



Project Development Branch  
 Standards and Specifications Unit

## MEMORANDUM

**DATE:** December 7, 2016  
**TO:** Members of the CDOT/CCA Specifications Committee  
**FROM:** Mohan Sagar, Specifications Program Specialist  
**SUBJECT:** December 15 Agenda

The next meeting of the CDOT Specifications Committee will be taking place on December 15, 2016 beginning at 9:00 AM. The Joint CDOT/CCA Committee meeting will be taking place in the afternoon of the same day.

CDOT Meeting: Time - 9:00 a.m.  
 Location: Turnpike Conference Room  
 CDOT North Holly Office  
 4670 Holly Street, Denver, 80216

CDOT/CCA Meeting: Time - 1:00 p.m.  
 Location: Same location

### Agenda

Topic	Presenter
1. Introductions	Lacey/Brown
2. Report on Special Provisions Out for Review	Sagar
3. DBE-9	Katherine Williams
4. Log No. 108-51, Subletting of Contract	Katherine Williams
5. Log No. 109-56, Prompt Payment	Katherine Williams
6. Log No. 518-4, Polyester Concrete End Dam	Pete Chomsrimake
7. Log No. 618-6, Prestressed Concrete	Kevin Howland
8. Log No. 614 (FYI) Impact Attenuator (Low Maintenance)	Brinck
9. 632-2, Night Work Lighting	Brinck
10. The 2017 CDOT Spec Book	Brinck
11. Other	



**REVIEW OF NEW SPECIFICATION OR SPECIFICATION CHANGE**

DBE-9

**Specification Section No.:** DBE

**Item:** DBE

**Originating Office:** Civil Rights Program

**By:** Williams

**Date Sent For Review:** 12.05.16

**Date Comments Due:** 12.21.16

**Submit response to: STANDARDS AND SPECIFICATIONS UNIT, DIVISION OF PROJECT SUPPORT  
4<sup>TH</sup> FLOOR, CDOT HEADQUARTERS**

Vote Y/N	Concurrent Reviews – Others Commenting	
	<b>Spec Committee Members:</b>	✓
	Co-Chairman: Lacey	
	Region 1: Quirk	
	Region 1: Stratton	
	Region 2: Phillips	
	Region 3: Jean	
	Region 4: Boespflug	
	Region 5: Valentinelli	
	Project Development: Vacant	
	Specifications: Brinck	
	Bridge: Hasan	
	Contracts & Market Analysis: Eddy	
	Materials: Schiebel	
	Traffic Engineering: Matthews	
	Maintenance: Weldon	
	FHWA: Feery	
	Attorney General: Milan	
	<b>Others:</b>	
	Colorado Contractors Assoc.: Moody	
	<b>Technical Committees:</b>	
	PDAC	
	Drainage Advisory Committee (DAC)	
	Water Quality Advisory Committee (WQAC)	

The attached Draft Specification is submitted for your review and comments. If not returned by Date Comments Due, the draft specification will be considered to be approved unless the Standards and Specifications Unit of the Project Development Branch [(303) 757-9474, (303) 757-9402] is advised otherwise.

**REMARKS:**

If these proposed changes are approved, our unit will issue these in a revised version of this standard special provision.

This revision is a complete rewrite of the DBE special provision. Language has been re-ordered and text has been modified throughout the document. A summary of significant changes is summarized in the attached Form 1215a.

**REVIEWER COMMENTS:**

( ) Approved ( ) Disapproved ( ) Modified

If disapproved or modified, give reason why and show any modifications on the attached draft copy:

\_\_\_\_\_ Name/Signature \_\_\_\_\_ Date

<b>COLORADO DEPARTMENT OF TRANSPORTATION</b>		Log No. (Assigned by Standards and Specifications Unit)
<b>SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE</b>		DBE-9
TO: Standards and Specifications Unit, Project Development, Suite 290	FROM: Civil Rights and Business Resource Center (Region, Branch or Technical Committee)	
SPECIFICATION SECTION NO.	ITEM	Priority
DBE Standard Special Provision	DBE	Routine <input checked="" type="checkbox"/> Fast <input checked="" type="checkbox"/>

Reason for this new or changed specification:

To make the DBE specification compliant with 2014 regulation changes and to make modifications to utilize B2GNow.

1. Clarification of "Federal Aid Design Bid Build Projects": The instructions have been modified for CDOT engineers and staff in order to clarify that federal funding of the design portion of the contract, does not make the construction project a Federal Aid Design Bid Build Project.
2. Modification of Contract Assurance: 49 CFR Part 26 (the DBE Regulation) was updated in October 2014. It includes a revised non-discrimination assurance which provides for sanctions and other enforcement measures in the event of non-compliance.
3. Removal of Definitions Section: All definitions have been moved to appropriate sections.
4. Removal of Form 1413, Bidders List: Due to the upcoming registration for all subcontractors, the bidders list is no longer necessary for CDOT projects. This data will be captured via a survey instead.
5. Online Submission of 1414: The 1414 has been added to the online bidding system and no longer needs to be emailed to the CRBRC.
6. Addition of Utilization Plan in B2GNow (where 1415s and GFE documentation will be uploaded for review): Replaces email submission. Additional guidance on using B2G Now will be provided.
7. Removal of Substitution Exception: In the current specification, CDOT made an exception from the substitution requirements for instances where CDOT eliminated work. This exception was eliminated as the regulation requires good faith efforts in all circumstances.
8. Modification of 1419: The Form 1419 will still serve to verify CUF but will only be required at the end of the project. One must be submitted for each DBE.
9. Additional Sanction Language in Section 7: The changes to the DBE Regulation include a new required contract provision that states that payment shall not be made for work allocated to DBE but performed by another firm unless such change has been approved. This language has been added to the regulation and it serves to further support CDOT's withholding of sanctions on the project.
10. Submission of all terminations and substitutions in B2G: Allowed CDOT to eliminate 1420 requirement.
11. Updated counting language: Added language to be more clear regarding trucking and employee leasing companies.

New or Revised Specification:  
Please see attached.

NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.

CDOT Form 1215 10/01

DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

**NOTICE**

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

**Instructions for use on CDOT construction projects:**

Use this Standard Special Provision on all Federal-Aid Design-Bid-Build Projects. For purposes of this Standard Special Provision, Federal-Aid Design-Bid-Build Projects includes only those projects for which the construction contract will be federally funded in whole or part. This Standard Special Provision will be used only for the construction phases of CM/GC projects. Do not use on design-build or other innovative projects. For DBE provisions for these projects, contact the Civil Rights and Business Resource Center (CRBRC) at (303)757-9234. This Standard Special Provision shall also not be used for Local Agency projects. Use the DBE Local Agency Requirements Standard Special Provision for Local Agency projects.

Use this Standard Special Provision in conjunction with the Project Special Provision Worksheet, Disadvantaged Business Enterprise (DBE) Contract Goal. The Designer will not set a DBE contract goal. The Designer will consult with the Regional Civil Rights Office (RCRO) to obtain the contract goal. A contract goal of zero still requires the use of this Standard Special Provision and Project Special Provision Worksheet.

## DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

1. **Overview.** The Disadvantaged Business Enterprise (DBE) Program is a federally-mandated program that seeks to ensure non-discrimination in the award of U.S. Department of Transportation (DOT)-assisted contracts and to create a level playing field on which DBEs can compete fairly for DOT-assisted contracts. In order to be awarded a Contract, the lowest apparent bidder must show that it has committed to DBE participation sufficient to meet the goal or has otherwise made good faith efforts to do so.

CDOT will monitor the progress of the Contractor throughout the project to ensure that the Contractor's DBE commitments are being fulfilled. Modifications to the commitments, substitutions and terminations must be approved by CDOT. If the amount of the contract increases during the performance of the contract, the Contractor must make good faith efforts to obtain additional participation to meet the contract goal. CDOT may reduce the final payment to the Contractor if the Contractor has failed to fulfill the commitments or make good faith efforts to meet the contract goal.

For general assistance regarding the DBE program and compliance, contact CDOT's Civil Rights and Business Resource Center (CRBRC) at (303)757-9234 or the Regional Civil Rights Manager. For project specific issues, contact the Engineer or Regional Civil Rights Manager.

All forms referenced herein can be found on the CDOT website in the forms library: <http://www.coloradodot.info/library/forms/cdot-forms-by-number>.

2. **Contract Assurance.** By submitting a proposal for this Contract, the bidder agrees to the following assurance and shall include it verbatim in all subcontracts including those with non-DBE firms:

The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as CDOT deems appropriate, which may include, but is not limited to: (1) Withholding monthly progress payments; (2) Assessing sanctions; (3) Liquidated damages; and/or (4) Disqualifying the contractor from future bidding as non-responsible.

3. **Contract Goal.** The contract goal is a percentage of the contract that the CDOT Regional Civil Rights Office has established for participation by DBEs. The contract goal is unique for each contract and is set forth in the Project Special Provision, Disadvantaged Business Enterprise Contract Goal.
  - (a) *Pre-award Calculation.* For pre-award, the dollar value of the contract goal is calculated by multiplying the lowest responsible bidder's proposal amount less any force account items by the percentage set forth in the Project Special Provision, Disadvantaged Business Enterprise Contract Goal.
  - (b) *Final Calculation.* At the end of the project, the dollar value of the contract goal is calculated by multiplying the total earnings amount by the contract goal percentage less any waiver granted to the Contractor. Total earnings amount means the amount of the Contract earned by the Contractor, including approved changes and force account work performed, but not including incentives or deductions.

4. **Good Faith Efforts.** Good faith efforts means all necessary and reasonable steps to achieve the contract goal which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if not fully successful. Good faith efforts of the Contractor should include, but are not limited to, reaching out to DBEs that could perform subcontracting opportunities on the project, unbundling work the prime would self-perform to create opportunities for DBEs, negotiating in good faith with DBEs and not refusing to utilize a DBE for price alone, and other efforts to obtain DBE participation on the contract. For additional guidance on making good faith efforts see 49 CFR Part 26 Appendix A.
  
