or other reasons beyond the control of the Contractor that prevent procurement of materials or fuel within the allowable contract time limits will be considered excusable delays.

(d) Extension of Contract Time. The Contractor shall orally notify the Engineer as soon as the Contractor recognizes a potential project delay. The Contractor or Engineer shall document the discussion in writing. This discussion and documentation are not considered an official notice of a delay.

The Contractor shall provide a written notice of delay within seven days of determining the need for additional contract time. The notice of delay shall describe the nature and specific cause of the delay. Failure to submit the written notice of delay within seven days constitutes a waiver of entitlement to additional time or compensation.

The Contractor shall submit the time extension request and supporting analysis within 30 days of the written delay notice. The request shall include a schedule analysis with all information needed to support the time extension request pursuant to one of the following methods including an explanation for selecting that method:

(1) Time Impact Analysis (TIA) for all forward-looking analyses of time impacts following the guideline AACE® International Recommended Practice No. 52R-06 Prospective Time Impact Analysis – As Applied in Construction.

(2) Forensic Schedule Analysis for all time impacts absorbed into the schedule following the AACE® International Recommended Practice 29R-03 Forensic Schedule Analysis.

(3) Other acceptable method of schedule analysis, as approved by the Engineer.

The analyses shall show a delay to the critical path in order to obtain a contract time extension. The Contractor shall demonstrate that efforts were made to avoid the delay by resequencing the work or by using other reasonable alternatives. Failure to submit the documentation to support the time extension request within 30 days of the Contractor's written notice of delay constitutes a waiver of entitlement to additional time or compensation. The Engineer's review of the time extension request will not exceed 15 days.

The schedule included in the request shall be per subsection 108.03(c). The Engineer will base a determination of an allowable contract time extension on the current "Approved, no exceptions taken" or "Approved-as-Noted" Project Schedule that shall have a data date within 30 days before the alleged delay, the supporting documentation and schedule analysis submitted by the Contractor, and any additional relevant information available.

The Contractor's assertion that insufficient contract time was specified is not a valid reason for an extension of contract time. Adding activities to or changing logic on a Project Schedule Update shall not constitute supporting documentation of a delay request justification. The Contractor shall submit a justification for determination of a contract time extension separately from the Project Schedule Update. Approval of a Project Schedule Update or Revised Schedule will not constitute approval of a contract time extension. When the Engineer grants a contract time extension, the revised Contract Completion date will be in effect as though it were the original contract date. The Contractor's failure to have an "Approved" or "Approved-as-Noted" current project schedule in place will preclude the Department from approving a Contractor's time extension request.

108.09 Failure to Complete Work on Time. A daily charge will be made against the Contractor for each calendar day, including free time, that any work remains uncompleted after the elapse of contract time. This daily charge 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 by the Contractor and the Department, as reasonably representing additional construction engineering costs incurred by the Department if the Contractor fails to complete performance within the contract time.

Table 108-2

LIQUIDATED DAMAGES

Original Contract Amount ($); from more than, to, and including	Liquidated Damages per Calendar Day ($)
0 -1,000,000	1,400
1,000,000 – 2,000,000	2,500
2,000,000 – 6,000,000	4,500
6,000,000 – 9,000,000	8,000
9,000,000 – 20,000,000	8,800
Above 20,000,000	12,500

Due account shall be taken of any adjustment of the contract time for completion of the work granted under the provisions of subsection 108.08.

Permitting the Contractor to continue and finish the work or any part thereof after elapse of contract time will not operate as a waiver on the part of the Department of any of its rights under the Contract.

Deductions assessed as liquidated damages under this subsection 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 times.

108.10 Default of Contract.

(a) The Engineer may send a written notice of intent to find the Contractor in default to the Contractor and the Surety by certified mail for any of the reasons listed below.

The notice will describe the conditions causing the impending default, advise them of the actions required for remedy, and state that if the conditions have not been corrected within 10 days of receipt of the notice, CDOT will find the Contractor in default.

The Department may send a written notice of intent under this part (a) if the Contractor:

(1) Fails to begin the Contract work within the time specified to begin work, or

(2) Fails to perform the Contract work with sufficient resources to assure its timely completion, or

(3) Discontinues the Contract work, or

(4) Fails to resume discontinued Contract work, or

(5) Becomes insolvent, is declared bankrupt, commits an act of bankruptcy or insolvency, allows a final judgment to remain unsatisfied for a period of 10 calendar days, makes an assignment for the benefit of creditors, or

(6) Fails to comply with the Contract regarding minimum wage payments, Disadvantage Business Enterprise (DBE) requirements, or Equal Employment Opportunity (EEO) requirements, or

(7) Is a party to fraud.

If the Contractor fails to correct the conditions identified in the notice of intent to find the Contractor in default within 10 calendar days of receipt, the Department may serve the Contractor with an immediate notice of default and take prosecution of the work from the Contractor. Copies of the default notice will also be sent, by certified mail, to the Contractor and the Surety.

(b) The Engineer may send a written notice of intent to find the Contractor in default to the Contractor and the Surety by certified mail for the reason listed below. The notice will include a suspension of work, which will require the Contractor to cease work on the Contract Items that are unacceptable. The notice will describe the conditions causing the impending default, advise the Contractor of the actions required for remedy and state that if the conditions have not been corrected within 10 days of receipt of the notice, CDOT will find the Contractor in default.

The Department may send a written notice of intent under this part (b) if the Contractor fails to perform the work to Contract requirements or neglects or refuses to correct or remove and replace rejected materials or unacceptable work.

The Contractor shall not resume work on the unacceptable Contract Items until the following conditions have been met:

(1) The Contractor shall submit a written proposal to the Engineer outlining the procedures that will be followed by the Contractor to correct the unacceptable conditions, and

(2) The Engineer and the Contractor shall meet to discuss the written proposal; and

(3) The Engineer will issue written permission for the Contractor to commence work.

If the Contractor fails to meet these three conditions within 10 calendar days of receipt of the notice of intent to find the Contractor in default, or if at any time after the Contractor resumes work, the work does not meet Contract requirements or the Contractor again neglects or refuses to correct or remove and replace rejected materials or unacceptable work, the Department may serve the Contractor with an immediate notice of default and take prosecution of the work from the Contractor. Copies of the default notice will also be sent, by certified mail, to the Contractor and the Surety.

