

Number: 01
Date: 02-17-2021
Project Number: 2020-003
Project: Portage Park District Headwater Trail PVII
To: Bidders
From: Chris Bednar
Karpinski Engineering

This Addendum is a revision of the original Bid Documents Drawings and/or Specifications.

Item 1 - Sheet C03 Grading Plan

1. Revised concrete swale to aggregate swale for the section
2. Revised edge of impermeable liner to turn and extend under 304 base 18"
3. Revised granular backfill in aggregate swale to #57 stone and added 4" bedding below pipe
4. Swale shifted over the top of aggregate section.

Item 2 Sheet C08 SWPPP Notes

1. Note 8 on Construction Sequence revised.

Item 3 – Specification 00 01 10 - Summary of Work

Revised section Part 1.I

Item 4 – Specification 00 01 10 - Summary of Work

Revised the following sections:

1. Part 1 – 1.3.A
2. Part 1 – 1.3.C
3. Part 1 – 1.5A

Item 4 Response to Bidders RFI's

1. Is the contractor permitted to access the site from the trail head (near 4612 W. Mill St. Mantua, OH)? We are concerned with the safety of backing trucks in off of Mennonite Road.

Answer: Contractor may access the site from Line Street to the east and use the trail to get to the site. However, the contractor will be responsible to repair the trail which is not paved. Trail shall be repaired to the satisfaction of the Portage Park District. No separate payment will be provided for the trail repair.

2. If access is not allowed from trail head, is MOT included in the bid?

Answer: MOT is included in Mobilization and at minimum would require flaggers.

3. One more thing I just wanted to confirm- Item 630 "Sign Flat Sheeting" this item just covers the required signage of the project, correct?

Answer: Correct all signage to be paid under Item 630 Sign Flat Sheeting

4. Please verify the SWPPP note 8 about building under construction sequence.

Answer: delete around entire building as shown. Intent is for a construction entrance into the site.

5. On pp C-08 SWPPP – Construction Entrance – Note 8 – Is this note applicable to this job?

Answer: delete around entire building as shown. Intent is for a construction entrance into the site.

6. Are the quantities of debris to be removed on pp C-01 included in the given excavation quantity? If not how is that work to be paid?

Answer: to be paid under site clearing

7. Where are the proposed removals on C-01 to be paid? Is there an available quantity of fence and pipe to be removed so that all bidders are on the same page?

Answer: Removals to be paid under site clearing. For bidding purposes provide 30 LF of fence removal and 21 LF of storm pipe removal.

8. Measurement and Payment Specification 01 29 01 – p 12 – W-1.a(5) – Permanent seeding is to be paid under Item 25 or here as stated under Item 23 SWPPP.

Answer: Paid under Item 25.

9. Is there a specific contact at the village or county to speak with in regards to permits?

Answer: Contact the Village of Mantua and also the Portage County Engineer.

10. In Summary of Work 00 01 10 – Page 1 Section I - The contractor is required to pay for testing of subgrade while Section 01 40 00 Section 1.1 A – 1 – states the owner will provide inspection and testing laboratory services. Which section takes precedence? If the owner is paying for the testing will that cover compaction and ODOT 611 testing?

Answer: All subgrade testing to be provided by owner. Contractor to provide proof roll for PPD testing agency to inspect.

11. The clearing specification calls for a site video. Is that video to be paid for under the clearing item?

Answer: Pre-Construction video to be paid for under mobilization

12. Is this project tax exempt?

Answer: yes the park district is tax exempt.

SECTION 00 01 10 – SUMMARY OR WORK

PART 1 - GENERAL

DESCRIPTION

- A. The proposed work is defined in this project specifications, construction drawings and other documents identified herein and is the official contract documents. All work shall be in accordance with these documents.
- B. The proposed Headwaters Trail Phase VII project is located at the south side of Mantua Center Road intersection with Mennonite Road in the Village of Mantua, Ohio. The site of the proposed work is an existing gravel trail end, repurposed from abandoned rail road tracks.
- C. The proposed work for this project includes installing a new 10 foot wide, approximately 550 lineal feet long asphalt trail to an existing gravel path. The project includes underdrains, storm sewer drainage work, guard rail placement and removal as well as fence/railing construction.
- D. In order to facilitate construction of the new trail proposed tree clearing, grubbing, earthwork and grading is anticipated for the project area. This project provides ADA access to the existing trail network.

The project also includes clearing trees/brush along the right of way of Mennonite Road at the park's entrance to improve line of site, site traffic control and signage.

