4.2.6.3 Gravel Access Road Stabilization

Source: TDEC

Definition and Purpose

Access or construction road stabilization involves reinforcing temporary access routes, vehicle transportation paths, and parking areas on construction sites to minimize erosion and reduce the need for regrading. By applying materials like gravel immediately after grading, these stabilized routes help maintain safe and durable travel paths for construction traffic, especially during wet weather. This practice ensures that roadbeds remain intact from initial grading through final stabilization, reducing sediment runoff and maintaining site accessibility.

Appropriate Applications

Access road stabilization is applicable wherever temporary or permanent access roads, parking areas, or other travel ways are needed to support construction traffic. This includes stone-base roads and parking areas that may be exposed to erosion and degradation from vehicles, especially during wet weather. It is commonly used on streets, highways, and other traffic areas immediately after grading to maintain stability and minimize soil disruption. Additionally, construction road stabilization helps reduce ground compaction from vehicular traffic and can prevent access and disturbance to sensitive ecological areas (VDEQ, 2024).

Limitations and Maintenance

Inspections should be conducted routinely and after rainfall events to assess surface conditions, check for erosion issues, and ensure drainage structures like roadside ditches and culverts remain clear of sediment and debris. Any areas showing signs of erosion, such as rills or gullies, should be repaired promptly to prevent further degradation. This may require top dressing with stone or gravel (NCDEQ, 2013). Vegetated areas adjacent to stabilized roads should be monitored to maintain healthy plant cover, which helps minimize soil disturbance.

Planning and Design Considerations

Access roads are especially prone to erosion and sediment transport due to constant vehicle movement and exposed soil surfaces. Unstabilized roads often become muddy and unusable during wet weather, causing construction delays and increasing the sites sediment yield (NCDOT, 2013; VDEQ, 2024). Effective road stabilization not only reduces maintenance costs but also ensures safe and efficient construction operations.

To minimize erosion, access roads should be situated following the natural contour of the terrain, avoiding steep slopes, rocky areas, and soils prone to erosion. Aligning roads to follow natural topography reduces disturbance and helps maintain stable drainage patterns (GSWCC, 2016). Where possible, roads should be located on naturally flat or gently sloping areas to reduce grading requirements and minimize the risk of sediment transport. Ridge tops can provide stable road conditions. Additionally, roads built on south- or west- facing slopes are often drier due to sun exposure in intensity, reducing the potential for muddy conditions (VDEQ, 2024).

The roadbed should be cleared of vegetation, roots, and other debris to ensure a solid foundation. Applying a minimum six inch layer of coarse aggregate, such as #57 stone or other coarse aggregate, immediately after grading helps stabilize the surface and prevents erosion. PUG base (Twisted Nail LLC), or other concrete byproducts, may also be used. In areas subject to heavy traffic, increasing the material depth to eight or ten inches may be necessary to prolong roadbed stability (GSWCC, 2016; WVDEP, 2016). Geotextile fabric can also be placed beneath the aggregate to improve stability and reduce the risk of gravel loss, which may be ideal in areas with weaker subgrade conditions.

Road grade plays a significant role in long-term stabilization. It is recommended that road grades do not exceed 10 to 12 percent (NCDOT, 2013), as steeper slopes can lead to gravel loss, rill erosion, and gully formation. Frequent grade changes can help minimize erosion compared to long, continuous slopes. In areas requiring steep grades, switchbacks are preferable to reduce the overall slope length (GSWCC, 2016). Access roads are to be a

minimum of 14 feet in width for one way traffic and 20 feet in width for two way traffic. It is recommended to include a two foot shoulder on each side of the road. Embankment side slopes are most stable when they are 2H:1V or flatter (GSWCC, 2016; NCDOT, 2013). Temporary parking areas are best located on flat or gently sloping terrain with a grade less than four percent (WVDEP, 2016).