(c) In the case of default under either subsection 108.10(a) or 108.10(b):

(1) The Department will revoke the Contractor's Prequalification. If the Department chooses to rebid the remaining Contract work on this project, the Contractor will not be allowed to submit a bid for this work.

(2) The Department may appropriate or use materials at the project site and contract with others to complete the remaining Contract work.

(3) The Department will determine the methods used for completion of the Contract.

(4) Resulting costs and charges incurred by the Department will be deducted from payments owed the Contractor. If such costs exceed the payment owed the Contractor, the Contractor and Surety shall reimburse the Department for these costs. These costs and charges may include but are not limited to cost of Contract completion, including designing, advertising, bidding and awarding the remaining work and liquidated damages or disincentives.

(d) If the notice of default is determined to be in error, the rights and obligations of the parties shall be the same as if the Contract had been terminated per subsection 108.10. Damages for improper notice of default may be awarded accordingly.

108.11 Termination of Contract.

(a) Termination Notice. The Department may terminate work under the Contract in whole or in part if the Engineer determines that termination is in the Department's best interest. Contract termination will be initiated by the Engineer's written Contract Termination Notice to the Contractor. The notice will specify the effective date.

(b) Canceled Commitments. The Contractor, after receiving the Contract Termination Notice, shall cancel any outstanding commitments for procurement of materials, supplies, equipment, and miscellaneous items. In addition, the Contractor shall use reasonable effort to cancel or divert any outstanding subcontract commitments to the extent they relate to any work terminated. With respect to such canceled commitments the Contractor shall:

(1) Settle all outstanding liabilities and all claims arising out of these canceled commitments. Such settlements will be approved by the Engineer and shall be final; and

(2) Assign to the Department all of the rights, title and interest of the Contractor under the terminated orders and subcontracts, as directed. The Department will then have the right to settle or pay any or all claims arising out of the termination of these commitments.

(c) Termination Claim. The Contractor shall submit the termination claim to the Engineer within 90 days after the termination notice effective date. During the 90-day period, the Contractor may make a written request for a time extension in preparing the claim. Any time extension must be approved by the Engineer. If the Contractor fails to submit the termination claim within the time allowed, the Engineer may determine the amount due the Contractor by reason of the termination.

(d) Payment. Subject to subsection 108.11(c) above, the Contractor and Engineer may agree upon the whole or any part of the amount to be paid to the Contractor because of the termination. The amount may include reasonable cancellation charges incurred by the Contractor. The amount may also include any reasonable loss upon outstanding commitments for subcontracts that the Contractor is unable to cancel, provided the Contractor has made reasonable effort to divert the commitments to other activities.

The amount agreed upon shall be embodied in a Contract Modification Order and the Contractor shall be paid that amount.

Payments claimed and agreed to pursuant to termination shall be based on the Contract unit prices. Payment for partially completed lump sum items may be made in the proportion that the partially completed work is to the total lump sum item. Where work performed is of a nature that it is impossible to separate the costs of uncompleted work from completed units, the Contractor will be paid the actual cost incurred for the necessary preparatory work and other work accomplished.

The Department may from time to time, under terms and conditions it may prescribe, make partial payments against costs incurred by the Contractor in connection with the contract termination. The total of such payments shall not exceed the amount, as determined by the Engineer, the Contractor will be entitled to hereunder.

(e) Disposition of Work and Inventory. The Contractor shall transfer title and deliver to the Department, as directed, such items which, if the Contract had been completed, would have been furnished to the Department including:

(1) Completed and partially completed work; and

(2) Materials or equipment produced or in process or acquired in connection with the performance of the work terminated by the notice.

Other than the above, any termination inventory resulting from the contract termination may, with written approval of the Engineer, be sold or acquired by the Contractor under the conditions prescribed by and at prices approved by the Engineer. The proceeds of any such disposition shall be applied to reduce any payments to the Contractor under the Contract or shall otherwise be credited to the cost of work covered by the Contract or paid in a manner as directed. Until final disposition, the Contractor shall protect and preserve all the material related to the Contract that is in the Contractor's possession and that the Department has or may acquire an interest.

(f) Cost Records. The Contractor agrees to make cost records available to the extent necessary to determine the validity and amount of each item claimed.

(g) Contractual Responsibilities. Termination of a Contract or portion thereof shall not relieve the Contractor of contractual responsibilities for the work completed, nor shall it relieve the Surety of its obligation for and concerning any just claim arising out of the work performed.

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SECTION 109

MEASUREMENT AND PAYMENT

109.01 Measurement of Quantities. All work completed under the Contract will be measured by the Engineer according to United States standard measure (English units).

A station when used as a definition or term of measurement will be 100 linear feet.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the Contract will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and deductions will not be made for individual structures having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or as ordered in writing by the Engineer.

Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.

Items that are measured by linear foot, such as pipe culverts, guardrail, underdrains, etc., will be measured parallel to the base or foundation that the structures are placed, unless otherwise shown on the plans.

In computing volumes of excavation and embankment, the average end area method or the method incorporated into the Department's computer earthwork program will be used.

The term "gauge," when used in connection with the measurement of plates, will mean the U.S. Standard gauge.

When the term "gauge" refers to the measurement of wire, it will mean the wire gauge specified in ASTM A510.

The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois.

Materials measured or proportioned by weight shall be weighed on accurate scales. Scales shall be accurate within the allowable tolerances as prescribed by State law. The scales shall be tested for accuracy by the Colorado Department of Agriculture or an approved Colorado Department of Agriculture vendor at least once each year, each time the scales are relocated, and as often as the Engineer may deem necessary. Scales shall be furnished by the Contractor, or the Contractor may utilize commercial scales.

Scales shall be operated according to the Colorado Department of Agriculture's regulations. Weighers, scales, scale tickets, scale house, and verification of the scales' accuracy will not be measured and paid for separately but shall be included in the work.

The Contractor may use either certified hopper scales or certified platform scales.

When platform scales are used to weigh vehicles carrying material paid for by weight, a certified weigher shall weigh each vehicle. Hopper scales used to directly measure material paid for by weight shall be operated by certified weighers and provide an accurate net weight.