5. **Pre-award Process.** When CDOT has established a DBE contract goal for a project, it may not award the contract until it determines the bidder has demonstrated good faith efforts to meet the contract goal. At pre-award, good faith efforts may be evidenced by either (1) documenting sufficient commitments to DBEs to meet the contract goal or (2) documenting adequate good faith efforts to meet the goal even though it did not obtain enough participation to do so. A commitment is a portion of the Contract, identified by dollar amount and work area, designated by the bidder or Contractor for participation by a particular DBE. A commitment may be made to a firm at any tier. A commitment is not a subcontract, however the Contractor must have received a quote from a DBE in order to claim a commitment to a DBE.
  - (a) *Anticipated Participation Plan.* With its proposal, the bidder shall submit a Form 1414, Anticipated DBE Participation Plan listing its commitments obtained from DBEs, even if such commitments do not meet the contract goal. If the bidder has not obtained any DBE commitments, it shall still submit Form 1414 documenting zero anticipated participation. If the Contract Goal is greater than zero, failure to submit a signed Form 1414 shall result in rejection of the proposal and the bidder deemed non-responsive. The bidder shall ensure that commitments, and the estimated DBE eligible participation resulting therefrom, have been properly calculated prior to submitting its proposal. If the bidder is a DBE seeking credit for self-performance, the bidder shall include itself in Form 1414 and list the work to be self-performed and amount that the bidder intends to count for DBE credit.
  - (b) *Utilization Plan.* Within five days of bid opening, the low responsible bidder shall submit a Utilization Plan (UP) to CDOT. The bidder will receive notice from CDOT to submit a Utilization Plan (UP) via B2GNow.

In order to complete the UP the bidder shall obtain and upload a Form 1415, Commitment Confirmation from each DBE listed on Form 1414. The bidder shall complete Section 1 of the Form 1415 and the DBE shall complete Section 2 of Form 1415. The commitment confirmations shall be consistent with the commitment listed on Form 1414. If a commitment is made to second tier or lower DBE subcontractor, the Contractor is still ultimately responsible for the fulfillment of the commitment and shall sign the Form 1415. The bidder shall contact the CRBRC if any issues arise which may require the bidder to alter a commitment. The bidder shall not terminate a commitment listed on Form 1414 without following the procedures outlined below.

If the total eligible participation submitted by the bidder on the Form 1414 did not meet the contract goal, the bidder shall request a waiver of the goal by submitting a Form 1416, Good Faith Effort Report, in the UP. The bidder shall include any supporting documentation that the bidder would like considered by CDOT as evidence of good faith efforts. If a non-DBE was selected in lieu of a DBE, the bidder shall include all quotes from the non-DBE and DBE firms.



- (c) *Pre-award Good Faith Effort Review.* The CRBRC will evaluate the documentation submitted in the UP to ensure that each commitment is valid and all eligible participation has been properly calculated. CDOT may investigate or request additional information in order to confirm the accuracy of a commitment. If the bidder's 1414 claimed that the contract goal was met but CDOT determines that the total estimated eligible participation of the commitments does not meet the contract goal, CDOT will return the UP to the Contractor. The Contractor will be given two business days to amend the UP and return it to CDOT. CDOT may require the Contractor to complete Form 1416 and provide documentation of good faith efforts.

When required, CDOT will review Form 1416 and all supporting documentation submitted by the bidder. A bidder will be deemed to not have made good faith efforts if the bidder lists a DBE for a work area for which the DBE is not certified and the bidder cannot establish a reasonable basis for its determination. CDOT will only consider commitments made after submission of the bid if the bidder demonstrates that (1) good faith efforts were made prior to submission of the bid and (2) there is a reasonable justification for not obtaining the commitments prior to submission of the bid. If the CRBRC determines that the bidder did not demonstrate good faith efforts to meet the contract goal, it will provide the bidder with written notice of its determination and an opportunity to appeal.

- (d) *Approval.* If CDOT determines that the bidder has met the contract goal or made good faith efforts to do so, the CRBRC will approve the UP. If CDOT determines the bidder did not meet the contract goal but made good faith efforts to do so, CDOT may grant a waiver to the Contractor and amend the contract goal.

6. **Utilization Plan Modifications.** The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which it is listed unless the Contractor obtains CDOT's written consent to terminate, reduce or modify the commitment. Unless CDOT grants such consent, the Contractor will not be entitled to payment for the work or materials. Failure to carry out the requirements of this section is a material breach of the Contract and may result in the termination of the Contract or other remedies established by CDOT.

- (a) *Terminations and Reductions.* A termination occurs when a Contractor no longer intends to use a DBE for fulfillment of a commitment. A reduction occurs when the scope of the commitment changes and constitutes a partial termination. Terminations and reductions include, but are not limited to, instances in which a Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces, those of an affiliate, a non-DBE firm or with another DBE firm.

CDOT cannot approve a termination or reduction unless the Contractor has good cause to terminate or reduce the commitment. Good cause includes: the DBE fails or refuses to execute a written contract; the DBE fails or refuses to perform the work of its subcontract consistent with normal industry standards, provided that such failure is not the result of bad faith or discriminatory actions of the Contractor or one of its subcontractors; the DBE fails to meet reasonable, nondiscriminatory bond requirements; the DBE becomes bankrupt, insolvent, or exhibits credit unworthiness; the DBE is ineligible to work because of suspension or debarment proceedings or other state law; the DBE is not a responsible contractor; the DBE voluntarily withdraws from the project and provides written notice to CDOT, the DBE is ineligible to receive DBE credit for the work required; the DBE owner dies or becomes disabled and is unable to complete the work; the DBE ceases business operations or otherwise dissolves; or other documented good cause that compels termination. Good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

The Contractor shall provide the DBE notice of the Contractor's intent to terminate or reduce the commitment and the reason for such termination or reduction, with a copy to the CDOT engineer and Regional Civil Rights Office (RCRO). In the notice of intent, the Contractor shall provide the DBE at least five calendar days to respond to the notice and inform CDOT and the Contractor of the reasons, if any, why it objects to the proposed termination or reduction and any reasons that it shall not be approved. The Contractor is not required to provide the five days written notice in cases where the DBE in question has provided written notice that it is withdrawing from the subcontract or purchase order. The notice period may be reduced by CDOT if required by public necessity.

Following the notice period, the contractor shall submit a request for the approval of termination or reduction via the B2G Now System. If the RCRO determines that the Contractor had good cause for termination, the RCRO will approve the termination or reduction. If the RCRO does not agree, the RCRO may reject the termination and require the Contractor to make additional good faith efforts with the DBE.

- (b) *Substitutions.* When a commitment is terminated or reduced (including when a DBE withdraws), the Contractor shall make good faith efforts to find another DBE to substitute for the original DBE. These good faith efforts shall be directed at finding another DBE to perform at least the same amount, but not necessarily the same type, of work under the contract as the participation that was terminated or reduced up to the contract goal. If the substitution is known at the time of the termination or reduction, the Contractor shall request the addition of a new DBE and provide a Form 1415, Commitment Confirmation with the request. If the Contractor has not obtained substitute participation, the RCRO may require the Contractor to submit evidence of good faith efforts to substitute. The contractor shall have seven days to submit such information. This period may be extended at the discretion of the RCRO.
- (c) *Commitment Modifications.* If the contractor seeks modifying the work to be performed under a DBE commitment, it shall obtain and upload a revised Form 1415 with the request for the modification via the B2G now system. Increases in work included in the original 1415 do not need CDOT approval.
- (d) *Change Orders.* The Contractor is required to make good faith efforts to meet the goal on the total earnings amount. Therefore, if CDOT issues a change which increases or adds new work items, the Contractor shall ensure that it has obtained sufficient DBE participation to meet the Contract Goal on the increased amount or has made good faith efforts to do so. If the Contractor determines that additional DBE participation cannot be obtained, request a waiver of the participation. The Contractor shall include its justification for not obtaining additional participation and, at its discretion, CDOT may require additional information regarding the efforts of the Contractor. If the Contractor seeks to add additional DBEs to the contract to meet the goal, it shall submit a request via B2Gnow with a Form 1415, commitment confirmation.

7. **Counting.** In order for work performed by a DBE to count as DBE credit toward the contract goal, the following criteria must be met:

- (a) *DBE Certified to Perform the Work.* The DBE must be certified by the Colorado Unified Certification Program (UCP) in the work to be performed. DBEs are certified in particular areas of work which are designated by a six digit North American Industry Classifications System code plus a descriptor. Each DBE's work codes can be found in its profile on the Colorado UCP DBE Directory at [www.coloradodbe.org](http://www.coloradodbe.org).

The DBE must be certified to perform the work, and not under suspension, upon submission of the commitment and upon execution of the DBE's subcontract. When a commitment has been made, but upon review of the sublet request the DBE is no longer certified in the work code which covers the work to be performed, the Contractor may not use the DBE's participation toward the contract goal. The Contractor shall terminate the DBE commitment and seek substitute DBE participation. However, a DBE's work will continue to count as eligible participation if the DBE was certified upon approval of the sublet request but the certification status changes during the performance of the work. Suppliers must be certified upon execution of the purchase order.

- (b) *Work Included in Commitment.* The work performed by the DBE must be reasonably construed by CDOT be included in the work area and work code identified by the Contractor in an approved commitment. If the Contractor intends to use a DBE for work that was not listed in the commitment, the Contractor shall submit a request for modification. Unapproved work will not count toward the contract goal. A DBE commitment cannot be modified to include work for which the DBE was not certified at the time of the approval of the original commitment unless such work is in addition to the original commitment.
- (c) *Work Performed by DBE.* The work must be actually performed by the DBE with its own forces. For purposes of this specification, work performed by the DBE with its own forces includes work by temporary employees, provided such employees are under the control of the DBE, the cost of supplies and materials obtained by the DBE for its work on the Contract, provided that such supplies are not purchased or leased from the Contractor or a subcontractor that is subletting to the DBE, the cost any equipment leased by the DBE, provided that such equipment is not leased from the Contractor or a subcontractor that is subletting to the DBE.

When a DBE subcontracts part of the work, the value of the subcontracted work be counted toward the goal if the subcontractor is a DBE and meets the criteria of this standard special provision. Performance by non-DBE subcontractors, including non-DBE trucking firms and owner-operators, shall be deducted from the DBE's participation.

