December 2, 2010

REVISION OF SECTIONS 101, 107, 208, 213 AND 620

WATER QUALITY CONTROL

UNDER ONE ACRE OF DISTURBANCE

**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 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 projects not having a Colorado Discharge Permit System (CDPS) Stormwater Construction Permit (SCP) [Projects with less than one acre of disturbance].

Sections 101, 107, 208, 213 and 620 are hereby revised for this project as follows:

Add subsections 101.92, 101.93, 101.94, and 101.95 which shall include the following:

**101.92 Stormwater Management Plan (SWMP).** The Stormwater Management Plan comprises those contract documents containing the requirements necessary to protect and identify sensitive environments (state waters, wetlands, habitat and existing vegetation), minimize the amount of disturbed soil, control and minimize erosion and sedimentation during and after project construction, minimize runoff from offsite areas from flowing across the site, slow down the runoff, and reduce pollutants in stormwater runoff.

**101.93** **Best Management Practices (BMPs) for Stormwater Pollution Prevention.** BMPs prevent or reduce the pollutants in stormwater discharges from the construction site.

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

This is typically the 2 year storm event elevation.

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systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

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

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

Delete subsection 107.25(b) and replace it with the following:

* 1. *Construction Requirements.*
		+ 1. The Contractor shall comply with the "Colorado Water Quality Control Act" (Title 25, Article 8, CRS), the "Protection of Fishing Streams" (Title 33, Article 5, CRS), the "Clean Water Act" (33 USC 1344), regulations promulgated, certifications or permits issued, and to the requirements listed below. In the event of conflicts between these requirements and water quality control laws, rules, or regulations of other Federal, or State agencies, the more restrictive laws, rules, or regulations shall apply.
1. If the Contractor determines construction of the project will result in a change to the permitted activities, the Contractor shall detail the changes in a written report to the Engineer. Within five days after receipt of the report, the Engineer, after coordination with Region Environmental, will approve or reject in writing the request for change, or detail a course of action including revision of existing permits or obtaining new permits.
2. If construction activities result in noncompliance of any permitted activity, the project will be suspended and the permitting agency notified. The project will remain suspended until the Engineer receives written approval by the permitting agency.
3. The Contractor may be legally required to obtain permits associated with specific activities within, or off the Right of Way, such as borrow pits, concrete or asphalt plant sites, waste disposal sites, or other facilities. It is the Contractor's responsibility to obtain these permits. The Contractor shall consult with the Engineer, and contact the Colorado Department of Public Health and Environment (CDPHE) or other appropriate federal, state, or local agency to determine the need for any permit.
4. The Contractor shall conduct the work in a manner that minimizes pollution of any adjacent waters, including wetlands. Erosion control work shall be performed in accordance with Section 208 and the Contract.
5. Prior to the preconstruction conference the Contractor, shall identify and describe all potential pollutant sources, including materials and activities, and evaluate them for the potential to contribute pollutants to stormwater discharges associated with construction activities. The list of potential pollutants shall be continuously updated during construction. Each of the following shall be evaluated for the potential for contributing pollutants to stormwater discharges and identified in the SWMP, if found to have such potential:
6. All exposed and stored soils
7. Vehicle tracking of sediments
8. Management of contaminated soils
9. Vehicle and equipment maintenance and fueling
10. Outdoor storage activities (building materials, fertilizers, chemicals, etc.)
11. Significant dust or particle generating processes
12. Routine maintenance involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.
13. On site waste management practices (waste piles, dumpsters, etc.)
14. Dedicated asphalt and concrete batch plants
15. Concrete truck and equipment washing, including the concrete truck chute and associated fixtures and equipment
16. Concrete placement and finishing tool cleaning
17. Non-industrial waste sources that may be significant, such as worker trash and portable toilets
18. Loading and unloading operations
19. Other areas or procedures where spills could occur

The Contractor shall record the location of potential pollutants on the plans. Descriptions of the potential pollutants shall be submitted to and approved by the Engineer.

At or prior to the preconstruction conference the Contractor shall submit a Spill Prevention, Control, and Countermeasure Plan (SPCC) for any petroleum products, chemicals, solvents, or other hazardous materials in use, or in storage, at the work site. See subsection 208.06(c) for SPCC plan requirements. Work shall not be started until the plan has been submitted to and approved by the Engineer.

1. The Contractor shall obtain a Construction Dewatering (CDW) permit from CDPHE anytime groundwater, including groundwater that is commingled with stormwater or surface water, is encountered during construction activities and the groundwater or commingled water needs to be discharged to surface water.
2. Water from dewatering operations shall not be directly discharged into any state waters, unless allowed by a permit. Water from dewatering shall not be discharged into a ditch unless:
3. Written permission is obtained from the owner of the ditch.
4. It is covered in the approved CDW permit that allows the discharge.
5. A copy of this approval is submitted to the Engineer.

A copy of the CDW Permit shall be submitted to the Engineer prior to dewatering operations commencing.

If surface water or seeps are diverted around a construction area and no pollutants are introduced during the diversion, a CDW Permit is not required. If the diverted water enters the construction area and contacts pollutant sources (e.g. disturbed soil, concrete washout, etc.), the Contractor shall obtain a CDW permit for the discharge of this water to surface water or to the ground.

