Sediment Basin

1064
New Sediment Basin Criteria

- Treatment Surface Area
- Depth of Treatment Surface Area
- Active Storage Volume
Treatment Surface Area

\[ Sa = 1.2 \times (Q_{\text{out}} / V_s) \]

- \( Sa \) = Surface area at lowest outlet (sq ft)
- \( Q_{\text{out}} \) = Peak outflow during 1-yr, 24-hr event (cfs)
- \( V_s \) = Target particle settling velocity (fps); 3 soil classes with polymer option
Depth of Treatment

Surface Area

- 50% of surface area minimum 5-ft deep
- Maximize 5-ft deep area for surface area < 5,000 sq ft
Active Storage Volume

- TR-55 detention basin storage volume method or pond routing calculations
- 1-yr, 24-hr design storm through principle outlet
• Permanent storm water ponds can be used as sediment basins during site construction
Can the basin be constructed?
Where will excess soil be placed?
When will outlet structures be installed?
Sediment Trap

1063
New Sediment Trap Criteria

• Surface Area
• Depth
• Outlet
Surface Area

\[ As = SF \times Adr \]

- \( As \) = Surface area at invert of stone outlet (sq ft)
- \( Adr \) = Contributing drainage area (acres)
- \( SF \) = Factor based on soil texture; 3 soil classes with polymer option
Depth

- 3-ft from bottom of trap to invert of stone outlet
- Side slopes no steeper than 2:1
- If site conditions prevent 3-ft depth, equivalent storage volume must be created by increasing surface area
Outlet

- Use angular well graded 3 to 6 inch clear washed stone
- Use keyway trench to protect from undercutting
- Filter fabric optional
Contributing drainage area must be less than 5 acres
Water Application of Polymers

1050
Polymers can be used to enhance settling and reduce surface area of sediment basins and sediment traps.
• Polymers products need DNR use restriction and application rate letter
Passive Application
Active Application
Silt Fence
1056
New Fabric Specifications & Detail

NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

WOOD POSTS
LENGTH 3'-4'
20' DEPTH
IN GROUND

GEOTEXTILE FABRIC ONLY

BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL

ATTACH THE FABRIC TO THE POSTS WITH WIRE STAPLES OR WOODEN LATH AND NAILS

FLOW DIRECTION

FLOW

*NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.

SILT FENCE
Joining two lengths of silt fence is addressed in the new detail.
Placement

- Maximum slope length (see Table 1)
- Place on the contour
- Extend ends upslope
Silt fence is only appropriate for small drainage areas (sheet flow conditions)
Silt fence should not be placed in swales, ditches or any other locations where flow is concentrated.
Sediment Bale Barrier

1055
Placement

- Similar to silt fence
- Sheet flow conditions
- No channels
  (see Ditch Check tech standard for bales in channels)
Sediment bale barriers are only effective for 3 months.
Vegetative Buffer for Construction Sites

1054
Vegetated Buffer Criteria

- Sheet flow conditions
- Located along entire length of disturbed area
- Located on the contour
- Densely vegetated before land disturbance
Vegetated Buffer Criteria
• Disturbed area to buffer 6% slope or less
• Width of buffer < 5% slope
• Buffer width 25-ft minimum
Dewatering (1061)
Dewatering Solutions
Too Small
Water Application of Polymer for Dewatering
Passive Application
(Super Simple)
Rain For Rent
Sand Filtration
Sand Filters
Sand Filters

- Presently available for rent in Wisconsin
- Can be set up and working in minutes
- Perfect for congested or urban sites
- Cost effective and worry free for contractors
Dirty In - Clean Out
(with Gel treatment)

Typical Filter Performance

477 NTU <10 NTU

Before and After Filtration

After Filtration
Sequencing & Phasing

Staging

(on roadway projects)
Staging Using Mobilizations
The plan must identify when specific erosion & sediment control practices will be installed or implemented relative to major construction operations.
<table>
<thead>
<tr>
<th>Construction Activity</th>
<th>Schedule Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Identify and label protection areas (e.g., buffer zones, filter strips, trees).</td>
<td>Site delineation should be completed before construction begins.</td>
</tr>
<tr>
<td>2 Construction access. Construction entrance, construction routes, equipment parking areas and cutting of vegetation (necessary perimeter controls).</td>
<td>First land-disturbing activity -- Establish protected areas and designated resources for protection. Stabilize bare areas immediately with gravel and temporary vegetation as construction takes place.</td>
</tr>
<tr>
<td>3 Sediment traps and barriers. Basin traps, sediment fences, and outlet protection (necessary perimeter controls).</td>
<td>Install principal basins after construction site is accessed. Install additional traps and barriers as needed during grading.</td>
</tr>
<tr>
<td>4 Runoff control. Diversions, silt fence, perimeter dikes, water bars, and outlet protection.</td>
<td>Install key practices after principal sediment traps and before land grading. Install additional runoff control measures during grading.</td>
</tr>
<tr>
<td>5 Runoff conveyance system. Stabilize stream banks, storm drains, channels, inlet and outlet protection, and slope drains.</td>
<td>Where necessary, stabilize stream banks as early as possible. Install principal runoff conveyance system with runoff-control measures. Install remainder of system after grading.</td>
</tr>
<tr>
<td>6 Grubbing and grading. Site preparation: cutting, filling and grading, sediment traps, barriers, diversions, drains, surface roughening.</td>
<td>Begin major grubbing and grading after principal sediment and key runoff control measures are installed. Clear borrow and disposal areas only as needed. Install additional control measures as grading progresses.</td>
</tr>
<tr>
<td>7 Surface stabilization: temporary and permanent seeding, mulching, sodding and installing riprap.</td>
<td>Apply temporary or permanent stabilization measures immediately on all disturbed areas where work is delayed or complete.</td>
</tr>
<tr>
<td>8 Building construction: buildings, utilities, paving.</td>
<td>Install necessary erosion and sedimentation control practices as work takes place.</td>
</tr>
<tr>
<td>9 Landscaping and final stabilization: topsoiling, planting trees and shrubs, permanent seeding, mulching, sodding, installing riprap.</td>
<td>Last construction phase - Stabilize all open areas, including borrow and spoil areas. Remove and stabilize all temporary control measures.</td>
</tr>
<tr>
<td>10 Maintenance</td>
<td>Maintenance inspections should be performed weekly, and maintenance repairs should be made immediately after periods of rainfall.</td>
</tr>
</tbody>
</table>

Source: MPCA, 2000
Phasing

- Break a large project into smaller parts to reduce disturbed soil areas and exposure time
- Start subsequent phases when earlier phases are substantially complete