CONCRETE WASTE MANAGEMENT

DESCRIPTION - The purpose of this specification is to set forth procedures and practices designed to eliminate the discharge of concrete waste materials to storm drainage systems, drainage areas, streets or watercourses, which shall be required of the contractor.

APPROPRIATE APPLICATION OF BMP - Concrete waste management procedures and practices will be implemented on construction projects as follows:

- Where concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Where slurries containing Portland cement concrete (PCC), asphaltic concrete (AC) or bituminous concrete (BC) are generated, such as from saw cutting, coring, grinding, grooving and hydro-concrete demolition.
- Where concrete trucks and other concrete-coated equipment are washed on-site, when approved by the Resident Engineer or Construction Inspector.
- Where mortar-mixing station exist.

AWARENESS / ENFORCEMENT

- Contractor's and / or permit holder's superintendent or representative shall oversee and enforce concrete waste management procedures.
  - ➢ Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.
- The site superintendent shall make drivers aware of the presence of the concrete waste management facilities. The site superintendent should post signage indicating the location and designated use of the concrete waste management areas, and provide careful oversight to inspect for evidence of improper dumping of concrete waste and wash water.

IMPLEMENTATION

- Contractors, private individuals, public agencies, etc. using concrete material, shall incorporate requirements for concrete waste management into material supplier and subcontractor agreements. Include requirements in contracts with concrete delivery companies that drivers must use designated concrete washout facilities.
- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- Cover the structures before predicted rainstorms to prevent overflows.
- Monitor on site concrete waste storage and disposal procedures at least weekly or as directed by the Resident Engineer or Construction Inspector.

- In St. Louis County, the contractor is required by Missouri State Law (10 CSR 10-6.170) and County Ordinance (612.340) to control fugitive dust blown from the construction site, signal installation, etc. Dust control, including saw-cut material etc., on the construction site shall be monitored for safety purposes and to prevent nuisances. The contractor / permitee shall apply reasonable measures to control dust and particulate matter (of any size or source) due to roadway / construction traffic, grading, clearing and grubbing, building demolition, saw-cutting etc. from migrating off the site of origin. Operations residue from grinding, saw-cutting etc. should be picked up (cleaned-up) by means of a vacuum device or swept up. Compressed or blown air may be used to clean negligible residual dust that the vacuum or sweeping did not clean up, as long as the above dust control procedures (and law and ordinance) are met. Saw cutting residue, slurry or dry, should not be allowed to enter storm drains or watercourses. Saw cutting residue should not be allowed to flow across the pavement and should not be left on the surface of the pavement when traffic is present, when precipitation is anticipated before cleanup or overnight. In approved locations, saw-cut slurry may flow into the dirt (where it can soak into the ground) adjacent to the saw-cutting operation and be buried, on site, 2' minimum below finished grade. Other dust control and clean-up procedures may be acceptable as approved by the Engineer or St. Louis County. See additional Concrete Waste Management requirements in this Manual.