- (d) *Payment Received for Work.* The DBE must receive payment, including the release of its retainage, in order for the work to count.
- (e) *Special Calculations for Suppliers.* When a DBE supplies goods or materials for a project, the DBE may be classified as a manufacturer, dealer or broker. The DBE's status as a manufacturer, dealer or broker is determined on a contract-by-contract basis by CDOT, based upon the actual work performed, in accordance with 49 CFR Part 26.53(e). When a DBE is deemed to be acting as a manufacturer, one hundred percent of the commitment will count as eligible participation. When a DBE is deemed to be acting as a regular dealer (i.e. non-manufacturer supplier), only sixty percent of the commitment will count as eligible participation. When a DBE is deemed to be acting as a broker, only the reasonable brokerage fee will count as eligible participation.
- (f) *Reasonable Service Fees.* For a DBE firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, the fees and commissions charged by the DBE shall count toward the contract goal, provided CDOT determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. In the case of DBE temporary employment placement agencies, only the placement fee for a temporary employee that will be specifically and exclusively used for work on the contract shall count as DBE credit; the hourly fee does not count toward the contract goal unless the firm is also certified in the work to be performed.
- (g) *Joint Venture Calculation.* When a DBE is a participant in a joint venture, the DBE must apply to CDOT to determine how much of the work performed by the joint venture will count toward the contract goal. The DBE shall complete Form 893, Information for Determining DBE Participation when a Joint Venture Includes a DBE. To ensure sufficient time for review, Form 893 shall be submitted to CDOT no less than ten days before the submission of the proposal or, if requested during the contract, the point at which the DBE will begin work.
- (h) *Commercially Useful Function.* If CDOT determines that a DBE has not performed a commercially useful function (CUF) on the project, no participation by such DBE shall count toward the contract goal. CUF means responsibility for the execution of the work and carrying out such responsibilities by actually performing, managing and supervising the work. CDOT will monitor performance during the Contract to ensure each DBE is performing a CUF. If CDOT determines that a DBE is not performing a CUF, no work performed by such DBE shall count as eligible participation. The DBE, Contractor, and any other involved third parties may also be subject to additional enforcement actions.

When determining whether a DBE is performing a CUF, CDOT will consider the amount of work subcontracted, industry practices, the amount the firm is to be paid compared to the work performed and eligible participation claimed, and any other relevant factors. With respect to material and supplies used on the Contract, in order to perform a CUF the DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing the material, if applicable, and paying for the material itself.

With respect to trucking, in order to perform a CUF, the DBE trucking firm must own and operate at least one fully licensed, insured and operational truck used on the Contract. Additionally, the DBE trucking firm must be responsible for the management and supervision of the entire trucking operation for which it is responsible on the Contract. CDOT only permits a DBE trucking firm to count the work performed with trucks it owns, insures and operates using drivers it employs or with trucks it leases from another DBE firm including owner operators who are certified DBEs. The DBE who leases trucks from another DBE receives credit for the transportation services the lessee DBE provides on the contract.

A DBE does not perform a CUF when its role is limited to that of an extra participant in a transaction, contract or project through which funds are passed in order to obtain the appearance of DBE participation. CDOT will evaluate similar transactions involving non-DBEs in order to determine whether a DBE is an extra participant. If a DBE does not perform or exercise responsibility for at least 30 percent of

the total cost of its contract with its own work force, or the DBE subcontracts a greater portion of the work than would be expected on the basis of normal industry practice for the type of work involved, CDOT will presume that the DBE is not performing a CUF. The DBE may present evidence to rebut this presumption.

- (i) *Joint Checks.* All joint checks must be approved by CDOT before they are used in payment to a DBE. A joint check is a check issued by the Contractor or one of its subcontractors to a DBE firm and a material supplier or other third party for materials or services to be incorporated into the work. Joint checks used in payments to DBEs will be monitored closely to ensure (1) the DBE is performing a CUF and (2) the joint checks are not being used in a discriminatory manner. The Contractor shall request approval for the use of a joint check in a written letter signed by the DBE and the Contractor, stating the reason for the joint checks and the approximate number of checks that will be needed. Failure to receive approval of a joint check may result in CDOT not counting such payment as participation by the DBE.

## 8. **Contract Finalization**

- (a) *Form 1419, CUF Validation.* In order to finalize the project, the Contractor must submit a Form 1419, CUF Validation for each DBE that performed work or provided supplies toward meeting the contract goal. The Form 1419 ensures that each DBE performed a commercially useful function on the project and must be signed by the DBE, Contractor and Engineer.
- (b) *Payment Reduction.* The Contractor's retainage will not be released until CDOT has determined whether the Contractor will be subject to a payment reduction. The Contractor will be subject to a payment reduction for any termination or reduction which was not approved. Additionally, the Contractor will be subject to a payment reduction for the portion of the contract goal that was not met and was not waived. The contractor will not be subject to duplicate reduction for the same offense. CDOT may adjust the payment reduction wherein the Contractor demonstrates that its failure to obtain DBE participation was due to circumstances outside of its control.

- 9. **Other Enforcement.** As it determines necessary, CDOT may conduct reviews or investigations of participants. All participants, including, but not limited to, DBE firms and applicants for DBE certification, complainants, and contractors using DBE firms to meet contract goals, are required to cooperate fully and promptly with compliance reviews, certification reviews, investigations, and other requests for information.

Participants shall not intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by the DBE program or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under the DBE program. Failure to comply with this paragraph shall be a ground for appropriate action against the party involved (e.g., with respect to recipients, a finding of noncompliance; with respect to DBE firms, denial of certification or removal of eligibility and/or suspension and debarment; with respect to a complainant or appellant, dismissal of the complaint or appeal; with respect to a contractor which uses DBE firms to meet goals, findings of non-responsibility for future contracts and/or suspension and debarment).

If CDOT determines that a Contractor or subcontractor was a knowing and willing participant in any intended or actual subcontracting arrangement contrived to artificially inflate DBE participation or any other business arrangement determined by CDOT to be unallowable, or if the Contractor engages in repeated violations, falsification or misrepresentation, CDOT may refuse to count any fraudulent or misrepresented DBE participation; withhold progress payments to the Contractor commensurate with the violation; suspend or reduce the Contractor's prequalification status; refer the matter to the Office of Inspector General of the US Department of Transportation for investigation; or seek any other available contractual remedy.

**REVIEW OF NEW SPECIFICATION OR SPECIFICATION CHANGE**

108-51

**Specification Section No.:** 108

**Item:** Subletting of Contract

**Originating Office:** Civil Rights Program

**By:** Williams

**Date Sent For Review:** 12.05.16

**Date Comments Due:** 12.21.16

**Submit response to: STANDARDS AND SPECIFICATIONS UNIT, DIVISION OF PROJECT SUPPORT  
4<sup>TH</sup> FLOOR, CDOT HEADQUARTERS**

Vote Y/N	Concurrent Reviews – Others Commenting	
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	Co-Chairman: Lacey	
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	Region 3: Jean	
	Region 4: Boespflug	
	Region 5: Valentinelli	
	Project Development: Vacant	
	Specifications: Brinck	
	Bridge: Hasan	
	Contracts & Market Analysis: Eddy	
	Materials: Schiebel	
	Traffic Engineering: Matthews	
	Maintenance: Weldon	
	FHWA: Feery	
	Attorney General: Milan	
	<b>Others:</b>	
	Colorado Contractors Assoc.: Moody	
	<b>Technical Committees:</b>	
	PDAC	
	Drainage Advisory Committee (DAC)	
	Water Quality Advisory Committee (WQAC)	

The attached Draft Specification is submitted for your review and comments. If not returned by Date Comments Due, the draft specification will be considered to be approved unless the Standards and Specifications Unit of the Project Development Branch [(303) 757-9474, (303) 757-9402] is advised otherwise.

**REMARKS:**

**If these proposed changes are approved, our unit will issue them in a revised version of this standard special provision.**

**REVIEWER COMMENTS:**

( ) Approved ( ) Disapproved ( ) Modified

If disapproved or modified, give reason why and show any modifications on the attached draft copy:

\_\_\_\_\_  
Name/Signature

\_\_\_\_\_  
Date

<b>COLORADO DEPARTMENT OF TRANSPORTATION SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE</b>		Log No. (Assigned by Standards and Specifications Unit)  108-51
TO: Standards and Specifications Unit, Project Development, Suite 290		FROM: Civil Rights and Business Resource Center (Region, Branch or Technical Committee)
SPECIFICATION SECTION NO.	ITEM	Priority
108.01	Subletting of Contract	Routine <input checked="" type="checkbox"/> Fast <input type="checkbox"/>
<p>Reason for this new or changed specification:  The CRBRC is proposing modifications to the subletting specification to allow for online submissions of sublet requests via the B2GNow System. This system will allow CDOT to cummulatively calculate subcontract requests without manual calculation and improve CDOT efficiency in approving requests. At this time, the system is only set up for CDOT and not local agency projects.</p> <p>The 205 form will me modified to only require signatures between the prime and sub and will not require the manual cummulative calculation made in the past. A new form will be created for local agency requests as those will still need an approval signature and manual calculations.</p> <p>CDOT is requesting a copy of all subcontracts after finding a number of contractors not to have executed subcontracts with DBEs and other firms.</p> <p>Finally, changes have been made to be consistent with the requirements of FHWA Form 1273, including calculations for leasing employees, and the spec has been reorganized.</p>		
New or Revised Specification: See attached.		
NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.		

**108.01 Subletting of Contract.** The Contractor shall perform with its own organization Contract work amounting to 30 percent or more of the original total cost of bid items. The cost of “specialty items” shall be deducted from the original total cost of bid items before computing the amount of work required to be performed by the Contractor’s own organization. Any items designated in the contract as “specialty items” may be performed by subcontract.

~~written pthe ermission approval of the Engineer~~CDOT. The subcontract work shall not begin until the Contractor has received CDOT’s approval. Approval will be given only after CDOT has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the Contract. Subcontracts or transfer of Contract shall not release the Contractor of liability under the Contract and bonds.

The Contractor shall request and receive CDOT’s approval via the B2G Now System. The Contractor shall include a copy of the executed subcontract or purchase order and Form 205.

~~Subcontracts or transfer of Contract shall not release the Contractor of liability under the Contract and bonds.~~

~~Prior to beginning any work by subcontractor, the Contractor shall request permission from the Engineer by submitting a completed Sublet Permit Application, CDOT Form No. 205. The subcontract work shall not begin until the Contractor has received the Engineer’s written permission. The Contractor shall make all project related written subcontracts 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 original total cost of bid items. 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 original total cost of bid items 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 which are to be purchased or produced by the Contractor and the actual agreement amounts between the Contractor and a subcontractor.~~

The term “perform work with its own organization” refers to workers employed or leased by the Contractor, and equipment owned or rented by the Contractor, with or without operators. The term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the Contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements.

