CHAPTER 13:
TURF ESTABLISHMENT and EROSION CONTROL

CULVERT END ENERGY STABILIZATION

All culvert outfall ends require some form of energy stabilization, and is critically important on safety aprons. Not every culvert end needs riprap, and in some circumstances, the flared end is sufficient. See Standard Plans detail for culvert end stabilization quantities.

EROSION CONTROL BLANKET PRODUCTS (RECP)

Spec 2016 and 2018 … Pay items for CATEGORY 3 and CATEGORY 4 EROSION CONTROL BLANKETS have multiple options that fall under the same pay item. If these options are not specified, the default will typically be a blanket with plastic netting and straw fill because this is often the lowest-cost blanket. While this may meet the needs of the project, be aware that this is a less expensive product and there may be disputes if a change is asked for in the field. Clarify the expected options to avoid confusion.

- Netting… use the suffix "P" (for plastic netting) or "N" (for natural netting) as part of the pay item description. Plastic netting is more common and often less expensive. However, natural netting may be desired or even required due to concerns about animal entanglement, permit requirements, appearance, difficulty of mowing, or other reasons.
- Fill Material…is not included in part of the pay item description however it should be identified in a note either in the SEQ or Tabulation.
  - For example..
    - "Category 3N (Wood Fiber)" identifies category 3 blanket with natural netting and wood fiber
    - "Category 3P (Straw)" means the blanket will have plastic netting and straw fill material.
  - Wood fiber may be preferred in concentrated flow conditions such as ditch grades. Wood fiber may last longer than straw.
  - The same options exist for Category 4 blankets, with the exception that the "Straw" filler for Category 4 blankets is actually a straw/coconut blend.
  - Do not rely solely on the plan sheets or the special provisions to clarify these options—include them on the SEQ and/or Tabulations to reduce confusion and disputes on projects.

For example it is recommended that it be shown in the plan as follows….

STATEMENT OF ESTIMATED QUANTITIES						
TAB	SHT NO	ITEM NO	DESCRIPTION	NOTES	UNITS	TOTAL EST QUANT
E	15	2575.504	EROSION CONTROL BLANKETS CATETORY 3N	①	SQ YD	400
E	15	2575.504	EROSION CONTROL BLANKETS CATETORY 3P	①	SQ YD	300
①	WOOD FIBER IS REQUIRED FOR SPECIFIC AREAS ON THE PLAN, SEE TAB FOR LOCATIONS.					

If you do not have a preference for the fill material then do not use note one and do not break it out in the tab (e.g. straw or wood fiber…just one column instead of two).

EROSION CONTROL BLANKETS					E
STA TO STA	LOC	EROSION CONTROL BLANKETS CATEGORY 3N (STRAW)	EROSION CONTROL BLANKETS CATEGORY 3N (WOOD FIBER)	EROSION CONTROL BLANKETS CATEGORY 3P (STRAW)	EROSION CONTROL BLANKETS CATEGORY 3P (WOOD FIBER)
		SQ YD	SQ YD	SQ YD	SQ YD
13+00 to 17+00	RT	250			
13+00 to 17+00	LT		150		
17+00 to 20+00	RT			100	
17+00 to 20+00	LT				200
TABULATION TOTAL		**400**		**300**	

EROSION CONTROL SUPERVISOR

Erosion Control Supervisor will be required on all MNDOT Projects when there are vegetation or pervious surface disturbing activities or working in public waters. Method of payment for the erosion control supervisor is highlighted in the following table:

EROSION CONTROL SUPERVISOR

Description of Project	Method of Payment
Less than 1 acre land disturbance with minimal to moderate risk of impacts to resource waters. Duration of project 1 construction season. (examples include; projects more than 100 feet from public waters, culvert extensions, ADA, Signalization)	Incidental
One (1) acre or more of land disturbance with minimal to moderate risk of impacts to resource waters. Duration of project 1 construction season. (Examples include; landscape projects, mill and overlay projects, turn lanes, etc.)	Incidental
Less than 1 acre land disturbance with high risk of Impacts to resource waters. Duration of project 1 to two construction seasons (Examples include culvert replacements in streams, work on river/stream banks and shorelines, bridge work over public waters, etc.)	Lump Sum

One (1) acre or more of land disturbance with high risk of impacts to resource waters. Duration of project 1 or more construction seasons. (Examples include; culvert replacements in streams, work on river/stream banks and shorelines, grading/surfacing, etc.)	Lump Sum
One (1) acre or more of land disturbance with low risk of impact to resource waters. Duration of project 1 to two construction seasons. (Examples include grading/surfacing in rural areas and no public water crossings)	Incidental/lump sum (Designers Discretion)

When the erosion control supervisor is incidental include in the construction notes the following: ***Erosion control supervisor is required for this project and will be incidental.*** Also include a standard boiler plate special provision (Special Provision (2573) Erosion Control Supervisor).

