December 1, 2019

1. REVISION OF SECTION 208

EROSION CONTROL

**NOTICE**

This is a project 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 CDOT’s Standards and Specifications Unit. 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 on all projects not having a Federal, State or Local Stormwater Construction Permit.

[Projects with less than one acre of disturbance and not part of a common plan of development].

Section 208 of the Standard Specifications is hereby deleted for this project and replaced with the following:

**DESCRIPTION**

**208.01** This work consists of constructing, installing, maintaining, and removing when required, control measures during the life of the Contract to prevent or minimize erosion, sedimentation, and pollution of any State waters as defined Section 101

Stormwater runoff from all disturbed areas and soil storage areas for which permanent or interim stabilization is not implemented, must flow to at least one control measure to minimize sediment in the discharge. This shall be accomplished through filtering, settling, or straining. The control measure shall be selected, designed, installed, and adequately sized in accordance with good engineering, hydrologic, and pollution control practices. The control measures shall contain or filter flows in order to prevent the bypass of flows without treatment and shall be appropriate for stormwater runoff from disturbed areas and for the expected flow rate, duration, and flow conditions (i.e., sheet or concentrated flow).

The Contractor shall coordinate the construction of temporary control measures with the construction of permanent control measures to assure economical, effective, and continuous erosion and sediment control throughout the construction period.

When a provision of Section 208 or an order by the Engineer requires that an action be immediate or taken immediately, it shall be understood that the Contractor shall at once begin affecting completion of the action and pursue it to completion in a manner acceptable to the Engineer.

**MATERIALS**

**208.02** Erosion control materials are subject to acceptance in accordance with Section 106. Erosion control materials shall be subject to the following approval process:

|  |  |  |
| --- | --- | --- |
| Material | Approval Process | Notes: |
| Erosion Bales (Weed Free) | COC | The Contractor shall provide a transit certificate number or a copy of the transit certificate as supplied from the producer. |
| Silt Fence | COC |  |
| Silt Berm | APL |  |
| Erosion Log (Type 1, Type 2, and Type 3) | COC |  |
| Silt Dikes | COC |  |
| Pre-fabricated Concrete Washout Structures (above ground) | APL |  |
| Pre-fabricated Vehicle Tracking Pad | APL |  |
| Aggregate Bag | COC |  |
| Storm Drain Inlet Protection  (Type I, II, and III) | APL |  |
| COC = Certificate of Compliance; APL= Approved Product List | | |

The material for control measures shall conform to the following:

1. *Erosion Bales*. Material for erosion bales shall consist of Certified Weed Free hay or straw. The hay or straw shall be certified under the Colorado Department of Agriculture Weed Free Forage Certification Program and inspected as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS. Each certified weed free erosion bale shall be identified by blue and orange twine binding the bales.

The Contractor shall not place certified weed free erosion bales or remove their identifying twine until the Engineer has inspected them.

The Contractor may obtain a current list of Colorado Weed Free Forage Crop Producers who have completed certification by contacting the:

Colorado Department of Agriculture, Weed Free Forage Program,

305 Interlocken Pkwy, Broomfield, CO 80021

Contact the Weed Free Forage Coordinator at (303) 869-9038. Also available at [www.colorado.gov/ag/csd](http://www.colorado.gov/ag/csd).

Bales shall be approximately 5 cubic feet of material and weigh at least 35 pounds. Stakes shall be wood and shall be 1.5 inch by 1.5 inch by 30 inch actual.

1. *Silt Fence*. Silt fence posts shall be wood with a minimum length of 46 inches. Wood posts shall be 1.5-inch width by 1.5-inch thickness actual dimensions with 1/8 inch tolerance. Geotextile shall be attached to wood posts with three or more staples per post.

Silt fence geotextile shall conform to the following requirements:

**Physical Requirements for Silt Fence Geotextiles**

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Wire Fence Supported Requirements** | **Self-Supported Requirements**  **Geotextile Elongation <50%** | **Test Method** |
| Grab Strength, lbs. | 90 minimum | 124 minimum | ASTM D4632 |
| Permittivity sec-1 | 0.05 | 0.05 | ASTM D4491 |
| Ultraviolet Stability | Minimum 70% Strength Retained | Minimum 70% Strength Retained | ASTM D4355 |

*Silt Fence (Reinforced)*. Silt fence posts shall be metal "studded tee" T-post with a minimum length of 66 inches. Metal posts shall be “studded tee” with 0.095-inch minimum wall thickness. Wire fabric reinforcement for the silt fence geotextile shall be a minimum of 14 gauge with a maximum mesh spacing of 6 inches. Geotextile shall be attached to welded wire fabric with ties or nylon cable ties at 12 inches on center at top, middle and bottom wire. Welded wire fabric shall be attached to the post with a minimum three 12-gauge wire ties per post. Vinyl or rubber safety caps shall be installed on all T-post.

1. *Temporary Berms*. Temporary berms shall be constructed out of compacted embankment (subsoil) and not out of salvaged topsoil.
2. *Temporary Slope Drains*. Temporary slope drains shall consist of fiber mats, plastic sheets, stone, concrete or asphalt gutters, half round pipe, metal or plastic pipe, wood flume, flexible rubber, or other materials suitable to carry accumulated water down the slopes. Outlet protection riprap shall conform to Section 506. Erosion control geotextile shall be a minimum Class 2, conforming to Section 712.
3. *Silt Berm*. Silt berm shall consist of permeable multi-use material consisting of ultraviolet (UV) stabilized high-density polyethylene or other approved material effective in reducing water velocity. Designed and tested system shall be installed on a Turf Reinforcement Mat or Soil Retention Blanket in accordance with Section 216. The segment shall be secured to the ground with either metal or wood stakes. Minimum requirements for securing stakes shall be in accordance with the plans. Dimensions of individual segments shall meet the following criteria:

|  |  |
| --- | --- |
| Width | 6 - 11 inches |
| Height | 6 - 10 inches |
| Weight | > 0.25 lbs./sq. ft. |
| Percent Open Area | 20 – 50% |

1. *Rock Check Dam*. Rock Check dams shall be constructed of stone. Stone shall meet the requirements of Section 506.
2. *Sediment Trap*. In constructing an excavated sediment trap, excavated soil may be used to construct the dam embankment, provided the soil meets the requirements of Section 203. Outlet protection riprap shall be the size specified in the Contract and shall conform to Section 506. Erosion control geotextile shall be a minimum Class 1, conforming to Section 712.
3. *Erosion Logs*. Erosion logs shall be one of the following types unless otherwise shown on the plans:
4. Erosion Log (Type 1) shall consist of cylinder casings filled with curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing shall be seamless, photo-degradable tube netting. The curled aspen wood excelsior shall be fungus free, resin free, and free of growth or germination inhibiting substances.
5. Erosion Log (Type 2) shall consist of cylinder casings filled with Erosion Log (Type 2) Compost in accordance with Section 212. The compost-wood chip blend may be pneumatically shot into a geotextile cylindrical casing or be pre-manufactured. The geotextile casing shall consist of high density polyethylene (HDPE) or polypropylene mesh (knitted, not extruded) with openings of ⅛ to ⅜ inch and contain the compost-wood chip material while not limiting water infiltration.
6. Erosion Log (Type 3) shall consist of cylinder casings filled with curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing shall be seamless, 100 percent natural fiber cylinder netting (compostable) and shall have minimum dimensions as shown in Table 208-1, based on the diameter of the log shown on the plans. Netting shall be a woven cotton or cellulose base mesh that has an approval to compost certification with a maximum mesh size of 0.075 inches and index values as shown in Table 208-2. The curled aspen wood excelsior shall be fungus free, resin free, and free of growth or germination inhibiting substances.

Natural compostable fiber netting shall not contain any synthetic material woven into the netting such as polypropylene, nylon, polyethylene, or polyester dyes. Oxo-degradable or oxo-biodegradable petrochemical-based fiber shall not be part of the netting material. Burlap netting material shall not be used for Erosion Log (Type 3).