The operator of each vehicle carrying material measured and paid for by weight shall obtain a scale ticket (certificate of correct weight) from the certified weigher and deliver the ticket to the Engineer at the point of delivery of the material.

The scale ticket shall include the following information:

(1) Project Number.

(2) Date.

(3) Ticket Number.

(4) Haul Unit Number.

(5) CDOT Form 43 Number (HMA and SMA Only)

(6) Plant Location

(7) Gross Weight.

(8) Tare Weight.

(9) Net Weight.

(10) Material Type.

(11) Certified Weigher's Name.

Vehicles used to haul material being paid for by weight shall bear a plainly legible identification mark. Each of these vehicles shall be weighed empty daily at times directed by the Engineer. The Contractor shall furnish to the Engineer, in writing, a vehicle identification sheet that lists the following for each delivery vehicle to be used on the project:

(1) Identification mark.

(2) Vehicle length.

(3) Tare weight.

(4) Number of axles.

(5) The distance between extreme axles.

(6) Information related to legal weight, including the Permit Number and permitted weight of each vehicle that the State has issued an overweight permit.

This information shall be furnished before time of delivery of the material and at any subsequent time the Contractor changes vehicles, combination vehicles, axle length relationships, or overweight permitting of vehicles.

Weighers using hopper scales solely for batching materials not measured and paid for by weight need not be certified.

The Engineer will randomly verify the accuracy of the certified weigher on every project where the weights are manually entered on the scale ticket. This verification will consist of at least one comparison check on the project. Additional verification checks may be required as determined by the Engineer. The Engineer will randomly select a loaded truck after the truck has been issued a scale ticket by the certified weigher. The loaded truck will then be reweighed, in the presence of the Engineer, on the same scale and the weight compared with the weight on the scale ticket. Reweighed loads shall be within the tolerance of 200 pounds plus or minus.

The Engineer will also verify the accuracy of computerized scales. Computerized scales are scales that automatically print weights on the scale ticket. This verification will consist of at least one comparison check when the project requires more than 2,500 tons of material to be weighed. This comparison check shall be made by reweighing a loaded vehicle. The Contractor shall either provide a second certified scale or select a second certified scale in the vicinity to be used for the comparison check. Comparison checks shall be performed using the following procedures:

- Hopper Scale. A loaded truck will be randomly selected by the Engineer. The loaded truck shall be weighed on a certified platform scale to record the gross weight. The truck shall be unloaded and weighed again on the same scale to record the tare weight. The tare weight shall be subtracted from the gross weight and compared against the net weight recorded on the scale ticket.
- Platform Scales. The Engineer will randomly select a loaded truck. The loaded truck shall be reweighed on a second certified scale and the gross weight shall be compared against the gross weight on the first scale ticket.

  Should a comparison check reveal a weight difference of more than one percent, a second comparison check shall be performed immediately. If the weight differences of both comparison checks exceed the one percent limit, the Contractor shall immediately stop weighing and the scale shall be recertified and resealed at the Contractor's expense. The necessary adjustments as indicated by the recertification will be made to all scale tickets issued since the last certification or on the entire project, whichever occurred later, unless the Contractor demonstrates to the satisfaction of the Engineer that the defect in the scale was present for a lesser period of time.

  If it is necessary to recertify a scale, and more than 2,500 tons of material remain to be weighed, another scale comparison check shall be made.

  All comparison checks shall be made at the Contractor's expense.

Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured at the point of delivery. Vehicles for this purpose may be of any size or type, provided the body is shaped so the actual contents may be readily and accurately determined. All vehicles shall be loaded to their water level capacity and all loads shall be leveled when the vehicles arrive at the point of delivery.

Water used in the work will be measured by the M Gallon or 1,000 U.S. Gallons. The weight of inherent moisture in the material will not be deducted. Water added for the Contractor's convenience will not be paid for.

Water may be measured by either volume or weight. Water meters shall be accurate within a range of plus or minus 3 percent. When water is metered, the Contractor shall use an approved metering device and shall furnish the Engineer a certificate showing the meter has been accurately calibrated within the time allowed in the following schedule:

2 inch	4 years
4 inch to 6 inch	2 years
8 inch to 10 inch	1 year

Water meters shall be calibrated when the Engineer determines there is reason to believe the meters are not accurate within the allowable tolerance. If water meter accuracy is found acceptable, the cost involved in checking the water meter shall be at the Department's expense. If the water meter accuracy is found unsatisfactory, the cost involved in checking the water meter shall be at the Contractor's expense.

For those materials specified to be measured by the cubic yard, an acceptable method of computing volumes of excavation is to determine a weight to volume factor and convert weight to volumes by means of the factor. Colorado Procedure 80 as described in the Department's Field Materials Manual shall determine the weight to volume factor. The number of tests used to determine the material weight to volume factor will be determined by the Engineer. The locations where the tests are taken shall be at those locations specified in the "Method of Measurement" for the particular bid item; i.e., Unclassified Excavation - in its original position: Embankment Material - in its final compacted position, etc.

Asphalt materials will be measured by the gallon or ton. Volumes will be measured at 60 ˚F or will be corrected to the volume at 60 ˚F using ASTM D1250 for asphalts or ASTM D633 for tars. Net certified scale weight or weight based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weight or volume subject to correction for loss or foaming will be used for computing quantities.

Cement will be measured by the ton.

Timber will be measured by the number of thousand feet board measure or MFBM actually incorporated in the structure. Measurement will be based on nominal commercial widths and thicknesses.

The term "lump sum" when used as an item of payment will mean complete payment for the work described in the Contract.

When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will include all necessary fittings and accessories.

Rental of equipment will be measured in hours of actual working time and necessary traveling time of the equipment within the limits of the project. If special equipment has been ordered by the Engineer in connection with force account work, travel time and transportation to the project will be measured. If equipment has been ordered held on the job on a standby basis by the Engineer, and is not otherwise utilized by the Contractor, standby rental rates for the equipment will be paid at the rates specified in subsection 109.04.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, and pipe conduit, and these items are identified by gauge, unit weight, and section dimensions, the identification will be considered to be nominal weight or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

109.02 Scope of Payment. The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials and for performing all work under the Contract in a complete and acceptable manner and for all risk, loss, damage, or

expense of whatever character arising out of the nature of the work or the prosecution thereof, subject to the provisions of subsection 107.21.

