

Earthwork leaves the soil in a bare condition and measures must be taken to protect the completed work from the elements of nature. Designers should use the Erosion and Sedimentation Control Handbook to develop sedimentation control for all projects. The most recent version of the Erosion and Sediment Control Handbook is on the web at <http://www.dot.nd.gov/manuals/manuals-publications.htm> under “Erosion and Sediment Control Handbook”.

See sections 110 and 708 of the Standard and Supplemental Specifications for further guidance.

Note: A North Dakota Pollution Discharge Elimination System (NDPDES) Construction Permit is required whenever 1 or more acres are disturbed. The contractor applies to the Department of Health for the permit. A NDDOT representative does not need to sign the permit.

III-04.01 Common Excavation

It is the intent to try to get all the common excavation from within the right of way without impacting environmentally sensitive areas such as wetlands, easement wetlands, and cultural resource areas. Please refer to Standard Specification 107.04 Historic Preservation Responsibilities. When all the useable material has been utilized, provisions for additional borrow are required.

III-04.02 Borrow

Borrow is needed when there is insufficient dirt on the project from common excavation to build the roadway template. When borrow is required, the quantity of borrow and where on the project it is needed should be given to the Right Of Way Services in the Environmental and Transportation Services Division (ETS Division) or its consultant, as soon as possible (no later than 10 weeks prior to plan completion), for acquisition. Snow cover may not allow Cultural Resources Section of the ETS Division to complete the cultural survey on the borrow site between November and April.

There are times when the contractor will be required to furnish borrow. There are different procedures for contractor furnished borrow versus DOT furnished borrow. See sections 107 and 203 of the Standard Specifications.

Generally the following guide may be used for contractor furnished borrow:

- < 5,000 C.Y. – Contractor
- 5,000-10,000 C.Y. – If needed at multiple locations, such as a guardrail project, the contractor will furnish. If only needed at one location, consider DOT furnished.
- > 10,000 C.Y. – DOT

The following procedures should be followed for State Optioned Borrow:

1. Right of Way Services or their consultant will submit a Material Source Clearance Request Form. The Material Source Clearance Request Form (SFN 58466) can be found on the web at <http://www.dot.nd.gov/business/contractorinfo.htm>.
 - o If Right of Way Services requested the Material Source Clearance, then Right of Way Services will send the Certificate of Approval (COA) link to:
 - The designer if the project is being completed in-house
 - The Technical Support Contact if the project is being completed by a consultant
 - o If a consultant requested the Material Source Clearance, then the COA should be sent to them directly. However, the consultant should send the COA link to the Technical Support Contact.
2. The designer or consultant should electronically attach the COA to the borrow area list. Be sure to change the COA from color to black and white.
3. The designer or Technical Support Contact will submit the electronic file (borrow area list and COA) to O:\81 Special Projects\DIP PLANS\Appropriate Bid Opening\Appropriate Project Folder.

Try to obtain borrow close to where it is needed to keep the hauls as short as possible (desirably no more than 1 mile).

There may be times when NDDOT will want to make the borrow area a mandatory area. In that event, a public interest finding will be submitted to FHWA if federal funds are involved.

There may be special circumstances when Materials and Research would be requested to checkout a borrow area.

III-04.03 Haul (rural grading)

It is the aim to keep the haul distances as short as practicable. Calculate the average haul for all splits and balances. Do this for each dirt mile and also for the total project. For calculation guidance, see the information on the web at <http://www.dot.nd.gov/manuals/design/caddmanual/caddmanual-welcome.htm> under “Procedures for Calculating Final Earthwork Quantities” and section 203 of the Standard Specifications.

Don't show a haul for a distance of less than one station.