Construction Dewatering may be discharged to the ground on projects that are not covered by a Colorado Discharge Permit System – Stormwater Construction Permit a CDPS-SCP if the conditions of the CDPHE’s low risk guidance document for Discharges of Uncontaminated Groundwater to Land are met. The conditions of this guidance are:

1. The source of the discharge is solely uncontaminated groundwater or uncontaminated groundwater combined with stormwater and does not contain pollutants in concentrations that exceed water quality standards for groundwater referenced above.
2. Discharges from vaults or similar structures shall not be contaminated. Potential sources of contamination include process materials used, stored, or conveyed in the structures, or introduced surface water runoff from outside environments that may contain oil, grease, and corrosives.
3. The groundwater discharge does not leave the project boundary limits where construction is occurring.
4. Land application is conducted at a rate and location that does not allow for any runoff into state waters or other drainage conveyance systems, including but not limited to streets, curb and gutter, inlets, borrow ditches, open channels, etc.
5. Land application is conducted at a rate that does not allow for any ponding of the groundwater on the surface, unless the ponding is a result of implementing BMPs that are designed to reduce velocity flow. If the BMPs used result in ponding, the land application shall be done in an area with a constructed containment, such as an excavation or berm area with no outfall. The constructed containment shall prevent the discharge of the ponding water offsite as runoff.
6. A visible sheen is not evident in the discharge.
7. BMPs are implemented to prevent any sediment deposited during land application from being transported by stormwater runoff to surface waters or other conveyances.

All BMPs used shall be selected, installed, implemented, and maintained according to good engineering, hydrologic and pollution control practices. The selected BMPs shall provide control for all potential pollutant sources associated with the discharge of uncontaminated groundwater to land.

The discharge shall be routed in such a way that it will not cause erosion to land surface. Energy dissipation devices designed to protect downstream areas from erosion by reducing the velocity of flow (such as hose attachments, sediment and erosion controls) shall be used when necessary to prevent erosion.

Discharged water shall be drained slowly so that it soaks into the ground without running outside the project boundary or causing flooding issues.

The discharge shall be routed in such a way that it will not contact petroleum products or waste.

1. At least 15 days prior to commencing dredging or fill operations in a watercourse, the Contractor shall provide written notification to owners or operators of domestic or public water supply intakes or diversion facilities, if these facilities are within 20 miles downstream from the dredging or fill operations. Notification shall also be given to Owners or operators of other intakes or diversions that are located within five miles downstream from the site of the project. Identities of downstream owners and operators can be obtained from Colorado Division of Water Resources, Office of the State Engineer.
2. Temporary fill into wetlands or streams will not be allowed, except as specified in the Contract and permits. If such work is allowed, upon completion of the work all temporary fills shall be removed in their entirety and disposed of in an upland location outside of flood plains unless otherwise specified in the Contract.
3. Construction operations in waters of the United States as defined in 33 CFR Part 328.3, including wetlands, shall be restricted to areas and activities authorized by the U.S. Army Corps of Engineers as shown in the Contract. Fording waters will be allowed only as authorized by the U.S. Army Corps of Engineers 404 Permit.
4. Wetland areas outside of the permitted limits of wetland disturbance shall not be used for storage, parking, waste disposal, access, borrow material, or any other construction support activity.
5. Pollutant by‑products of highway construction, such as concrete, asphalt, solids, sludges, pollutants removed in the course of treatment of wastewater, excavation or excess fill material, and material from sediment traps shall be handled, stockpiled, and disposed of in a manner that prevents entry into state waters, including wetlands.

Removal of concrete waste and washout water from mixer trucks, concrete finishing tools, concrete saw and all concrete material removed in the course of construction operations or cleaning shall be performed in a manner that prevents waste material from entering state waters.

A minimum of ten days prior to the start of the construction activity, the Contractor shall submit in writing a method for containing pollutant by-products to the Engineer for approval.

1. The use of chemicals such as soil stabilizers, dust palliatives, herbicides, growth inhibitors, fertilizers, deicing salts, etc., shall be in accordance with the manufacturer's recommended application rates, frequency, and instructions. These chemicals shall not be used, stored, or stockpiled within 50 horizontal feet of any state waters except when otherwise specified in the Contract.
2. Salvable material, excess excavated material, and fill material shall not be stored or stockpiled within 50 horizontal feet of any state waters except when constrained by the ROW or when the work takes place within roadside ditches. In both cases the excavated material shall be protected by BMPs approved by the Engineer.
3. Construction equipment, fuels, lubricants, and other petroleum distillates shall not be stored or stockpiled within 50 horizontal feet of any state waters. Equipment fueling and servicing shall occur only within approved designated areas.
4. All materials stored on‑site shall be stored in a neat, orderly manner, in their original containers, with the original manufacturer's label. Materials shall not be stored in a location where they may be carried into a state water at any time.
5. Spill prevention and containment measures conforming to subsection 208.06 shall be used at storage, and equipment fueling and servicing areas to prevent the pollution of any state waters, including wetlands. All spills shall be cleaned up immediately after discovery, or contained until appropriate cleanup methods can be employed.

Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods.