Work or materials that have pay items and that are to be paid for separately will be included in the appropriate pay item in the Summary of Approximate Quantities on the plans. Work or materials that are essential to the project but do not have pay items, will not be measured and paid for separately but shall be included in the project.

Payment for any pay item listed in the Summary of Approximate Quantities on the plans, having additional items shown within parentheses, shall be full compensation for all work necessary to complete the item as designated.

109.03 Compensation for Altered Quantities. When the accepted quantities of work vary from the quantities in the Contract the Contractor shall accept as payment in full, payment at the original contract unit prices for the accepted quantities of work done. Allowance will not be made except as provided in subsections 104.02 and 108.11, for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation of overhead expense among the contract items or from any other cause.

If any such alteration directly causes the loss of any work or materials already furnished by the Contractor under the terms of the original Contract, reimbursement for such work or of salvaging such materials will be at actual cost. Any such materials may, at the option of the Department, be purchased at the actual cost to the Contractor, as evidenced by certified invoices.

109.04 Compensation for Changes and Force Account Work. Differing site conditions, changes, and extra work performed under Section 104 will be paid for as stipulated in the order authorizing the work. Compensation will be at unit prices or lump sum, or the Department may require the Contractor to do the work on a force account basis to be compensated in the following manner:

(a) Labor. For all labor and foremen in direct charge of the specific operations, the Contractor will receive the actual rate of wage normally paid for each and every hour that the labor and foremen are actually engaged in the work, as documented by certified payrolls.

The Contractor will receive the actual costs paid to, or on behalf of, workers by reason of subsistence and travel allowances, health and welfare benefits, pension fund benefits, or other benefits, when the amounts are required by a collective bargaining agreement or other employment contract or generally applicable to the classes of labor employed on the work.

An amount equal to 67 percent of the actual wages and fringe benefits paid directly to the employees will also be paid to the Contractor. This 67 percent will not be applied to subsistence, travel allowance, or to fringe benefits paid to a third party or a trustee.

(b) Materials. For materials accepted by the Engineer and incorporated in the work, the Contractor shall receive the actual cost of such materials, including transportation charges paid (exclusive of equipment rentals as set forth), to which 15 percent will be added.

(c) Owned or Leased Equipment. For the use of any machinery or equipment, approved by the Engineer, which is owned or leased directly by the Contractor or subcontractors, or by entities that are divisions, affiliates, subsidiaries or in any other way related to the Contractor or subcontractors or their parent companies, the Contractor will be paid in the

manner specified. Rental rates will be from the current edition of the Rental Rate Blue Book of Rental Rates for Construction Equipment and will be used as follows:

1. Determination of the rental rate to be used will be as follows:

   Hourly rate: RR = (ADJ BB/176)(RF)+EOC

   Standby rate: SR = (ADJ BB/176)(RF)(0.5)

   Where:

RR	=	Hourly rental rate
SR	=	Standby rate
ADJ BB	=	Blue Book Monthly Rate adjusted for year of manufacture
RF	=	Regional Factor of 1.06
EOC	=	Estimated Hourly Operating Costs from Blue Book

2. The number of hours to be paid for will be the number of hours that the equipment is actually used on a specific force account activity.
3. Overtime shall be compensated at the same rate indicated in subsection 109.04(c)1. above.
4. The EOC will be used for each hour that the equipment is in operation on the force account work. Such costs do not apply to idle time regardless of the cause.
5. Idle time for equipment will not be paid for, except where the equipment has been held on the Project site on a standby basis at the direction of the Engineer. Such payment will be made at the standby rate established in subsection 109.04(c)1 above. The Engineer must approve the payment of standby rates for equipment before the costs are incurred. Payment for standby time will not be made on any day the equipment operates for eight or more hours. For equipment accumulating less than eight hours operating time on any normal workday standby payment will be limited to only that number of hours that, when added to the operating time for that day, equals eight hours. Additionally, payment for standby time will not be made in any consecutive 30-day period that the equipment operates for 176 or more hours. For equipment accumulating less than 176 hours operating time in any consecutive 30-day period, standby payment will be limited to only that number of hours that, when added to the operating time for that consecutive 30-day period, equals 176 hours. Standby payment will not be made in any case on days not normally a workday.
6. The rates established above include the cost of fuel, oil, lubrication, supplies, incidental tools valued at less than $500, necessary attachments, repairs, overhaul and maintenance of any kind, depreciation, storage, overhead, profit, insurance, all costs (including labor and equipment) of moving equipment onto and away from the site, and all incidentals, except as allowed in subsection 109.04(c)8.
7. The rental rate for small tools shall be $2 per hour. Small tools are defined as any tool that would be valued between $500 and $2,000 if purchased new.
8. Transportation charges for each piece of equipment to and from the site of the work will be paid provided:

   (1) The equipment is obtained from the nearest source,

   (2) Charges are restricted to those units of equipment not already available or required on the Project, and

(3) The equipment is used solely for the force account work.

9. Fast use expendable parts not included in the Rental Rate Blue Book will be paid at certified invoice cost plus 10percent. Such parts not totally expended on the force account work will be prorated based on actual use.

10. Payable time periods will not include:

(1) Time elapsed while equipment is broken down.

(2) Time spent in repairing equipment; or

(3) Time elapsed after the equipment is no longer needed.

If a piece of equipment that is not in the Blue Book is needed, rates shall be agreed to in writing before the equipment is used.

(d) Rental Equipment. Use of rental equipment not owned or leased by the Contractor or subcontractors will be paid for by certified invoice cost. The EOC will also be paid if not included in the rental rate. The use of and rates for rental equipment shall be approved by the Engineer before use. Proration of rental rates to an hourly rate for equipment not used solely for the force account shall be based on 176 hours per month, 40 hours per week or 8 hours per day as applicable. The cost of moving the rental equipment onto and away from the job will also be paid when the equipment is used solely for the force account work. An amount equal to 10 percent of the total due to the Contractor for rental equipment cost will be added to compensate the Contractor for related overhead costs.

