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EXAMPLE EROSION AND SEDIMENT CONTROL PLAN

Introduction

What follows is an example erosion and sedimentation control plan based on one from the files of the State of North Carolina. The site is located in the Piedmont region. The plan was modified to demonstrate the application of a variety of erosion and sedimentation control practices.

This example plan was developed in detail for instructive purposes. The specific number of maps, practices, drawings, specifications, and calculations required depends on the size and complexity of the development. The vegetative treatment is from a sample North Carolina plan and no attempt was made to modify the treatment for New York conditions. The designer should select the most practical and effective practices to control erosion and prevent sediment from leaving the site. The plan should be organized and presented in a clear, concise manner. Sufficient design and background information should be included to facilitate review by erosion control personnel. Construction details should be precise and clear for use by an experienced general contractor.

An acceptable erosion and sedimentation control plan must, at a minimum, contain:

1. brief narrative
2. construction schedule
3. maintenance plan
4. vicinity map
5. site topographic map including soil survey information
6. site development plan
7. erosion and sedimentation control plan drawing¹
8. detail drawings and specifications
9. vegetative plan

Although this example is from North Carolina, its organization, analysis, and detail are appropriate in all locations. The original content of the example was retained for continuity. Regarding practices selected, refer to the flow charts in Section 2 to correlate with the control groups. In the example, the temporary diversion equates to New York’s earth dike. Supporting calculations for these practices are not included to maintain the size of this publication. However, the criteria in each of the practice standards in the appropriate sections, will guide the user in their design.

¹ On large projects, the designer should show the erosion and sediment control plan on separate sheets, reflecting the actual topography at the time the phase starts, and show only existing and final grades for that phase under construction.
Narrative

Project Description

The purpose of the project is to construct two large commercial buildings with associated paved roads and parking area. Another building will be added in the future. Approximately 6 acres will be disturbed during this construction period. The site is 11.1 acres located in Granville County, 2 miles north of Deal, NC, off Terri Road (see Vicinity Map).

Site Description

The site has rolling topography with slopes generally 4 to 6%. Slopes steepen to 10 to 20% in the northwest portion of the property where a small, healed-over gully serves as the principal drainageway for the site. The site is now covered with volunteer heavy, woody vegetation, predominately pines, 15 to 20 ft. high. There is no evidence of significant erosion under present site conditions. The old drainage gully indicates severe erosion potential and receives flow from 5 acres of woods off-site. There is one large oak tree, located in the western central portion of the property, and a buffer area, fronting Terri Road, that will be protected during construction.

Adjacent Property

Land use in the vicinity is commercial/industrial. The land immediately to the west and south has been developed for industrial use. Areas to the north and east are undeveloped and heavily wooded, primarily in volunteer pine. Hocutt Creek, the off-site outlet for runoff discharge, is presently a well stabilized, gently flowing perennial stream. Sediment control measures will be taken to prevent damage to Hocutt Creek. Approximately 5 acres of wooded area to the east contribute runoff into the construction area.

Soils

The soil in the project area is mapped as Creedmoor sandy loam in B and C slope classes. Creedmoor soils are considered moderately well to somewhat poorly drained with permeability rates greater than 6 inches/hour at the surface, but less than 0.1 inches/hour in the subsoil. The subsurface is pale brownstone loam, 6 inches thick. The subsoil consists of a pale brown and brownish yellow sandy clay loam ranging from light gray clay, 36 inches thick. Below 36 inches is a layer of fine sandy loam to 77 inches. The soil erodibility factor (K value) ranges from 0.20 at the surface to 0.37 in the subsoil.

Due to the soil permeability of the subsoil that will be exposed during grading, a surface wetness problem with high runoff is anticipated following significant rainfall events. No groundwater problem is expected. The tight clay in the subsoil will make vegetation difficult to establish. A small amount of topsoil exists on-site and will be stockpiled for use in landscaping.
Planned Erosion and Sedimentation Control Practices

1. **Sediment Basin**: A sediment basin will be constructed in the northwest corner of the property. All water from disturbed areas, about 6 acres, will be directed to the basin before leaving the site (Note: The undisturbed areas to the east and north could have been diverted, but this was not proposed because it would have required clearing to the property line to build the diversion and the required outlet structure). See pages F.10-F.12 for details.