- E. Access to the site will be from Mennonite Road, the contractor will be responsible for not tracking debris, dust and/or mud onto the nearby streets.
- F. This section includes descriptions and references to drawings and specifications intended to summarize the work of each separate prime contract. The descriptions and references included herein shall not limit the scope of the contract as may be further developed in the drawings and specifications as a whole. Each prime contractor shall review every drawing and every specification to fully ascertain the scope of the work contained herein, including drawings and specifications contained in other bid packages of the project that were made available to them. The assignment of work as defined in this section will prevail over work assignments that may be otherwise shown in the drawings and other sections of the specifications.
- G. In case of a single prime contractor performing the entire work, the assignment of work is generally the responsibility of the prime contractor, except as specifically required for specialty subcontractors and for meeting DBE requirements. The Owner reserves the right to review prime contractor's assignment of work and request substantiation of expertise in case of such specialties.

- H. The Contractor shall schedule their Work between the week day hours permitted by the Mantua Village as the project is located within a residential area with houses adjacent to the property. If work is required on weekends or outside of the hours mentioned above the contractor shall notify the owner and also make a request with the Village for the hours outside of those mentioned above.
- I. **The owner will provide all testing of materials and subgrade as called for in the project specifications and certifying test results meet the projects specifications. Contractor shall work with owners testing agency to provide all info as required.**
- J. The contractor is responsible to obtain all required permits, registration with the Village to perform work, bonding, and insurance for the project and shall include these costs under Bid Items – Mobilization and permits
- K. This contractor shall be responsible for furnishing all supervision, labor, materials, tools, equipment, freight, trade permits, insurance, taxes and tariffs (as applicable), testing (as specified), inspection and permit fees, construction layout, and other services as necessary to completely furnish and install the new parking lot.

1.2 DEFINITION

- A. Whenever “Contractor” is reference in these specifications, it is meant to refer to the “Prime contractor”.

1.3 CONTRACT DOCUMENTS

- A. The Contract Documents include the following:
 - 1. GENERAL REQUIREMENTS – Division 01.
 - 2. Technical Specifications – Sections 02, 31, 32 and 33
 - 3. Construction Drawings – Dated January 28, 2021 including the following.
 - a. Cover Sheet
 - b. Existing and Demolition Plan
 - c. Site Plan
 - d. Grading Plan
 - e. SWPPP
 - f. Notes and Legend
 - g. Details

h. SWPPP Details

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 31 20 00 - EARTH MOVING

PART 1 - GENERAL

- A. For this project a Geotechnical Study and Report was provided by PSI dated February 24,2020 and is included as part of the bid package. This report governs where any conflict occurs between this section and the recommendations in the report.

1.1 WORK INCLUDES

- A. Preparing sub grades for slabs-on-grade, walks, pavements, lawns, and plantings.
- B. Aggregate base course for asphalt paving.
- C. Subsurface drainage backfill for walls and trenches.
- D. Engineered fill.
- E. Base bids on excavating and filling with materials encountered at site except where special fill or backfill materials are specified herein or indicated on Drawings. No allowance or extra payments will be made by reason of variations in types of soil encountered or variations in their moisture contents. Furnish additional fill material required and included as a part of the work. Include removal of excess or objectionable materials as part of the work.
- F. Excavating and filling areas containing unsuitable material. CONTRACTOR is to supply unit costs with bid for this item. This item is not included in base bid.
 - 1. Unit Cost 1 - Excavate and remove unsuitable material to limits determined by Engineer or Geotechnical Engineer. Properly install and compact excavation with engineered fill (ASTM NO 1's and 2's) over a geogrid and proof roll to verify suitability. In the event the engineered fill is found to be unsuitable it is the sole responsibility of the CONTRACTOR to provide a suitable backfilled excavation to the OWNER/ARCHITECT or ENGINEER. Provide cost per Cubic Yard.

1.2 DEFINITIONS

- A. Backfill: soil materials used to fill an excavation.
 - 1. Initial Backfill: backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: backfill placed over initial backfill to fill an excavated area to final grade.