Leased employees by the Contractor may only be included in this term if the arrangement meets all of the following conditions:

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

For leased employees, the contractor shall still submit a sublet request for subletting the work to the leased employees and attest to meeting the criteria above.

~~Proportional value for a subcontracted partial contract item will be verified by the Engineer. Additionally, for the purpose of calculating the value of subcontracted work, materials and manufactured products directly procured by the Contractor are included in the work performed with its own organization. However, when a firm both (1) sells material to a prime contractor and (2) performs the work of incorporating the materials into the project, these two phases shall be considered in combination and as constituting a single subcontract and count against the contractor’s self-performance requirement. -~~

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 bonds.~~

REVISION OF SECTION 108  
SUBLETTING OF CONTRACT

Section 108 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 108.01 and replace with the following:

**108.01 Subletting of Contract.** The Contractor shall perform with its own organization Contract work amounting to 30 percent or more of the original total cost of bid items. The cost of “specialty items” shall be deducted from the original total cost of bid items before computing the amount of work required to be performed by the Contractor’s own organization. Any items designated in the contract as “specialty items” may be performed by subcontract.

The Contractor shall not sublet, sell, transfer, assign, or dispose of the Contract or Contracts, or any portion thereof without the approval of CDOT. The subcontract work shall not begin until the Contractor has received CDOT’s approval. Approval will be given only after CDOT has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the Contract. Subcontracts or transfer of Contract shall not release the Contractor of liability under the Contract and bonds.

The Contractor shall request and receive CDOT’s approval via the B2G Now System. The Contractor shall include a copy of the executed subcontract or purchase order and Form 205.

The term “perform work with its own organization” refers to workers employed or leased by the Contractor, and equipment owned or rented by the Contractor, with or without operators. The term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the Contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements.

Leased employees by the Contractor may only be included in this term if the arrangement meets all of the following conditions:

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

For leased employees, the contractor shall still submit a sublet request for subletting the work to the leased employees and attest to meeting the criteria above.

Additionally, for the purpose of calculating the value of subcontracted work, materials and manufactured products directly procured by the Contractor are included in the work performed with its own organization. However, when a firm both (1) sells material to a prime contractor and (2) performs the work of incorporating the materials into the project, these two phases shall be considered in combination and as constituting a single subcontract and count against the contractor’s self-performance requirement. The calculation of the percentage of subcontracted work shall be based on subcontract unit prices.



**REVIEW OF NEW SPECIFICATION OR SPECIFICATION CHANGE**

109-56

**Specification Section No.:** 109

**Item:** Prompt Payment

**Originating Office:** Civil Rights Program

**By:** Williams

**Date Sent For Review:** 12.05.16

**Date Comments Due:** 12.21.16

**Submit response to: STANDARDS AND SPECIFICATIONS UNIT, DIVISION OF PROJECT SUPPORT  
4<sup>TH</sup> FLOOR, CDOT HEADQUARTERS**

Vote Y/N	Concurrent Reviews – Others Commenting	
	<b>Spec Committee Members:</b>	✓
	Co-Chairman: Lacey	
	Region 1: Quirk	
	Region 1: Stratton	
	Region 2: Phillips	
	Region 3: Jean	
	Region 4: Boespflug	
	Region 5: Valentinelli	
	Project Development: Vacant	
	Specifications: Brinck	
	Bridge: Hasan	
	Contracts & Market Analysis: Eddy	
	Materials: Schiebel	
	Traffic Engineering: Matthews	
	Maintenance: Weldon	
	FHWA: Feery	
	Attorney General: Milan	
	<b>Others:</b>	
	Colorado Contractors Assoc.: Moody	
	<b>Technical Committees:</b>	
	PDAC	
	Drainage Advisory Committee (DAC)	
	Water Quality Advisory Committee (WQAC)	

The attached Draft Specification is submitted for your review and comments. If not returned by Date Comments Due, the draft specification will be considered to be approved unless the Standards and Specifications Unit of the Project Development Branch [(303) 757-9474, (303) 757-9402] is advised otherwise.

**REMARKS:**

**If these proposed changes are approved, our unit will issue them in a revised version of this standard special provision.**

**REVIEWER COMMENTS:**

( ) Approved ( ) Disapproved ( ) Modified

If disapproved or modified, give reason why and show any modifications on the attached draft copy:

\_\_\_\_\_  
Name/Signature

\_\_\_\_\_  
Date

<b>COLORADO DEPARTMENT OF TRANSPORTATION SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE</b>		Log No. (Assigned by Standards and Specifications Unit)  109-56
TO: Standards and Specifications Unit, Project Development, Suite 290		FROM: Civil Rights and Business Resource Center (Region, Branch or Technical Committee)
SPECIFICATION SECTION NO.	ITEM	Priority
109.06	Prompt Payment	Routine <input checked="" type="checkbox"/> Fast <input checked="" type="checkbox"/>
Reason for this new or changed specification: To ensure prompt payment to subcontractors by: - allowing for partial payments to prime even when there is an outstanding issue; - requiring primes to complete monthly audits in B2GNow (and eliminating the Form 1418 for CDOT projects); and - requiring subs to confirm payments and enter payment to lower tier subs		
New or Revised Specification: Please see attached.		
NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.		

## 109.06

(e) *Prompt Payment.* The Contractor shall pay subcontractors and suppliers for all work which 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 fails to~~ comply with this provision, the Engineer will not authorize further progress ~~estimates payment for work performed directly by the Contractor or the noncompliant subcontractor~~ until the required payments have been made, ~~and the Contractor agrees to make payments as specified. The Engineer will continue to authorize progress payments for work performed by compliant subcontractors.~~

~~The Contractor shall submit the Form 1418, Monthly Payment Report, along with the project schedule updates, in accordance with subsections 108.03 (b) or 108.03 (c) (3). Failure to submit a complete and accurate Form 1418 shall be grounds for CDOT to withhold subsequent payments or retainage to the Contractor.~~

(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 No. 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 ten working days 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 in accordance with 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 in accordance with Contract requirements and at unit bid prices.

For this subsection only, satisfactory completion of all work described on CDOT Form No. 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 in accordance with subsection 105.21(a), the Contractor shall release all subcontractors' retainage on the portion of the partially accepted work performed by subcontractors. Prior to the Department releasing the Contractor's retainage on work that has been partially accepted in accordance with 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 prior to 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 ~~Department and the~~ subcontractor and Engineer 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 15<sup>th</sup> 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 (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 payor, 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.

REVISION OF SECTION 109  
PROMPT PAYMENT

Section 109 of the Standard Specifications is hereby revised for this project as follows:

In subsection 109, delete (e) and (f) and replace with the following:

(e) *Prompt Payment.* The Contractor shall pay subcontractors and suppliers for all work which 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 No. 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 ten working days 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 in accordance with 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 in accordance with Contract requirements and at unit bid prices.

For this subsection only, satisfactory completion of all work described on CDOT Form No. 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 in accordance with subsection 105.21(a), the Contractor shall release all subcontractors' retainage on the portion of the partially accepted work performed by subcontractors. Prior to the Department releasing the Contractor's retainage on work that has been partially accepted in accordance with 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 prior to 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 and Engineer 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 15<sup>th</sup> 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 (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 payor, 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.

<b>COLORADO DEPARTMENT OF TRANSPORTATION SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE</b>		Log No. (Assigned by Standards and Specifications Unit) 518-4
TO: Standards and Specifications Unit, Project Development, Suite 290	FROM: Preeda Chomsrimake, P.E. CDOT Staff Bridge Branch (Region, Branch or Technical Committee)	
SPECIFICATION SECTION NO. 518	ITEM 518-02030	Priority Routine <input checked="" type="checkbox"/> Fast <input type="checkbox"/>
Reason for this new or changed specification: The Polyester Concrete will be placed in bridge expansion devices' end dam blockouts to accelerate a bridge resurfacing construction project and open to traffic quicker than the elastomeric end dam. The product will also last about 20 years which is longer than the elastomeric end dam, and this will be beneficial for long term maintenance cost saving to CDOT.		
New or Revised Specification: The new spec is "518 Polyester Concrete End Dam."		
NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.		

CDOT Form 1215 10/01

**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM**

Section 518 of the Standard Specifications is hereby revised for this project to include the following:

**DESCRIPTION**

This work consists of furnishing and placing a Polyester Concrete End Dam system, Polyester-based Polymer Concrete (PPC or Polyester Concrete) with High-molecular-weight Methacrylate (HMWM) resin primer in the concrete blockouts, Portland Cement Concrete (PCC) of the bridge expansion devices on the concrete bridge deck, abutment backwalls and/or approach slabs as shown on the plans.

**QUALIFICATIONS AND SUBMITTALS**

The Contractor shall submit the Polyester Concrete End Dam system, Manufacturer Qualifications, Contractor Qualifications, Manufacturer's Technical Representative Qualifications, Certified Test Report with laboratory testing for each property, Placement Plan, Equipment, Material Samples, and any other relevant documents for the PPC system at least 15 days prior to the Pre-placement Conference and delivery of any materials to the job site. These submittals shall be for approval and directed to the Engineer.

- (a) *Polyester Concrete End Dam System.* The Contractor shall submit to the Engineer 2 copies of the manufacturer's written instructions for the installation of the Polyester Concrete End Dam system. The literature containing pertinent materials and installation data for the PPC supplied on the project. The Contractor shall submit the proposed testing procedures, mix design, form installation and criteria for all PPC materials.
- (b) *Manufacturer Qualifications.* The Contractor shall install a Polyester Concrete End Dam system with all components of PPC provided through a single manufacturer, with documented experience successfully supplying 5 projects of similar size and scope within the past 5 years. The Contractor shall submit documentation of the manufacturer's project experience including the following:
  - (1) Project construction dates.
  - (2) PPC quantities.
  - (3) Reference names and contact information for owner representatives.
- (c) *Contractor Qualifications.* The Contractor shall submit documentation of at least 5 successful projects placing structural concrete (bridge deck or concrete pavement), Thin Bonded Overlay (Polyester Concrete), and Polyester Concrete End Dam to established grade lines using similar equipment as specified herein within the past 5 years. The documentation of Contractors qualifications shall include the following:
  - (1) Project construction dates.
  - (2) PPC quantities.
  - (3) Reference names and contact information for owner representatives.