Erosion Log (Type 1, Type 2, and Type 3) shall have minimum dimensions as shown in Table 208-1, based on the specified diameter of the log.

**Table 208-1  
Dimensions of Erosion Logs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Diameter**  **Type 1 & 3**  **(Inches)** | **Diameter**  **Type 2**  **(Inches)** | **Length (feet)** | | **Weight (minimum) (pounds/foot)** | **Stake Dimensions**  **(Inches)** |
| **Min.** | **Max.** |
| 9 | 8 | 10 | 180 | 1.6 | ¾ thickness by ¾ width by 18 long |
| 12 | 12 | 10 | 180 | 2.5 | 1.5 thickness by 1.25 width by 24 long |
| 20 | 18 | 10 | 100 | 4.0 | 1.5 thickness by 1.25 width by 30 long |

Wood stake acceptable tolerance +/- 1/8 inch.

**Table 208-2  
Index Values for Natural Fiber Netting**

|  |  |  |
| --- | --- | --- |
| **Property** | **Requirement** | **Test Method** |
|
| Fabric Tensile Strength | >70 lbs. | ASTM D3822 |
| Biodegradable | 100% | ASTM D5988 |
| Mesh Pattern | Rib |  |

Stakes to secure erosion logs shall consist of pinewood or hardwood.

1. *Silt Dikes*. Silt dikes shall be pre-manufactured flexible sediment barrier that will fully rebound when driven over by heavy equipment. Material shall consist of outer geotextile fabric covering closed cell urethane or polyethylene foam core. The geotextile fabric aprons shall extend beyond the foam core a minimum of 8 inches on both sides.

**Table 208-3  
Geotextile Requirements**

|  |  |  |
| --- | --- | --- |
| **Property** | **Requirement** | **Test Method** |
|
| Water Flow Rate | 100-150 gallons per minute/square foot | ASTM D4491 |
| Grab Breaking Load | 200 lbs. minimum in each direction | ASTM D4632 |
| Ultraviolet Degradation | 70% of original unexposed grab breaking load after 500 hours | ASTM D4595 |

Each silt dike segment shall have the following dimensions:

**Dimension Length**

Vertical height after installation >5 inches

Geotextile sleeve section to interlock segments >8 inches

Silt dike segments shall be anchored down using the minimum requirements shown in Table 208-4.

**Table 208-4  
Silt Dike Segment Requirements**

|  |  |  |
| --- | --- | --- |
| **Surface** | **Nail** | **Washers** |
|
| Soil Surface | Installed in 4 inch deep trench with 6 inch nails no more than 4 feet O.C. (on center) | 1 inch washers |
| Hard Surface | 1 inch concrete nails no more than 4 feet O.C. | 1 inch washers and solvent-free adhesive |

1. *Concrete Washout Structure*. The Contractor shall construct a washout structure that will contain washout from concrete placement, construction equipment cleaning operations, and residue from cutting, coring, grinding, grooving, and hydro-concrete demolition. Embankment required for the concrete washout structure may be excavated material, provided that this material meets the requirements of Section 203 for embankment. If the bottom of the excavated structure is within 5 feet of anticipated high ground water elevation or the soil does not have adequate buffering capacity to meet water quality standards, an impermeable synthetic liner shall be installed with the minimum properties shown in Table 208-5.

**Table 208-5  
Impermeable Synthetic Liner Requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tested Property** | **Test Method** | **Units** | **Value** |
| Thickness | ASTM D5199 | mil | >30 +/- 1.5 |
| Tear Strength | ASTM D1004 | lbs | >8 |
| Low Temperature Impact | ASTM D1790 | °F | Pass at -20 |

1. *Pre-Fabricated Concrete Washout Structure.* Pre-Fabricated Concrete Washout Structures shall be one of the following types unless otherwise shown on the plans:
2. Pre-Fabricated Concrete Washout Structure (Type 1). Type 1 portable bins shall be used only when specified in the Contract. It shall consist of a watertight multi-use container designed to contain liquid concrete washout wastewater, solid residual concrete waste from washout operations, and residue from saw cutting, coring, grinding, grooving, and hydro-concrete demolition. Minimum capacity including freeboard shall be 440 gallons.
3. Pre-Fabricated Concrete Washout Structure (Type 2). Type 2 portable bins shall be used only when specified in the Contract. It shall consist of a watertight one-time use container designed to contain liquid concrete washout wastewater, solid residual concrete waste from washout operations, and residue from saw cutting, coring, grinding, grooving, and hydro-concrete demolition. The structure shall have a system to secure to the ground. Minimum capacity including freeboard shall be 50 gallons.
4. *Vehicle Tracking Pad (VTP)*. Aggregate for the vehicle tracking pad shall be crushed natural aggregate with at least two fractured faces that meets the following gradation requirements:

**Sieve size Percent by weight**

**Passing Square Mesh Sieves**

75 mm (3 inch) 100

50 mm (2 inch) 0-25

19.0 mm (¾ inch) 0-15

Recycled crushed concrete or asphalt shall not be used for vehicle tracking pads.

Erosion control geotextile shall be a minimum Class 2, conforming to Section 712.

Pre-Fabricated or manufactured vehicle tracking pads shall only be used if specified in the Contract. Multi-use pads shall consist of industrial grade materials and shall be designed to minimize sediment leaving the project.

Minimum dimensions of the modular systems shall be:

|  |  |
| --- | --- |
| Width | 12 feet |
| Length of pad | 35 feet |

To accommodate construction traffic turning radii between the tracking pad and a stabilized surface, additional flared sections of approved pads or aggregate in accordance with this specification shall be used at no additional cost to CDOT.

|  |  |
| --- | --- |
| Weight (min.) (lbs./sq. ft.) | 8 |
| Crush strength (min.) (psi) | 400 |

If pads weigh less than 8 pounds per square foot, an anchoring system approved by the manufacturer shall be used for pads placed on soil and hard surfaces.

A thin layer of stone, geotextile, or other stable surface may be required to stop rutting under the pad or area where the vehicles mount or dismount the manufactured trackout control device.

1. *Aggregate Bag*. Aggregate bags shall consist of crushed stone or recycled rubber filled fabric with the following properties:

|  |  |
| --- | --- |
| **Diameter (inches)** | **Weight (minimum)**  **(pounds per foot)** |
| 6-8 | 6 |
| 10 | 10 |
| 12 | 15 |

Rubber used in bags shall be clean, 95 percent free of metal and particulates.

Crushed stone contained in the aggregate bags shall conform to Table 703-1 for Coarse Aggregate No. 6.

The aggregate bag shall consist of a woven geotextile fabric with the following properties:

|  |  |  |
| --- | --- | --- |
| **Property** | **Requirement** | **Test Method** |
| Grab Tensile Strength | 90 lbs. min. | ASTM D4632 |
| Trapezoid Tear Strength | 25 lbs. min. | ASTM D4533 |
| Mullen Burst | 300 psi | ASTM D3786 |
| Ultraviolet Resistance | 70% | ASTM D4355 |

1. *Storm Drain Inlet Protection*. Storm drain inlet protection shall consist of aggregate filled fabric with the following dimensions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Storm Drain Inlet Protection Properties** | **Protection Types** | | |
| **Type I1** | **Type II2** | **Type III3** |
| Diameter | 4 in. | 4 in. | N/A |
| Minimum Section Length | 7 ft. | 5 ft. | 5 ft. |
| Apron Insert | --- | 30 in. or sized to grate | 30 in or sized to grate |
| 1Type I protection shall be used with Inlet Type R.  2Type II protection shall be used with Combination Inlet. Option A or B  3Type III protection shall be used with Vane Grate Inlet only. Option A or B  Note: Options A and B are shown on Standard Plan M-208-1. | | | |

The Storm Drain Inlet Protection (Type I, II and III) shall consist of a woven geotextile fabric with the following properties:

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Test Method** | **Unit** | **Requirement** |
| Grab tensile strength | ASTM D4632 | lbs. | minimum 150X200 |
| Mullen Burst Strength | ASTM D3786 | lbs. | 400 |
| Trapezoid Tear Strength | ASTM D4533 | lbs. | minimum 60X60 |
| Percent Open Area | COE-22125-86 | % | ≥20 |
| Water Flow Rate | ASTM D4491 | gal./min./sq. ft. | ≥100 |
| Ultraviolet Resistance | ASTM D4355 | % | ≥70 |

Curb roll for Storm Drain Inlet Protection (Type I and II) shall have a weight >4 pounds per linear foot of device. The device shall be capable of conforming to the shape of the curb. Aggregate contained in the storm drain inlet device shall consist of gravel or crushed stone conforming Table 703-1 for Coarse Aggregate No. 6.