Adequate cross-slope grading is crucial to ensure proper drainage to roadside drainage structures, maintain stable road conditions, and minimize erosion. The best suited cross section (Figure 4.2.6.3-A) is often dependent on drainage needs, soil stability, and the expected volume of traffic (VDEQ, 2024):

1. Crowned Fill Section: Use on flat ground where standing water on a road surface may be problematic;
2. Crowned Turnpike Section: Use on low ground roads where fill is not available;
3. Outslope: Use on moderate slopes for low-volume roads and stable soils. Outsloping can be more dangerous in wet and snowy weather;
4. Inslope with Ditch Section: Use on steep hills, areas with fine-textured soils, winter logging roads, and where drainage is necessary; and
5. Crowned and Ditched Section: Use on high-volume roads on steep side hills

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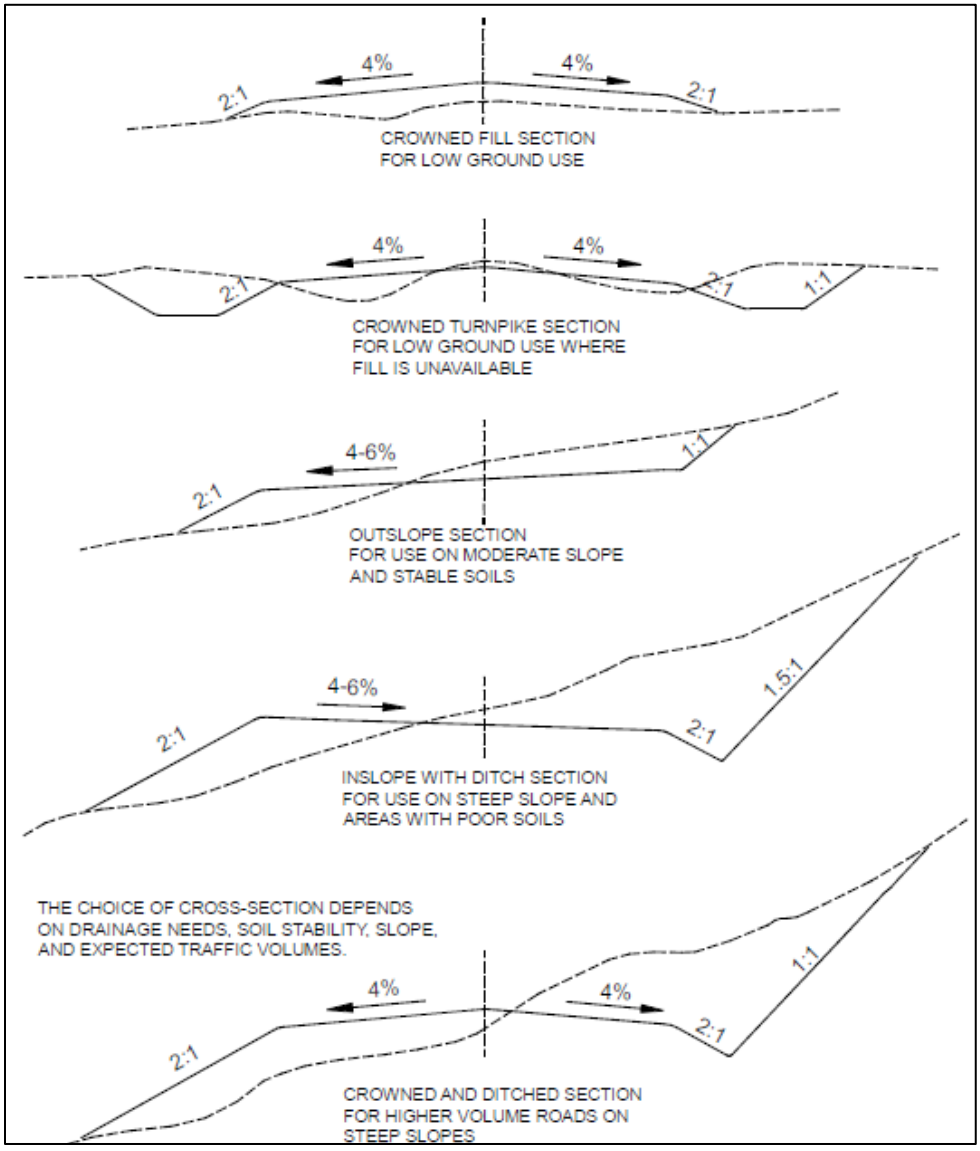

Figure 4.2.6.3-A: Access road cross section details. Adapted from VDEQ (2024).

Roadway cross sections are to convey runoff to roadside ditches, culverts, or other drainage structures. Additionally, roadside ditches, cut and fill slopes, and other disturbed areas adjacent to roadways should be stabilized with vegetation or other erosion control measures as soon as grading is completed.

Example Application

No formal design or quantities are required for this measure and therefore are not presented here.

References

AEP. (2018). *FY 2018 General Erosion and Sediment Control and Stormwater Management Specifications for the Construction and Maintenance of Electric Utility Lines.* American Electric Power Service Corporation Environmental Services.

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