If the Contractor does not have 5 years of experience placing structural concrete and PPC systems with at least 5 documented successful projects, the Contractor shall arrange for a qualified Manufacturer's Technical Representative with 5 years of documented experience with PPC systems to be on site throughout the duration of the project to provide technical support for the material mixing and placement.

If the Contractor has 5 years of experience placing structural concrete and PPC systems with at least 5 documented successful projects, the qualified manufacturer's Technical Representative with 5 years of documented experience with PPC systems shall, at a minimum, be on site the first day of PPC placements and shall be available as requested by the Engineer if it is necessary.

- (d) *Manufacturer's Technical Representative Qualifications.* The manufacturer's Technical Representative shall have a minimum of 5 years of experience with PPC placements, and be completely competent in all aspects of the work including all materials to install the PPC systems. This includes, but not limited to, surface preparation, PPC application and PPC curing. The Technical Representative shall be available on site at least one day to facilitate the installation in the first day. The Technical Representative shall have experience on a minimum of 5 successful projects of similar size and scope.



**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM**

The Contractor shall submit documentation of the Technical Representative's experience including the following:

- (1) Years of experience with PPC systems.
- (2) Project construction dates.
- (3) PPC quantities.
- (4) Reference names and contact information for owner representatives.

- (e) *Certified Test Report.* The Contractor shall furnish a Certified Test Report, in accordance with subsection 106.13, confirming that all materials required for a Polyester Concrete End Dam system shall be pretested, and meet all requirements required and accompanied by Certified Test Reports from independent accredited laboratories.
- (f) *Placement Plan.* The Contractor shall submit a Polyester Concrete Placement Plan that includes the following:
- (1) Schedule of work and required testing.
  - (2) Placement sequence and procedure.
  - (3) Description of all equipment used.
  - (4) Method for preventing leakages of HMWM primer and Polyester Concrete.
  - (5) Method for measuring, and maintaining thickness and profile for each lift.
  - (6) Tining plan showing methods and locations.
  - (7) Finishing surface method including sequence and repair of damaged sections.
  - (8) Cure time for Polyester Concrete.
  - (9) Storage and handling of resin and PPC components.
  - (10) Procedure for disposal of excess resin, PPC and containers.
  - (11) Procedure for cleanup of mixing and placement equipment.
- (g) *Equipment.* The Contractor shall submit documentation of certification of scales that will be used to calibrate the mobile mixing truck. The certification shall be dated within last month. A new certification shall be done if any adjustments are made to the scales.
- (h) *Material Samples.* Samples of materials, from the same lots used for the project, for all components of the PPC system shall be submitted by the manufacturer, if requested by CDOT, to the Materials Section a minimum of 60 days prior to the PPC application, and shall consist of one four-liter sample for each liquid and a 5 pound sample for each dry component.

**MATERIALS**

The PPC shall consist of Polyester Resin and dry aggregate specified in Table 518-3. It shall also include a compatible primer, which when mixed with other specified ingredients and applied as specified herein, shall produce a PPC meeting the requirements of this specification.

- (a) *Polyester End Dam Concrete.* Polyester Concrete shall consist of Polyester Resin binder and dry aggregate, and shall:
- (1) Be an unsaturated Isophthalic Polyester-styrene Co-polymer. The Polyester Resin content shall be 12 percent  $\pm$ 1 percent of the weight of the dry aggregate.
  - (2) Contain at least 1.0 percent by weight Gamma-methacryloxypropyltrimethoxysilane, an Organosilane Ester Silane coupler.
  - (3) Be used with a promoter that is compatible with suitable Methyl Ethyl Ketone Peroxide and Cumene Hydroperoxide initiators.
  - (4) Have the values for the material properties shown in Table 518-1.

**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM**

Accelerators or inhibitors may be required to speed up the chemical reaction, and achieve proper Set Time of the PPC. They shall be used as recommended by the PPC manufacturer.

**Table 518-1  
POLYESTER RESIN BINDER PROPERTIES  
(Tested each lot sent to the job)**

- (b) *Primer.* Primer for the concrete blackout surfaces shall be a wax-free low odor, High-molecular-weight Methacrylate primer, and consist of a resin, initiator and promoter.

Property	Test Method	Value
Viscosity*	ASTM D 2196	0.1x10 <sup>-5</sup> to 2.9x10 <sup>-5</sup> psi-sec (0.075 to 0.20 Pa-s) RVT No.1 Spindle, 20 RPM at 77°F
Specific Gravity*	ASTM D 1475	1.05 to 1.10 at 77°F
Elongation	ASTM D 638	35 percent, minimum Type I specimen, thickness 0.25 ± 0.03” at Rate = 0.45 inch/minute.
	ASTM D 618	Sample Conditioning: 18/25/50+5/70
Tensile Strength	ASTM D 638	2,500 psi, minimum Type I specimen, thickness 0.25 ± 0.03” at Rate = 0.45 inch/minute.
	ASTM D 618	Sample Conditioning: 18/25/50+5/70
* Test shall be performed before adding initiator.		

When initiators and promoters are required to achieve proper modifications for working under different temperature conditions and applications of the primer, they shall be used as recommended by the PPC manufacturer.

The primer shall be applied to bond in PCC surfaces and promote adhesion to the PPC materials. The primer shall be tested for the Bond Strength in accordance with ASTM C 882 or Cal-Trans Test 551. The primer shall have a maximum volatile content of 30 percent prior to adding the initiator, when tested in accordance with ASTM D 2369, and conform to Table 518-2.

Initiators for the Methacrylate Resin shall consist of a metal drier and Peroxide. If supplied separately from the resin, the metal drier shall not be mixed with the Peroxide directly. The containers shall not be stored in a manner that allows leakage or spilling to contact the containers or materials of the other.

**Table 518-2  
HIGH MOLECULAR WEIGHT METHACRYLATE RESIN PROPERTIES  
(Tested yearly)**

Property	Test Method	Value
Viscosity*	ASTM D 2196	4.0x10 <sup>-5</sup> psi-sec (0.025 Pa-s) maximum (Brookfield RVT with UL adapter, 50 RPM at 77°F)
Volatile Content*	ASTM D 2369	30 percent, maximum
Specific Gravity*	ASTM D 1475	0.90 minimum at 77°F
Flash Point*	ASTM D 3278	180 °F minimum
Vapor Pressure*	ASTM D 323	0.04 inch Hg, maximum at 77°F
PCC Saturated Surface-Dry Bond Strength (Adhesive)	ASTM C 882 Bond Test or Cal-Trans Test 551, Part 5	700 psi, minimum at 24 hours and 70 ± 1°F (with Polyester Concrete at 12 % resin content by weight of the dry aggregate)
* Test shall be performed before initiator is added		

**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM**

(c) *Aggregate.* Aggregate for Polyester Concrete shall:

- (1) Have not more than 45 percent crushed particles retained on the No. 8 sieve when tested in accordance with AASHTO Test Method T335.
- (2) Provide fine aggregate consisting of natural sand.
- (3) Have a weighted-average aggregate absorption of no more than 1.0 percent when tested under AASHTO Test Methods T84 and T85.
- (4) At the time of mixing with resin, have moisture content of not more than one half of the weighted-average aggregate absorption when tested under AASHTO Test Method T225.
- (5) Comply with the requirements for the aggregate gradation shown in Table 518-3.

**Table 518-3  
AGGREGATE GRADATION  
(Tested yearly)**

Sieve Size	Percent Passing
3/8"	100
No. 4	65-85
No. 8	45-67
No. 16	29-50
No. 30	16-36
No. 50	5-20
No. 100	0-7
No. 200	0-3

(d) *Sand.* Sand for abrasive sand finish shall:

- (1) Be commercial-quality blast sand.
- (2) Have not less than 95 percent pass the No. 8 sieve, and not less than 95 percent retained on the No. 20 sieve when tested under AASHTO Test Method T27.
- (3) Have an average absorption of not more than 1.0 percent when tested under AASHTO Test Method T85.

(e) *Composite Properties.* Polyester Concrete End Dam system shall have the values for the composite properties shown in Table 518-4:

**Table 518-4  
COMPOSITE PROPERTIES  
(Tested every 2 years)**

Property	Test Method	Values
Abrasion Resistance	ASTM C 418-12 or Cal-Trans Test 550	< 2g weight loss (at 12% resin content by weight of the dry aggregate)
Modulus of Elasticity	ASTM C 469	1,000,000 psi to 2,000,000 psi (at 12% resin content by weight of the dry aggregate)
PPC (Bond Strength)	ASTM C 882 Bond Test or Cal-Trans Test 551, Part 5	500 psi, minimum at 24 hours and 70 °F (without Primer, at 12 % resin content by weight of the dry aggregate, and saturated surface dry specimen)
Compressive Strength at Set Time	ASTM C 805 or C 39	3,000 psi at 4 hours
Compressive Strength at Cure Time	ASTM C 39	4,500 psi at 24 hours

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**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM  
CONSTRUCTION REQUIREMENTS**

Subsection 518.11 shall include the following:

- (a) *Pre-placement Conference.* A Polyester Concrete Pre-placement Conference shall be held at least 15 days before any PPC placement operation begins. Attendees include all parties involved in the work.
- (b) *Trial Application.* The Contractor shall construct a test box for a test pour. The test box shall be at least 4 feet long, the depth of the Polyester Concrete End Dams and the maximum width of the End Dams, or as approved by the Engineer. Prior to constructing the Polyester Concrete End Dams, one or more trial applications shall be placed in the test box to determine the Gel Time, Initial Set Time, Set Time and Cure Time, and to demonstrate the effectiveness of the mixing, placing, and finishing equipment proposed. The Set Time can be determined when the in-place PPC cannot be deformed by pressing with a finger, indicating the resin binder is no longer in a liquid state.

After mixing all PPC materials, the PPC begins to harden and reaches the Gel Time, and then the Initial Set Time of PPC occurs between 30 to 120 minutes. The PPC achieves the Set Time after 4 hours, and the Compressive Strength Test shall meet the acceptable strength as specified herein. At 24 hours, the PPC reaches the Cure Time and it shall achieve the full strength as specified herein.