**CONSTRUCTION REQUIREMENTS**

**208.03 Project Review, Schedule, and Erosion Control Management.**

Prior to construction the Contractor shall implement control measures in accordance with the approved project schedule as described in this section.

At the Pre-Construction Conference, the attendees shall discuss the Stormwater Management Plan (SWMP), maintaining water quality standards, sensitive habitats on-site, wetlands, other vegetation to be protected, and the enforcement mechanisms for not meeting the requirements of this specification.

Prior to beginning construction, the Contractor shall evaluate the project site for storm water draining into or through the site. When such drainage is identified, control measures shall be used if possible to divert stormwater from running on-site and becoming contaminated with sediment or other pollutants. The diversion may be accomplished with a temporary pipe or other conveyance to prevent water contamination or contact with pollutants. Run-on water that cannot be diverted shall be treated as construction runoff and adequate control measures shall be employed.

The SWMP Administrator shall evaluate all non-stormwater coming onto the site, such as springs, seeps, and landscape irrigation return flow. If such flow is identified, control measures shall be used to protect off-site water from becoming contaminated with sediment or other pollutants.

The SWMP Administrator shall review existing inlets and culverts to determine if inlet protection is needed due to water flow patterns. Prior to beginning construction, inlets and culverts needing protection shall be protected and the location of the implemented control measure added to the SWMP site map.

Prior to construction, the Contractor shall implement appropriate control measures for protection of wetlands, sensitive habitat, and existing vegetation from ground disturbance and other pollutant sources, in accordance with the approved project schedule as described in Section 208.

When additional control measures are required and approved by the Engineer, the Contractor shall implement the additional control measures and the SWMP Administrator shall record and describe them on the SWMP site map. The approved control measures will be measured and paid for in accordance with Section 208.

1. *Project Review*. The Contractor shall submit modifications to the Contractor’s control measures or SWMP in a written proposal to the Engineer. The written proposal shall include the following information:
2. Reasons for changing the control measures.
3. Diagrams showing details and locations of all proposed changes.
4. List of appropriate pay items indicating new and revised quantities.
5. Schedules for accomplishing all erosion and sediment control work.
6. Effects on certifications caused by the proposed changes.

The Engineer will approve or reject the written proposal in writing within seven days after receipt of the submittal. The Engineer may require additional control measures prior to approving the proposed modifications. Additional modifications and additional control measures will be paid for at the Contract Unit Price for the specific items involved. If no items exist, they will be paid for as extra work in accordance with Section 109.

1. *Erosion and Sediment Control Activities*. The erosion and sediment control activities shall be included in the weekly meeting update. The project schedule shall specifically indicate the sequence of clearing and grubbing, earthwork operations, and construction of temporary and permanent erosion control features and stabilization. The project schedule shall include erosion and sediment control work for haul roads, borrow pits, storage, asphalt or concrete batch sites, and all areas within the project limits. If during construction the Contractor proposes changes which would affect the Contract's control measures, the Contractor shall propose revised control measures to the Engineer for approval in writing. If necessary, the Contractor shall update proposed sequencing of major activities in the SWMP. Revisions shall not be implemented until the proposed measures have been approved in writing by the Engineer.
2. *Erosion Control Management (ECM).* Erosion Control Management for this project shall consist of SWMP Administration and Erosion Control Inspection. All ECM staff shall have working knowledge and experience in construction, and shall have successfully completed the Transportation Erosion Control Supervisory Certificate Training (TECS) as provided by the Department. The Superintendent may be permitted to serve in an ECM role, unless otherwise specified in the contract.
3. SWMP Administration. The SWMP shall be maintained by a SWMP Administrator. The name of the SWMP Administrator shall be recorded on the SWMP. The SWMP Administrator shall have full responsibility to maintain and update the SWMP and identify all critical action items needed to maintain water quality standards:
4. Complete the SWMP as described in Section 208.
5. Participate in the Pre-Construction Conference.

1. Attend erosion and sediment control meetings.

1. Implement necessary actions to reduce erosion or water quality problems, anticipated or presently existing, resulting from construction activities.
2. Ensure that all labor, material, and equipment needed to install, maintain, and remove control measures are available as needed.
3. During construction, the SWMP site map shall be updated to reflect current field conditions and include, at a minimum, the following if applicable:
4. Limits of Construction (LOC).
5. Areas of disturbance (AD), including areas of borrow and fill.
6. Limits of Disturbance (LDA).
7. Areas used for storage of construction materials, equipment, soils, or wastes.
8. Location of dedicated asphalt, concrete batch plants, and masonry mixing stations.
9. Location of construction offices and staging areas.
10. Location of work access routes during construction.
11. Location of waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt.
12. Location of temporary, interim and permanent stabilization.
13. Location of outfalls.
14. Flow arrows that depict stormwater flow directions on-site and runoff direction.
15. Location of structural and non-structural control measures.
16. Location of springs, streams, wetlands, and other State waters, including areas that require pre-existing vegetation be maintained within 50 horizontal feet of a receiving water, unless infeasible.
17. Location of stream crossings located within the construction site boundary.
18. Start a new site map before the current one becomes illegible. All site maps shall remain as part of the SWMP.
19. Install control measures according to Standard Plans M-208-1, M-216-1, and M-615-1.
20. Record in the SWMP, the approved Method Statement for Containing Pollutant Byproducts.
21. Update the Potential Pollutants list in the SWMP and Spill Response Plan throughout construction.
22. Erosion Control Inspector (ECI).

The SWMP Administrator shall complete the duties of the ECI.

1. ECI duties shall be as follows:
2. Inspect initial placement and adherence to approved SWMP and SWMP site plan control measures
3. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges.
4. Identify all areas of concern that may impact water quality and, if necessary, implement corrective actions.

Ensure all other agency Stormwater and inspection requirements are followed unless a waiver or other agreement has been made.

1. The ECI shall immediately report to the Contractor and Engineer the following instances:

Noncompliance which may endanger health or the environment, regardless of the cause of the incident.

Spills or discharges which exceeds any water quality standards.

Upset conditions which cause an exceedance of any water quality standards.

