SECTION 02211

ROUGH GRADING

1. PART 1 GENERAL

1.1 WORK INCLUDES

A. Strip and Stockpile Topsoil.

B. Strip and Remove Wetland Topsoil.

C. Surficial Sand Excavation.

D. Rough Grading.

E. Embankment Construction.

F. Fill and Grade Residential Lot.

G. Roadway Embankment and Cut.

H. Clay Liner (Division VII Only.)

I. Scarify, Blend, and Compact Subgrade (Division VII Only.)

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control.

B. Section 02110 - Site Clearing.

C. Section 02222 - Excavation.

D. Section 02223 - Backfilling.

E. Section 02225 - Trenching.

F. Section 02923 - Landscape Grading.

1.3 REFERENCES

A. MDOT Density Control Handbook, current addition.

B. MDOT Standard Specifications for Construction, current addition.

C. Test Method for Density of Soil in Place with loss by wash less than 15 percent - One Point Michigan Cone Test.

D. Test Methods for Density of Soil with loss by wash greater than 15 percent - One Point T-99 Test.

E. ASTM D2922 - Test Methods of Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Submit under provisions of Section 01300 - Submittals.

B. Samples: Submit a 5 gallon bucket sample of each type of fill to Geotechnical Engineer, in airtight containers.

1.5 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Strip and Stockpile Topsoil:
1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
2. Basis of Payment: Includes all labor and equipment required for stripping organic topsoil and stockpiling as shown on the plans and as directed by the Engineer.

B. Strip and Remove Wetland Topsoil:
1. Basis of Measurement: At the unit price bid per acre as stated in the proposal.
2. Basis of Payment: Includes all labor and equipment necessary to strip, load, and haul topsoil from areas specified on the plans. Removed wetland topsoil shall become property of the Contractor and shall be deposited outside of the Project limits.

C. Embankment Construction – Division IV Only:
1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
2. Basis of Payment: Includes all labor, material, and equipment required for subgrade preparation, excavating, hauling, placing, compacting, and final grading the Type G clay and Type H granular material to construct the embankments on both sides of the drain as shown on the plans and described in the specifications. Also include Echo Valley site grading and leveling of existing spoils as shown on the plans.

D. Embankment Construction – Division V Only:
1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
2. Basis of Payment: Includes all labor, material and equipment required for subgrade preparation, excavating and hauling from borrow Area G, placing, compacting, and final grading the Type G clay and Type H granular material to construct the embankment as shown on the plans and described in the specifications.

E. Embankment Construction – Division VI Only:
1. Basis of Measurement: At the unit price bid per cubic yard as stated in the proposal.
2. Basis of Payment: Includes all labor, material, and equipment required for excavating, hauling, placing, compacting, and final grading the Type G clay and Type H granular embankment material to construct the surcharge and embankment as shown on the plans and described in the specifications. The embankment shall be constructed in stages as shown on the plans and is included under this pay item.

F. Embankment Construction – Division VII Only:
1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
2. Basis of Payment: Includes all labor, material, and equipment required for subgrade preparation, excavating, hauling, placing, compacting, and final grading the Type G clay and Type H granular material to construct the embankment as shown on the plans and described in the specifications.

G. Clay Liner – Division VII Only:
1. Basis of Measurement: At the unit price bid per cubic yard, 4 feet compacted thickness, as stated in the proposal.
2. Basis of Payment: Includes all labor, material, and equipment necessary to excavate the bottom of the basin 4 feet below the topsoil subgrade, placing, compacting, and final grading the Type G clay liner to a depth of 4 feet as shown on the plans. Also includes all dewatering necessary to perform this Work item.

H. Fill and Grade Residential Lot:
1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
2. Basis of Payment: Includes all labor, material, and equipment for excavation, filling with Type B, C, or D engineered material, grading, and compacting to construct indicated areas to the required contours as shown on the plans.

I. Roadway Embankment and Cut
1. Basis of Measurement: At the unit price bid per lump sum as stated in the proposal.
2. Basis of Payment: Includes all labor, material, and equipment necessary to excavate or place material consistent with embankment design as needed to construct as shown on the plans, place and compact embankment, and prepare subgrade within roadway as necessary for roadway construction.

J. Scarify, Blend, and Compact Subgrade – Division VII Only:
1. Basis of Measurement: At the unit price bid per square yard as stated in the proposal.
2. Basis of Payment: Includes all labor and equipment necessary to scarify the subgrade to 12 inches deep, blend the 12 inches scarified to a uniform consistency, and compact to a minimum 90 percent of the blended materials maximum dry density as determined by the Modified Proctor Method. Also includes any dewatering necessary for the Work performed in this pay item.

2. PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Excavated material, graded, free of roots, rocks, subsoil, debris, and large weeds.

B. Type A – Coarse Stone Fill: MDOT 6A, 100 percent crushed for wet excavation, excavation within open drain, backfill for subgrade undercutting for poor soil or in pipe trench

3. PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01039.

B. Verify that survey benchmark and intended elevations for the Work are as indicated.

C. Verify that fill materials to be used are acceptable.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known underground, above ground, and aerial utilities. Stake and flag locations.

C. Notify utility company to remove and relocate utilities.

D. Protect above and below grade utilities, which are to remain.

E. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.

F. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped or re-graded.

B. Stockpile in area designated on site or haul from site as designated on the plans. Remove excess topsoil not being reused, from site.

~~C. Do not excavate wet topsoil.~~

D. Stockpile topsoil to depth not exceeding 8 feet. Cover to protect from erosion.

3.4 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.

B. Stockpile in area designated on site. Remove excess and unsuitable subsoil not being reused from site.

C. Do not excavate wet subsoil.

D. Stockpile subsoil to depth not exceeding 8 feet. Cover to protect from erosion.

E. When excavation through roots is necessary, perform work by hand and cut roots with sharp axe.

3.5 FILLING

A. Fill areas to contours and elevations with unfrozen materials allowing for placement of topsoil.

B. Granular Fill: Place and compact materials in continuous layers not exceeding 6 inches compacted depth, compacted to a minimum 95 percent of the materials dry density.

C. Subsoil and Topsoil Fill: Place and compact material in continuous layers not exceeding 12 inches compacted depth, compacted to a minimum 95 percent of the materials dry density.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Make grade changes gradual. Blend slope into level areas.

F. Remove surplus and unsuitable fill materials from site.

G. Slope grade away from buildings and structures minimum 2 inches in 10ft, unless noted otherwise.

H. Remove surplus and unsuitable fill materials from site.

3.6 SURFICIAL SAND EXCAVATION

A. Excavate surficial sand soils from the area where the clay embankment will be placed as directed by the Professional.

B. If sand soil is approved for use as granular embankment, stockpile in area designated on site or as approved by the Professional. Otherwise, remove from site.

C. Stockpile sand for reuse to depth not exceeding 8 feet. Cover to protect from erosion.

3.7 PLACING EMBANKMENT

A. Place clay embankment and granular embankment to the contours and elevations on the plans.

B. Maintain optimum moisture content of embankment materials to attain required compaction density.

C. Make grade changes gradual. Blend slope into level areas.

D. Remove surplus and unsuitable embankment materials from site.

3.8 SPOIL LEVELING

A. In accordance with Section 02222 - Excavation.

3.9 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot.

3.10 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01400.

B. Tests and analysis of fill material will be performed in accordance with MDOT standard requirements and with Section 01400.

C. Compaction testing will be performed in accordance with MDOT standard requirements and with Section 01400~~/ 01410/01411~~.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

E. Frequency of Tests: At the discretion of the Engineer.

3.11 SCHEDULE

A. Fill Under Grass Areas:
1. Subsoil Type D fill, to 6 inches below finish grade, compacted to 95 percent maximum dry density as determined by MDOT standard requirements.

B. Fill Under Asphalt Paving:
   1. Type B fill, to subgrade elevation, compacted to 95 percent maximum dry density as determined by MDOT standard requirements.

C. Fill Under Concrete Building Pads, Concrete Pads, Concrete Curb and Gutter and Sidewalks:
   1. Type B fill, to within 4" of underside of concrete slab. All fill to be compacted to 95 percent maximum dry density as determined by MDOT standard requirements.

D. Backfill for Utility Trenches:
   1. Bedding as specified in individual utility specification section.
   2. Backfill material as specified in Section 02225 - Trenching and as defined here in for typed fill.

E. Fill for Subgrade and Undercutting:
   1. Type B fill to proposed subgrade elevation, compacted to 95 percent maximum dry density as determined by MDOT standard requirements.

3.12 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot.

3.13 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01400.

B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D1557 and with Section 01400.

C. Compaction testing will be performed in accordance with ANSI/ASTM D1556 and ANSI/ASTM D1557 and with Section 01400.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

E. Frequency of Tests: As directed by the Professional.

END OF SECTION