1. The Contractor shall prevent construction activities from causing grass or brush fires.
2. The construction activities shall not impair Indian tribal rights, including, but not limited to, water rights, and treaty fishing and hunting rights.
3. The Contractor shall certify in writing to the Engineer that construction equipment has been cleaned prior to initial site arrival. Vehicles shall be free of soil and debris.
4. During construction vehicle cleaning shall not occur on site unless in an approved area where wash water can be properly contained.
5. At the end of each day the Contractor shall collect all trash and dispose of it in appropriate containers.
6. Construction waste that is considered a pollutant or contaminant shall be collected and disposed of in appropriate containers. This material may be stockpiled on the project when it is contained or protected by an appropriate BMP.

Delete Section 208 and replace it with the following:

**SECTION 208**

**EROSION CONTROL**

**DESCRIPTION**

**208.01**This work consists of constructing, installing, maintaining, and removing when required, Best Management Practices (BMPs) during the life of the Contract to prevent or minimize erosion, sedimentation, and pollution of any state waters as defined in subsection 107.25, including wetlands.

The Contractor shall coordinate the construction of temporary BMPs with the construction of permanent BMPs 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 effecting completion of the action and pursue it to completion in a manner acceptable to the Engineer.

**MATERIALS**

**208.02** The material for BMPs 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 and accepted them.

The Contractor shall provide a certificate of compliance (COC) showing the transit certificate number or a copy of the transit certificate as supplied from the forage producer.

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, 700 Kipling Street, Suite 4000, Lakewood, CO 80215, (303) 239-4177.

Bales shall be approximately 5 cubic feet of material and weigh at least 35 pounds. Stakes shall be wood and shall be 2 inch by 2 inch nominal.

1. *Silt Fence.* Silt fence posts shall be wood with a minimum length of 42 inches. Wood posts shall be 1.5 inch by 1.5 inch nominal. 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 D 4632 |
| Permittivity sec-1 | 0.05 | 0.05 | ASTM D 4491 |
| Ultraviolet stability | minimum70% Strength Retained | minimum70% Strength Retained | ASTM D 4355 |

1. *Temporary Berms.* Temporary berms shall be constructed of compacted soil.
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 subsection 712.08.
3. *Silt Berm.* Silt berm shall consist of an ultraviolet (UV) stabilized high-density polyethylene, shall be triangular in shape, and shall have the following dimensions:

|  |  |
| --- | --- |
| Width | 6 - 11 inches |
| Height | 6 - 10 inches |
| Weight | 0.3 - 1.4 lbs./sq. ft. |
| Percent Open Area | 30 – 50% |

Securing spikes shall be10 to12 inch x 0.375 inch diameter (minimum).

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 subsection 203.03. 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 subsection 712.08.
3. *Erosion Logs*. Erosion logs shall be curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing shall be seamless, photodegradable tube netting and shall have minimum dimensions as shown in Table 208-1, based on the diameter of the log called for on the plans. The curled aspen wood excelsior shall be fungus free, resin free, and free of growth or germination inhibiting substances.

**Table 208-1**

**Nominal Dimensions of Erosion Logs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Diameter** | **Length** | **Weight (minimum)** | **Stake Dimensions** |
|  |  |  |  |
| 12 inch | 10 feet | 2.5 pounds/foot | 1.25 by 1.25 by 24 inches |
| 20 inch | 10 feet | 4 pounds/foot | 2 by 2 by 30 inches |

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

1. *Silt Dikes.* Silt dikes shall be premanufactured triangular shaped urethane foam covered with a woven geotextile fabric. The fabric aprons shall extend a minimum of two feet beyond each side of the triangle.

Each silt dike shall have the following dimensions:

**Dimension Length**

Center height 8 to 10 inches

Base 16 to 21 inches

Section length 3 to 7 feet

Section width including fabric extensions 5.6 feet

Staples shall be 6 gauge and at least 8 inches long.

1. *Concrete Washout Structure.* The Contractor shall construct a washout structure that will contain washout from concrete placement and construction equipment cleaning operations. Embankment required for the concrete washout structure may be excavated material, provided that this material meets the requirements of Section 203 for embankment.

Fabricated concrete washout structures may be used. Fabricated concrete washouts are pre-manufactured watertight containers designed to contain liquid and solid waste from concrete washout. Only the fabricated concrete washout structures listed on CDOT's Approved Product List may be used. After use, the structure shall be removed from the project site and disposed of at the Contractor’s expense.

1. *Vehicle Tracking Pad*. 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.

Geotextile (Erosion Control) shall be Class 2 and conform to the requirements of subsection 420.02.

1. *Gravel Bag.* Gravel bags shall consist of aggregate filled fabric with the following dimensions:

**Diameter** 4 to 6 inches

**Section Length** 1 foot minimum

The sediment control device shall consist of a woven geotextile fabric with the following properties:

|  |  |  |
| --- | --- | --- |
| **Property** | **Requirement** | **Test Method** |
| Grab tensile strength | 90 lbs. min. | ASTM D 4632 |
| Trapezoid Tear Strength | 25 lbs. min. | ASTM D 4533 |
| Mullen Burst | 300 psi. | ASTM D 3786 |
| Ultraviolet Resistance | 70% | ASTM D 4355 |

Aggregate contained in the gravel bags shall consist of gravel or crushed stone conforming to Table 703-7 for Class C.