1. Document spills, leaks, or overflows that result in the discharge of pollutants. The ECI shall record the time and date, weather conditions, reasons for spill, and how it was remediated.
2. *Documentation Available on the Project*. The following Contract documents and references shall be made available for reference at the CDOT field office during construction:

SWMP. The Engineer will provide an approved SWMP design (includes items (1) through (4) as listed below) at the Pre-construction Conference, which is and shall remain the property of CDOT. The following Contract documents and reports shall be included or kept maintained, (as applicable), and updated in the SWMP under the appropriate items by the SWMP Administrator:

* + - 1. SWMP Plan Sheets – Notes, tabulation, site description, sequence of major activities, area of disturbance, existing soil data, existing vegetation percent cover, potential pollutant sources, receiving water, non-stormwater discharges and environmental impacts.
      2. SWMP Site Maps and Project Plan Title Sheet, if included in the original contract.
      3. Specifications – Standard and project special provisions related to stormwater and erosion control.
      4. Standard Plans M-208-1, M-216-1 and M-615-1.
      5. Control measure Details not in Standard Plan M-208-1 – project specific non-standard details.
      6. All Water Quality Audit Reports and Form 105(s) relating to Water Quality, if applicable.
      7. Spill Response Plan – Reports of reportable spills submitted to CDPHE.
      8. List and Evaluation of Potential Pollutants – List of potential pollutants as described in subsection 107.25 and approved Method Statement for Containing Pollutant Byproducts.
      9. Other Correspondence including agreements with other Municipal Separate Storm Sewer System (MS4s), approved deferral request, CDPHE audit documentation.
      10. TECS Certifications of the SWMP Administrator, kept current through the life of the project.
      11. Pre-construction Conference – Conference agenda with a certification of understanding for maintaining water quality standards and SWMP. The certification shall be signed by all attendees. A certification shall also be signed by all attendees of meetings held for new subcontractors beginning work on the project that could adversely affect water quality after the Pre-construction Conference has been held, if applicable.
      12. All Project Environmental Permits – All project environmental permits and associated applications and certifications, including, water quality standards, Senate Bill 40, USACE 404, temporary stream crossings, dewatering, biological opinions, and all other permits applicable to the project, including any separate permits obtained by the Contractor for staging area on private property, asphalt or concrete batch plant, etc.

The Engineer will incorporate the documents and reports available at the time of award. The Contractor shall provide and insert all other documents and reports as they become available during construction.

Reference Materials. The following Reference materials shall be used:

* + - 1. CDOT Erosion Control and Stormwater Quality Guide.
      2. CDOT Erosion Control and Stormwater Quality Field Guide.

1. *Weekly Meetings*: If applicable, the Contractor shall conduct a weekly meeting with the Engineer and subcontractors to discuss construction activities that could adversely affect water quality, including the following:
2. Unresolved issues from observations.
3. Requirements of the SWMP.
4. Problems that may have arisen in implementing the site specific SWMP or maintaining control measures.
5. Control measures that are to be installed, removed, modified, or maintained, and associated SWMP modifications.
6. Planned activities that will affect stormwater in order to proactively phase control measures.

**208.04 Control Measures for Stormwater.**

The SWMP Administrator shall modify the SWMP to clearly describe and locate all control measures implemented at the site to control potential sediment discharges.

Vehicle tracking pads shall be used at all vehicle and equipment exit points from the site to prevent sediment exiting the limits of construction (LOC) of the project site. Access shall be provided only at locations approved by the Engineer. The SWMP Administrator shall record vehicle tracking pad locations on the SWMP site map.

New inlets and culverts shall be protected during their construction. Appropriate protection of each culvert and inlet shall be installed immediately. When riprap is called for at the outlet of a culvert, it shall be installed within 24 hours of completion of each pipe. The Contractor shall remove sediment, millings, debris, and other pollutants from within the newly constructed drainage system, prior to use, at the Contractor’s expense. All removed sediment shall be disposed of outside the project limits in accordance with all applicable regulations.

Concrete products wasted on the ground during construction including, but not limited to, excess concrete removed from forms, spills, slop, and all other unused concrete are potential pollutants that shall be removed from the site or contained at a pre-approved containment area that has been identified in the SWMP. The concrete shall be picked up and recycled in accordance with 6 CCR 1007-2 (CDPHE Regulations Pertaining to Solid Waste Sites and Facilities) at regular intervals, as needed, or as directed by the Engineer.

1. *Unforeseen Conditions*. The Contractor shall design and implement erosion and sediment control measures for correcting conditions unforeseen during the design of the project, or for emergency situations that develop during construction. The Department’s Erosion Control and Stormwater Quality Guide shall be used as a reference document for the purpose of designing erosion and sediment control measures. Measures and methods proposed by the Contractor shall be reviewed and approved in writing by the Engineer prior to installation.
2. *Other Agencies*. If CDPHE, US Army Corps of Engineers (USACE), the Environmental Protection Agency (EPA), or a Local Agency reviews the project site and requires additional measures to prevent and control erosion, sediment, or pollutants, the Contractor shall cease and desist activities resulting in pollutant discharge and immediately implement these measures. If the work may negatively affect another MS4, the Contractor shall cease and desist activities resulting in the discharge and shall implement appropriate measures to protect the neighboring MS4, including installing additional measures. Implementation of these additional measures will be paid for at contract unit prices.
3. *Work Outside the Right of Way*. Disturbed areas, including staging areas, which are outside CDOT ROW and outside easements acquired by CDOT for construction, are the responsibility of the Contractor.
4. *Construction Implementation*. The Contractor shall incorporate control measures into the project as outlined in the accepted schedule.
5. *Stabilization*. Once earthwork has started, the Contractor shall maintain erosion control measures until permanent stabilization of the area has been completed and accepted. Clearing, grubbing and slope stabilization measures shall be performed regularly to ensure final stabilization. Failure to properly maintain erosion control and stabilization methods, either through improper phasing or sequencing will require the Contractor to repair or replace sections of earthwork at the Contractor’s expense. The Contractor shall schedule and implement the following stabilization measures during the course of the project:
6. Temporary Stabilization. At the end of each day, the Contractor shall stabilize disturbed areas by surface roughening, vertical tracking, or a combination thereof. Disturbed areas are locations where actions have been taken to alter the existing vegetation or underlying soil of a site, such as clearing, grading, road bed preparation, soil compaction, and movement and stockpiling of sediment and materials. Designated topsoil distributed on the surface or in stockpiles shall not receive temporary stabilization. Other stabilization measures may be implemented, as approved.

1. Interim Stabilization. As soon as it is known with reasonable certainty that work will be temporarily halted for 14 days or more, sediment and material stockpiles and disturbed areas shall be stabilized using one or more of the specified following methods:
2. Application of 1.5 tons per acres of mechanically crimped certified weed free hay or straw in combination with an approved organic mulch tackifier.
3. Placement of bonded fiber matrix in accordance with Section 213.
4. Placement of mulching (hydraulic) wood cellulose fiber mulch with tackifier, in accordance with Section 213.
5. Application of spray-on mulch blanket in accordance with Section 213. Magnesium Chloride, Potassium Chloride and Sodium Chloride, or other salt products, shall not be used as a stabilization method.

(5) Topsoil stockpiles shall receive interim stabilization in accordance with Section 207, unless specified as a different material than the other disturbed areas on-site.

1. Summer and Winter Stabilization. Summer and winter stabilization is defined as stabilization during months when seeding will not be permitted. As soon as the Contractor knows shutdown is to occur, interim stabilization shall be applied to the disturbed area. Protection of the interim stabilization method is required. Reapplication of interim stabilization may be required as directed.
2. Permanent Stabilization. Permanent stabilization is defined as the covering of disturbed areas with topsoil, seeding, mulching with tackifier, soil retention coverings, and such non-erodible methods as riprap, road shouldering, etc., or a combination thereof as required by the Contract. Other permanent stabilization techniques may be proposed by the Contractor, in writing, and shall be used when approved in writing by the Engineer. All permanent stabilization requirements shown on the plans shall be completed within four working days of the placement of the topsoil in accordance with Section 207.
3. Final Stabilization. Final stabilization is achieved when all ground disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent physical erosion reduction methods have been employed.
4. *Maintenance*. Erosion and sediment control practices and other protective measures identified in the SWMP as control measures for stormwater pollution prevention shall be maintained in effective operating condition until final acceptance of the project. Control measures shall be continuously maintained in accordance with good engineering, hydrologic, and pollution control practices, including removal of collected sediment when silt depth is 50 percent or more of the effective height of the erosion control device. When possible, the Contractor shall use equipment with an operator rather than labor alone to remove the sediment.