MULCH MATERIAL TYPE 4

As stated in the 2016 Spec Book, Type 4 Mulch Material is paid for by the acre, but in the 2018 Spec Book it is paid by the square yard. This includes MULCH MATERIAL TYPE 1or 3 (you must designate Type 3 by a footnote in SEQ if using seed mixes 3x-xxx in the plan).

NATIVE MIXES

MnDOT will be increasing the use of native species on the roadsides. The 2X-XXX series (composed of primarily non-native species) will continue to be utilized on regularly mowed areas such as in-slopes (e.g. top 8-15ft) and residential and commercial areas. The 3X-XXX series (composed primarily of native species) were designed in part to protect and enhance natural resources, promote biodiversity, display native vegetation, introduce travelers to the regional physical or biological character of the native landscape, and enhance visual quality by using vegetation to frame or screen views to and from the roadway corridor. The new District Vegetation Establishment Memo's will have recommended mixes for riparian areas, roadside ditches, and backslopes. They may differ from district to district and within each district due to adjacent habitat, ecological characteristics, or desired visual quality and aesthetics. Project designers will be given options based on the contextual setting of the road segment. It will become more common to have projects with both native mixes and non-native mixes. An example would be to have native mixes (3X-XXX series) on the backslope and ditch bottom, while the inslope and/or median may be a non-native mix (2X-XXX series).

The use of native seed mixes are often required to be utilized for mitigation due to impacts regulated by other agencies, such as when a project requires a DNR Public Waters Permits. In fact, this is a standard condition of the DNR General Permit to MnDOT for repair or bridges and culverts (GP2004-0001). The DNR may also require that native vegetation be utilized when projects run through or adjacent to DNR managed lands such as Wildlife Management Areas, Scientific & Natural Areas, Public Access, State Parks, State Forests, etc. Native vegetation suitable to the local habitat is also recommended when projects run through or adjacent to areas that include rare species, in areas identified as a Site of Biodiversity Significance, or in an Area of Environmental Sensitivity (AES). The DNR is not alone in these requirements. Use of native vegetation can come up by request from adjacent landowners or from other regulatory compliance measures as well.

SEDIMENT CONTROL STANDARD PLAN SHEETS

Temporary Sediment control standard plan sheets are updated to reflect the 2016 Specifications for Construction, division II 2573 specifications. Refer to the Standard Plans for Drainage and Erosion Control. Only use the sheets that pertain to the project and associated pay items.

SITE MANAGEMENT PLAN (SMP)

Site management plan are areas designed to help the project engineer visualize and analyze the actual work the contractor will perform when working in areas of environmental sensitivity and other critical areas. Types of work include all center line culverts, all bridge types, all in-water or over-water works, all dewatering, and engineered slopes (e.g. RSS walls). Tabulate and show these SMP areas in the plan.

STRAW MULCH MATERIALS

Mulch material Type 3 (certified grain straw) is recommended to limit the introduction of noxious weed species and a reduction in the need for herbicides (often needed when noxious weeds are introduced in other products). However, Type 3 mulch has a more finite supply than Type 1 (clean straw/hay) and is best reserved for use where 3X-XXX series seed mixes (native mixes) are proposed. Use the same type mulch for temporary and permanent use. Provide a 1.3 multiplier of the permanent mulch for use as temporary and note that in the Tabulation sheets. Also increase the disk anchor accordingly.

TURBIDITY BARRIER

Sediment control occurs by one of three methods: settling (traps), filtration (fabrics), and isolation (barriers). A turbidity barrier is designed to isolate expected turbidity generating activities from the receiving waters. As currently specified, a 3886 silt fence type turbidity barrier is a hybrid of a flotation silt curtain, but placed like silt fence. It is for shallow, stagnant waters less than 2 feet depth that have solid stable underlying soils.

VEGETATIVE COVER REQUIREMENTS

Be aware that the new MPCA NPDES Construction Stormwater General Permit (MN R 100001) has a change from previous versions in the vegetative cover required prior to closing out the permit. The previous permit conditions required 70% vegetative cover to be established, regardless of vegetation types. The new permit now requires 70% of the *expected* cover to be established prior to closeout. This small detail has a large impact on determining suitable permanent seed mix options. MPCA has recognized that some permanent vegetation types, such as grasses that will tolerate sandy soils aren't intended, nor were ever expected, to achieve 70% cover. This is also true of many of the native vegetation cover types in Minnesota. Rather than wait 3 or more years until maturity, (or bolster seed amounts as is commonly done now), we can now close out the MPCA permit when we reach 70% of the eventual expected cover at maturity.