2. **Temporary Gravel Construction Entrance/Exit**: A temporary gravel construction entrance will be installed near the northwest corner of the property. During wet weather it may be necessary to wash vehicle tires at this location. The entrance will be graded so that runoff water will be directed to an inlet protection structure and away from the steep fill area to the north. See page F.12 for specifications.

3. **Temporary Block and Gravel Drop Inlet Protection**: A temporary block and gravel drop inlet protection will be installed at the drop inlet located on the south side of the construction entrance. Runoff from the device will be directed into the sediment basin (Note: The presence of this device reduces the sediment load on the sediment basin and provides sediment protection for the pipe. In addition, sediment removal at this point is more convenient than from the basin). See page F.13 for specifications.

4. **Temporary Diversion**: Temporary diversions will be constructed above the 3:1 cut slopes south of Buildings A and B to prevent surface runoff from eroding these banks (Note: Sediment-free water may be diverted away from the project sediment basin). A temporary diversion will be constructed near the middle of the disturbed area to break up this long, potentially erosive slope, should the grading operation be temporarily discontinued. A temporary diversion dike will be constructed along the top edge of the fill slope at the end of each day during the filling operation to protect the fill slope. This temporary diversion will outlet to the existing undisturbed channel near the north edge of the construction site and/or to the temporary inlet protection device at the construction entrance as the fill elevation increases. See page F.14 for specifications.

5. **Level Spreader**: A level spreader will serve as the outlet for the diversion east of Building A and south of Building B. The area below the spreader is relatively smooth and heavily vegetated with a slope of approximately 4%. See page F.15 for specifications.

6. **Tree Preservation and Protection**: A minimum 2.0 ft. high protective fence will be erected around a large oak tree at the dripline to prevent damage during construction. Sediment fence materials may be used for this purpose. See page F.16 for specifications.

7. **Land Grading**: Heavy grading will be required on approximately 6 acres. The flatter slope after grading will reduce the overall erosion potential of the site. The buildings will be located on the higher cut areas, and the access road and open landscaped areas will be located on fill areas. See pages F.16–F.17 for specifications.

All cut slopes will be 3:1 or flatter to avoid instability due to wetness, provide fill material, give an open area around the buildings, and allow vegetated slopes to be mowed. Cut slopes will be fine graded immediately after rough grading; the surface will be disked and vegetated according to the Vegetation Plan (pages F.29–F.31).

Fill slopes will be 2:1 with fill depths as much as 12 to 15 ft. Fill will be placed in layers not to exceed 9 inches in depth and compacted (Note: Fills of this depth should have detailed compaction specifications in the general construction contract. These specifications are not part of the erosion and sedimentation control plan).
The fill slope in the north portion of the property is the most vulnerable area to erosion on the site. Temporary diversions will be maintained at the top of this fill slope at all times, and the filling operation will be graded to prevent overflow to the north. Filling will be done as a continuous operation until final grade is reached. The paved road located on the fill will be sloped to the south and will function as a permanent diversion. The area adjacent to the roads and parking area will be graded to conduct runoff to the road culverts. Runoff water from the buildings will be guttered to the vegetated channels. The finished slope face to the north will not be back-bladed. The top 2 to 6 inches will be left in a loose and roughened condition. Plantings will be protected with mulch, as specified in the Vegetation Plan.

A minimum 15-ft undisturbed buffer zone will be maintained around the perimeter of the disturbed area (Note: This will reduce water and wind erosion, help contain sediment, reduce dust, and reduce final landscaping costs).

8. **Temporary Sediment Trap:** A small sediment trap will be constructed at the intersection of the existing road ditch and channel number 3 to protect the road ditch. Approximately 2 acres of disturbed area will drain into this trap. See pages F.18–F.19 for specifications.

9. **Sediment Fence:** A sediment fence will be constructed around the topsoil stockpile and along the channel berm adjacent to the deep cut area as necessary to prevent sediment from entering the channels. See pages F.19–F.20 for specifications.

10. **Grass-Lined Channel:** Grass-lined channels with temporary straw-net liners will be constructed around Buildings A and B to collect and convey site water to the project’s sediment basin. See pages F.21–F.23 for specifications.