Maintenance of erosion and sediment control devices shall include replacement of such devices upon the end of their useful service life as recommended by the Contractor and approved by the Engineer. Maintenance of rock check dams and vehicle tracking pads shall be limited to removal and disposal of sediment or addition of aggregate. Damages resulting from failure to maintain control measures shall be repaired at the Contractor’s expense.

Site assessments shall be performed to assess the adequacy of control measures at the site and the necessity of changes to those control measures to ensure continued effective performance. Where site assessment results in the determination that new or replacement control measures are necessary, the control measures shall be installed to ensure continuous effectiveness. When identified, control measures shall be maintained, added, modified or replaced as soon as possible, immediately in most cases.

Approved new or replaced control measures will be measured and paid for in accordance with this section. Devices damaged due to the Contractor's negligence shall be replaced at the Contractor’s expense.

From the time seeding and mulching work begins until project acceptance the Contractor shall maintain all seeded areas. Damage to seeded areas or to mulch materials shall be immediately restored. If damage is due to Contractor negligence, it shall be restored at the Contractor’s expense. Restoration of other damaged areas will be measured and paid for under the appropriate bid item.

Temporary control measures may be removed prior to final acceptance of the project, as determined by the Engineer. If removed, the area in which these control measures were constructed shall be returned to a condition similar to that which existed prior to its disturbance. Removed control measures shall become the property of the Contractor. Maintenance shall be notified of the locations of any control measures left in place.

If the Contractor fails to complete construction within the approved contract time, the Contractor shall continue erosion and sediment control operations at its expense until acceptance of the work.

Sediment removed during maintenance of control measures and material from street sweeping may be used in or on embankment, provided it meets the requirements of Section 203 and is distributed evenly across the embankment.

Whenever sediment collects on the paved surface, the surface shall be cleaned. Street washing will not be allowed. Storm drain inlet protection shall be in place prior to shoveling, sweeping, or vacuuming. Sweeping shall be completed with a pickup broom or equipment capable of collecting sediment. Sweeping with a kick broom will not be allowed.

Material from pavement saw cutting operations shall be cleaned from the roadway surface during operations using a vacuum. A control measure, such as a berm, shall be placed to contain slurry from joint flushing operations until the residue can be removed from the soil surface. Aggregate bags, erosion logs or other permeable control measures shall not be used. Residue shall not flow into driving lanes. It shall be removed and disposed of in accordance with subsection 107.25. Material containment and removal will not be paid for separately, but shall be included in the work.

**208.05 Construction of Control Measures.** Control measures shall be constructed in accordance with Standard Plans M-208-1 and M-216-1, and with the following:

1. *Seeding, Mulching, Sodding, Soil Retention Blanket*. Seeding, mulching, sodding, and soil retention blanket installation shall be performed in accordance with Sections 212, 213, and 216.
2. *Erosion Bales*. The bales shall be anchored securely to the ground with wood stakes. Erosion Bales shall be entrenched 4 inches minimum into the soil, tightly abutted with no gaps, staked, and backfilled around the entire outside perimeter. Erosion Bales cannot be used for Check Dams.
3. *Silt Fence*. Silt fence shall be installed in locations as per M standard plans 208-1 and as specified in the Contract.
4. *Temporary Berms*. Berms shall be constructed to the dimensions as per M 208-1 standard plans and as shown in the Contract, and sufficiently compacted to prevent erosion or failure. If the berm erodes or fails, it shall be immediately repaired or replaced at the Contractor's expense. Berms must be at least 18 inches tall or high enough to prevent overtopping. Berms must have a minimum of 4 to 6-foot base. Gradient of all receiving area above berm must be less than 2:1, or flatter. Outlets of anticipated flow from captured water behind berms must be designed with additional control measures suitable to control concentrated flow. Maximum drainage area for each outlet must be limited to 2 acres.
5. *Temporary Diversion*. Diversions shall be constructed to the dimensions as per M standard plans 208-1 and as shown in the Contract and graded to drain to a designated outlet. The berm shall be sufficiently compacted to prevent erosion or failure. If the diversion erodes or fails, it shall be immediately repaired or replaced at the Contractor's expense.
6. *Temporary Slope Drains*. Temporary slope drains shall be installed prior to installation of permanent facilities or growth of adequate ground cover on the slopes. All temporary slope drains shall be securely anchored to the slope. The inlets and outlets of temporary slope drains shall be protected to prevent erosion. Ensure drainage area for every slope drain is smaller than 5 acres. Ensure pipe or channel is properly sized, and for drainage areas larger than 1 acre the pipe size must be designed by an Engineer to ensure the drainage structure can accommodate the runoff resulting from a 2-year, 24-hour storm event. The use of prefabricated flared inlet sections is recommended.
7. *Silt Berm*. Prior to installation of silt berms, the Contractor shall prepare the surface of the areas in which the berms are to be installed such that are they free of materials greater than 2 inches in diameter and are suitably smooth for the installation of the silt berms, as approved. See M standard 208-1 for details. Silt berms shall be secured with spikes. The Contractor shall install the silt berm in a manner that will prevent water from going around or under the silt berm. Silt berms shall be installed on top of soil retention blanket or turf reinforcement blanket.
8. *Rock Check Dam*. Rock shall be installed at locations shown on the plans. Rock check dams shall conform to the dimensions shown on the plans. The Geotextile Erosion Control shall be Class 2 and conform to the requirements of Section 712, and shall extend up ⅔ of the riprap height with 6inch minimum cover over geotextile. Rock Check Dam shall be installed within a ditch sub excavated 6 inches below the flow line. The ends of the rip rap check dam shall be a minimum of 6 inches higher than the center of the check dam. Stone shall meet the requirements of Section 506. Larger rocks with larger void spaces should be used on top. See M standard 208-1 for details.
9. *Riprap Outlet Protection*. Geotextile used shall be protected from cutting or tearing. Overlaps between two pieces of geotextile shall be 1-foot minimum. Riprap size shall be in accordance with Section 506 and as shown on the plans.
10. *Storm Drain Inlet Protection*. Prior to installation, the Contractor shall sweep the surface of the area in which the storm drain inlet protection devices are to be installed such that the pavement is free of sediment and debris. The ends of the inlet protection Type 1 and Type 2 shall extend a minimum of 1 foot past each end of the inlet.

The Contractor shall remove all accumulated sediment and debris from the surface surrounding all storm drain inlet protection devices after each rain event or as directed. The Contractor shall remove accumulated sediment from each Type II and III containment area when it is more than one third full of sediment, or as directed.

The Contractor shall protect storm drain facilities adjacent to locations where pavement cutting operations involving wheel cutting, saw cutting, sand blasting, or abrasive water jet blasting are to take place.

1. *Sediment Trap*. Sediment traps shall be installed to collect sediment laden water and to minimize the potential of pollutants leaving the project site. Locations shall be in accordance with M standard 208-1 and as shown on the plans or as directed.

Sediment traps shall be constructed prior to disturbance of upslope areas and shall be placed in locations where runoff from disturbed areas can be diverted into the trap.

The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and roots.

Fill material for the embankment shall be free of roots or other vegetation, organic material, large stones, and other objectionable material.

Sediment shall be removed from the trap when it has accumulated to one half of the wet storage depth of the trap and shall be disposed of in accordance with Section 208.

1. *Erosion Logs*. Erosion logs shall be embedded 2 inches into the soil. Stakes shall be embedded so that the top of the stake does not extend past the top erosion log more than 2 inches, at the discretion of the Engineer, a shallower stake depth may be permitted if adverse site conditions are encountered, e.g. rock or frozen ground.

The Contractor shall maintain the erosion logs during construction to prevent sediment from passing over or under the logs. See M standard 208-1 for details.