- B. Base Course: layer placed between the sub-base course and asphalt paving.
- C. Sub-base course: layer placed over the excavated sub-grade in a trench before laying pipe. Layer placed between the sub-grade and base course for asphalt paving, or layer placed between the sub-grade and a concrete pavement or walk.
- D. Sub-grade: surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.
- E. Borrow Soils: satisfactory soil imported from off-site for use as fill or backfill as approved by the Geotechnical Engineer.
- F. Drainage Course: layer supporting slab-on-grade used to minimize capillary flow of pore water.
- G. Excavation: removal of material encountered above sub-grade elevations.
 - 1. Additional Excavation: excavation below subgrade elevations as recommended by the testing agency and approved by the OWNER/ENGINEER to reach specified compaction level. Additional excavation, replacement, and proof-roll unit costs are to be included in the base contract amount.
 - 2. Bulk Excavation: excavations more than 10 feet in width and pits more than 30 feet in either length or width.
 - 3. Unauthorized Excavation: excavation below sub-grade elevations or beyond indicated dimensions without direction by the testing agency and approved and directed by the OWNER/ENGINEER. Unauthorized excavation, as well as remedial work recommended by the testing agency and approved and directed by the OWNER/ENGINEER, shall be without additional compensation.
- H. Fill Soils: suitable soil materials, as determined by the testing agency geotechnical engineer and the OWNER/ENGINEER, used to raise existing grades.
- I. Shale: Laminated material, formed by the consolidation in nature of soil, having a finely stratified structure. For the purpose of these Specifications, the following bedrock types shall also be considered as shale: mudstone, claystone, siltstone and clay bedrock.
- J. Rock: rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 C.Y. for bulk excavation or 3/4 C.Y. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment, without systematic drilling, ram hammering, ripping, or blasting, when permitted.
- K. Structures: buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

- L. Utilities: Include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings, as applicable.
- M. Optimum Moisture: The water content at which the maximum density is produced in a soil as determined ASTM D698 (Standard Proctor), or field test strip.
- N. Field Testing: Testing of fill and subgrade compaction shall be as directed by the OWNER/ENGINEER and performed by the testing agency.
- O. Laboratory Dry Weight: The maximum laboratory dry weight shall be the weight provided by the Laboratory when the sample is tested in accordance with ASTM D698

1.3 SUBMITTALS

- A. Product data for the following:
 - 1. Notify and provide data to regulatory authorities and OWNER/ENGINEER prior to commencement of work.
 - 2. Provide notice of: encounter with unknown utilities; subgrades before filling; areas requiring testing or inspection.
 - 3. Materials Sources: Name of fill material source, location, date of sample, sieve analysis, and laboratory compaction characteristics.
 - 4. Disposal Locations: Name and location of final destination for all materials hauled off site.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D2487 of each on site and borrow soil material proposed for fill and backfill.
 - 2. Current laboratory compaction curve according to ASTM D698 for each on site and borrow soil material proposed for fill and backfill.
 - 3. Field reports; in-place soil density tests.
 - 4. One optimum moisture – maximum density curve for each type of soil encountered.
 - 5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.
 - 6. Test reports must be submitted daily to the Architect and Owner.
 - 7. Water Content

- C. Samples: for the following (if indicated by X below):
1. **X 30-lb samples sealed in airtight containers, of each proposed soil material from on-site or borrow sources and engineered fill materials delivered to geotechnical testing agency for running proctor tests. Document borrow material source(s) for each sample submitted. Documentation shall include name of source, location, date of sample, sieve & grain size analysis, soil characteristics, unit weight, and Std. Proctor laboratory compaction results at designated optimum moisture content.**

1.4 QUALITY ASSURANCE & REPORTS

- A. Reference Standards:
1. American Association of State Highway and Transportation Officials (AASHTO).
 2. American Society for Testing and Materials (ASTM).
 3. Ohio State Department of Transportation “Construction Materials Specifications”, 2019 or current edition.
- B. “Codes and Standards” - perform earthwork complying with requirements of authorities having jurisdiction.
- C. Tolerances: As indicated herein.
- D. “Geotechnical Testing Agency Qualifications” - an independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- E. Soil testing service: The OWNER will engage a qualified independent testing agency to perform material evaluation tests for all geotechnical work specified herein. The testing agency shall provide the OWNER/ENGINEER a letter certifying soil material used and compaction results. All requested extra work and/or change orders based on existing soil conditions or tests of soils that do not meet the project specifications shall be approved and directed by the OWNER /ENGINEER.
- F. Testing: Requirements as specified herein.
- G. The testing agency shall provide results from field density testing during construction to OWNER/ENGINEER. Note material sampled and characteristics of soil. CONTRACTOR is to be advised immediately of tests failing to meet specifications. CONTRACTOR is solely responsible to correct deficiencies and to supply test and proof rolling results to Engineer in order to confirm suitability.