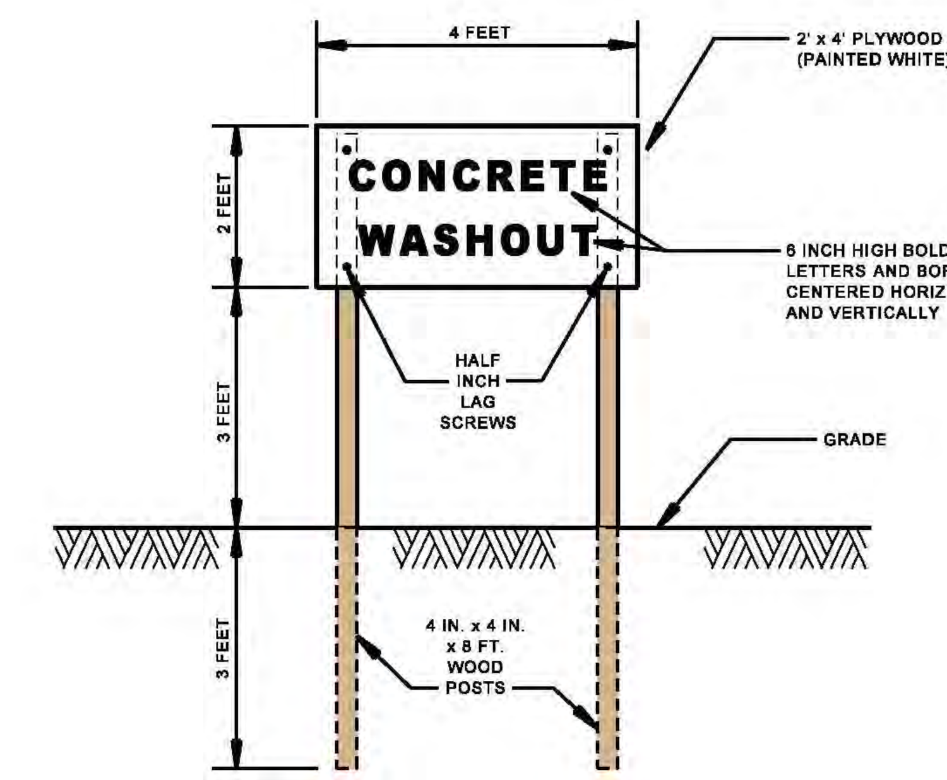
WASHOUT AREA PROTOCOL

- Contain concrete washout on site or take it offsite for disposal in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- For onsite washout:
  - ➢ Locate washout area on-site at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough to contain liquid and solid waste. Locate it in a dirt area where the liquid portion of the washout can soak into the ground. They are preferably built below-grade to prevent breaches and reduce the likelihood of runoff. Discontinue use of the washout once it reaches 75% capacity. Washouts should be sized to handle solids and wash water to prevent overflow. It is estimated that 7 gallons of wash water are used to wash one truck chute and 50 gallons are used to wash out the hopper of a concrete pump. Implement a maintenance schedule for washout areas.
  - ➢ Temporary washout facilities should have pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
  - ➢ Wash out wastes into the pit where the concrete can set, be broken up, and used on site; or buried on site; or disposed of properly.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose of in the trash.
- Do not place concrete wash water in a pit that is connected to the storm drain system or that drains to nearby waterways.

- Locate concrete washout facilities in an area that allows convenient access for concrete trucks, preferably near the area where the concrete is being poured. Appropriate gravel or rock should cover paths to concrete washout facilities if the facilities are located on undeveloped property. These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills. The number of facilities you install should depend on the expected demand for storage capacity. On large sites with extensive concrete work, place washouts in multiple locations for ease of use. If the dried concrete washout is buried on the site it shall have a 2-foot cover minimum. The 2-foot cover shall match with surrounding finished grade.
- Concrete washed out in areas other than those designated for such activity, shall be cleaned up by the contractor.
- Install signage adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
- Perform washout of concrete mixers, delivery trucks and other delivery systems in designated areas only.
- Wash out concrete from concrete pumper bins into concrete pumper trucks and discharge into designated washout area.
- Equipment that cannot be easily moved, such as concrete pavers, shall only be washed in designated areas that do not drain to waterways or storm drain systems.
- Backfill and repair holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities.
- Wash out concrete on site into a future designated final concrete pour location. This location cannot be within 50 feet of a storm or sanitary sewer; or water course; or where it can drain off site. The washout cannot jeopardize the integrity of the final concrete pour. Concrete to be removed from the site shall be disposed of in conformance with the provisions in Standard Specification Manual, Section 202, all as directed by the Engineer. No additional payment will be made for complying with the above specification.
- A self-contained and watertight container may be used to control, capture, and contain concrete wastewater and washout material. The container must be portable and temporary, damage resistant, protect against spills and leaks, and sized to handle solids and wash water to prevent overflow. The container should be emptied and cleaned when 75% of its capacity is reached. After all liquids evaporate or are pumped or vacuumed, and the remaining slurry solidified, the Contractor may bury the solids on site. On County roadway projects, the solids may be buried on site if approved by the Engineer. In either case, solids shall be buried a minimum of 2 feet below finished grade. Disposal of container contents that are removed from the site shall be made at an approved landfill. In order to prevent overflows caused by natural occurrences and to provide security for safety purposes and against acts of vandalism, the container shall be covered at the end of each workday and remain covered until the beginning of the next workday. The cover shall remain on site with the container at all times. Container shall be free of liquids during any on-site relocation process or transport to another site. On County roadway projects, location(s) for the container shall be approved by the Engineer.