The trial applications shall be tined as per the tining requirements as stated in the Contractor's Tinning Plan for the final application. The trial application shall replicate field conditions and be constructed using the same equipment as the production work. The location of the trial application shall be as approved by the Engineer. Trial applications shall be properly disposed of off-site by the Contractor.

The number of trial applications required shall be as many as necessary for the Contractor to demonstrate the ability to construct an acceptable trial end dam section and competency in ability to perform the work. All Set Times are based on anticipated application temperatures, conditions, and lane closure timing. The Contractor shall adjust the mix design, and construct a test box and demonstrate that the adjusted mix consolidates and sets properly. The methods, installer, or the PPC system may be rejected after three trial applications if not shown to be adequate or in compliance with this specification as directed by the Engineer.

The Bond Tests shall be performed in accordance with the accepted testing as specified herein. Acceptable test results shall be achieved on a trial application before installation may proceed.

- (c) *Equipment.* All equipment for cleaning the existing concrete surface, and mixing and applying the PPC system shall be in accordance with the manufacturer's recommendations as approved by the Engineer prior to commencement of any work.
- (d) *Surface Preparation.* The concrete surfaces in the blockouts shall be prepared. Prior to the primer and PPC applications, the concrete surfaces to be treated shall be cleaned by shot-blasting, scarifying, chipping or sandblasting until all unsound materials and contaminants, which may interfere with the primer and PPC have been removed from the blockouts. Exposed concrete surfaces shall be protected from precipitation and heavy dew during and after the application of the primer.
- (e) *Forms.* Forms of the concrete blockouts shall be tight, and sufficiently rigid to prevent distortion due to the pressure of the PPC and other loads incidental to the PPC. The formwork shall be inspected by the Engineer prior to the PPC placements. If any gap or void is present, it shall be sealed to ensure that there is no leakage even of the liquid component.
- (f) *Primer Application.* Prior to placing primer in the concrete blockouts, the exposed surfaces of the existing concrete shall be completely dry and clean with oil-free. However the primer shall be placed after 28-day curing time of new concrete.

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**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM**

After the exposed concrete surfaces have been prepared and cleaned, the primer shall be applied in accordance with the manufacturer's recommendations. The primer shall be evenly applied and the concrete surface temperature shall be at 40°F and raising to 95°F maximum. The relative humidity shall be not more than 85 percent.

- (g) *Polyester Concrete Application.* The Polyester Concrete shall be applied in the concrete blockouts within 2 hours after the primer has been applied. The PPC shall be applied in accordance with this specification in conformity with the lines, grades, thickness, and typical cross-sections shown on the plans or as approved by the Engineer. Prior to PPC placement, the surface temperature of the concrete blockouts to receive PPC shall be at 40°F and raising to 95°F maximum.

The PPC shall be placed prior to the Initial Set Time and 15 minutes following addition of an initiator, whichever occurs first, or within a more restrictive temperature range if recommended by the manufacturer. After placing PPC in the concrete blockouts, if the Initial Set Time of PPC has exceeded 120 minutes, the materials shall be removed and replaced at the Contractor's expense.

After 4 hours, the Set Time will achieve and the Polyester Concrete End Dams can be opened to traffic safely. Prior to opening to traffic, the Compressive Strength Test for Polyester Concrete End Dams shall be performed in accordance with the Rebound Hammer of Hardness Concrete, ASTM C 805 or Standard Test Method for Cylindrical Concrete Specimens, ASTM C 39. The test results shall achieve the Compressive Strength of 3,000 psi minimum.

Cured Density Test at 24 hours on the site shall be performed in accordance with the ASTM C 138 for the acceptable consolidation of the PPC materials, and the average test results shall be within 135 pcf  $\pm$  5 pcf of three core samples. If the PPC exhibits an insufficient set at the Cure Time, the PPC materials shall be removed and replaced at the Contractor's expense.

If the Polyester Concrete End Dams are thicker than 6 inches, they shall be placed in lifts. The maximum thickness of each lift shall be recommended by the manufacturer or approved by the Engineer. Each lift of the PPC shall be properly consolidated and achieve a relative compaction in the concrete blockouts accepted by the Engineer. The core samples shall be taken in each lift as directed by the Engineer if the Engineer determines through a visual inspection that the Initial Set Time or consolidation has not occurred prior to the PPC placement of next lift. The core shall have a minimum diameter of at least 2 inches, and the Contractor shall completely patch the core holes with new PPC system to the proposed finish grade.

- (h) *Surface Finishing.* The proposed surface of Polyester Concrete End Dams shall be consolidated and finished to the required grade and cross slope using finishing equipment as approved by the Engineer.

Sand finish shall be applied by either mechanical means or hand broadcasting at a minimum rate of 2.75 ounces per square foot before the Set Time occurs. The smoothness of the PPC surface shall be tested with a 10 foot straightedge transversely and longitudinally. Deviations greater than 3/8 of an inch shall be diamond ground to the proposed finish grade. The thickness of the PPC shall not be reduced by more than 3/8 of an inch. Where there is low spot reduced by more than 3/8 of an inch on the PPC surface, the low area shall be removed at least 3/4" and replaced with new PPC system to the proposed finish grade as directed by the Engineer. If there is a damaged surface on the PPC, the Contractor shall remove unsound PPC surface and replace it with new PPC system in accordance with the Finishing Surface Method.

After final surface finishing, traffic or equipment shall not be allowed on the treated surface until the PPC has been achieved the Set Time. The Polyester Concrete End Dams shall be protected from moisture until adequate Set Time has been obtained. The Contractor shall follow all manufacturer's recommendations including surface preparation and all Set Times prior to opening treated surfaces to traffic or completing the work.

**REVISION OF SECTION 518  
POLYESTER CONCRETE END DAM**

**METHOD OF MEASUREMENT**

Polyester Concrete End Dam will be measured by the number of cubic foot completed in place and accepted. The pay volume for each discrete location (a contiguous treated area not touching other treated areas) shall be rounded up to the next whole cubic foot.

The quantity of Polyester Concrete End Dam will be paid for at the contract unit price per cubic foot, and shall include all work and materials necessary to complete the item including surface preparation, primer application, PPC application, surface finishing, trial application test boxes, testing, the technician representative and all miscellaneous work required. All of these work will not be measured and paid for separately, but shall be included in the cost of the Polyester Concrete End Dam.

**BASIS OF PAYMENT**

The accepted quantities of Polyester Concrete End Dam will be paid for the pay item listed below that appear in the bid schedule.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Polyester Concrete End Dam	Cubic Foot

<b>COLORADO DEPARTMENT OF TRANSPORTATION SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE</b>		Log No. (Assigned by Standards and Specifications Unit)
TO: Standards & Specifications Unit Project Development Branch		FROM: HQ Bridge Construction Unit-Div of Project Support (Region, Branch or Technical Committee)
SPECIFICATION SECTION NO.	ITEM	Priority
618	Prestressed Concrete	Routine <input type="checkbox"/> Fast <input checked="" type="checkbox"/>
Reason for this new or changed specification:		
601.02 – add Class PS		
618.01 - Require formal mix design submittal and lab trial mix data for review and approval every 2 years.		
618.06(a) - Require QA Inspection personnel training and certifications in compliance with CDOT Fabrication Inspection Manual for Prestressed and Precast Concrete.		
618.06(d)6 - Revise submittal requirements for length and camber measurements from precast fabricator.		
618.07(a)9 & 618.07(c)3 - Correct Typographical Errors.		
618.11(a) - Delete information that is duplicated in Section 601.		
618.11(b) - Implement new mix design submittal criteria.		
618.11 (c) - Require equipment calibration and verification of testing apparatus.		
618.11(g) - Require Contractor's QC concrete tester to be ACI certified.		
618.11(g)1 - Revise cylinder curing procedures.		
618.11(g)2 - Revised cylinder testing and coring procedures.		
618.11(g)5, 7-9 - Revised criteria for concrete testing frequency.		
618.12(a)3 - Revised concrete temperature monitoring frequency, procedures and submittal requirements.		
618.13(b) - Require product repairs of structural defects be analyzed by the Contractor's Engineer and a PE stamped letter provided certifying the repairs meet design criteria.		

New or Revised Specification:  
See Attached.

NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.

CDOT Form #1215

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**REVISIONS TO CDOT STANDARD SPECIFICATION 618**

**\*\*\*REVISED 12/5/16\*\*\***

In subsection 601.02 Add Class PS to Table 601-1:

<b>PS</b>	(strength) As specified in the contract	(Min cement content) 610	(Air content) As specified in the contract	(Maximum w/cm ratio) 0.45
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In subsection 601.02 add Class PS:

Class PS concrete is used for pretensioned and combination tensioned concrete elements. Class PS shall have a compressive strength and air content specified in the contract. Fine aggregate shall not exceed 45 percent of the total aggregate volume.

Delete subsection 618.01 (c) and replace with the following:

Concrete. Concrete for all members shall conform to the requirements of Section 601 and the Plans.

Delete subsection 618.01 (d) and replace with the following:

Steel for other members. Reinforcing steel for other members shall conform to the requirements of Section 602.

Subsection 618.06(a) second paragraph shall be revised as follows:

Quality Assurance inspection shall be performed on all pretensioned and combination tensioned members. The QA representative acts for and on behalf of the Engineer on all matters within the scope of the contract documents, as delegated by the Engineer. QA administration will be performed to the extent necessary to assure contract compliance. Fabrication Inspection QA personnel shall have training, certification and work experience as described in section 3.0 of the CDOT Staff Bridge Fabrication Inspection Manual.

Subsection 618.06(d)6. shall be revised as follows:

- (2) Length measurement of beams a minimum of three calendar days prior to shipping.
- (3) Product camber measurement a minimum of seven calendar days prior to shipping.

**TYPOGRAPHICAL ERRORS**

618.07(a)9., second paragraph, second sentence-Replace “stands” with “strands”.

618.07(c)3., sixth paragraph, third sentence-Replace “gout” with “grout”.

Subsection 618.11 (a) shall be revised as follows:

- (a) Classification. Concrete shall be designated as Class PS. Delete the remainder of the subsection.

Subsection 618.11 (b) shall be revised as follows:

(b) *Concrete Mix Components.* The Contractor shall develop a mix design for Class PS concrete. The mix design shall conform to the requirements of Section 601 and CP-62. Materials sources shall be listed on the contractor’s mix design. The QC Manager must notify the QA representative in writing before changing the sources as listed in the QCP. Changes in mix design material sources or proportions require a new mix design to be submitted to the engineer for approval at least 5 days prior to the new mix being used in production.