(e) Administrative Compensation. Administrative compensation will be paid to the Contractor for work performed on a force account basis by a subcontractor, utility, railroad, waste disposal company, or specialty firm. The compensation will be a percentage of the value of the force account work performed per the following:

To $1,000	10%
Over $1,000 to $10,000	$100 plus 5% of excess over $1,000
Over $10,000	$550 plus 3% of excess over $10,000

The percentages will be calculated after certified invoices are furnished by the Contractor. Compensation for administrative loading expenses will be applied to each individual billing for each force account, not to exceed one administrative loading per billing nor one billing per force account per month.

(f) Records. The Contractor's representative and the Engineer shall, on a daily basis, agree in writing on the quantities of labor, equipment and materials used for work completed on a force account basis.

(g) Statements. Payment will not be made for work performed on a force account basis until the Contractor has furnished the Engineer with triplicate itemized statements of the cost of the force account work, detailed as follows:

(1) Labor classification, hours, rate, and extension for each labor class or pay rate within a class.

(2) Equipment type, hours, rate and extension for each unit of equipment.

(3) Quantities of materials, prices, extensions and transportation charges.

(4) Administrative compensation when applicable.

Statements shall be accompanied and supported by certified invoices for all materials and rental equipment including transportation charges. If materials used on the force

account work are not specifically purchased for the work, but are taken from the Contractor's stock, the Contractor shall furnish a written statement certifying that the materials were taken from stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

(h) Alternative Method of Documenting Force Account Work. The following method of documenting the amount of force account work done may be used in lieu of the method described in subsections 109.04(f) and (g) above, when agreed to by both the Engineer and the Contractor.

The Engineer will keep a daily record of the labor, equipment and material used on approved force account work. The Contractor's representative shall review and initial the record each day to ensure that the record is accurate and complete, and that the costs were actually incurred.

The Contractor shall furnish certified copies of invoices for the cost of all materials used including transportation charges. If materials used on force account work are not specifically purchased for the work, but are taken from the Contractor's stock, the Contractor shall furnish a written statement certifying that the quantity claimed was actually used, and that the price and transportation charges claimed represent the actual cost to the Contractor.

The Engineer will calculate the cost of the force account work each month and include payment on the monthly progress estimate.

(i) The additional percentages stated in (a) through (h) above constitute full compensation for all items of expense not specifically designated, including general superintendence, use of incidental tools, field and office overhead and profit. The total payment made as provided above shall constitute full compensation for such work.

109.05 Eliminated Items. Should any items contained in the Contract be found unnecessary for the proper completion of the work, the Engineer will notify the Contractor in writing, to eliminate the item. Such action will not invalidate the Contract. The Contractor, by Contract Modification Order, will be reimbursed for actual work done and all costs incurred, including mobilization of materials and equipment before the elimination of the items.

109.06 Partial Payments. Partial payments will be made once each month as the work progresses, when the Contractor is performing satisfactorily under the Contract. Payments will be based upon progress estimates prepared by the Engineer, of the value of work performed, materials placed per the Contract, and the value of the materials on hand per subsection 109.07. The amount of the progress estimate paid to the Contractor will be subject to the following:

(a) Standard Amount Retained. The Department will make a deduction from the progress estimate in the amount considered necessary to protect the interests of the State, pursuant to Section 24-91-103, CRS. The amount to be retained will be 3 percent of the value of the completed work, exclusive of mobilization and payments for materials on hand, to a maximum of 1 1/2 percent of the original contract amount. No further amount will be retained if the Contractor makes satisfactory progress in the contract work. The amount retained will be in effect until such time as final payment is made, with the following exception that requires the Contractor's written request and consent of the Surety: Upon completion and acceptance of the project, after the project quantities are finalized, and the Contractor has submitted the necessary forms, the Engineer may make reduction in the amount retained.

The Contractor shall request release of retainage on work that has been partially accepted per subsection 105.21(a). The Contractor shall provide a certified invoice to the Engineer stating the percentage of the original contract amount constituted by the partially accepted work. The calculated percentage will be multiplied by the maximum retainage amount allowed to determine the retainage to be released.

(b) *Securities in Lieu of Standard Amount Retained.* When the original contract amount exceeds $150,000, the Contractor may withdraw all or any portion of the standard amount retained if acceptable securities are assigned to the Department, and deposited as set forth in Section 24-91-105, CRS and the implementing regulations. The securities shall at all times have a market value at least equal in value to the sums withdrawn. If at any time the Department determines that the market value of the securities has fallen below the sums withdrawn, the Contractor, shall deposit additional acceptable securities in an amount sufficient to reestablish a total deposit of securities equal in value to the sums withdrawn. This security substitution shall not apply if a part of the contract price is paid from federal, or other sources, and the federal or other source has requirements that are inconsistent with this subsection.

(c) *Subcontractor and Supplier Claims.* In addition to a standard amount retained, the Department will withhold funds for all claims against the Contractor filed by subcontractors and suppliers, pursuant to Sections 38-26-107 and 24-91-103, CRS.

(d) *No Payment.* A partial payment will not be made when the total value of the work done since the last estimate amounts to less than $500.

(e) *Prompt Payment*. The Contractor shall pay subcontractors and suppliers for all work that has been satisfactorily completed within seven calendar days after receiving payment for that work from the Department. For the purpose of this section only, work shall be considered satisfactorily complete when the Department has made payment for the work. The Contractor shall include in all subcontracts a provision that this requirement for prompt payment to subcontractors and suppliers must be included in all subcontracts at every tier. The Contractor shall ensure that all subcontractors and suppliers at every tier are promptly paid. If the Contractor or its subcontractors fail to comply with this provision, the Engineer will not authorize further progress payment for work performed directly by the Contractor or the noncompliant subcontractor until the required payments have been made. The Engineer will continue to authorize progress payments for work performed by compliant subcontractors.

(f) *Retainage by the Contractor*. The Contractor may withhold retainage of each progress estimate on work performed by subcontractors. If during the prosecution of the project, a subcontractor satisfactorily completes all work described on CDOT Form 205, as amended by changes directed by the Engineer, the following procedure will apply:

1. The subcontractor may make a written request to the Contractor for the release of the subcontractor's retainage.
2. Within 10 workdays of the request, the Contractor shall determine if all work described on Form 205 has been satisfactorily completed and shall inform the subcontractor in writing of the Contractor's determination.
3. If the Contractor determines that the subcontractor has not achieved satisfactory completion of all work described on Form 205, the Contractor shall provide the subcontractor with written notice, stating specifically why the subcontract work is not

satisfactorily completed and what has to be done to achieve completion. A copy of this written notice shall be provided to the Engineer.