TYPICAL DETAIL - 806-46.03

NEW	REVISIONS				
4/15/08	10/10/11	1/1/16			



CONCRETE WASHOUT SIGN DETAIL
(OR EQUIVALENT AS APPROVED BY COUNTY)

GENERAL NOTES

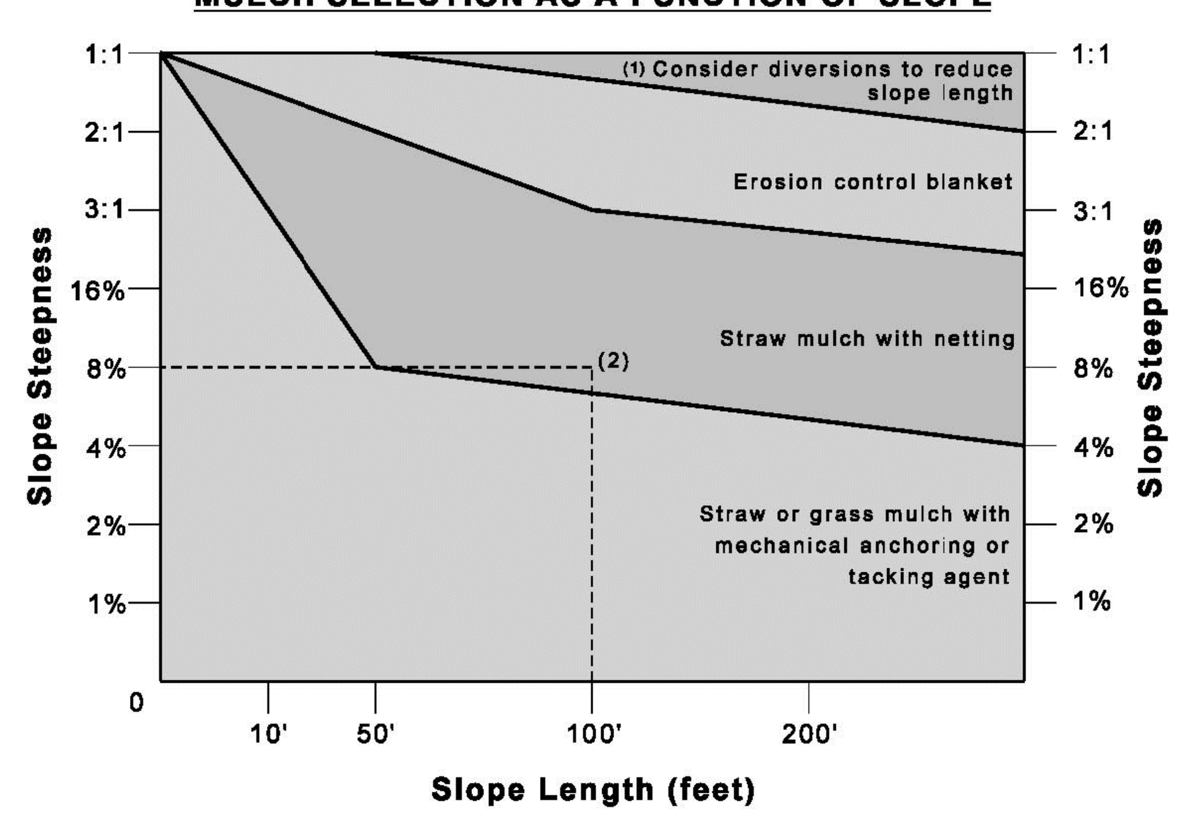
1) DO NOT SCALE DRAWING, FOLLOW DIMENSIONS.
2) ACTUAL LAYOUT DETERMINED IN THE FIELD
3) THE "CONCRETE WASHOUT" SIGN SHALL BE INSTALLED WITHIN 30 FEET OF EACH TEMPORARY CONCRETE WASHOUT FACILITY.