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

| **Storm Drain Inlet Protection Properties** | **Protection Type** |
| --- | --- |
| **1Type I** | **2Type II** |
| Diameter | 4 in. | 4 in. |
| Minimum Section Length | 7 ft. | 5 ft. |
| Apron Insert | --- | 30 in. or sized to grate |
| **1**Type I protection shall be used with Inlet Type R.**2**Type II protection shall be used with Inlet Type 16. |

The inlet protection device shall consist of a woven geotextile fabric with the following properties:

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Test Method** | **Unit** | **Requirement** |
| Grab tensile strength | ASTM D 4632 | lbs. | minimum 450x300 |
| Trapezoid Tear Strength | ASTM D 4533 | lbs. | minimum 160x170 |
| Mullen Burst Strength | ASTM D 3786 | lbs. | 550 |
| Percent Open Area | COE-22125-86 | % | 10 |
| Water Flow Rate | ASTM D 4491 | gal./min./ft. | 210 |
| Ultraviolet Resistance | ASTM D 4355 | % | 90 |

Storm drain inlet protection shall have an approximate weight of 7 to 10 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 to Table 703-7 for Class C.

**CONSTRUCTION REQUIREMENTS**

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

Prior to construction the Contractor shall implement BMPs in accordance with the approved project schedule as described in subsection in 208.03(b).

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, BMPs 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. Run-on water that cannot be diverted shall be treated as construction runoff and adequate BMPs shall be employed.

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

The Contractor 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 BMP added to the plans.

When additional BMPs are required and approved by the Engineer, the Contractor shall implement the additional BMPs and shall record and describe them on the plans. The approved BMPs will be measured and paid for in accordance with subsections 208.11 and 208.12.

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

The Engineer will approve or reject the written proposal in writing within 5 working days afterthe submittal. The Engineer may require additional control measures prior to approving the proposed modifications.

1. *Erosion and Sediment Control* *Activities.* The erosion and sediment control activities shall be included in the CPM or bar chart project schedule. 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 and plant sites, and all areas within the project limits.

If during construction the Contractor proposes changes which would affect the Contract's BMPs, the Contractor shall propose revised BMPs 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.

1. *Implementation, Maintenance and Revision of the SWMP.*

The Contractor's responsibilities shall be as follows:

1. Install, construct, and maintain all BMPs specified in the Contract and coordinate the construction of BMPs with all other construction operations.
2. Implement suitable temporary erosion and sediment control features as necessary to correct unforeseen conditions or emergency situations. Dismantle those features when their purpose has been fulfilled unless the Engineer directs that the features be left in place.
3. Implement necessary actions to reduce anticipated or presently existing water quality or erosion problems resulting from construction activities.
4. Make available, all labor, material, and equipment needed to install, maintain, and remove BMPs.
5. When included in the Contract, the Contractor shall assign to the project an individual to serve in the capacity of Erosion Control Supervisor (ECS). The ECS may be the Superintendent. The ECS shall be experienced in all aspects of construction and have satisfactorily completed an ECS training program authorized by the Department. Proof that this requirement has been met shall be submitted to the Engineer prior to or at the preconstruction conference. A list of authorized ECS training programs will be provided by the Engineer upon request by the Contractor. The ECS shall be the person responsible for ensuring that the responsibilities listed in (1) through (4) above are fulfilled
6. *Documentation Available on the Project.* The following Contract documents and references will be made available for reference in one location on the project during construction.
7. Project Documents. The following documents shall be kept, maintained, and updated in a single notebook:
	1. SWMP Sheets
	2. SWMP site map, if applicable to the project.
	3. Details of BMPs used on the project not covered in Standard Plan M-208-1.
	4. List of potential pollutants as described in subsection 107.25.
	5. SPCC and reports of reportable spills submitted to CDPHE.
	6. Form 105s and all other correspondence relating to water quality.
	7. Project environmental permits and associated applications and certifications.
8. Reference Materials
9. CDOT *Erosion Control and Stormwater Quality Guide.*
10. CDOT *Erosion Control and Stormwater Quality Field Guide.*
11. Copy of biological opinion, if applicable.

**208.04 Best Management Practices for Stormwater.**

The Contractor shall modify the SWMP to clearly describe and locate all BMPs implemented at the site to control potential sediment discharges from vehicle tracking.

Vehicle tracking pads shall be used at all vehicle and equipment access points to the site to prevent sediment exiting the project site onto paved public roads. Access shall be provided only at locations approved by the Engineer.

New inlets and culverts shall be protected during their construction. Appropriate protection of each culvert and inlet shall be installed immediately upon its completion. 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.

Concrete wasted on the ground during construction shall be collected, removed from the project site, and disposed of properly. Wasted concrete includes excess concrete removed from forms, spills, slop, and all other unused concrete that ends up on the ground.