Example: A project that utilizes of a permanent mix that is expected to reach 70% cover at maturity can be 'closed out' when that mix achieves 50% cover (70% of 70%, which is about

50%). This will reduce the focus on achieving 70% total cover for short term achievements, eliminate bolstering seed mixes to achieve 70%, and re-focus long-term benefits of other vegetation types, such as native vegetation options.

Table 3 from the 2014 seeding manual, with 'expected final cover' column added

TYPE	NUMBER	PLS Rate	NAME	REPLACES	Expected final Cover of Target Plant Community*
CoverCrop					
	21-111	100	Oats Cover Crop	MNDOT 110, BWSR UT1	95%
	21-112	100	Winter Wheat Cover Crop	MNDOT 100	95%
	21-113	110	Soil Building Cover Crop	MNDOT 130	95%
Mid-Term Stabilization					
	22-111	30.5	Two-year Stabilization	MNDOT 150	95%
	22-112	40.0	Five-year Stabilization	MNDOT 190	95%
Non-Native Grassland					
	25-121	61.0	Sandy General Roadside	MNDOT 240	90%
	25-131	220	Low Maintenance Turf	MNDOT 260	95%
	25-141	59	Mesic General Roadside	MNDOT 250	95%
	25-142	45	Agricultural Roadside	MNDOT 280	95%
	25-151	120	High Maintenance Turf	MNDOT 270	100%
Mid-term Stabilization Native					
	32-241	38	Native Construction	BWSR U12, BWSR U11	85%
Stormwater Facilities					
	33-261	35	Stormwater South and West	MNDOT 310 & 328	90%
	33-262	44	Dry Swale / Pond	BWSR W4	85%
	33-361	35	Stormwater Northeast	BWSR W7, MNDOT 310 & 328	90%
Wetland					
	34-171	5.3	Wetland Rehabilitation	BWSR WT3	85%
	34-181	5	Emergent Wetland	BWSR W1	80%

	34-261	31.5	Riparian South & West	BWSR R1	85%
	34-262	14.5	Wet Prairie	BWSR W3, MNDOT 325	90%
	34-271	12	Wet Meadow South & West	BWSR W2	90%
	34-361	31.5	Riparian Northeast	BWSR R1	85%
	34-371	12.5	Wet Meadow Northeast	BWSR W2N	90%
Native Grassland					
	35-221	36.5	Dry Prairie General	MNDOT 330	75%
	35-241	36.5	Mesic Prairie General	MNDOT 350	85%
	35-421	11	Dry Prairie Northwest	BWSR U2	75%
	35-441	11	Mesic Prairie Northwest	BWSR U1	85%
	35-521	12.5	Dry Prairie Southwest	BWSR U4	75%
	35-541	12	Mesic Prairie Southwest	BWSR U3	85%
	35-621	11	Dry Prairie Southeast	BWSR U6	75%
	35-641	12	Mesic Prairie Southeast	BWSR U5	85%
Woodland					
	36-211	34.5	Woodland Edge South & West	BWSR U7	70%
	36-311	33.5	Woodland Edge Northeast	BWSR U13, BWSR U14	70%
	36-411	35.5	Woodland Edge Northwest		70%
	36-711	35.5	Woodland Edge Central		70%

More information to aid in planning, design, and maintenance of roadside vegetation: Information on planning your vegetation design, see the vegetation section of the Highway Project Development Process (HPDP) at:

MnDOT HPDP Webpage

Information on designing and maintaining permanent roadside vegetation can be found here:

MnDOT Roadside Vegetation Management Webpage

Also refer to the MnDOT Seeding Manual (2014 edition): 2014 MnDOT Seeding Manual (pdf)

MnDOT Seedmix and turf establishment recommendations:

MnDOT Erosion Control and Stormwater Management Webpage

For additional help selecting appropriate seed mixes for your project; contact the Erosion Control & Stormwater Management Unit or Roadside Vegetation Management Unit.

Environmental Stewardship Contacts

WORK EXCLUSION DATES TO ALLOW FISH SPAWNING AND MIGRATION

Indicate in the plan all DNR Public Waters within 200 feet of a project area. DNR and MPCA require stringent measures during fish protection timeframes (commonly called Work Exclusion Dates). DNR Public Waters permits will limit work in the water during fish spawning time frames (varies by species and DNR region), and the MPCA Construction site NPDES general permit requires all exposed soil areas that are within 200 feet of the Public Water's edge, and that drain to these waters must complete the stabilization activities within 24 hours during this restriction period. It is not prohibited, though if possible, projects should be staged to avoid working within 200 feet of Public Waters during the Work Exclusion Dates. However, in all cases, work within these areas should be carried through to final stabilization, thus skipping the need for the added step of temporary stabilization.