SECTION 02222

EXCAVATION

1. PART 1 GENERAL

1.1 SECTION INCLUDES

A. Open Channel Excavation.

B. Earth Excavation.

C. Spoil Leveling.

D. Spoil Hauling.

E. Subgrade Undercutting and Backfilling.

F. Subgrade Undercutting and Topsoil Fill.

G. Stream Channel Restoration Grading.

1.2 RELATED SECTIONS

A. Section 02211 – Rough Grading.

B. Section 02223 – Backfilling.

C. Section 02110 – Site Clearing.

D. Section 02178 – Steel Sheet Pile Boring and Jacking Pits/Cofferdams.

E. Section 02160 – Excavation Support Systems

F. Section 02751 – Drain Crossings.

G. Section 01019 – Contract Considerations.

H. Section 01400 – Quality Control.

I. Section 01500 – Construction Facilities and Temporary Controls.

J. Section 02225 – Trenching.

K. Section 02280 – Geogrid and Geosynthetics.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Open Channel Excavation:

1. Basis of Measurement: At the unit price bid linear foot of open channel excavation as stated in the proposal.
2. Basis of Payment: Includes material, labor, and equipment to excavate the drain to required contours and flow lines as shown on the plans, excavation of side drain inlets to right-of-way line, diversion of water and/or dewatering, site clearing, grubbing and snagging of woods, shrubs, and brush within drain right-of-way.

B. Earth Excavation:
   1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
   2. Basis of Payment: Includes labor and equipment necessary to excavate detention basins, structures, and other areas to the proposed subgrade elevations and contours as shown on the plans; load, haul, and dispose of spoils as indicated on the plans and specifications; dewater excavations; and stockpile materials to be re-used on Site. Contractor is responsible for providing a disposal site for the removed material.

C. Spoil Leveling:
   1. Basis of Measurement: At the unit price bid per linear foot of spoil leveling as stated in the proposal.
   2. Basis of Payment: Includes material, labor, and equipment necessary to level open channel excavation spoils on one or both sides of the drain as indicated on plans and specifications according to the leveling details, removal of debris from leveled spoil areas, and root raking of spoils.

D. Spoil Hauling:
   1. Basis of Measurement: At the unit price bid per linear foot as stated in the proposal.
   2. Basis of Payment: Includes labor and equipment to load, haul, and dispose of open channel excavation spoils as indicated on the plans and specifications or as directed by the Engineer.

E. Subgrade Undercutting and Backfilling:
   1. Basis of Measurement: At the unit price bid per cubic yard as stated in the proposal.
   2. Basis of Payment: Includes all material, labor, and equipment to remove poor subgrade below the proposed subgrade elevations shown on the plans. Replace with embankment material or Type A fill as indicated or directed by the Engineer. Compact as specified in Section 02223 – Backfilling.

F. Subgrade Undercutting and Topsoil Fill (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, equipment, and material necessary to undercut from finished grade, haul, and dispose of spoils offsite, import wetland topsoil if necessary, place and lightly compact topsoil to provide a minimum 18 inch deep wetland topsoil as shown on the plans and as directed by the Engineer.

G. Stream Channel Restoration Grading:
   1. Basis of Measurement: At the unit price bid per lump sum as stated in the proposal.
   2. Basis of Payment: Includes labor and equipment necessary to remove and dispose tree and vegetation, unsuitable organic soil and sediment. Excavation, filling, shaping, grading, and compacting of suitable existing or imported soil to achieve contours and grades. Remove and dispose of excess soils.

2. PART 2 PRODUCTS

2.1 Not Applicable.

3. PART 3 EXECUTION

3.1 PREPARATION

A. Notify Engineer in accordance with Section 01039 - Coordination and Meetings.

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

C. Identify known underground, above ground, and aerial utilities, stake, and flag locations.

D. Notify utility company when specified to remove and relocate utilities.

E. Protect above and below grade utilities.

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

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

H. Protect grade and slope stakes.

3.2 OPEN CHANNEL EXCAVATION

A. Clear site in accordance with Section 02110 - Site Clearing.

B. Excavate drain to the dimensions and cross sections specified on plans.

C. Contractor shall check flow line elevations every 100 feet (Engineer will provide grade stakes). Undercutting of 0.3 feet or greater will be filled with Type A Fill - 6A Stone - to the proposed flow line as incidental cost to the Contractor.

D. Contractor shall remove all sediment from existing culverts.

E. Underpin, brace, or shore adjacent structures, which may be damaged by excavation work, including utilities and pipe chases.

F. Machine slope banks to required slopes.

G. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume Work.

H. Correct unauthorized excavation at no extra cost to Owner.

I. Seed disturbed areas daily in accordance with Section 02936 – Seeding.

J. Repair and replace field tile outlets as directed by Engineer and in accordance with Section 2715 – Lateral Tile Drains.

K. Match existing side slopes in reaches identified channel cleanout.

L. Excess spoils on roadsides and lawn areas are to be hauled away.

M. When excavating one side slope of drain, the opposite ditch bank shall be cleared in accordance with Section 02110 - Site Clearing. Grass vegetation should not be removed on opposite side slopes when excavation of opposite side slope is not needed.

N. In muck areas construct pilot channels to dewater spoils based on field conditions. Cost included in open channel excavation.

3.3 EARTH EXCAVATION

A. Clear site in accordance with Section 02110 – Site Clearing.

B. Excavate detention areas to the subgrade elevations, dimensions and cross sections specified on plans.

C. Underpin, brace, or shore adjacent structures, which may be damaged by excavation work, including utilities and pipe chases.