ST. LOUIS COUNTY
DEPARTMENT OF TRANSPORTATION
CREVE COEUR, MISSOURI

TYPICAL BMP DETAIL
CONCRETE WASTE MANAGEMENT
(CONCRETE WASHOUT SIGN)

REVISION DATE: January 1, 2016
DRAWING 806-46.03

MULCH SELECTION AS A FUNCTION OF SLOPE



(1) For slopes steeper than 1:1, consider building a diversion above slope to divert water.
(2) Example: An 8% slope, 100 feet long, requires straw mulch with netting

GENERAL MULCH RECOMMENDATIONS TO PROTECT FROM SPLASH AND SHEET FLOW

Material	Rate Per Acre	Requirements	Notes
Straw	2 to 2.5 tons	Dry, unchopped unweathered; avoid weeds	Spread by hand or machine; must be tacked or tied down
Wood Fiber or Wood Cellulose	0.5 to 1 ton		Use with hydro seeder; may be used to tack straw. Do not use in hot, dry weather.
Wood Chips	5 to 6 tons	Air dry. Add nitrogen fertilizer at 12 lb per ton	Apply with blower, chip handler, or by hand. Not for fine turf areas.
Bark	35 cu. yds.	Air dry, shredded, or hammermilled; or chips	Apply with mulch blower, chip handler or by hand. Do not use asphalt tack.

MULCH

PHYSICAL DESCRIPTION - A layer of organic material designed to protect exposed soil or freshly seeded areas from erosion by eliminating direct impact of precipitation and slowing overland flow rates. Mulch materials may include, but are not limited to, such things as grass, hay, straw, wood chips, wood fibers, hydro mulch and shredded bark. Type 1 mulch is prohibited in the flood plain.

- Type I Mulch-Vegetative (includes grass, hay, straw).
- Type II Mulch-Vegetative with asphalt emulsion (includes grass, hay, straw).
- Type III Mulch-Vegetative with overspray (includes grass, hay, straw).
- Type V Mulch-Hydro mulch (includes wood fiber, wood cellulose).
- Shredded Hardwood Bark Mulch.
- Wood Chips, (not recycled lumber).

WHERE BMP IS TO BE INSTALLED - Typically installed on seeded areas for temporary use, and in landscaped areas for permanent use.

CONDITIONS FOR EFFECTIVE USE OF BMP:
Type of Flow: Sheet flow only
Slopes: See attached chart for types of mulch acceptable as a function of slope length and steepness
Mulching Rates: See attached table

WHEN BMP IS TO BE INSTALLED - Immediately after grading landscaped areas or seeding other areas.

INSTALLATION/CONSTRUCTION PROCEDURES:
- ✓ Install upstream BMP's to protect area to be mulched
- ✓ Rough grade area and remove all debris larger than 1 inch if area is to be vegetated and mowed in the future, larger than 2 inches if area is to be permanently mulched
- ✓ If area is to be seeded, follow requirements of Seeding BMP
- ✓ Spread mulch and anchor by punching it into the ground, using netting, peg and twine, or tacking with liquid binder
- ✓ For additional information see Section 802 of St. Louis County's Standard Specification for Road and Bridge Construction.