1.5 PROJECT CONDITIONS

- A. **Subsurface Conditions: Subsurface soils investigations have been made at the site.**
- B. Existing Utilities: do not interrupt utilities serving facilities occupied by OWNER others unless permitted in writing by OWNER/ENGINEER, and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify OWNER/ENGINEER not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without OWNER/ENGINEER written permission.
 3. The utilities protection service does not locate utilities outside public R/W's. The CONTRACTOR shall employ a qualified utility locating service for all underground utilities on the project.
 4. Cut and cap, demolish, and completely remove from site existing underground utilities indicated to be removed in accordance with both City and utility provider requirements. Coordinate with utility companies to shut off services if lines are active. The Engineer may, with written approval, allow abandoned utilities greater or equal to 6" diameter, located under parking or buildings, to be completely filled with non-shrink grout or LSM.
 5. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility OWNER/ENGINEER immediately for directions. Cooperate with OWNER/ENGINEER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the Utility OWNER/ENGINEER and the utility owner representative.

1.6 PROTECTION

- A. Safety: Provide protective measures necessary for the safety of workmen, to the public and adjacent property. Prevent cave-ins, collapse of walls, structures, and slopes, both on and adjacent to the site.
- B. Standards: Comply with regulations of local authorities having jurisdiction, including all applicable O.S.H.A. requirements.
- C. Repair: Includes the removal and replacement with new materials affected by settlement.

1.7 ENVIRONMENTAL CONDITIONS:

- A. Do not apply soil treatment when temperature is at or below freezing or when ground is frozen or frost is expected.

- B. Do not apply soil treatment when surface water is present.

1.8 EXISTING CONDITIONS:

- A. Accept the site in the condition which it exists at the time of the award of the contract and perform all work to the grades indicated.
- B. Protect plant material, lawns and other features not designated for removal.
- C. Protect bench marks, existing structures, fences, sidewalks, paving and curbs from excavating equipment and vehicular traffic.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soil Materials:
 - 1. Complying with American Association of State Highway and Transportation Officials (AASHTO) M145, soil classification Groups A-1, A-2-4, A-2-5, and A-3. Soil classification Group A-6 may be satisfactory if approved by the testing laboratory.
 - 2. Complying with ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, AND SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. CL can be used if approved by the geotechnical testing agency engineer and approved by the OWNER.
 - 3. Compacted fill and backfill shall be free of deleterious matter such as frozen materials, organics, wood, debris, or rock larger than 4 inches.
 - 4. All material shall have a liquid limit and plasticity index not exceeding 40 and 15 respectively when tested in accordance with ASTM D-4318.
 - 5. The minimum dry unit weight shall not be less than 110 PCF maximum dry density as determined by ASTM D-1557 (Modified Proctor).
 - 6. All fill and backfill materials shall be obtained from on site or from off-site sources and shall be approved by the Geotechnical Engineer prior to placement.
 - 7. Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- C. Unsatisfactory Soils:

1. ASTM D 2487 soil classification groups GC, SC, MH, CH, OL, OH, and PT, or a combination of these group symbols.
 2. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
 3. Unsatisfactory soil materials are those defined in AASHTO M145 soil classification Groups A-2-6, A-2-7, A-4, A-5, and A-7; also, peat and other highly organic soils. Material that fails to meet requirements for suitable materials; or contains any of the following:
 - a. Organic clay, organic silt, or peat; as defined in ASTM D2487.
 - b. Vegetation, wood, roots, leaves, or organic, degradable material.
 - c. Stones or rock fragments over six inches in any dimension.
 - d. Porous biodegradable matter, excavated pavement, construction debris, rubbish, or refuse.
 - e. Ice, snow, frost, or frozen soil particles.
 - f. Slag.
- D. General Fill: Suitable, unclassified soils.
- E. Structural Fill: Suitable material that is classified by the Unified Soil Classification System (USCS) in accordance with ASTM D2487 as GW, GP, GM, SW, SP, SM, or if approved CL. Verify that the largest particles in the fill are no greater in dimension than one-half the thickness of the compacted lift thickness.
1. Representative samples of the proposed fill materials should be collected at least one week prior to the start of the filling operations. The samples should be tested to determine the maximum dry density, optimum moisture content, particle size distribution and plasticity characteristics. These tests are needed to determine if the material is acceptable as structural fill and for quality control during the compaction process.
 2. All on site material that is stockpiled and designated to be used as Structural Fill shall be field tested and evaluated by the testing agency Geotechnical Engineer to determine if it meets the requirements ODOT and the additional requirements as set forth in this section. Written acceptance from the testing agency and owner shall be obtained prior to be accepted as Structural Fill.
 3. The fill should be placed in layers of not more than 8 inches in thickness, with each layer being compacted to a minimum density of 100 percent of the maximum dry density and within $\pm 2\%$ of the optimum moisture content, as determined by the

Standard Proctor Method ASTM D-698. Moisture control (increasing or decreasing the natural moisture content) of the engineered fill materials may be necessary for compaction.