D. Machine slope banks to required slopes.

E. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume Work.

F. Correct unauthorized excavation at no cost of Owner.

G. Remove and haul material from site or dispose of materials on Site as specified on the plans. Payment for these items is included in the Earth Excavation pay item.

H. Dewater excavations as necessary for construction. Payment for dewatering shall be included in the Earth Excavation pay item.

I. Grade top perimeter of excavation to prevent surface water from draining into excavation.

J. Provide, operate and maintain pumping equipment to keep excavation free of water.

K. Remove lumped subsoil, boulders, and rock.

L. Correct areas over-excavated by error in accordance with Section 02223 - Backfilling.

3.4 SPOIL LEVELING

A. Spoils in all areas shall be placed according to the plan details.

B. Seed spoils in accordance with Section 02936 – Seeding.

C. Spoils are to be leveled in drain right-of-way or on Site, as shown on plans, unless Contractor receives written permission from Landowner to stockpile utilizing Landowner Agreement Form.

D. Spoils placed on tillable land shall be spread evenly as shown on plans.

E. Spoils are to be kept a minimum 3 feet from excavation area.

F. No excavated materials shall be placed on roads without written permission of the authorities having jurisdiction of said road.

G. Spoils excavated in areas adjacent to residential or lawn areas are to be removed from the area unless directed by the Engineer, shown on plans, or Contractor receives written permission from Landowner to level in area.

H. No spoils are to be placed in any watercourse or drain.

I. Side grade outs for watercourse and ditches shall be done at the time of open drain excavation or channel cleanout.

J. Non-combustible items (i.e. roots and stumps), brush, or debris shall not be mixed with leveled spoil material.

K. Shape leveled spoils to prevent the ponding of water behind spoil piles.

L. Level spoils on the same side of the drain which excavation occurs. If excavation occurs from both sides of drain then make even spoil piles on both sides of drain unless otherwise directed by the Engineer.

M. In agricultural, lawn, landscaped, or otherwise developed areas, root rake and hand pick sticks and rocks so that all foreign debris is disposed of.

N. Prior to completion, spoil piles must be raked to remove wood and rocks.

O. Topsoil must be placed on spoil piles in which the native excavated material is not suitable for establishing vegetation as determined by the Engineer.

3.5 SPOIL HAULING

A. Contractor is responsible for identifying and disposing of spoils in acceptable locations in accordance with all local, state and or federal requirements.

B. Spoils must be hauled from lawn and landscaped areas and as indicated in the plans. No extra payment will be made for spoil hauling in areas not indicated to be hauled; however, for ease of construction, Contractor may choose to haul spoils.

3.6 SUBGRADE UNDERCUTTING AND BACKFILLING

A. In areas that are suspect and may require subgrade undercutting, notify Engineer immediately. Do not proceed until it is agreed subgrade undercutting is required and quantities can be documented.

B. Remove the subgrade undercut quantity of material as determined adequate by Engineer.

C. Backfill with Type A fill for Work under structures, crossings, etc. Backfill with Embankment Material for embankment construction. All Work shall be according to the plans and directed by the Engineer.

D. Compact fill material as specified in Section 02223 - Backfilling.

3.7 SUBGRADE UNDERCUTTING AND TOPSOIL FILL (Division VI Only):

A. In areas where finished grade will be at elevation 848 or lower, a minimum of 18-inch wetland topsoil is required.

1. If the existing material to 18 inches deep from finished grade does not meet the designation of wetland topsoil, excavate the unsuitable material and haul from Site.

2. If the existing material to 18 inches below finished grade meets the designation for wetland topsoil, no excavation below the final grade shall occur.

B. Excavate to finish grade and stockpile material that meets the designation for topsoil or wetland topsoil on site as directed by the Engineer. Haul unsuitable materials and dispose of off site.

C. After excavation to finished grade, if a minimum 18-inch material meeting the designation of wetland topsoil remains below finished grade as determined by the Engineer, stop excavation at finished grade. However, if a minimum 18 inch wetland topsoil does not exist below finished grade, undercut to 18 inches below finished grade, but stop excavation if topsoil is exposed at a depth less than 18 inches below finished grade.

D. Backfill the undercut areas with material meeting the wetland topsoil designation. The minimum depth of wetland topsoil shall be 18 inches.

E. Wetland topsoil fill shall match specification in Section 02923 – Landscape Grading, Part .2.1.D.

F. Protect survey stakes.

3.8 STREAM CHANNEL RESONSTRUCTION GRADING

A. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.

B. Excavate subsoil required to accommodate structures and construction operations.

C. Machine slope banks to angle of repose or less, until shored.

D. Grade top perimeter of excavation to prevent surface water from draining into excavation.

E. Provide, operate and maintain pumping equipment to keep excavations free of water.

F. Hand trim excavation. Remove loose matter.

G. Remove lumped subsoil, boulders, and rock.

H. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume Work.

I. Correct unauthorized excavation at no extra cost to Owner.

J. Correct areas over-excavated by error in accordance with Section 02223 – Backfilling.

K. Stockpile excavated material in area designated on Site and remove excess material not being reused, from Site.

L. Remove adequate amount of material to place erosion control practice.
1. Riprap placement, over excavate a minimum of 16 inches.

3.9 FIELD QUALITY CONTROL

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

B. Provide for visual inspection of bearing surfaces.

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

D. Frequency of Tests: As directed by the Engineer.

3.10 PROTECTION

A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect landscape areas, mailboxes, trees, lawns, etc. Any damage to these areas are the responsibility of the Contractor.

END OF SECTION