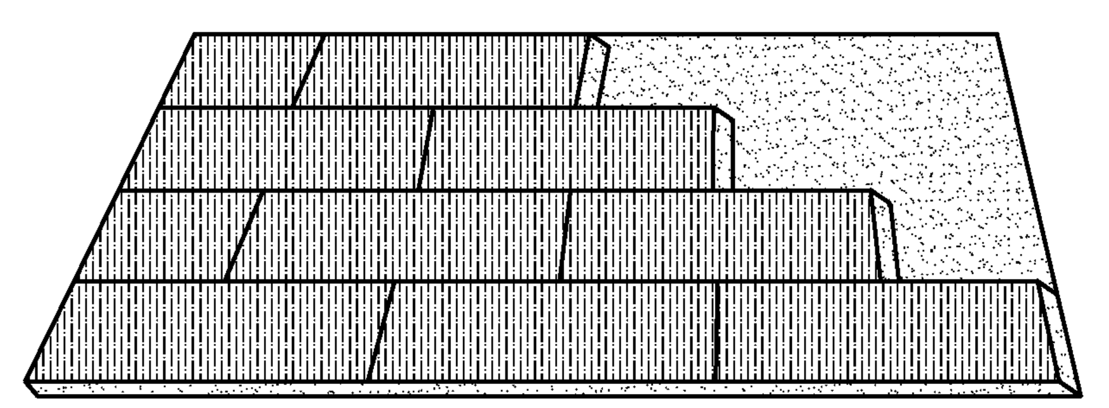
O&M PROCEDURES:
- ✓ Inspect every week and after every storm until adequate vegetation is established; annually for permanent mulch
- ✓ Protect from vehicular and foot traffic
- ✓ Repair damaged, degraded or eroded areas - reseed as needed and replace mulch

SITE CONDITIONS FOR REMOVAL - Temporary mulch should be removed when adequate vegetation is established.

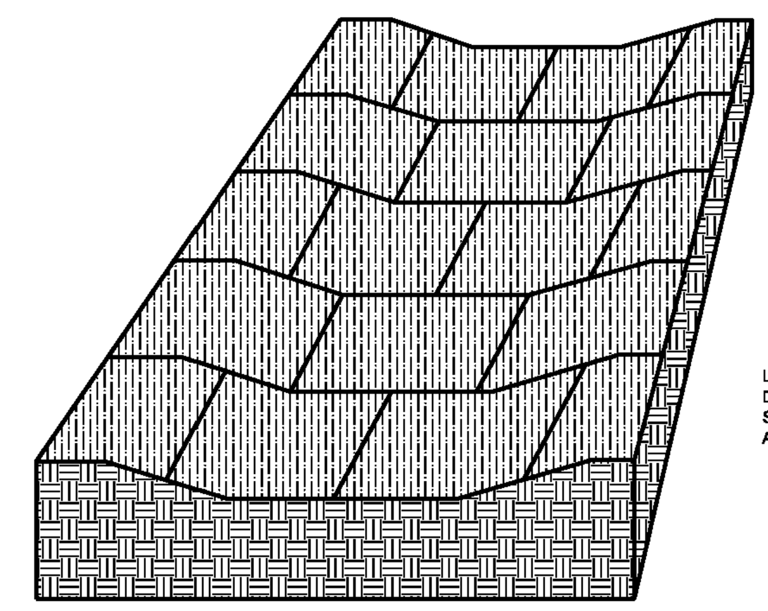
TYPICAL DETAILS - Type of mulch required for various slopes and application rates attached.

NEW	REVISIONS				
1/15/04	10/10/11	11/1/14	1/1/16		

1) LAY SOD IN A STAGGERED PATTERN WITH STRIPS BUTTED TIGHTLY AGAINST EACH OTHER.
2) ON SLOPES GREATER THAN 4%, USE PEGS OR STAPLES TO FASTEN SOD FIRMLY AT THE CORNERS AND CENTERS.



INSTALLATION OF GRASS SOD



LAY SOD PERPENDICULAR TO THE DIRECTION OF FLOW. USE PEGS OR STAPLES TO FASTEN SOD FIRMLY AT THE CORNERS AND CENTERS.

INSTALLATION OF SOD IN WATERWAYS

NOTE: JUTE MATTING CAN BE USED WHERE ADDITIONAL STABILITY IS REQUIRED.