Subsection 618.11 (c) shall be deleted and replaced with the following:

*Equipment Calibration and Verification.* The Contractor shall implement a plan for equipment calibration and verification of testing apparatus in compliance with ASTM C1077. The calibration records shall be made available to the QA representative upon request.

Subsection 618.11 (g) the following shall be inserted after the first sentence in the first paragraph:

The Contractor's QC representative casting QA concrete cylinders shall be ACI Concrete Field Testing Technician-Grade I certified.

Subsection 618.11 (g) 1. Last sentence shall be replaced with the following:

QA cylinders shall be initially cured by full immersion in saturated lime water at a temperature of 73.4 +/-3 degrees Fahrenheit, with lime concentrations per AASHTO M201. Between 24-48 hours after casting, the concrete cylinders shall be removed from the molds, labeled, put in lime saturated water within 30 minutes per ASTM C31, and further cured by full immersion in saturated lime water at a temperature of 73.4 +/-3 degrees Fahrenheit, with lime concentrations per AASHTO M201. Water temperature shall be recorded by a continuous recording thermometer, calibrated every six months.

Subsection 618.11 (g) 2. shall be revised as follows:

Cylinders shall be tested in accordance with ASTM C 39. The average strength of at least two test cylinders shall be greater than the minimum required strength. When evaluating a single test consisting of three 28-day standard cured cylinders, if the compressive strength of any one cylinder differs from the average by more than 10%, that cylinder shall be discarded and the average strength determined using the strengths of the remaining two cylinders. If the compressive strength of more than 1 cylinder differs from the average by more than 10%, all 3 cylinders will be used to determine the compressive strength.

When the compressive strength of the concrete is less than that specified in the contract, the structural adequacy of the element will be evaluated by the Engineer. The Contractor may request to core the element represented by the low strength results. If approved by the engineer, the locations of the cores shall be as directed by the engineer. Coring shall be at the expense of the contractor and witnessed by the Project Engineer or designee. Coring shall take place no more than 45 days after casting. A minimum of 3 cores shall be collected with a minimum diameter of 3 inches. The cores shall be obtained by the Contractor and immediately turned over to the Engineer for compressive strength testing. Cores shall be obtained in accordance with AASHTO T24 with the exception that immediately after removal from the structure, cores will be cured at a temperature between 60-80 degrees Fahrenheit and at a relative humidity below 60% for 24 to 48 hours prior to testing. When evaluating a single test consisting of three cores, if the compressive strength of any one core differs from the average by more than 10%, that core shall be discarded and the average strength determined using the strengths of the remaining two cores. If the compressive strength of more than 1 core differs from the average by more than 10%, all 3 cores will be used to determine the compressive strength. If the average core compressive strength is greater than the average of the cylinder compressive strength, the core strength will be used in the Engineer's evaluation. If the core compressive strength is less than the cylinder compressive strength, the cylinder strength will be used in the Engineer's evaluation.

Final determination of acceptance or rejection of the element shall be at the sole discretion of the Engineer based on evaluation of the cylinders and/or core strengths. If the element is accepted, the core holes shall be filled with a non-shrink grout or mortar approved by the Engineer.

Subsections 618.11(g) 5., 7., 8. & 9. Shall include the following:

This test shall be conducted for each load of concrete in which compressive strength specimens are cast in accordance with ASTM C39.

Section 618.12(a)3. Shall be revised as follows:

The contractor shall monitor the internal concrete temperature using thermocouples with concrete temperature recorded at intervals not to exceed 15 minutes. A minimum of three thermocouples shall be installed in the element. One thermocouple shall be installed at the center mass of the element, the remaining thermocouples shall be installed at the Engineer's direction. Temperature logs shall be submitted to the Engineer prior to transporting the element to the Project.

When the internal temperature of the element exceeds 160 degrees F, the Contractor shall submit a mitigation plan to ensure future castings do not exceed the 160 degree maximum temperature requirement. The mitigation plan shall also include procedures for sampling and testing the element to identify the potential risk for Delayed Ettringite Formation, and/or waterproofing applications to protect against moisture intrusion. The mitigation plan shall be submitted to the Bridge Fabrication Engineer for review and approval. Acceptance or rejection of the element exceeding the temperature specification will be based on review and assessment of the specific curing temperature logs and the submitted documentation. The element shall not be shipped until the Contractor receives written acceptance by the Engineer.

Section 618.13(b) second paragraph, second sentence revise as follows:

When repairs have been completed, the Contractor's Engineer shall examine and analyze the product for construction and service load capacity. A PE stamped letter shall be provided by the Contractor's Engineer certifying that the repair work meets all design serviceability criteria.

<b>COLORADO DEPARTMENT OF TRANSPORTATION SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE</b>		Log No. (Assigned by Standards and Specifications Unit)  614 FOR INFORMATION ONLY
TO: Standards & Specifications Unit Project Development Branch		FROM: Project Development Branch (Region, Branch or Technical Committee)
SPECIFICATION SECTION NO.  614	ITEM  Impact Attenuator (Low Maintenance)	Priority  Routine <input type="checkbox"/> Fast <input type="checkbox"/>
Reason for this new or changed specification: The Department is finding that the use of this impact attenuator is not being used in intended areas. Consequently, the instructions to designers is being modified to require the use of this impact attenuator in all urban areas and to clarify its use at other locations.		
New or Revised Specification: SEE ATTACHED.		
NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.		

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REVISION OF SECTION 614  
IMPACT ATTENUATOR (LOW MAINTENANCE)

Section 614 of the Standard Specifications is hereby revised for this project to include the following:

**DESCRIPTION**

This work consists of furnishing and installing low-maintenance impact attenuators. This work shall be done in accordance with these specifications and in conformity with the lines and details shown on the plans or established.

**MATERIALS**

The low maintenance impact attenuator shall be one of the following:

- (1) Smart Cushion, as manufactured by SCI Inc., 2500 Production Drive, St. Charles, IL 60174
- (2) QUADGUARD Elite System, as manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601
- (3) QUADGUARD LMC System, as manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601

The design speed of this portion of the roadway is ♦ miles per hour.

The low maintenance impact attenuator shall meet the following design parameters:

NCHRP Report 350 (or) MASH Test Level: TL ♪

Hazard Width: ▲

Bi-directional: ♥

Location: ♣

Object to be shielded: ♠

**CONSTRUCTION REQUIREMENTS**

The site shall be prepared to receive the low maintenance impact attenuator by filling, excavating, and smoothing the subgrade, constructing the concrete foundation pad, installing approved transition and anchoring, and all other work necessary for the proper installation of the attenuator. The foundation pad shall be 6-inch thick reinforced concrete or 8-inch thick non-reinforced concrete. Other foundations may be used, if recommended by the impact attenuator manufacturer and approved by the Engineer. The impact attenuator shall be fabricated and installed in accordance with the manufacturer's recommendations. The Contractor shall provide a copy of the manufacturer's installation instructions and parts lists to the Engineer prior to installation of the device.

Each installation shall be certified as correct upon completion by a representative of the device manufacturer or by an employee of the Contractor who is a certified installer. The Contractor shall submit acceptable documentation to validate that the certified installer has completed device training and has been registered with the manufacturer as a certified installer.

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REVISION OF SECTION 614  
IMPACT ATTENUATOR (LOW MAINTENANCE)

**METHOD OF MEASUREMENT**

Low maintenance impact attenuators will be measured by the actual number of attenuators that are installed and accepted.

**BASIS OF PAYMENT**

The accepted quantities of low maintenance impact attenuators will be paid for at the contract unit price for the pay item listed below.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Impact Attenuator (Low Maintenance)	Each

Payment will be full compensation for all work and materials required to furnish, install, and certify the low maintenance impact attenuator. Site preparation, foundation pad and all necessary hardware including anchors and transitions will not be measured and paid for separately, but shall be included in the work.

All costs associated with either having a manufacturer's representative on-site, or training and certifying an employee of the Contractor as a certified installer, will not be measured and paid for separately, but shall be included in the work.

\*\*\*\*\*

**INSTRUCTIONS TO DESIGNERS** (Delete instructions and symbols from final draft.):

Use this special provision ~~for lower maintenance cost attenuators constructed with reusable components where the hazard is up to 3 feet wide and there is a high potential for impact. Example in all urban locations and~~ locations are where the device is anticipated to be impacted at least once per year, ADT is over 25,000 vehicles per day, or a repair time of less than one hour and an average repair cost of less than \$1,000 per impact is desired. The special provision may be used in other locations, as determined by the Designer.

- ◆ Insert the design speed.
- ♪ Insert NCHRP Report 350 or MASH and insert TL-2 or TL-3. NCHRP Report 350 should only be used for devices developed prior to 2011; otherwise, MASH testing criteria should be utilized, TL-2 is used for design speeds up to 45 miles per hour. TL-3 is used for speeds greater than 45 miles per hour.
- ▲ Insert the hazard width.
- ♥ Indicate "yes" or "no". Use of an approved transition from shielded obstacle to impact attenuator is required for bidirectional use.
- ♣ Indicate where the attenuator will be installed such as "Median", "Gore", "Roadside", or "Construction Zone".
- ♠ Identify the object to be shielded, such as "Guardrail Type 3", "Guardrail Type 7", "Bridge Rail", or other object.

**COLORADO DEPARTMENT OF TRANSPORTATION  
SUBMITTAL OF NEW SPECIFICATION  
OR SPECIFICATION CHANGE**

Log No. (Assigned by Standards and Specifications Unit)

TO: Standards & Specifications Unit  
Project Development Branch

FROM:  
(Region, Branch or Technical Committee)

SPECIFICATION SECTION NO.

ITEM

Priority

Routine

Fast

Reason for this new or changed specification:

New or Revised Specification:

NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.

REVISION OF SECTION 632  
NIGHT WORK LIGHTING

Section 632 is hereby added to the Standard Specifications for this project as follows:

**DESCRIPTION**

**632.01** This work consists of furnishing, installing, operating, maintaining, moving, adjusting, and removing lighting to illuminate construction work spaces for night work. Night work will be defined as work performed between 30 minutes before sunset and 30 minutes after sunrise.