1. *Silt Dikes*. Prior to installation of silt dikes, the Contractor shall prepare the surface of the areas in which the silt dikes are to be installed such that they are free of materials greater than two inches in diameter and are suitably smooth for the installation of the silt dikes, as approved by the Engineer.
2. *Concrete Washout Structure*. The concrete washout structure shall meet or exceed the dimensions shown on the plans. Work on this structure shall not begin until written acceptance of location is provided by the Engineer. See M standard 208-1 for details.

Control measures designed for concrete washout waste shall be implemented. If the bottom of the excavated structure is within 5 feet of anticipated high ground water elevation or the soil does not have adequate buffering capacity to meet water quality standards, an impermeable synthetic liner shall be installed with the minimum properties shown in Table 208-5 or use a prefabricated washout.

The following requirements shall be met:

1. The structure shall contain all washout water.
2. Stormwater shall not carry wastes from washout and disposal locations.
3. The site shall be located a minimum of 50 horizontal feet away from State waters and shall meet all requirements for containment and disposal as defined in subsection 107.25.
4. The site shall be signed as “Concrete Washout”.
5. The site shall be accessible to appropriate vehicles.
6. Freeboard capacity shall be included in the structure design to reasonably ensure the structure will not overtop during or because of a precipitation event.
7. The Contractor shall prevent tracking of washout material out of the washout structure.
8. Solvents, flocculants, and acid shall not be added to wash water.
9. The structure shall be surrounded on three sides by a compacted berm.
10. The structure shall be fenced with orange plastic construction fencing conforming to Section 607, to provide a barrier to construction equipment and to aid in identification of the concrete washout area.
11. Concrete waste, liquid and solid, shall not exceed ⅔ the storage capacity of the washout structure.
12. A concrete washout sign shall have letters at least 3 inches high and conform to Section 630.
13. *Pre-fabricated concrete washout structures (Type 1 and Type 2).* Structures and sites shall meet the following requirements:
14. Structure shall contain all washout water. If bins are determined to be leaking, the Contractor shall replace the bin on-site and clean up the spilled material and dispose of it properly.
15. Structure shall be located a minimum of 50 horizontal feet away from State waters, and shall be confined so that no potential pollutants will enter State waters and other sensitive areas as defined in the Contract. Locations shall be as approved by the Engineer. The pre-fabricated structure shall be signed as “Concrete Washout”. Sign can be on portable bin.
16. The site shall be accessible to appropriate vehicles.
17. Washout bins shall be covered with a tarp tied down to the structure or staked to the ground when a storm event is anticipated.
18. Solvents, flocculants, and acid shall not be added to wash water.
19. Concrete waste, liquid and solid, shall not exceed ⅔ the storage capacity of the washout structure.
20. Prefabricated structures cannot be moved when they contain liquid, unless otherwise approved.
21. The concrete washout structure shall be installed and ready for use prior to concrete placement operations.
22. Washout areas shall be checked and maintained as required. On-site permanent disposal of concrete washout waste is not allowed.

All liquid and solid wastes, including contaminated sediment and soils generated from concrete washout shall be hauled away from the site and disposed of properly at the Contractor's expense.

Delivery to the site shall not occur until written acceptance is provided by the Engineer for both the product and the concrete waste disposal facility.

1. *Vehicle Tracking Pad (VTP)*. Vehicle tracking pads shall be constructed to the minimum dimensions shown in the Contract, unless otherwise directed by the Engineer. Construction of approved vehicle tracking pads shall be completed before any disturbance of the area.

The Contractor shall maintain each vehicle tracking pad during the entire time that it is in use for the project. The vehicle tracking pad shall be removed at the completion of the project unless otherwise directed by the Engineer. Additional aggregate may be required for maintenance and will be paid for under Pay Item, Maintenance Aggregate (Vehicle Tracking Pad).

1. *Detention Pond*. Permanent detention ponds shown on the construction plans may be used as temporary control measures if all the following conditions are met:
   * + 1. The pond is designated as a construction control measure in the SWMP.
       2. The pond outfall and outlet are designed and implemented for use as a control measure during construction in accordance with good engineering, hydrologic, and pollution control practices. The stormwater discharges from the outfall shall not cause degradation or pollution of State waters, and shall have control measures, as appropriate.
       3. All silt shall be removed and the pond returned to the design grade and contour prior to project acceptance.
2. *Aggregate Bag*. Aggregate bags shall be placed on a stable surface, consisting of hardscape or compacted gravel. If approved by the Engineer, the aggregate bag may be placed on compacted dirt areas, where bags conform to the surface and can effectively minimize sediment transport. Aggregate bags can be used on frozen ground when other control measures cannot be trenched or staked, but only until the ground is capable of being trenched and staked. Aggregate bags shall not be placed in concentrated flow areas, other than gutter pans. Aggregate bags shall be placed to conform to the surface without gaps to ensure that discharge water does not cause erosion. See M standard 208-1 for details.
3. *Surface roughening*. Surface roughening creates horizontal grooves along the contour of the slope. Roughening may be accomplished by furrowing, scarifying, ripping, or disking the soil surface to create a 2 to 4-inch minimum variation in soil surface.
4. *Vertical Tracking*. Vertical tracking involves driving a tracked vehicle up and down the soil surface and creating horizontal grooves and ridges along the contour of the slope. Sandy soils or soils that are primarily rock need not be tracked.

**208.06 Materials Handling and Spill Prevention.** The SWMP Administrator shall clearly describe and record on the SWMP, all practices implemented at the site to minimize impacts from procedures or significant material that could contribute pollutants to runoff. Areas or procedures where potential spills can occur shall have a Spill Response Plan in place as specified in subsection 107.25 or Section208. Construction equipment, fuels, lubricants, and other petroleum distillates shall not be stored or stockpiled within 50 horizontal feet of any State waters or more if the Contractor determines necessary. Equipment fueling and servicing shall occur only within approved designated areas.

1. *Bulk storage structures*. Bulk storage structures for petroleum products and other chemicals shall have impervious secondary containment or equivalent adequate protection so as to contain all spills and prevent any spilled material from entering State waters. Secondary containment shall be capable of containing the combined volume of all the storage containers plus at least 10 percent freeboard. For secondary containment that is used and may result in accumulation of stormwater within the containment, a plan shall be implemented to properly manage and dispose of all accumulated stormwater which is deemed to be contaminated (e.g., has an unusual odor or sheen).
2. *Lubricant Leaks*. The Contractor shall inspect equipment, vehicles, and repair areas daily to ensure petroleum, oils, and lubricants (POL) are not leaking onto the soil or pavement. Absorbent material or containers approved by the Engineer shall be used to prevent leaking POL from reaching the soil or pavement. The Contractor shall have onsite approved absorbent material or containers of sufficient capacity to contain any POL leak that can reasonably be foreseen. The Contractor shall inform all Spill Response Coordinators in accordance with the Spill Response Plan if unforeseen leakage is encountered. All materials resulting from POL leakage control and cleanup shall become the property of the Contractor and shall be removed from the site. Control, cleanup, and removal of by-products resulting from POL leaks shall be performed at the Contractor's expense.
3. *Spill Response Plan*. A Spill Response Plan shall be developed and implemented to establish operating procedures for handling potential pollutants and preventing spills.

The Response Plan shall contain the following information:

1. Identification and contact information of each Contractor, CDOT spill cleanup coordinators and the SWMP Administrator.
2. Locations of areas on the project site where equipment fueling and servicing operations are permitted.
3. Location of cleanup kits.
4. Quantities of chemicals and locations stored on site.
5. Label system for chemicals and Safety Data Sheets (SDS) for products.
6. Clean up procedures to be implemented in the event of a spill that does not enter State waters or ground water.
7. Procedures for spills of any size that enter surface waters or ground water, or have the potential to do so. CDOT’s Erosion Control and Stormwater Quality Guide contains spill notification contacts and phone numbers required in the Spill Response Plan.
8. A summary of the employee training provided.

Information in items (1) through (8) shall be updated in the SWMP when they change.