4. Rock, shale and boulders is prohibited from being used as structural fill and shall be hauled and disposed of offsite.
 5. Silt shall not be used as fill in new pavement or building areas.
 6. The Structural Fill shall not be in a frozen condition during placement and should not be placed on a frozen subgrade.
- F. Granular Engineered Fill: naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a no. 200 sieve.
1. Engineered fill materials should consist of non-expansive materials. Pyritic and/or potentially expansive materials, such as mine tailings and slag should not be used as engineered fill material. Materials selected for use as engineered fill shall be properly moisture conditioned, inorganic and free of organic matter, cobbles, boulders, waste construction debris, or other deleterious materials.
 2. Fill materials shall have a Standard Proctor maximum dry density greater than 110 pounds per cubic foot (pcf), an Atterberg Liquid Limit less than 40, a Plasticity Index of less than 15, organic content less than 1% and a maximum particle size of 2 inches or less.
- G. Drainage fill:
1. Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel, (ASTM D 448 Coarse - aggregate grading size 57), with 100% passing of 1-1/2" sieve and not more than 5% passing a No. 8 sieve. Aggregate shall meet MSHA specification for No. 6 aggregate. Provide by CONTRACTOR from off-site source.
 - a. Located under all slab on grade areas.
- H. Backflow at Below Grade Walls
1. Provide a 24" wide zone of free draining gravel behind all below grade.
- I. Pavement Backfill:
1. Base: material shall comply with the requirements of ODOT Section 304 Aggregate Base Course.
 2. Sub Grade Preparation: material shall comply with the requirements of ODOT Section 203 and Section 204, Aggregate Base.

- J. Backfill for Utilities:
 - 1. See Section 31 23 33 Trenching and Backfill
- K. Filter Material: narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading size 67; with 100 percent passing a 1- inch sieve and 0 to 5 percent passing a no. 4 sieve.
- L. Impervious Fill:
 - 1. Where noted on plans): clayey gravel and sand mixture capable of compacting to a dense state at optimum moisture content. In special instances the Engineer may recommend the use of bentonite clay or an impervious (EDPM or approved equal) material. Special instances are not included in base bid.
- M. Top Soil:
 - 1. Clean natural topsoil free of vegetation, debris and other deleterious matter, and approved by OWNER/ARCHITECT or ENGINEER Representative. Upper 6 inches of topsoil stripped may be used, if suitable, otherwise use imported, screened, loose, fertile, friable, free of grass, brush, roots and rocks > 1-1/2” diameter, loamy soil possessing characteristics representative of productive growing soils in the area.
- N. Drainage Fabric, Separation Fabric, Erosion Control Blankets and Erosion Control Fiber Mesh
 - 1. See Section 31 32 19 Geotextile Fabric

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify existing ground surfaces have been stripped of topsoil, root mat and existing pavement, unsatisfactory soils, concrete spoil, obstructions and deleterious material.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- C. Protect sub-grades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- D. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties, walkways, and roadways.