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), or the Environmental Protection Agency (EPA) 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.
3. *Work Outside the Right of Way*. Disturbed areas, including staging areas that are outside CDOT ROW and outside easements acquired by CDOT for construction are the responsibility of the Contractor. These areas are subject to a local agency construction permit according to local requirements or a CDPS-SCP if they have over one acre of disturbance. The Contractor shall acquire these permits and submit copies to the Engineer prior to any disturbance. These permits shall be acquired and all erosion and sediment control work performed at the Contractor's expense.
4. *Construction Implementation.* The Contractor shall incorporate BMPs into the project as outlined in the accepted schedule.
5. *Stabilization.* Once earthwork has begun on a section, it shall be pursued until completion.

Clearing and grubbing operations shall be scheduled and performed so that grading operations and final stabilization measures can follow immediately thereafter if the project conditions permit. Otherwise temporary stabilization measures shall be taken between successive construction stages. Additional work required because the Contractor has failed to properly coordinate the entire erosion control schedule, thus causing previously seeded areas to be disturbed by operations that could have been performed prior to the seeding shall be performed at the Contractor's expense.

* + - 1. Temporary Stabilization. Temporary stabilization is defined as the covering of disturbed areas with seeding, mulching with a tackifier, surface roughening, soil binder, or a combination thereof. Other temporary soil stabilization techniques may be proposed, in writing, by the Contractor and used when approved in writing by the Engineer.

Disturbed areas where work is temporarily halted shall be temporarily stabilized immediately after the activity ceases for the day.

Temporary stabilization of areas where work is temporarily halted shall consist of one of the following:

1. surface roughening
2. vertical tracking
3. placing 1.5 tons of certified weed free forage hay or straw mulching per acre which shall be mechanically crimped into the soil in combination with an organic mulch tackifier
4. placing soil binder
5. placing cellulose fiber mulch with tackifier
6. placing a spray–on mulch blanket
7. using a combination from items (1) – (6), as approved.

Disturbed surfaces outside the pavement limits slope shall be left in a surface roughened or vertically tracked condition at the end of each shift.

Subgrade within the pavement limits that will remain uncovered by surfacing more than seven days shall be protected by an approved BMP.

Payment for temporary stabilization will be made at the contract unit price if the work is interrupted due to no fault or negligence of the Contractor. Payment will not be made for temporary stabilization required by Contractor’s negligence, by the lack of proper Contractor scheduling or for the convenience of the Contractor.

* + - 1. Final Stabilization. Final stabilization is defined as the covering of disturbed areas with final seeding, mulching with tackifier, soil retention blankets, or a combination thereof as required by the Contract. Other final stabilization techniques may be proposed by the Contractor, in writing, and used when approved in writing by the Engineer.

Final stabilization shall begin within 48 hours after topsoil placement, soil conditioning, or combination thereof starts and shall be pursued to completion.

If approved by the Engineer, slopes from the edge of pavement to the point of slope selection may be left unseeded until paving has been completed. Unseeded slopes shall be temporarily stabilized as approved by Engineer.

1. Summer and winter stabilization. During the summer and winter when seeding is not allowed, temporary stabilization shall be placed. Temporary stabilization shall consist of one of the following:
	1. surface roughening in combination with one of the items (3) thru (6)
	2. vertical tracking in combination with one of the items (3) thru (6)
	3. placing 1.5 tons of certified weed free forage hay or straw mulching per acre which shall be mechanically crimped into the soil in combination with an organic mulch tackifier
	4. placing soil binder
	5. placing cellulose fiber mulch with tackifier
2. placing a spray–on mulch blanket
3. *Maintenance.* Erosion and sediment control practices and other protective measures identified in the SWMP as BMPs for stormwater pollution prevention shall be maintained in effective operating condition. BMPs 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 height of the erosion control device. Removal and disposal of sediment shall be in accordance with subsection 208.04(g). 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 or the Engineer 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.

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

Approved new or replaced BMPs will be measured and paid for in accordance with subsections 208.11 and 208.12. Devices damaged due to the Contractor's negligence shall be replaced at Contractor’s expense.

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

Temporary BMPs shall be removed upon completion of the project unless otherwise directed by the Engineer. If removed, the area in which these BMPs were constructed shall be returned to a condition similar to that which existed prior to its disturbance. Removed BMPs shall become the property of the Contractor.

If a project delay occurs, the Contractor shall be responsible to continue erosion and sediment control operations beyond the original contract time.

Sediment removed during maintenance of BMPs may be used in or on embankment, provided it meets conditions of Section 203, or it shall be wasted in accordance with subsection 107.25.

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 BMP, such as a berm, shall be placed to contain slurry from joint flushing operations until the residue can be removed from the soil surface. Residue shall be removed and disposed of in accordance with subsection 107.25(b) 13. Erosion logs or other permeable BMPs shall not be used. Material containment and removal will not be paid for separately, but shall be included in the work.

**208.05 Construction of BMPs.** BMPs shall be constructedin accordance with the following.

* 1. *Seeding, Mulching, Sodding, Soil Retention Blanket.* Seeding, mulching, sodding, and soil retention blanket shall be performed in accordance with Sections 212, 213, and 216.
	2. *Erosion Bales.* The bales shall be shall be anchored securely to the ground with wood stakes.
	3. *Silt Fence.* Silt fence shall be installed in locations specified in the Contract prior to any grubbing or grading activity.
	4. *Temporary Berms.* Berms shall be constructed to the dimensions shown in the Contract, graded to drain to a designated outlet, 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.
	5. *Temporary Diversion.* Diversions shall be constructed to the dimensions 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.
1. *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.
2. *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.