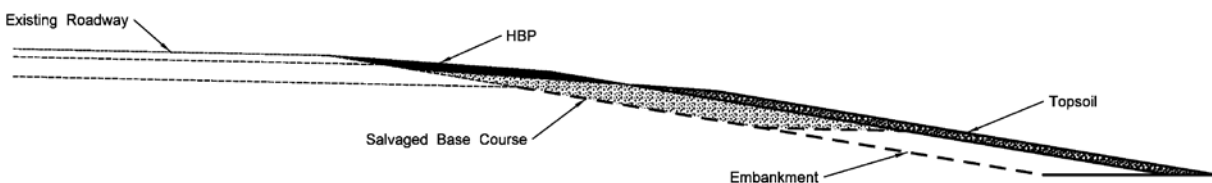
III-04.04 Waste

There may be times when there is too much material on the project and it must be disposed of. This could be subcut material or just because of the terrain. Sometimes it may be beneficial to use it to flatten the foreslopes beyond what is needed. In some cases, the quantity is large enough to have the Right Of Way Services go to the project and negotiate for a place to waste the material. If this approach is used, the quantity to be wasted must be forwarded to Right of Way Services to give them time to negotiate with the land owners. NDDOT could have the contractor find a waste area when there is minimal waste. Waste can't be disposed of in environmentally sensitive areas such as wetlands, easement wetlands, or cultural resource areas. Please refer to Standard Specification 107.04 Historic Preservation Responsibilities.

If a mandatory waste site is proposed, a public interest finding must be prepared.

III-04.05 Topsoil

The topsoil is to be removed and stockpiled, and then spread over the disturbed area, except the roadbed. There may be times when there is not sufficient topsoil available and in those cases a quantity for extra topsoil may be provided. Generally the top 6" is stripped for topsoil, except for where this amount doesn't exist. This should be discussed during the field review. Enough topsoil should be provided to cover the entire slough of the base material up to the bottom of the pavement slough. See the following example of a typical section.



If topsoil is not to be removed, stockpiled, and/or spread over the project, it should be stated in a plan note. See Section 203 of the Standard Specifications.

At a minimum, a slope staking report showing the break points and tie points to the top of the topsoil shall be developed and provided to the field engineer. When ditch profile elevations are shown in the plans, the elevations shall be to the top of the topsoil.

Cross sections should show the existing topsoil so that the areas of excavation, embankment, topsoil, etc. can be verified.

The topsoil will be paid as specified in the Standard Specifications.

III-04.06 Clearing and Grubbing

This is the first item that has to be accomplished on the project. Generally, this includes the removal and disposal of trees, shrubs, stumps, roots, brush and other surface objects from the excavation and embankment areas. Measurements will be by one or more alternate methods as described in Section 201.03 of the Standard Specifications.

III-04.07 Compaction

The recommendations for the mainline are provided by the Materials and Research Division based on the following guide:

- Generally AASHTO T-99 is used in the Red River Valley, where the engineering properties of the soil indicate that the soil would benefit from a lower maximum dry density and a higher moisture content range.
- Type “A” compaction:
 - Density 85% of AASHTO T-180; moisture range from optimum to 5% above optimum.
 - Density 95% of AASHTO T-99; moisture range from 4% below optimum to 5% above optimum.
 - Fill deposited in 12 inch layers. Use motor graders, tamping rollers, discs and water to construct embankment.
- Type “B” compaction:
 - Same construction efforts as Type “A” except that tests are not required. Use moisture as needed.
- Type “C” compaction:
 - Fill deposited in 8 inch layers and compaction achieved by the passage of construction equipment.

The following table lists the item of work and the corresponding compaction:

<u>ITEM</u>	<u>COMPACTION</u>
202 – Removal of Structures, Obstructions, Surfacing, etc.	Under roadway – Type “A” Off roadway – Type “C”
203 – Excavation and Embankment	Type “A”
210 – Structural Fill	Type “A” – Box culverts and Berms. Abutments – Select Backfill – 6 inch layers
230 – Subgrade Preparation (asphalt)	Type “A” – Driving Lanes Type “A” – Shoulders
234 – Stabilized Base	Type “A” – Top 12 inches
550 – PCC Subgrade	Type “A” – For all
602 – Concrete Structures	See 210
638 – Structural Plate Pipe	Type “A” (consult manufacturer’s Specification)
708 – Concrete Slope Protection	Type “C”
710 – Temporary Bypass	Type “C”
710 – Interstate Crossovers and Ramp Connections.	Type “A”
714 – Culverts, Drains, etc. (RCP & Metal)	Type “A” – Centerline Type “B” – Approach
722 – Manholes, Inlets, etc.	Type “A” – 6 inch layers
724 – Water and Sewer	Special Backfill to 3 inches above pipe, remainder of fill Type “A”. All other Type “C”.
748 – Curb and Gutter	6 inch layers
750 – Sidewalks and Driveways	Type “C”
764 – Guardrail	Type “C” except if on a full grading project, use Type “A”.