4. If the Contractor determines that the subcontractor has achieved satisfactory completion of all work described on Form 205, the Contractor shall release the subcontractor's retainage within seven calendar days.
5. In determining whether satisfactory completion has been achieved, the Contractor may require the subcontractor to provide documentation such as certifications and releases, showing that all laborers, lower-tiered subcontractors, suppliers of material and equipment, and others involved in the subcontractor's work have been paid in full. The Contractor may also require any documentation from the subcontractor that is required by the subcontract or by the Contract between the Contractor and the Department or by law such as affidavits of wages paid, material acceptance certifications and releases from applicable governmental agencies to the extent that they relate to the subcontractor's work.
6. Within 14 calendar days after receiving the Contractor's request, the Engineer will make inspection of all work described on Form 205. The Engineer will measure and furnish the final quantities to the Contractor of the items completed by the subcontractor. Agreement on these final quantities by the Contractor will not constitute the acceptance of the work described on Form 205 by the Engineer.
7. If the subcontractor performs only a portion of an item of work, the Contractor shall release retainage per the procedures stated above and when the subcontractor has completed all of the work included in the subcontract, however, final measurement of quantities will not be made until the item of work and all of the work on the associated Form 205 has been completed.
8. If additional quantities of a particular item of work are required at a later date after final measurement has been made, the Contractor shall perform this work per Contract requirements and at unit bid prices.
   For this subsection only, satisfactory completion of all work described on CDOT Form 205 is when all tasks called for in the subcontract as amended by changes directed by the Engineer have been accomplished and documented as required by the Department.
   The requirements stated above do not apply to retainage withheld by the Department from monies earned by the Contractor. The Department will continue to process the release of that retainage based upon the completion date of the project as defined in the Commencement and Completion of Work special provision.
9. If during the prosecution of the project a portion of the work is partially accepted per subsection 105.21(a), the Contractor shall release all subcontractors' retainage on the portion of the partially accepted work performed by subcontractors. Before the Department releasing the Contractor's retainage on work that has been partially accepted per subsection 105.21(a), the Contractor shall submit to the Engineer a certified statement for each subcontractor that has participated in the partially accepted work. The statement shall certify that the subcontractor has been paid in full for its portion of the partially accepted work including release of the subcontractor's retainage. The statement shall include the signature of a legally responsible official for the Contractor, and the signature of a legally responsible official for the subcontractor.
10. The Contractor shall be solely responsible for all additional costs involved in paying retainage to the subcontractors before total project completion.

(g) *Good Cause Exception.* If the Contractor has "good cause" to delay or withhold a subcontractor's progress payment, the Contractor shall notify the subcontractor in writing within seven calendar days after receiving payment from the Department. The notification shall specify the amount being withheld and provide adequate justification for withholding the payment. The notice shall also clearly state what conditions the subcontractor must meet to receive payment. "Good cause" shall include but not be limited to the failure of the subcontractor to make timely submission of required paperwork.

(h) *Monthly Reporting.* For CDOT projects, by the 15th of each month, the Contractor shall record all payments to subcontractors by completing an audit in the B2GNow System. If the Contractor has good cause for delay as described in subsection 109.06(g), the Contractor shall include the justification in its monthly audit. Once the prime enters a payment to a subcontractor or supplier, the subcontractor or supplier will receive a notice to confirm payment. The subcontractor or supplier shall have fifteen days from the notice to confirm payment or report an issue. If a subcontractor or supplier is also a payer, the subcontractor or supplier shall also report all prompt payment to its subcontractors. If the subcontractor or supplier does not report a prompt payment issue within fifteen days from the Contractor's monthly reporting, the subcontractor waives CDOT's assistance in resolving the prompt payment issue and the monthly audit will be closed. This provision should not be construed to limit the subcontractor's contractual remedies.

(i) *Fuel Cost Adjustments.* Contract cost adjustments will be made to reflect increases or decreases in the monthly average prices of gasoline, diesel and other fuels from the average price for the month preceding the month that bids were received for the Contract. These cost adjustments are not changes to the Contract unit prices bid. When bidding, the Contractor shall specify on the Form 85 whether the cost adjustment will apply to the Contract. After bids are submitted, the Contractor will not be given any other opportunity to accept or reject this adjustment. If the Contractor fails to indicate a choice on the Form 85, the cost adjustment will not apply to the Contract. If the fuel cost adjustment is accepted by the Contractor, the adjustment will be made per the following criteria:

1. Cost adjustments will be based on the fuel price index established by the Department and calculated as shown in subsection 109.06(i)2.D below. The index will be the monthly average of the rates posted by the Oil Price Information Service (OPIS) for Denver No. 2 Diesel. The rate used will be the *OPIS Average* taken from the OPIS Standard Rack table for *Ultra-Low Sulfur w/Lubricity Gross Prices* (ULS column), expressed in dollars per gallon and rounded to two decimal places.

2. Cost adjustments will be made on a monthly basis subject to the following conditions:

   A. Adjustment will be based on the pay quantities on the monthly partial pay estimate for each of the pay items listed in the table below that fuel factors have been established. Adjustment will be made only when the pay item is measured by the pay unit specified in the table:

Table 109-1

FUEL COST ADJUSTMENT FACTORS

Item	Pay Unit	Fuel Factor (FF)
202-Removal of Asphalt Mat (Planing)	Square Yard	0.006 Gal/SY/Inch depth
203-Excavation (muck, unclassified) Embankment, Borrow	Cubic Yard	0.29 Gal/CY
203-Rock Excavation	Cubic Yard	0.39 Gal/CY
206-Structure Excavation and Backfill [applies only to quantities paid for by separate bid item; no adjustment will be made for pay items that include structure excavation and backfill, such as RCP(CIP)]	Cubic Yard	0.29 Gal/CY
304-Aggregate Base Course (Class___)	Cubic Yard	0.85 Gal/CY
304-Aggregate Base Course (Class___)	Ton	0.47 Gal./Ton
307-Processing Lime Treated Subgrade	Square Yard	0.12 Gal/SY
310-Full Depth Reclamation	Square Yard	0.06 Gal/SY
403-Hot Mix Asphalt (HMA) (Grading __) *	Ton	2.47 Gal/Ton
403-Stone Matrix Asphalt (Grading __)	Ton	2.47 Gal/Ton
405-Heating and Scarifying Treatment	Square Yard	0.44 Gal/SY
405-Heating and Repaving Treatment	Square Yard	0.44 Gal/SY
405-Heating and Remixing Treatment	Square Yard	0.44 Gal/SY
406-Cold Bituminous Pavement (Recycle)	Square Yard	0.01 Gal/SY/Inch depth
412- Concrete Pavement (___Inch)	Square Yard	0.03 Gal/SY/Inch thickness
412-Place Concrete Pavement**	Square Yard	0.03 Gal/SY/Inch thickness

Table 109-1 Notes: *Hot Mix Asphalt (Patching) is not subject to fuel cost adjustment.