 Silt berms shall be secured with spikes. A minimum one spike per foot shall be installed on both sides of each silt berm and in accordance with the manufacturer’s recommendations. 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.

1. *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.
2. *Rip rap Outlet Protection.* Geotextile used shall be protected from cutting or tearing. Overlaps between two pieces of geotextile shall be 1 foot minimum. Rip rap size shall be as shown on the plans.
3. *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 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 the Type I and II inlet protection device after each rain event or as directed. The Contractor shall remove accumulated sediment from Type II 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 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 area can be diverted into the trap.

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

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 subsection 208.04(g).

1. *Erosion Logs.* Erosion logs shall be embedded 2 inches into the soil. Stakes shall be embedded to a minimum depth of 12 inches. At the discretion of the Engineer, a shallower depth may be permitted if rock is encountered.

The Contractor shall maintain the erosion logs during construction to prevent sediment from passing over or under the logs.

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 Design.* The concrete washout structure shall meet or exceed the dimensions shown on the plans or be used in accordance with manufacturer’s recommendations. Work on this structure shall not begin until written acceptance is provided by the Engineer.

Earthen in ground concrete washout structures shall meet the following requirements:

1. 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 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. The bottom of excavation shall be a minimum of five feet vertical above groundwater or, alternatively, excavation must be lined with an impermeable synthetic liner that is designed to control seepage to a maximum rate of 10-6 centimeters per second.
7. Freeboard capacity shall be included into structure design to reasonably ensure the structure will not overtop during or because of a precipitation event.
8. The Contractor shall prevent tracking of washout material out of the washout structure.
9. Solvents, flocculents, and acid shall not be added to wash water.
10. The use of an in ground concrete washout site shall be less than one year.
11. The structure shall be fenced with orange plastic construction fencing to provide a barrier to construction equipment and to aid in identification of the concrete washout area.
12. Concrete waste, liquid and solid, shall not exceed 2/3 the storage capacity of the washout structure

Fabricated concrete washout structures shall meet the following requirements.

1. Structure shall contain all washout water.
2. The site shall be located a minimum of 50 horizontal feet from state waters and shall meet all requirements for containment and disposal as defined in subsection 107.25.
3. The site shall be delineated with orange plastic fence or other means and signed as “Concrete Washout”.
4. The site shall be accessible to appropriate vehicles.
5. Freeboard capacity shall be included into structure design to reasonably ensure the structure will not overtop during or because of a precipitation event.
6. Solvents, flocculants, and acid shall not be added to wash water.
7. Concrete waste, liquid and solid, shall not exceed 2/3 the storage capacity of the washout structure.

The concrete washout structure shall be completed and ready for use prior to concrete placement operations.

Washout areas shall be checked by the Contractor 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.

1. *Vehicle Tracking Pad.* 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 excavation or work begins.

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.

1. *Detention Pond.* Permanent detention ponds shown on the construction plans may be used as temporary BMPs if all the following conditions are met:
	1. The pond is designated as a construction BMP in the SWMP.
	2. The pond outfall and outlet are designed and implemented for use as a BMP 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 BMPs, as appropriate.
	3. The pond is inspected and maintained.
	4. All silt shall be removed and the pond returned to the design grade and contour prior to project acceptance.
2. *Gravel Bag.* Gravel bags shall be placed on a stable surface, consisting of pavement, grass or aggregate. Gravel bags shall be placed to conform to the surface without gaps. Discharge water shall not cause erosion.
3. *Surface roughening*. Surface roughening creates 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. Sands or soils that are primarily rock need not be roughened. Surface roughening will not be paid for separately, but shall be included in the work.
4. *Vertical Tracking*. Vertical tracking involves driving a tracked vehicle up and down the soil surface and creating horizontal grooves and ridges. Sands or soils that are primarily rock need not be tracked. Vertical tracking will not be paid for separately, but shall be included in the work.

**208.06 Materials Handling and Spill Prevention.** The Contractor 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 spill contingency plans in place as specified in subsections 107.25(b)6 or 208.06(c).

1. 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 volume of the storage structures plus at least 10 percent freeboard. If secondary containment is used and results in accumulation of stormwater within the containment, a plan shall be implemented to properly manage and dispose of accumulated stormwater.
2. 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. 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 Prevention, Control, and Countermeasure Plan shall be developed and implemented to establish operating procedures for handling potential pollutants and preventing spills.

The Spill Prevention, Control, and Countermeasure Plan shall contain the following information:

* 1. Identification and contact information of the Contractor and CDOT spill cleanup coordinators.
	2. Locations of areas on 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 Materials Safety Data Sheets (MSDS) 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 (current edition) contains Spill notification contacts and phone numbers required in the SPCC.
	8. A summary of the employee training provided.
	9. Information in items (1) through (8) shall be updated when it changes.

**208.07 Stockpile Management.** Material stockpiles shall be located away from sensitive areas and shall be confined so that no potential pollutants will enter state waters or conveyances to state waters (e.g., ditches). Locations shall be approved by the Engineer.