**208.07 Stockpile Management.** Material stockpiles shall be located 50 horizontal feet away from State waters, and shall be confined so that no potential pollutants will enter State waters and other sensitive areas as defined in the Contract. Locations shall be approved by the Engineer.

Erodible stockpiles (including topsoil) shall be contained with acceptable control measures at the toe (or within 20 feet of the toe) throughout construction. Control measures shall be approved by the Engineer. The SWMP Administrator shall describe, detail, and record the sediment control devices on the SWMP.

**208.08 Limits of Disturbance.** The Contractor shall limit construction activities to those areas within the limits of disturbance shown on the plans and cross-sections. Construction activities, in addition to the Contract work, shall include the on-site parking of vehicles or equipment, on-site staging, on-site batch plants, haul roads or work access, and all other activities which would disturb existing soil conditions. Staging areas within the LDA shall be as approved by the Engineer. Construction activities beyond the limits of disturbance due to Contractor negligence shall be restored to the original condition by the Contractor at the Contractor’s expense. The SWMP Administrator shall tabulate additional disturbances not identified in the SWMP. If the disturbance at any time exceeds 1 acre (including as part of a common plan of development), the Contractor will need to apply for a Colorado Discharge Permit System- Stormwater Construction Permit (CDPS-SCP) and comply with all of CDOT’s over one acre specifications.

The Contractor shall pursue stabilization of all disturbances to completion.

**208.09 Regulatory Mechanism for Water Quality.** Failure to implement the Stormwater Management Plan is a violation of the Colorado Water Quality Control Act. Penalties may be assessed to the Contractor by the appropriate agencies. All fines assessed to the Department for the Contractor’s failure to implement the SWMP will be deducted from monies due the Contractor.

The Contractor shall be subject to liquidated damages for incidents of failure to perform erosion control as required by the Contract. Liquidated damages will be applied for failure to comply with these specifications, including the following:

1. Failure of the Contractor to implement necessary actions required by the Engineer as required by this section.
2. Failure to construct or implement erosion control or spill containment measures required by the Contract, or failure to construct or implement them in accordance with the Contractor’s schedule.
3. Failure to stabilize disturbed areas as required by this section.
4. Failure to replace or perform maintenance on an erosion control feature after notice from the Engineer to replace or perform maintenance as required by this section.
5. Failure to remove and dispose of sediment from control measures as required.
6. Failure to install and properly utilize a concrete washout structure for containing washout from concrete placement operations.
7. Failure to perform permanent stabilization as required by this section.
8. Failure to prevent discharges not composed entirely of stormwater from leaving the construction site.
9. Failure to provide the survey of Permanent Water Quality features when required on the project in accordance with this section.

The Engineer will immediately notify the Contractor of each incident of failure to perform erosion control in accordance with any water quality standards, specifications, including items (1) through (9) above by issuing a Form 105. Correction shall be made as soon as possible, immediately in most cases, but no later than 48 hours from the date of notification to correct the failure. The Contractor will be charged liquidated damages in the amount of $970 for each day after the 48-hour period has expired that one or more of the incidents of failure to perform the requirements for each Form 105 remains uncorrected. Liquidated damages will begin at Midnight of the date on which the 48 hours has expired.

This deduction will not be considered a penalty, but will be considered liquidated damages based on estimated additional construction engineering costs. The liquidated damages will accumulate, for each cumulative day that one or more of the incidents remain uncorrected. The number of days for which liquidated damages are assessed will be cumulative for the duration of the project; that is: the damages for a particular day will be added to the total number of days for which liquidated damages are accumulated on the project. The liquidated damages will be deducted from any monies due the Contractor.

If all other failures are not corrected within 48 hours after liquidated damages have begun to be assessed, the Engineer will issue a Stop Work Order in accordance with Section 105. Work shall not resume until the Engineer has approved a written corrective action plan submitted by the Contractor that includes measures to prevent future violations and a schedule for implementation.

If the Contractor requires more than 96 hours to perform the corrective work from the date on the Form 105, the Contractor shall submit a request for deferment. The deferment request shall be in writing and shall include the specific failure, temporary measures until final correction is made, the methodology which will be employed to make the correction, and interim milestones to completing the work. The Region Water Pollution Control Manager (RWPCM), Engineer, the SWMP Administrator, and the Contractor shall concur on this deferral and set a proposed date of completion. If approved, the Contractor shall complete the corrective measures by Midnight of the proposed completion date. If corrective work is not corrected by the completion date the Engineer will issue a Stop Work Order.

Liquidated Damages will apply retroactively back to the 48 hours after the Form 105 date of notification. Liquidated Damages will be assessed until the corrective work has been completed and accepted.

Deferment of work to correct failures to perform erosion control will not affect the Contractor’s other contractual responsibilities, notifications for other non- compliance, nor the final completion date of the project. Liquidated Damages for other non-compliance notifications will continue to apply during the deferment period in addition to liquidated damages associated with the deferment.

Based on the submittal date of the approved deferment, Liquated Damages and a Stop Work Order may not be mandated to the Contractor.

Disagreements regarding the suggested corrective action for a control measure compliance issue between the Project Engineer, SWMP Administrator, and Superintendent, shall be discussed with the Resident Engineer and Region Water Pollution Control Manager. If after the discussions, the Project Engineer and the Contractor are still in disagreement and the Contractor believes that additional compensation is owed, the Contractor shall follow the decision of the Project Engineer, keep track of the costs and negotiate further with the Project Engineer. If after pursuing the issue, the Contractor is unable to reach an agreement with the Project Engineer, then the Contractor can follow the dispute process outlined in Section 105.

If the Contractor’s corrective action plan and schedule are not submitted and approved within 96 hours of the initial notice, the Engineer will issue a Stop Work Order and have an on-site meeting with the Superintendent, SWMP Administrator, and the Superintendent’s supervisor. This meeting will also be attended by the Resident Engineer, the Region Water Pollution Control Manager, and the Region Program Engineer. This meeting will identify and document needed corrective actions and a schedule for completion. If after the meeting, the unacceptable work is not remedied within the schedule as agreed to in the meeting, the Engineer will take action to effect compliance with the Contract and these specifications by utilizing CDOT Maintenance personnel or other non-Contractor forces and deduct the cost from any monies due or to become due to the Contractor pursuant to Section 105. Delays due to these Stop Work Orders shall be considered non- excusable. The Stop Work Order shall be in place until the project is in compliance.

If the Contractor remains non-responsive to requirements of the on-site meeting, the Engineer will start default or Contract termination procedures in accordance with Section 108. CDOT will proceed with corrective or disciplinary action in accordance with the Rules for Prequalification, Debarment, Bidding and Work on Transportation, Road, Highway and Bridge Public Projects.

When a failure meets any one of the following conditions, the Engineer will immediately issue a Stop Work Order in accordance with Section 105 irrespective of any other available remedy:

1. It may endanger health or the environment.
2. It consists of a spill or discharge of hazardous substances or oil which may cause pollution of the waters of the state.
3. It consists of a discharge which may cause a violation of water quality standards.
   1. **Items to Be Completed Prior to Requesting Partial Acceptance of Water Quality Work.**
4. *Reclamation of Washout Areas*. After concrete operations are complete, washout areas shall be reclaimed in accordance with this section at the Contractor’s expense.
5. *Survey*. When Permanent Water Quality (PWQ) control measures are required on the project and once built, the Contractor shall survey the control measures to confirm that the PWQ control measures conform to the configuration, grade, and volume shown on the plans. The survey shall conform to Section 625. The results of the survey shall be submitted in accordance with CDOT’s Survey Manual (AutoCAD to GIS and TMOSS Codes), or GIS with attribute tables, showing both designed and final elevations and configurations. Paper versions of the drawings shall be submitted with the stamp and seal of the Contractor’s Surveyor.