ST. LOUIS COUNTY
DEPARTMENT OF TRANSPORTATION
CREVE COEUR, MISSOURI

TYPICAL BMP DETAIL
SODDING

REVISION DATE: January 1, 2016
DRAWING 803-10.00

Additional erosion control measures may be required during construction that are not shown on these plans. Contractor is responsible for installing and maintaining temporary and/or interim erosion control measures during construction progression or as required by the City and/or MDNR Inspector. Any changes/additions to the Storm Water Pollution Prevention Plan (SWPPP) shall be documented by the contractor and remain on file at the site.

Table 60-7 Temporary Fall Seeding

Plant Species	Rate [1] (lb/acre)	Seeding Times
Side-Oats	65	8/16 – 9/30
Winter Rye	50	8/01 – 10/15
Winter Wheat	60	8/01 – 10/15
Orchard Grass	120	8/01 – 10/15
Perennial Ryegrass	80	8/01 – 10/15
Tall fescue, Smooth Brome	80	8/01 – 10/15
K-31 Fescue	120	9/01 – 11/15
Ladino Clover	2 [2]	8/15 – 9/15
Crimson Clover	6 [2]	8/15 – 9/15
Orchard Grass and Oats or Rye	15 [2] 40 [2]	8/15 – 9/15

[1]If using aerial seeding or other broadcast method to apply seed without rolling or culti-packing, increase seeding rates by 50 percent.

[2]Pure live seed (PLS)

Table 60-8 Temporary Spring Seeding

Plant Species	Rate [1] (lb/acre)	Seeding Dates
Winter Rye	50	3/15 – 5/31
Spring Oats	65	3/15 – 5/31
Annual Ryegrass	4 [2]	3/15 – 6/15
Sudangrass	16 [2]	4/15 – 6/15
K-31 Fescue	30 [2]	3/15 – 5/31
Red Clover & Oats	2 [2] 30 [2]	3/15 – 5/31

[1]If using aerial seeding or other broadcast method to apply seed without rolling or culti-packing, increase seeding rates by 50 percent.

[2]Pure live seed (PLS)

SEEDING

PHYSICAL DESCRIPTION - Establishment of vegetation by spreading grass seed designed to protect exposed soil from erosion by eliminating direct impact of precipitation and slowing overland flow rates. Once established, the vegetative cover will also filter pollutants from the runoff. Use only perennial vegetation for final stabilization.

WHERE BMP IS TO BE INSTALLED - To exposed soil after a phase of rough or finish grading has been completed, or areas where no activity will occur for 30 days.

CONDITIONS FOR EFFECTIVE USE OF BMP:
Type of Flow: Sheet flow
Contributing Slope Length: 30 foot maximum for 3:1 slopes
50 foot maximum for slope between 3:1 and 10:1
100 foot maximum for slopes under 10%
Minimum Rates: See attached chart(s)
Acceptable Dates: See attached chart

WHEN BMP IS TO BE INSTALLED - Immediately after rough or finished grading is completed.

INSTALLATION/CONSTRUCTION PROCEDURES:
- ✓ Install upstream BMP's to protect area to be seeded.
- ✓ Rough grade area and remove all debris larger than 1 inch in diameter and concentrated areas of smaller debris.
- ✓ Install stabilization grids, if needed.
- ✓ Mix soil amendments (lime, fertilizer, etc.) into top 3 to 6 inches of soil as needed.
- ✓ Plant seed ¼ to ½ inch deep.
- ✓ Roll lightly to firm surface.
- ✓ Cover seeded area with mulch unless seeding completed during optimum spring and summer dates.
- ✓ Install additional stabilization (netting, bonded fiber matrix, etc.) as required.
- ✓ Water immediately - enough to soak 4 inches into soil without causing runoff.
- ✓ If contract / permit allows seeding to be used for final stabilization, only perennial vegetation seeds shall be used.
- ✓ For additional information see Sections 805 and 806.50 of St. Louis County's Standard Specifications for Road and Bridge Construction.