Erodible stockpiles (including topsoil) shall be contained with acceptable BMPs at the toe (or within 20 feet of the toe) throughout construction. BMPs shall be approved by the Engineer.

**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 action which would disturb existing conditions. Off road staging areas must be pre-approved by the Engineer, unless otherwise designated in the Contract. 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 Contractor shall tabulate additional disturbances not identified in the SWMP and indicate locations and quantities on the SWMP and report to the Engineer.

The Contractor shall pursue and stabilize all disturbances to completion.

**208.09 Failure to Perform Erosion Control.**  Failure to implement the Stormwater Management Plan is a violation of CDOT specifications. 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 moneys due the Contractor in accordance with subsection 107.25(c) 2.

The Contractor will 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, but not limited to the following:

1. Failure to include erosion control in the project schedule or failure to include erosion control in each schedule update as specified in subsection 208.03(b).
2. Failure of the Contractor to implement necessary actions required by the Engineer as required by subsection 208.03(c).
3. Failure to amend SWMP and implement BMPs as required by subsection 208.04.
4. Failure to keep documentation and records current.
5. 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 approved schedule as required by subsection 208.06(c).
6. Failure to stabilize disturbed areas as required by subsections 208.04(e) and 208.08.
7. Failure to replace or perform maintenance on an erosion control feature after notice from the Engineer to replace or perform maintenance as required by subsection 208.04(f).
8. Failure to remove and dispose of sediment from BMPs as required.
9. Failure to install and properly utilize a concrete washout structure for containing washout from concrete placement operations.
10. Failure to perform permanent stabilization as required by subsection 208.04 (e).

The Engineer will immediately notify the Contractor in writing of each incident of failure to perform erosion control in accordance with the Specifications, including, but not limited to items (1) through (10) above. Correction shall be made as soon as possible but no later than 48 hrs from the date of notification to correct the failure. The Contractor will be charged liquidated damages in the amount of $875 for each calendar day after the 48 hour period has expired, that one or more of the incidents of failure to perform items (1) through (10) above, remains uncorrected.

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 remains 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.

When a failure meets any one of the following conditions, the Engineer may immediately issue a Stop Work Order in accordance with subsection 105.01 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 of stormwater which may cause an exceedance of a water quality standard.

If all other failures are not corrected within 48 hours after liquidated damages have begun to be assessed, the Engineer may issue a Stop Work Order in accordance with subsection 105.01. 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.

Disagreements regarding the suggested corrective action for a BMP compliance issue between the Project Engineer and Superintendent, shall be discussed with the Resident Engineer and Region Water Pollution Control Manager. If after meeting the Contractor is still in disagreement and feels that additional compensation is owed, the Contractor will 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 agreement with the Project Engineer, then the Contractor can follow the dispute process outlined in subsection 105.21.

If the Contractor’s corrective action plan and schedule are not submitted and approved within 48 hours of the Stop Work Order or the corrective action plan is not implemented by the Contractor, the Engineer will have an on-site meeting with the Superintendent 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 by utilizing CDOT Maintenance personnel or other non-Contractor forces and deduct the cost from any moneys due or to become due to the Contractor pursuant to subsection 105.16. Delays due to these Stop Work Orders shall be considered nonexcusable. The Stop work Order shall be in place until the project is in Contract 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 subsections 108.09 and 108.10. 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*.

**208.10 Items to Be Accomplished Prior to Final Acceptance.**

1. *Reclamation of Washout Areas*. After concrete operations are complete, washout areas shall be reclaimed in accordance with subsection 208.05(n) at the Contractor’s expense.
2. *Survey.* The Contractor shall survey Permanent Water Quality BMPs (Permanent BMPs) on the project after they are constructed and confirm they are at final configuration and grade. The Engineer will identify which Permanent BMPs shall be surveyed prior to the final walk through. The survey shall be performed in accordance with Section 625.
3. *Removal of Temporary BMPs.* Temporary BMPs subject to removal shall be determined by the Engineer at a final walk through of the project and shall be removed by the Contractor. If any BMPs are left in place, the Region’s Water Pollution Control Manager shall be notified of the BMP locations.

**METHOD OF MEASUREMENT**

**208.11** Erosion bales will be measured by the actual number installed and accepted.

Silt fence, silt berms, erosion logs, gravel bags, silt dikes, temporary berms, rock check dams, temporary diversions, and temporary slope drains, will be measured by the actual number of linear feet that are installed and accepted.

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

Storm drain inlet protection will be measured by the linear foot of storm drain inlet protection device 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.

Erosion Control Supervisor will be measured by one of the following two methods; the method will be shown on the bid schedule:

1. The total number of hours the ECS is required to be on the project performing the duties outlined in subsection 208.03(c) specific to this project. The Contractor shall record the tasks that were performed by the Erosion Control Supervisor and the hours that were required to complete each task. The records shall be submitted to the Engineer weekly, after completion of the work, for approval and acceptance.
2. The total number of authorized 24 hour days used for erosion control services specific to this project. An authorized 24 hour day of ECS will be every calendar day that the ECS is required to be on the project performing the duties outlined in subsection 208.03(c). The Contractor shall record the tasks that were performed by the Erosion Control Supervisor. The records shall be submitted to the Engineer, weekly, after completion of the work, for approval and acceptance.