**Use the thickness shown on the plans.

B. A fuel cost adjustment will be made only when the current fuel price index varies by more than 5 percent from the price index at the time of bid, and only for that portion of the variance in excess of 5 percent. Fuel cost adjustments may be either positive or negative dollar amounts.

C. Fuel cost adjustments will not be made for any partial estimate falling wholly after the expiration of contract time.

D. Adjustment formula:

EP greater than BP:

FA = (EP – 1.05 BP)(Q)(FF)

EP less than BP:

FA = (EP – 0.95 BP)(Q)(FF)

Where:

BP	=	Average fuel price index for the calendar month before the calendar month that bids are opened
EP	=	Average fuel price index for the calendar month before the calendar month that the partial estimate pay period ends
FA	=	Adjustment for fuel costs in dollars
FF	=	Fuel usage factor for the pay item
Q	=	Pay quantity for the pay item on the monthly partial pay estimate

Note: When the pay item is based on area, and the rate of fuel use varies with thickness, Q should be determined by multiplying the area by the thickness. For example: for 1000 square yards of 8-inch concrete pavement Q should be 8000.

Example: Bids are opened on July 16. The BP will be the average of the daily postings for June 1 through June 30. For an estimate cut-off date selected by the Contractor at the Pre-construction Conference of the 20th of the month, a February estimate will include HMA quantities (Q) measured from the 21st of January through the 20th of February, the FF will be 2.47 Gal/Ton, and the EP index used to calculate FA will be the average of the daily postings for January 1 through January 31 as established by CDOT.

E. Fuel cost adjustment will not be made for the quantity of any item that is left in place at no pay.

F. Fuel cost adjustments will not be made to items of work added to the Contract by Change Order after the award of the Contract.

The fuel cost adjustment will be the sum of the individual adjustments for each of the pay items shown. No adjustment will be made for fuel costs on items other than those shown. The factors shown are aggregate adjustments for all types of fuels used, including but not limited to gasoline, diesel, propane, and burner fuel. No additional adjustments will be made for any other type of fuel.

Fuel cost adjustments resulting in an increased payment to the Contractor will be paid for under the planned force account item: Fuel Cost Adjustment. Fuel cost adjustments resulting in a decreased payment to the Contractor will be deducted from monies owed the Contractor.

(j) Asphalt Cement Cost Adjustments. Contract cost adjustments will be made to reflect increases or decreases in the monthly average price of asphalt cement from the average price for the month preceding the month that bids were received for the Contract. These cost adjustments are not a change to the contract unit prices bid. When bidding, the

Contractor shall specify on the Form 85 whether the cost adjustment will apply to the Contract. After bids are submitted, the Contractor will not be given the opportunity to accept or reject this adjustment. If the Contractor fails to indicate a choice on the Form 85, the cost adjustment will not apply to the Contract. If the asphalt cement cost adjustment is accepted by the Contractor, the adjustment will be made per the following criteria:

Abbreviations and Terms

1. Estimate Price for asphalt (EP) – Average Asphalt Cement price index for the calendar month before the calendar month that the partial estimate pay period ends.

   a. On the first Monday of each month, the Department determines the EP using price values from the most recent **Poten and Partners Asphalt Weekly** and the **Argus Americas Asphalt Report**. The Department averages values for the following, eliminating the single highest and single lowest values, before averaging.

      The high reported selling price (per ton) of typical non-modified paving grades of asphalt from the **Poten and Partners Asphalt Weekly Monitor**.

      Colorado
      Colorado Springs Area

      Montana
      Eastern markets
      Western markets

      Nebraska
      Western markets

      New Mexico
      Northern
      Southern

      Utah
      Salt Lake City area

      Wyoming
      Northern markets
      Southern markets

      The high reported selling price (per ton) of typical non-modified paving grades of asphalt from the **Argus Americas Asphalt Report**.

      Denver
      Kansas City
      Omaha

      Salt Lake City
      Wyoming

      This average value is then averaged with values obtained in the same manner for the previous three weekly reports to establish the EP.

   b. The EP remains in effect until the first Monday of the following month and is used for regular partial estimates closed before the first Monday of the following month.

2. Base Price for asphalt (BP) – Average Asphalt Cement price index for the calendar month before the calendar month that bids are opened.

3. Asphalt cost adjustment (ACCA) – Asphalt Cement Cost Adjustment.
4. Cost adjustments will be made on a monthly basis subject to the following conditions:

   A. Adjustment will be based on the pay quantities on the monthly partial pay estimate for the following two pay items when measured by the ton and asphalt cement is included in the pay items:

Item No.	Item	Pay Unit
411	Asphalt Cement (__)*	Ton

*Asphalt Cement used with Hot Mix Asphalt (Patching) is not subject to asphalt cement cost adjustment.

   B. A cost adjustment will be made only when the EP asphalt cement price index varies by more than 10 percent from the BP asphalt cement price index, and only for that portion of the variance in excess of 10 percent. Cost adjustments may be either positive or negative dollar amounts.

   C. The maximum allowable monthly and final price adjustment to the Contractor or rebate to The Department is limited to a (EP/BP) ratio of 1.6 and 0.4, respectively.

   D. Asphalt cement cost adjustments will not be made for any partial estimate falling wholly after the expiration of contract time.

