



City of Oakdale
1584 Hadley Avenue North
Oakdale, MN 55128

ENGINEERING SPECIFICATIONS CITY OF OAKDALE NO. 2105

EXCAVATION AND EMBANKMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Construction of roadway excavations and embankments within designated construction limits.
- B. Related Sections:
 - 1. MN/DOT Section 2573: Erosion Control
 - 2. MN/DOT Section 2104: Pulverizing Bituminous Pavement
 - 3. MN/DOT Section 2211: Aggregate Base
- C. Method of Measurement:
 - 1. Excavation Material:
 - a. Measure by volume of material in its original position.
 - b. Compute volumes in cubic yards by average end area method determined from original and final cross sections.
 - c. Basis of measure shall be Plan Quantity when noted (P).
 - d. Leveling off existing granular material across the bottom of the proposed subcut section is incidental to common excavation.
 - 2. Borrow Material:
 - a. Measure by volume in cubic yards.
 - b. Basis of measure will be Compacted Volume (CV).
 - c. Measure only materials that are accepted for use.
 - d. Basis of measure shall be plan quantity when noted (P).
 - e. Includes excavation and disposal of topsoil stripping areas.
 - 3. Salvage Material:
 - a. Measure by compacted volume (CV) in cubic yards for material used on-site.
 - b. Measure by stockpile volume (SV) in cubic yards for material hauled off-site to City stockpile area.
 - c. Salvaging, processing, stockpiling and placing shall be considered as a single operation.
 - d. Basis of measure shall be plan quantity when noted (P).
 - 4. Geotextile Fabric:
 - a. Measure by area in square yards of material acceptably placed with NO measurement for joint overlap.
 - b. Measure each type separately.



5. Sediment Removal:

- a. Measure by excavated material in cubic yards removed from existing ponds and storm sewer apron areas.

D. Basis of Payment:

1. Payment for acceptable quantities of excavation and embankment shall be at the Contract unit Price as listed on the Bid Form. All associated Work items shall be considered incidental.

1.02 REFERENCES

- A. MN/DOT 2105: Excavation and Embankment.

1.03 DEFINITIONS

- A. Common excavation consists of excavating all underground pipe repair and installation areas one-foot deep and backfilling with aggregate base.
- B. Subgrade correction consists of all excavation below the planned Subgrade for the purposed of correcting existing Subgrade material as directed by the Engineer; including backfilling area with salvaged aggregate base.
- C. Common channel ditch excavation consists of excavation for storm water conveyance.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Select granular borrow (MOD) shall be in accordance with MN/DOT 3149.2B except that no more than 40% shall pass the No.40 sieve and no more than five (5) percent shall pass the No. 200 sieve (STATE AID ROUTE).
- B. Select granular borrow – shall be in accordance with MN/DOT 3149.2B1 pitrun or crusher – run material of the portion passing the one inch sieve, not more than 125 by weight, will pass a No. 200 sieve.
- C. Topsoil borrow – shall be in accordance with MN/DOT 3877.2A.
- D. Geotextile fabric – shall be in accordance with MN/DOT 3733, Type V, and Type VI. Type VI shall meet the following:
 1. Grab tensile strength minimum each principal direction, or 315 pounds.
 2. Elongation maximum, each principal direction, 15 percent.
 3. Apparent opening size (ADS) maximum of number 40 sieve.



PART 3 EXECUTION

3.01 PREPARATION

- A. Provide gradation and other test results from borrow source to demonstrate specification compliance prior to importing borrow material to project site.
- B. Remove ice and snow prior to grading operations.
- C. Grading shall conform to planned grades, cross-sections, and stakes.
- D. Confine operations to established limits.
- E. Maintain Site in a well-drained condition at all times.
 - 1. Provide drainage facilities concurrent with embankment operations.
 - 2. Provide temporary drainage facilities to maintain existing drainage courses until permanent facilities are operative.
- F. Remove topsoil, organic and unstable material from roadbed prior to placing embankment.

3.02 EXCAVATING OPERATIONS

- A. Conform to lines, grades and slopes staked by Engineer.
- B. Provide seepage trenches for granular backfill replacement of unstable areas.
- C. Use suitable excavated materials for embankment construction.
- D. Excavated materials will be classified in accordance with MN/DOT 2105.2, approved by Engineer.
- E. Construct embankment layers from uniform materials.
- F. Place granular materials in upper most portion of embankment.
- G. Mechanically mix-non-uniform soils to produce uniform moisture content and density.
- H. Excavate suitable topsoil material separately and stockpile.
- I. Do not place snow, ice, or frozen lumps exceeding six (6) inches in roadbed embankment.



- J. Do not place stone, concrete or bituminous fragments exceed three (3) inches in upper six (6) inches of roadbed embankment or within 18 inches of structure.
- K. Grade emergency overflows from street low points to adjacent areas as directed by Engineer.
- L. Remove and dispose of sediment deposited in stormwater ponds and Tanners Lake as directed by Engineer. Use excavation, hydraulic vacuum or other engineer-approved equipment.

3.03 PLACING EMBANKMENTS

- A. Construct embankment layers from uniform materials.
- B. Place granular materials in upper most portion of embankment.
- C. Mechanically mix non-uniform soils to produce uniform moisture content and density.
- D. Do not place snow, ice, or frozen lumps exceeding six (6) inches in roadbed embankment.
- E. do not place stone, concrete or bituminous fragments exceeding three (3) inches in upper six (6) inches of roadbed embankment or within 18 inches of structure.
- F. Do not place material on soil which is frozen to a depth greater than four (4) inches.
- G. Backfill excavations below Subgrade and seepage trenches in accordance with this Section.
- H. Deposit and spread material in uniform layers, parallel to profile grade extending the full width of embankment.
- I. Place upper three (3) feet of roadbed in maximum 8-inch layers.
- J. Place remainder of roadbed in maximum 12-inch layers.

3.04 GEOTEXTILE FABRIC

- A. Place on shaped Subgrade in areas as directed by Engineer.
- B. Splice together with mechanical stitching on a minimum 18 inches overlap of fabric.
- C. Anchor fabric to prevent movement during backfilling.



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- D. Protect fabric during backfilling.

3.05 COMPACTING EMBANKMENTS

- A. Compact upper three (3) feet of embankment to not less than 100 percent of Standard Proctor Density.
- B. Compact remainder of embankment to not less than 95 percent of Standard Proctor Density.
- C. Maintain proper moisture content during placement and compaction.
- D. Compact each layer of material with approved compaction equipment until no further evidence of consolidation.

3.06 FINISHING OPERATIONS

- A. Finish earthwork to within 0.1 foot of staked grade.
- B. Conduct finishing and topsoiling concurrent with grading operations to provide for erosion control.

3.07 DISPOSING OF EXCAVATED MATERIAL

- A. Surplus excavated materials shall become property of Contractor for disposal.
- B. Submit a Disposal Plan to Engineer prior to starting disposal operations.
- C. Deposit peat, muskeg, and other unstable materials in Site approved by Engineer.
- D. Dispose of combustible debris materials and noncombustible materials other than soils in accordance with MN/DOT 2104.3C.

END OF SECTION