Excavation required for 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.

**BASIS OF PAYMENT**

**208.12** Erosion Control Supervisor and BMPs will be paid for at the Contract unit price for each of the items listed below that appear in the bid schedule.

Payment will be made under:

**Pay Item Pay Unit**

Concrete Washout Structure Each

Erosion Bales (Weed Free) Each

Erosion Control Supervisor Day

Erosion Control Supervisor Hour

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

Gravel Bag Linear Foot

Removal and Disposal of Sediment (Equipment) Hour

Removal and Disposal of Sediment (Labor) Hour

Removal of Trash Hour

Rock Check Dam Each

Sediment Trap Each

Silt Berm Linear Foot

Silt Dike Linear Foot

Silt Fence Linear Foot

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

Sweeping (Sediment Removal) Hour

Temporary Berm Linear Foot

Temporary Diversion Linear Foot

Temporary Slope Drains Linear Foot

Vehicle Tracking Pad Each

Temporary erosion control will be measured and paid for by the BMPs used, except that surface roughening and vertical tracking will not be measured and paid for separately.

Payment for each BMP item will be full compensation for all work and materials required to furnish, install, maintain, remove, and dispose of it.

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. This includes, but is not limited to: excavation, embankment, liner, erosion bales, fencing, signing, and containment and disposal of concrete washout and all other associated waste material.

Payment for *Erosion Control Supervisor* will be full compensation for the erosion control supervisor and all materials and equipment necessary for the ECS to perform the work. The ECS's commute time will not be measured and paid for separately, but shall be included in the work.

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

Silt berm 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.

Silt dike staples will not be measured and paid for separately, but shall be included in the work.

Spray–on mulch blankets required by the Contract 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 BMP 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. 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. Replacement aggregate for vehicle tracking pads will be measured and paid for by the ton in accordance with Section 304.

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

Surveying of permanent BMPS will not be measured and paid for separately, but shall be included in the Section 625 pay item, Surveying.

Payment will be made for BMPs replaced as approved by the Engineer.

Work performed to install measures for the control of erosion and sedimentation, and water pollution, for which there is no bid item originally included in the Contract will be considered extra work in accordance with subsection 104.03.

Temporary erosion and pollution 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 approved contract time, payment will not be made for Section 208 pay items for the period of time after expiration of the approved contract time. These items shall be provided at the Contractor's expense.

Subsection 213.01 shall include the following:

This work includes furnishing and applying spray–on mulch blanket on top of rock cuts and slopes after seeding or as temporary stabilization as shown on the plans or as directed by the Engineer.

Subsection 213.02 shall include the following:

Spray–on mulch blanket shall consist of wood fibers bound together by adhesive and photodegradable synthetic fibers and premixed in an air stream at the factory. The fibers may be crimped or un-crimped. The wood fibers shall be manufactured expressly from clean whole wood chips and contain a range of fiber lengths, with a minimum of 25 percent of the fibers averaging 0.4 inches long. The adhesive binder shall be formulated to form a water resistant bond. The fibers shall be colored yellow or green with a water-soluble, non‑toxic dye to help the operator apply the material uniformly. The mixture shall also contain a copolymer gel. A sample of the spray–on mulch blanket shall be submitted for approval at least two weeks in advance of its use on the project.

Subsection 213.03 shall include the following:

1. *Spray-On Mulch Blanket.* A technical representative of the manufacturer or authorized distributor shall be present for the initial mixing and application of the spray–on mulch blanket.

Spray–on mulch blanket shall be mixed and applied according to the following procedure:

1. Mix spray–on mulch blanket at a ratio of 50 lbs. of spray–on mulch blanket per 125 gallons of water. Seed will not be mixed into the spray–on mixture.
2. Fill tank with water sufficient to reach the level of the agitator shaft.
3. Start mixing agitators and regulate throttle throughout the loading process to achieve agitation.
4. Load machine with spray–on mulch blanket and the balance of the required water. Load spray–on mulch blanket through breaker or break by hand.
5. Vigorously agitate the mixture for a minimum of ten minutes after loading to allow thickening. Reduce agitation to a minimum.
6. Apply mixture in even layers, working back and forth between top and bottom of the slope, to uniformly cover soil with the mixture. Spray the product through a fan or slit type nozzle (22 to 50 degree tip). The nozzle shall create a fine, uniformly dispersed spray that "rains down" on the soil.

Spray–on mulch blanket shall be applied at the rate of 2600 pounds per acre.

Spray–on mulch blanket shall have no cure time once applied.

Spray–on mulch blanket shall not be applied in ditches or other areas of concentrated flow.

Subsection 213.04 shall include the following:

Spray-on mulch blanket will be measured by the actual number of acres to which it is applied based on slope distances.

Subsection 213.05 shall include the following:

**Pay Item Pay Unit**

Spray–on Mulch Blanket Acre

Payment for spray–on mulch blanket will be full compensation for all work and materials necessary to complete the item.

Subsection 620.06 shall include the following:

Sanitary facilities shall be placed at least 50 feet from the nearest State Water, in locations accessible for servicing, and not in low lying areas subject to ponding. They shall be anchored to prevent movement or overturning.