PWQ control measures that do not meet the Contract requirements will be identified in writing by the Engineer, and shall be repaired or replaced at the Contractor’s expense. Correction surveys shall be performed at the Contractor’s expense to confirm the locations, dimensions, and volume certification (for water quality capture volume structures only) of each PWQ control measure. The Engineer, CDOT Hydraulics Engineer for the region, Headquarters Permanent Water Quality Manager, and Headquarters Maintenance staff will perform a walkthrough of the PWQ control measures to confirm conformance to material requirements, locations, and dimensions. Before the walkthrough, the Contractor shall provide the corrected survey to the Engineer, Regional, and Headquarters Permanent Water Quality Managers.

1. *Locations of Temporary Control Measures*. The Engineer will identify locations where modification, cleaning, or removal of temporary control measures are required and will provide these in writing to the Contractor. Upon completion of work required, the SWMP Administrator shall modify the SWMP to provide an accurate depiction of control measures to remain on the project site.

All punch list and walkthrough items shall be completed and approved by the Engineer and Maintenance.

**METHOD OF MEASUREMENT**

**208.11** Erosion Control Management on projects having less than one acre of total disturbed area will not be measured and paid for separately but shall be included in the work, unless otherwise specified in the contract (bid schedule). If contracted, ECM work will be measured as the actual number of days of ECM work performed, regardless of the number of personnel required for SWMP Administration and Erosion Control Inspection, including erosion control inspections, documentation, meeting participation, SWMP Administration, and the preparation of the SWMP. If the combined hours of SWMP Administration and Erosion Control Inspection is four hours or less in a day, the work will be measured as ½ day. If the combined hours of SWMP Administration and Erosion Control Inspection is more than four hours in a day, the work will be measured as one day. Total combined hours of ECM work exceeding eight hours in a day will still be paid as one day.

Erosion bales and rock check dams will be measured by the actual number installed and accepted.

Silt fence, silt berms, erosion logs, aggregate bags, silt dikes, temporary berms, temporary diversions, and temporary slope drains, will be measured by the actual number of linear feet that are installed and accepted. Measured length will not include required overlap.

Concrete washout structure will be measured by the actual number of structures that are installed and accepted.

Pre-fabricated concrete washout structures will be measured by the actual number of structures delivered to the site. It shall not include structures moved on-site.

Storm drain inlet protection will be measured by linear foot or actual number of devices that are installed and accepted.

Sediment trap quantities will be measured by the actual number installed and accepted.

Removal of trash that is not generated by construction activities will be measured by the actual number of hours that Contractor workers actively remove trash from the project. Each week the Contractor shall submit to the Engineer a list of workers and the hours spent collecting such trash.

Removal of accumulated sediment from traps, basins, areas adjacent to silt fences and erosion bales, and other clean out excavation of accumulated sediment, and the disposal of such sediment, will be measured by the number of hours that equipment, labor, or both are used for sediment removal.

Vehicle tracking pads will be measured by the actual number constructed and accepted.

Additional aggregate required for maintaining vehicle tracking pads will be measured as the actual number of cubic yards installed and accepted.

Pre-fabricated vehicle tracking pads will be measured by the actual number of pads delivered to the site and set up to the minimum dimensions. It shall not include pads moved on-site.

**BASIS OF PAYMENT 208.12**  Control measures will be paid for at the Contract unit price for each of the items listed below that appear in the contract. Erosion Control management (ECM) duties on projects having less than one acre of total disturbed area will not be measured and paid for separately but shall be included in the work, unless otherwise specified in the contract.

Payment will be made under:

**Pay Item Pay Unit**

Aggregate Bag Linear Foot

Concrete Washout Structure Each

Erosion Bales (Weed Free) Each

Erosion Control Management Day (If in the contract)

Erosion Log (Type 1) (\_\_\_\_\_ Inch) Linear Foot

Erosion Log (Type 2) (\_\_\_\_\_\_Inch) Linear Foot

Erosion Log (Type 3) (\_\_\_\_\_\_Inch) Linear Foot

Pre-Fabricated Concrete Washout Structure (Type 1) Each

Pre-Fabricated Concrete Washout Structure (Type 2) Each

Pre-Fabricated Vehicle Tracking Pad Each

Maintenance Aggregate (Vehicle Tracking Pad) Cubic Yard

Removal and Disposal of Sediment (Equipment) Hour

Removal and Disposal of Sediment (Labor) Hour

Removal of Trash Hour

Rock Check Dam Each

Sediment Basin Each

Sediment Trap Each

Silt Berm Linear Foot

Silt Dike Linear Foot

Silt Fence Linear Foot

Silt Fence (Reinforced) Linear Foot

Storm Drain Inlet Protection (Type\_\_) Linear Foot

Storm Drain Inlet Protection (Type\_\_) Each

Sweeping (Sediment Removal) Hour

Temporary Berm Linear Foot

Temporary Diversion Linear Foot

Temporary Slope Drain Linear Foot

Vehicle Tracking Pad Each

Modifications to the SWMP due to construction errors or survey errors by the Contractor shall be made at the Contractor’s expense.

Surface roughening and vertical tracking (temporary stabilization) will not be measured and paid for separately but shall be included in the work. Payment for each control measure item will be full compensation for all work and materials required to furnish, install, maintain, and remove the control measure when directed.

Payment for Removal and Disposal of Sediment (Equipment) will be full compensation for use of the equipment, including the operator. Payment for Removal and Disposal of Sediment (Labor) will be full compensation for use of the labor.

Payment for concrete washout structure, whether constructed or prefabricated, will be full compensation for all work and materials required to install, maintain, and remove the item. Maintenance and relocation, as required, of these structures throughout the duration of the project will not be measured and paid for separately, but shall be included in the work.

Silt berm spikes and wood spikes will not be measured and paid for separately, but shall be included in the work. When required, soil retention blankets will be measured and paid for in accordance with Section 216.

Compost and wood stakes for Erosion Log (Type 2) will not be measured and paid for separately, but shall be included in the work.

Spray-on mulch blankets required by the Contract, including those used in both interim and final stabilization, will be measured and paid for in accordance with Section 213.

Payment for storm drain inlet protection will be full compensation for all work, materials, and equipment required to complete the item, including surface preparation, maintenance throughout the project, and removal upon completion of the work. Aggregate will not be measured and paid for separately, but shall be included in the work.

Sweeping, when used as a control measure as shown in the Contract, will be measured by the number of hours that a pickup broom or equipment capable of collecting sediment, authorized by the Engineer, is used to remove sediment from the roadway or other paved surfaces. Each week the Contractor shall submit to the Engineer a statement detailing the type of sweeping equipment used and the number of hours it was used to pick up sediment. The operator will not be measured and paid for separately, but shall be included in the work.

Stakes, anchors, connections, geotextile, riprap, and tie downs used for temporary slope drains will not be measured and paid for separately, but shall be included in the work.

Payment for vehicle tracking pad will be full compensation for all work, materials and equipment required to construct, maintain, and remove the entrance upon completion of the work. Aggregate and geotextile will not be measured and paid for separately, but shall be included in the work. If additional aggregate for maintenance of vehicle tracking pads is required, it will be measured by the cubic yard in accordance with Section 304 and will be paid for under this Section as Maintenance Aggregate (Vehicle Tracking Pad).

Seeding, sod, mulching, soil retention blanket, and riprap will be measured and paid for in accordance with Sections 212, 213, 216, and 506.

All work and materials required to perform the permanent control measure survey and furnish the electronic files shall be included in the original unit price bid for surveying. Surveying will be measured and paid for in accordance with Section 625.

Payment will be made for control measures replaced as approved by the Engineer. Temporary erosion and sediment control measures required due to the Contractor’s negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or ordered by the Engineer or for the Contractor's convenience, shall be performed at the Contractor’s expense. If the Contractor fails to complete construction within the contract time, payment will not be made for Section 208 pay items for the period of time after expiration of the contract time. These items shall be provided at the Contractor's expense.