

SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Excavation and fill for roadways, ponds, and other areas.

- B. Related Sections
 - 1. 01 57 13 – Temporary Erosion and Sediment Control
 - 2. 02 41 13 – Removals
 - 3. 31 10 00 – Site Clearing
 - 4. 31 23 13 – Subgrade Preparation
 - 5. 32 92 00 – Turf and Grasses
 - 6. 33 05 05 – Trench Excavation and Backfilling

1.02 REFERENCES

- A. North Dakota Department of Transportation “Standard Specifications for Road and Bridge Construction” 2008 Edition, As Revised
 - 1. Section 203 – Excavation and Embankment

1.03 SEQUENCING AND SCHEDULING

- A. Perform excavation as soon as possible after sewer and water construction.

- B. Complete subgrade for streets, driveways, walks, and parking lots immediately after trench backfill and compaction.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Granular Fill: Shall consist of a well graded material free of organic matter, bituminous material and salvaged concrete which meets the following gradation requirements:

Sieve Size	Percent Passing (by weight)
1”	100
3/4”	90 - 100
No. 4	45 – 80
No. 40	15 – 35

No. 200	0 - 15
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- B. Geosynthetic Material
 - 1. Type R1 shall conform to the requirements for Geosynthetic Reinforcement Type R1, Section 709.04 D of the NDDOT Specifications.

PART 3 EXECUTION

3.01 GENERAL

- A. Establish traffic control prior to excavations.
- B. Establish erosion control devices prior to all excavations.
- C. Perform removals consistent with Section 02 41 13.
- D. Strip Topsoil consistent with Section 31 10 00.

3.02 EXCAVATION OPERATIONS

- A. Excavation of unstable material below grading grade shall be done under the direction of the Engineer as the subsurface conditions are disclosed
- B. Subgrade Excavation includes the following:
 - 1. Remove soft clays, organic material, and topsoil within 3 feet of the subgrade.
 - 2. Backfill with suitable on site material.
 - 3. Compact in accordance with 3.05 of this Section.

3.03 DISPOSITION OF EXCAVATED MATERIAL AND BORROW MATERIAL

- A. Material in excess of that required for permanent work and/or materials deemed by the Owner's Representative to be unsuitable, with the exception of topsoil, shall be disposed of off-site at a location provided by the Contractor unless a disposal site is noted on the Drawings.
 - 1. Disposal sites where shown on the Drawings, shall be graded to drain, shall not impede an existing drainage and shall be re-seeded.
 - 2. Private disposal sites shall be restored to the satisfaction of the landowner.
- B. Borrow Material needed shall be provided by the Contractor.
 - 1. Contractor shall notify the Owner's Representative sufficiently in advance of opening any borrow areas so that the borrow material can be tested before being used.

3.04 COMPACTING EMBANKMENTS

- A. Clay or silty soil used as fill will need to be placed at a water content sufficient to attain compaction. It is the Contractor's responsibility to moisture condition the soil to a uniform condition.
- B. Contractor shall recognize that inclement weather occurs during the construction season and the Contractor shall be responsible for protecting the moisture condition of soils during the construction phase.
- C. Each layer of backfill or embankment shall be compacted to the density specified below.
 - 1. Material shall be compacted at a moisture content of no less than 4 percent below the optimum moisture content and no more than 5 percent above the optimum moisture content of the Standard Proctor as defined by ASTM D698.
 - 2. Below is the minimum density requirements for various applications.

Location	Standard Proctor
Unimproved areas (ag or lawns)	90%
Parking Lots, Streets, Sidewalks, Paths	95%
Buildings	100%
Lagoon and earthen basin floors	98%

- 3. Below is the test frequencies that shall be used.

Material	Test	Frequency
Subgrade	Proctor Moisture/Density	1 per soil type 1 per 200 lineal feet of street
Base Course	Proctor Moisture/Density	1 per soil type 1 per 200 lineal feet of street
Utility Trench	Proctor Moisture/Density	1 per soil type 1 per 400 lineal feet of per 2 vertical feet of fill

3.05 CLEANUP

- A. Cleanup of the site shall be completed before final acceptance of the work can be made.
- B. Cleanup shall include the removal and disposal of all unsuitable materials.
- C. All equipment shall be removed from site.
- D. The site shall be left in a manner so as to present a clean and neat appearance.