   E. Adjustment formula:

      EP greater than BP:

      ACCA = (EP – 1.10 BP) (PA) (Q)

      EP less than BP:

      ACCA = (EP – 0.90 BP) (PA) (Q)

Where:

BP = Average Asphalt Cement price index for the calendar month before the calendar month that bids are opened

EP = Average Asphalt Cement price index for the calendar month before the calendar month that the partial estimate pay period ends

ACCA = Asphalt Cement Cost Adjustment

PA = Percent of the paving mixture that is asphalt cement. Asphalt Cement content will be determined by the weighted average of all asphalt cement content percentages obtained from the field acceptance tests for that item (Use decimal in formula: 0.053). If Reclaimed Asphalt Pavement (RAP), Reclaimed Asphalt Shingles (RAS), or both is used, the percent of Virgin Asphalt Cement added to the mix will be determined by subtracting the percent of asphalt cement in the RAP, RAS, or both from the percent of asphalt cement in the mix as calculated from Revision of Section 401, Reclaimed Asphalt Pavement and Revision of Section 401 Reclaimed Asphalt Shingles.

Q = Pay quantity for all 403 items shown above on the monthly partial pay estimate in Tons.

Example: Bids are opened on July 16. The BP will be the average of the weekly postings for June 1 through June 30. For an estimate cut-off date selected by the Contractor at the Pre-construction Conference of the 20th of the month, a February estimate will include HMA quantities measured from the 21st of January through the 20th of February, and the EP index used to calculate ACCA will be the average of the weekly prices for January 1 through January 31 as established by CDOT.

F. Cost adjustment will not be made for the quantity of any item that is left in place at no pay or for material removed and replaced at the Contractor's expense.

G. Cost adjustments will not be made to items of work added to the Contract by Change Order after the award of the Contract.

H. The asphalt cement cost adjustment will be the sum of the individual adjustments for each of the pay items shown above. No adjustment will be made for asphalt cement costs on items other than those shown above.

I. Asphalt cement cost adjustments resulting in an increased payment to the Contractor will be paid for under the planned force account item: Asphalt Cement Cost Adjustment. Asphalt cement cost adjustments resulting in a decreased payment to the Contractor will be deducted from monies owed the Contractor.

109.07 Payment for Material on Hand (Stockpiled Material). Payments may be made to the Contractor for materials to be incorporated into the work as evidenced by invoices or cost analyses of material produced on the project subject to the following:

1. The material has been fabricated or processed and is ready for installation into the project and conforms to the requirements of the Contract. The Contractor shall provide the Engineer with a monthly accounting of all materials stockpiled on the project that stockpiled payment is being requested and certification of compliance that the materials conform to the requirements of the Contract. This monthly accounting shall include the specific location of materials, the amounts of materials stockpiled, the amounts of materials incorporated into

the work, and the net amounts of materials that stockpile material payment is being requested.

Payment for stockpiled structural steel (unfabricated milled plate) may be made subject to the following additional conditions:

A. The plan quantity of structural steel shall exceed one million pounds.

B. The structural steel shall have been delivered to the Contractor's fabrication plant.

C. The material conforms to the requirements of the Contract.

D. Payment shall not exceed 60 percent of the certified invoice cost of the structural steel.

2. The material is stored on the project, on State owned property, or at an acceptable secured location within the State of Colorado. In the latter case, the Contractor shall provide a document signed by the owner and lessee of the property establishing that the Department has a vested interest in, and the right of access to and possession of the material. The material shall be clearly identified for the CDOT project.

   If the material is structural steel (either completely fabricated or unfabricated milled plate), it is stored on the project, stored on State owned property, or identified and stored separately from all other lots of similar material in acceptable storage places. In the latter case, the Contractor shall provide a document signed by the owner and lessee of the property establishing that the Department has vested interest in, and the right of access to and possession of the structural steel. When the structural steel is stockpiled outside the State of Colorado, the Contractor shall reimburse the Department for all costs incurred to verify the quantity of the material, conformance to contract requirements, and proper storage.

3. The Contractor provides the Engineer with a written cost analysis that confirms that the balance of funds in the corresponding items is sufficient to complete the installation. Partial payments will not exceed 85 percent of the contract unit price for the item or 100 percent of the certified invoice cost of the stockpiled material, whichever is less.

4. The Contractor shall provide the Engineer with a certified invoice.

   Payment for stockpiled materials will not relieve the Contractor of responsibility for loss or damage to the material.

   Payment for living plant materials, perishable materials, or materials that will not become an integral part of the finished project will not be made under this subsection.

109.08 Reserved .

109.09 Acceptance and Final Payment. When the project has been accepted as provided in subsection 105.21, the Engineer will prepare the final estimate of the quantities of the various classes of work performed. After approval of the final estimate by the Contractor, payment of the entire sum found to be due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the Contract will be made.

All prior estimates and payments, except for those made per subsection 109.06(f)6. will be subject to correction in the final estimate and payment.

109.10 Compensation for Compensable Delays. If the Engineer determines that a delay is compensable per either subsection 105.22, 105.23, 105.24, or 108.08, monetary compensation will be determined per this subsection.

(a) These categories represent the only costs that are recoverable by the Contractor. All other costs or categories of costs are not recoverable:

1. Actual wages and benefits, including FICA, paid for additional labor not otherwise included in (5) below.
2. Costs for additional bond, insurance and tax.
3. Increased costs for materials.
4. Equipment costs calculated per subsection 109.04(c) for Contractor owned equipment and based on invoice costs for rented equipment.
5. Costs of extended job site overhead.
6. Costs of salaried employees not otherwise included in (1) or (5) above incurred as a direct result of the delay.
7. Claims from subcontractors and suppliers at any level (the same level of detail as specified is required for all such claims).
8. An additional 16 percent will be added to the total of items (1) through (7) as compensation for items that no specific allowance is provided, including profit and home office overhead.

(b) In adjustment for costs as allowed above, the Department will have no liability for the following items of damages or expense:

1. Profit in excess of that provided in (a) above.
2. Loss of profit.
3. Additional cost of labor inefficiencies in excess of that provided in (a) above.
4. Home office overhead in excess of that provided in (a) above.
5. Consequential damages, including but not limited to loss of bonding capacity, loss of bidding opportunities, and insolvency.
6. Indirect costs or expenses of any nature in excess of that provided in (a) above.
7. Attorney fees, claim preparation fees, and expert fees.

All costs claimed must be documented and accompanied by a claim certification form obtained from the Department.

NOTES