O&M PROCEDURES:
- ✓ Inspect every week and after every storm
- ✓ Protect area from vehicular and foot traffic
- ✓ Reseed areas that have not sprouted within 21 days of planting.
- ✓ Repair damaged or eroded areas and reseed and stabilize as needed
- ✓ Do not mow until 4 inches of growth occurs
- ✓ During the first 4 months, mow no more than 1/3 the grass height
- ✓ Re-fertilize during 2nd growing season

SITE CONDITIONS FOR REMOVAL - Does not require removal, but temporary seeding can be removed immediately prior to work returning to an area

TYPICAL DETAILS - Minimum seeding rates and acceptable dates for work attached.

SODDING

PHYSICAL DESCRIPTION - A ¾ inch to 1inch thick mat of vigorous turf, free of disease, insects and weeds. Sod prevents raindrops from disrupting the soil structure and causing erosion. Sod slows water runoff and acts as a filter when sediment-laden runoff crosses over the sodded area.

WHERE BMP IS TO BE INSTALLED - Typically installed in areas requiring immediate erosion protection, such as swales or detention ponds and as filter strips, around inlets, and adjacent to curbs. Also installed in areas requiring immediate aesthetic appearance or function such as entrances to new subdivision and off site construction areas.

CONDITIONS FOR EFFECTIVE USE OF BMP - Type of Flow: Sheet flow and low concentrated flows with velocities less than 5 fps.

WHEN BMP IS TO BE INSTALLED - Immediately after finish grading, installation of area inlets, and installation of underground services and foundations of new homes.

INSTALLATION / CONSTRUCTION PROCEDURES
- ✓ Finish grade area and remove all debris larger than ½ inch in diameter and concentrated areas of smaller debris.
- ✓ Soil preparation of area to be sodded shall be determined by tests to determine lime and fertilizer requirements. Soil amendments shall be mixed into top 3 to 6 inches of soil by disking or other means.
- ✓ Level and roll soil lightly to provide an even grade and firm the surface. Soil should not be excessively wet or dry.
- ✓ Lay first row of sod perpendicular to the slope or direction of flow. Butt subsequent rows tight against previous rows with strips staggered in brick-like pattern. Fill minor gaps with good soil and roll entire surface to ensure contact.
- ✓ Stake, staple and/or net corners and centers of sod strips as required.
- ✓ Water immediately after installation enough to soak 4 inches into soil without causing runoff.
- ✓ For additional information see Section 803 of St. Louis County's Standard Specification for Highway Construction.
- ✓ Type of sod shall be as specified in the contract or on the approved plans.

O&M PROCEDURES:
- ✓ Water sod daily for 3 weeks - enough to soak 4-inches into soil without causing runoff.
- ✓ Reposition areas of sod that has moved along the slope.
- ✓ Remove sediment accumulations - replace sod if necessary.
- ✓ Repair any eroded areas, replace sod, and stabilize as needed.
- ✓ Do not mow until 3-inches of new growth occur. During the first 4 months, mow no more than ⅓ the grass height.

SITE CONDITIONS FOR REMOVAL - Not applicable.

TYPICAL DETAIL - 803-10.00

PRINTED ON 24" x 36" SHEET

the clayton engineering company, inc.
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MO Cert. of Authority - Prof. Engineering #000067 & Prof. Surveying #000014
IL Dept. Financial & Prof. Reg. Prof. Design & Engineering Corp. #184.000879

REVISIONS

2	04-25-22	EAS	City of O'Fallon comments
4	05-13-22	EAS	BID SET

FILE: G:\21xxx\21243_RANGE-OF\Plans\Cover-SWPPP-details.dwg
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F.B. 1460

RANGE USA INDOOR GUN RANGE
9100 Veterans Memorial Parkway
O'Fallon, MO

SWPPP DETAILS 3

Prepared for:
PRIMAX PROPERTIES, LLC
1100 E. Morehead Street
Charlotte, NC 28204

Eric A. Skelton - Professional Engineer (PE-2000150069)

STATE OF MISSOURI
ERIC A. SKELTON
NUMBER E-2000150069
REGISTERED PROFESSIONAL ENGINEER
05-09-22

Designed	EAS
Drawn	EAS
Checked	EAS
Date	March 19, 2022

Project Number
21100

Sheet Number
C8.3 of ____