11. **Riprap-Lined and Paved Channels:** A riprap channel will be constructed in the old gully along the north side of the property starting in the northwest corner after all other construction is complete. This channel will replace the old gully as the principal outlet from the site. See pages F.24–F.25 for specifications.

12. **Construction Road Stabilization:** As soon as final grade is reached on the entrance road, the subgrade will be sloped to drain to the south and stabilized with a 6-inch course of NC DOT standard ABC stone. The parking area and its entrance road will also be stabilized with ABC stone to prevent erosion and dust during the construction of the buildings prior to paving. See pages F.25–F.26 for specifications.

13. **Outlet Stabilization Structure:** A riprap apron will be located at the outlet of the three culverts to prevent scour. See pages F.26–F.27 for specifications.

14. **Surface Roughening:** The 3:1 cut slopes will be lightly roughened by disk ing just prior to vegetating, and the surface 4 to 6 inches of the 2:1 fill slopes will be left in a loose condition and grooved on the contour. See page F.28 for specifications.

15. **Surface Stabilization:** Stabilization of the surface will be accomplished with vegetation and mulch as specified in the vegetation plan. One large oak tree, southwest of Building A, and a buffer area between the parking lot and Terri Road, will be preserved. Roadway and parking lot base courses will be installed as soon as finished grade is reached.

16. **Dust Control:** Dust control is not expected to be a problem due to the small area of exposure, the undisturbed perimeter of trees around the site, and the relatively short time of exposure (not to exceed 9 months). Should excessive dust be generated, it will be controlled by sprinkling.
Construction Schedule

1. Obtain plan approval and other applicable permits.

2. Flag the work limits and mark the oak tree and buffer area for protection.

3. Hold pre-construction conference at least one week prior to starting construction.

4. Install sediment basin as the first construction activity.

5. Install storm drain with block and gravel inlet protection at construction entrance/exit.

6. Install temporary gravel construction entrance/exit.

7. Construct temporary diversions above proposed building sites. Install level spreader and sediment trap and vegetate disturbed areas.

8. Complete site clearing except for the old gully channel in the northwest portion of the site. This area will be cleared during the last construction phase for the installation of the riprap liner.

9. Clear waste disposal area in the northeast corner of property, only as needed.

10. Rough grade site, stockpile topsoil, construct channels, install culverts and outlet protection, and install sediment fence as needed. Maintain diversions along top of fill slope daily. NOTE: A temporary diversion will be constructed across the middle of the graded area to reduce slope length and the bare areas mulched should grading be discontinued for more than 3 weeks.

11. Finish the slopes around buildings as soon as rough grading is complete. Leave the surface slightly roughened and vegetate and mulch immediately.

12. Complete final grading for roads and parking and stabilize with gravel.

13. Complete final grading for buildings.

14. Complete final grading of grounds, topsoil critical areas, and permanently vegetate, landscape, and mulch.

15. Install riprap outlet channel and extend riprap to the pipe outlet under the entrance road.

16. All erosion and sediment control practices will be inspected weekly and after rainfall events. Needed repairs will be made immediately.

17. After the site is stabilized, remove all temporary measures and install permanent vegetation on the disturbed areas.

18. Estimated time before final stabilization—9 months.
Maintenance Plan

1. All erosion and sediment control practices will be checked for stability and operation following every runoff-producing rainfall but in no case less than once every week. Any needed repairs will be made immediately to maintain all practices as designed and installed for their appropriate phase of the project.

2. The sediment basin will be cleaned out when the level of sediment reaches 2.0 ft below the top of the riser. Gravel will be cleaned or replaced when the sediment pool no longer drains properly.

3. Sediment will be removed from the sediment trap and block and gravel inlet protection device when storage capacity has been approximately 50% filled. Gravel will be cleaned or replaced when the sediment pool no longer drains properly.

4. Sediment will be removed from behind the sediment fence when it becomes about 0.5 ft deep at the fence. The sediment fence will be repaired as necessary to maintain a barrier.

5. All seeded areas will be fertilized, reseeded as necessary, and mulched according to specifications in the vegetative plan to maintain a vigorous, dense vegetative cover.

Vicinity Map
Site Development Map—Exhibit 2
Site Erosion and Sediment Control Plan—Exhibit 3