III-04.08 Seeding, Sodding and Soil Stabilization

Measures must be taken to protect the completed work from the elements of nature. This is generally done by seeding, sodding, and other soil stabilization methods. In most instances, cover is obtained through seeding. However, the engineer can dictate the use of sod. Soil stabilization measures such as, hydroseeding may be utilized in areas that cannot be stabilized using conventional techniques.

There will be times when it will take more than sod to protect soil because of the potential velocity of the runoff water. In these cases, an erosion control fabric may be needed or it may even require rock riprap. The hydraulics staff of the Bridge Division should be consulted.

These situations are covered in Section 708 of the Standard Specifications or in the special provisions.

III-04.09 Engineering Fabrics

Engineering fabrics have become a valuable tool in highway construction. They are not used as a matter of course, but rather to improve some feature such as soil or base stabilization, erosion control, filter, mechanically stabilized embankment, etc. The use of these fabrics should be addressed in the Materials and Research Linear Soil Survey Report.

III-04.10 Widening

When the roadway is not wide enough to place the proposed improvement that meets the respective Design Guide, it may have to be widened. Generally this means widening on both sides, but there may be circumstances where it would be best to shift the centerline and widen on only one side.

III-04.11 Selective Regrading

This would occur if there were some horizontal or vertical curves that needed some correction, or if there was a short segment of roadway needed to be widened or even completely regraded, but the rest of the roadway was satisfactory. This could occur if there were subgrade problems and it was necessary to tear up the existing roadway to correct the problem.

III-04.12 Grade Raises

Generally, this occurs when it becomes evident the roadway is too low and is creating a snow problem or that the roadway is in danger of being flooded.

If the problem is snow then it is desirable to get the roadway up where the wind has an opportunity to blow the roadway clear. Generally, this is most effective when the roadway surface is higher than the adjacent ground.

If the problem is flooding it would be desirable to raise the grade past the outlet elevation for the respective basin. However, the Designer should work with FHWA in determining the amount of raise which FHWA will participate. If the roadway is not designed to ultimate, the designer should consider providing enough width for an ultimate raise.

When considering a grade raise the drainage should be analyzed to determine if the waterway opening is adequate.

III-04.13 Relocations

Relocations occur when it is necessary to completely move a segment of roadway to a new location. This will no doubt result in having to acquire right of way, may involve utility relocation, and will involve the environmental, cultural and wetland reviews as well as public involvement.

III-04.14 Replacement of Approach and Centerline Culverts

Generally, the following procedures are followed in replacing culverts on grading and widening projects:

- Approach culverts are replaced on all grading and widening projects.
- Centerline culverts should be considered for replacement on full grading projects if the existing culverts have been in place for 50 years or longer. If replacement is difficult or costly, due to the depth of cover or culvert size, a condition survey should be done. This survey will be used to determine if the culvert can be left in place, or replacement is necessary. A video camera can be used in those culverts that are too small to visually inspect.
- On widening projects, all centerline culverts smaller than 24" diameter should be replaced. A condition survey should be done on all culverts that have been in place for 50 years or longer.
- Concrete culvert sections 48" diameter and larger, end sections, and cattle pass sections should be relaid if they are in good condition and have sufficient strength. Culverts that do not have sufficient strength for the proposed fill height can be used at the ends of the new culvert installation under the foreslope where the fill height is less and within the strength limitations of the old sections.

A determination should be made if the cattle pass is being used for drainage and if it should be removed or closed.