**MATERIALS AND EQUIPMENT**

**632.02** The Contractor shall provide lighting for night work in the activity area work space where construction equipment, workers on foot, or both are present. The work space is that portion of the roadway closed to road users, or outside of the roadway, set aside for workers, equipment and materials performing contract work. The work space may be stationary or may move as the work progresses.

Illumination may be accomplished by using a combination of portable lights, floodlights, equipment mounted lights, or other lighting methods that will provide the required minimum lighting intensity. Light fixtures that are mounted on the construction equipment shall have a secure connection to minimize vibration and ensure that the view of the equipment operator is not obstructed. Portable lights shall be aimed either generally parallel or perpendicular to the roadway, aimed downward towards the work to avoid glare to oncoming drivers. Existing street and highway lighting shall not eliminate the need for the Contractor to provide work area lighting. Vehicle headlights shall not be permitted as the sole means of illumination while working.

**632.03 Portable Generator and Inverter Generator.** The Contractor shall provide a portable generator, inverter generator, or both as needed to power the added equipment mounted lights on motorized equipment if the existing power supply on the equipment is insufficient to power the added lights. Fuel tank capacity and availability of fuel on site shall be sufficient to permit uninterrupted operation throughout the planned shift. All power sources shall be equipped with a ground-fault circuit interrupter. The generator shall be placed or temporarily mounted on the equipment without obstructing access onto the equipment or the view of the operator.

**632.04 Light Meter.** The Contractor shall furnish a light meter for use by the Engineer. The meter shall have a digital display calibrated to NIST standards, shall be cosine and color corrected with an accuracy of +/- 5 percent. The light meter shall remain the property of the Contractor after final acceptance.



REVISION OF SECTION 632  
NIGHT WORK LIGHTING

**CONSTRUCTION REQUIREMENTS**

**632.05** Lighting for night work shall include:

- (1) Minimum lighting intensity of 5 foot candles for work space illumination.
- (2) Illuminate the stationary work space as stated in (1) above where construction equipment, workers on foot or both are present.
- (3) Light sources shall be positioned not to interfere with or impede traffic in any direction and not cause glare for motorists or onto adjacent properties whenever possible. The Contractor shall make adjustments, use visors or shields, or both to minimize glare.
- (4) Illumination for mobile operations within a closed travel lane with traffic control devices will be defined as 20 feet in front of and behind and 5 feet to each side of each piece of moving equipment.
- (5) The Contractor shall provide portable lights for Engineer's and contractor personnel performing materials testing for either mobile or stationary operations to illuminate the testing work space as stated in (1) above. For concrete operations at night, the Contractor shall illuminate the designated concrete truck washout location including the access and the wash out site.
- (6) Workers on foot, performing work within a moving work space (i.e. striping layout/installation, surveying, etc.) shall wear ANSI approved high visibility apparel and headwear for Class 3 risk exposure including vest, Class E pants or leg gaiters, and reflective tape on hard hats. Workers may use portable lighting that can be worn on the hard hats that provide 360 degree visibility.
- (7) Portable light towers and lights mounted on stands shall be sturdy and free-standing without the aid of guy wires or bracing. Minimum illumination levels as stated in (1) above shall be maintained at a distance of 5 feet on all sides of stationary equipment with either equipment mounted or free standing lights.
- (8) The Contractor shall ensure that all pieces of equipment have operating lights to illuminate operator's controls, backhoe and loader buckets, and illuminate the equipment reach limits around rotating equipment (i.e. the paving machine shall have illumination for the hopper, auger, and screed areas).
- (9) The TCS vehicle shall have the rear of the truck illuminated while installing, maintaining, and removing traffic control devices unless sufficient lighting levels exist with stationary lights.
- (10) The Contractor shall maintain a uniformity ratio no greater than 5:1 over the stationary work space. Uniformity ratio is the ratio of average to minimum horizontal illuminance within the work space. The uniformity ratio shall be determined by dividing the average of all light meter measurements by the light meter measurement at the darkest spot within the illuminated area.

REVISION OF SECTION 632  
NIGHT WORK LIGHTING

**632.06 Night Work Lighting Plan.** The Contractor shall submit a lighting plan to the Engineer for review signed by the Contractor's designated person three days in advance of the Preconstruction Conference. The lighting plan shall appropriately describe the work and include the following:

- (1) Layout drawing and supplemental narrative showing light locations, equipment mounted lights, and configuration including both typical spacing and lateral placement for each work activity.
- (2) Tabulation of lights for those lights that are included within the Night Work Lighting pay item. Lights included in the tabulation such as tower lights, lights mounted on stands and lighting mounted to mobile equipment (not original equipment lights) but those additional equipment mounted lights or portable lights that provide the 20 feet in front and behind illumination zone shall have catalog cuts giving the specific brand names, model numbers, lamp type and wattage.
- (3) Narrative description of those operations where workers will be on foot in a moving work space.
- (4) Details of hoods, visors, louvers, shields or other means to be used to minimize glare.

The plan shall be revised and updated by the Contractor as requested by the Engineer during the progress of the work to accommodate changes to the work.

**632.07 Inspection of Lighting.** Lighting inspection by the Engineer will be performed jointly with the Contractor's designated person on a drive through the project to include (1) observation of the lighting setup to evaluate glare potential for drivers and workers and (2) light meter measurements to determine minimum illumination levels. The Contractor shall make adjustments to the lighting as needed based on the Engineer's inspection. In the event of any failure of the lighting system, the Engineer may determine to discontinue work until the required level of illumination is restored. Delays due to insufficient lighting levels are the responsibility of the Contractor. Any corrections and deficiencies needed to provide the minimum illumination levels shall be addressed by the start of the next work shift.

The Engineer will take light meter measurements to verify the minimum lighting levels using a light meter provided by the Contractor during the night work shift. Light meter readings will be taken within the work space where work is being performed, in a horizontal plane, light sensor part of the meter held parallel to the ground with the sensor aimed upward, 3 feet above the pavement or ground surface. Meter readings will be taken at the source at 5 foot intervals out to the illuminated work space perimeter. These measurements will be documented and filed in the project records.

REVISION OF SECTION 632  
NIGHT WORK LIGHTING

**632.08 Lighting for Flagger Stations.** For nighttime flagging, flagger stations shall be illuminated by an overhead light source providing a minimum lighting intensity level of 5 foot candles measured 1 foot out from the flagger’s chest. The flagger station light shall illuminate the station area with a radius of at least the width of the lane plus 5 feet, and be centered on the flagger in the initial flagging position. The size of the illuminated area shall be increased to account for flagger movements required to control traffic. The flagger station lighting shall be maintained at an adequate height above the pavement and be capable of being shielded through the use of visors, hoods, louvers, or screens as needed to minimize glare to approaching traffic and spilling over onto adjacent properties.

**METHOD OF MEASUREMENT**

**632.09** Lighting for night work will not be measured but will be paid for as a single lump sum.

**BASIS OF PAYMENT**

**632.10** Payment for lighting as shown on the Night Work Lighting Plan will include all labor, materials, and equipment necessary to complete and maintain the work. Payment for lighting will include portable 360° visibility lighting worn on hard hats.

Progress payments will be made based on the lump sum price bid as follows: 20 percent when the Lighting for Night Work Plan has been submitted, accepted, and satisfactory lighting of nighttime operations has begun; the remaining 80 percent will be paid in equal monthly progress payments for the remaining time lighting is required for the night work operations.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Night Work Lighting	Lump Sum

Flagger station lighting, designated person, light meters, and additional power sources (generator and inverter) will not be measured and paid for separately but shall be included in the work.

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**INSTRUCTIONS TO DESIGNERS** (delete instructions and symbols from final draft):

~~This is a pilot project special provision that is to be used only on selected projects. Submit proposed pilot projects to the Area Engineers for review prior to using this special provision.~~

Use this ~~pilot~~ project special provision on all projects where the work is done at night for illumination of the work.



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## ILLUMAGEAR introduces the Halo Light™ personal active safety system

Ideally suited for a variety of industries - The Halo Light first of many PASS products being rolled out

January 28, 2014

ILLUMAGEAR, a Seattle-based company focused on improving individual safety in risky environments, is pleased to introduce The Halo Light™, a patented 360° personal active safety system (PASS) that attaches to any hard hat, producing a halo of light around the wearer, enabling him or her to see and be seen in all directions at all times.

### Built for Risky Environments

The Halo Light is designed specifically for a hard hat, and lights the entire task area without adjustment. And unlike area task lights, The Halo Light is portable and personal, illuminating the task area without shadows regardless of where the worker moves. The Halo Light is ideally suited for a variety of markets including construction, railroad, DOTs, mining, military, oil and gas, pipeline, warehouse, and any other industry in which safety and illumination are of concern.

"There are millions of individuals who work in high-risk environments, for which the current solutions available are inadequate," said Andrew Royal, president and chief product officer at ILLUMAGEAR. "For example, many workers use less durable head lamps that break under heavy use and burn through batteries. The Halo Light is ideal for anyone wearing a hard hat and working in a high-risk environment."



## The Halo Light's features:

- 360° halo light active illumination system
- Personally visible over ¼ mile away in all directions
- Fully illuminates the task area out to the visual periphery
- Eliminates shadows no matter where you move
- Unique tension spring-mounting system connects securely to any hard hat
- Easy single button functionality
- Four light modes: high alert, normal, task, and dim
- International Protection (IP) Rating of 65 to protect against dust, dirt, and water
- Rechargeable battery lasts a minimum 2 hours on full power
- Breakaway quick-release battery cord
- Built to last in tough construction environments
- One-year warranty

### About ILLUMAGEAR

ILLUMAGEAR is a Seattle-based company focused on improving individual safety in risky environments. Founded in 2012 by Max Baker and Andrew Royal, ILLUMAGEAR's mission is to illuminate people at risk, making them safer and more prepared in any environment. ILLUMAGEAR builds personal, active, safety systems (tools, equipment, and software solutions) that lower the risk for people operating under hazardous circumstances.

ILLUMAGEAR is focused on promoting real improvement in worker safety and bringing innovative products to market that define a new category of safety gear. ILLUMAGEAR's first product is The Halo Light™, a patented 360° light system worn on a hardhat that produces a halo of light around the wearer enabling him or her to see and be seen in all directions at all times, especially in low light conditions.

For more information, please visit <http://www.illumagear.com/>.