- E. Protect trees, shrubs, lawns, rock out-croppings, and other features remaining as a portion of final landscaping.
- F. Protect benchmarks/project control, existing structures, fences, sidewalks, paving, and curbs from equipment and vehicular traffic.
- G. Protect above and below grade utilities which are to remain.
- H. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation. Monitor shoring system and surrounding ground surface during construction to detect movement. If movement becomes significant, take contingency steps to brace excavation and adjacent utility lines.
- I. Notify OWNER/ARCHITECT or ENGINEER Representative of unexpected subsurface conditions and discontinue work in affected area until notified to resume work.
- J. Grade excavation top perimeter to prevent surface water run-off into excavation.
- K. Material cut or excavated from building areas which is suitable for backfilling may be stored on site to be distributed later.
- L. Remove unsuitable and/ or excess material from site immediately.
- M. Establish extent of excavation by area and elevation; designate and identify datum elevation.
- N. Set required lines and levels.
- O. Maintain bench marks, project control monuments, and other reference points. Relocate if necessary and reference all benchmarks to remain so that it can be reestablished if disturbed.
- P. Before starting excavation, establish location and extent of underground utilities occurring in work area.
- Q. Notify utility companies to remove and relocate lines which are in way of excavation. Maintain, reroute or extend as required, existing utility lines to remain which pass through work area.
- R. Protect utility services uncovered by excavation.
- S. Upon discovery of unknown utility or concealed condition, discontinue affected work and notify OWNER/ ENGINEER representative immediately.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared sub-grades, and from flooding project site and surrounding area. Unsuitable soils as a result of improper dewatering are to be removed and replaced at the General CONTRACTOR's expense.
- B. Protect sub-grades from softening, undermining, washout, and damage by rain or water accumulation. Unsuitable soils as a result of improper sub-grade protection are to be removed and replaced at the CONTRACTOR's expense.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system or drainage trench, when necessary to keep sub-grades dry and convey ground water away from excavations in accordance with the recommendations of the geotechnical report. Maintain system until dewatering is no longer required.
 - 3. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding Project site and surrounding area.
 - 4. Do not allow water to accumulate in excavations.
 - 5. If presence of subsurface water is encountered during excavation, provide interior drainage.
 - 6. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations.
 - 7. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas.

3.3 EXPLOSIVES

- A. The use of explosives is prohibited.

3.4 EXCAVATION, GENERAL

- A. Unclassified excavation: excavation to, and beyond, sub-grade elevations as necessary to reach specified compaction level, regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions. Unclassified excavated material may include rock, soil materials, and obstructions. Changes in the contract sum or the contract time will be authorized in writing by the OWNER/ENGINEER for excavation or removal of unclassified material.

- B. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials as directed and approved by testing agency geotechnical engineer and the OWNER/ENGINEER.
- C. Replacement of soils shall be included in both the contract time and contract sum. No adjustments shall be authorized to either component for such occurrences.
- D. Verify areas to be backfilled are free of debris, snow, ice or water, and ground surfaces are not frozen.
- A. Proof roll exposed subgrade in building and paving areas with 20 cu. yd. (min.) fully loaded dump truck or similar acceptable construction equipment, to detect unsuitable soil conditions. Commence proof rolling operations after a suitable period of dry weather to avoid degrading acceptable subgrade surfaces. Make 8 passes over each section with proof rolling equipment, with the last 4 passes perpendicular to the first 4 passes. Testing agency geotechnical engineer and the representative must be present for proof roll.
- E. Cut out soft areas of subgrade not readily capable of in-situ compaction. Backfill and compact to density equal to requirements for suitable backfill material. Refer to Section 2.0.
- F. Site backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet or spongy subgrade surfaces.
- G. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of materials excavated.
 - 1. Maintain sides and slopes of excavations in safe conditions until completion of backfilling.
- H. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross-braces, in good serviceable condition.
 - 1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
 - 2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch.

- B. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
1. Excavations for footings and foundations: do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Excavation for underground tanks, basins, and mechanical or electrical utility structures: excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface. Extend excavation sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
 3. Refer to geotechnical report for additional recommendations.
 4. Locate and mark existing underground utilities and services before beginning structural excavation.
 5. Provide excavation for structures and footings, as required for construction, bracing and removal of forms, applying waterproofing, and to permit inspection.
 6. Machine slope banks to angle of repose or less until shored. Do not allow excavation to interfere with normal 45 degrees angle bearing splay of any foundation.
 7. Ensure bottom of excavation is reasonably level.
 8. Maintain excavations in as near their natural moisture conditions as possible.
 9. Fill over-excavated areas under structure bearing surfaces in accordance with testing agency geotechnical engineer direction.
 10. Do not allow construction equipment to create “pumping” of soils.
 11. Remove boulders or cobbles.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.
- B. Where rock or concrete spoil is encountered, carry excavation 18" below subgrade and backfill with suitable material approved by the testing agency geotechnical engineer and the OWNER/ENGINEER.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. See Section 31 23 23 Trenching and Backfill.

3.8 APPROVAL OF SUB-GRADE

- B. Notify testing agency when excavations have reached required sub-grade.
- C. If testing agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed with written approval of testing agency geotechnical engineer and the OWNER.
 - 1. Additional excavation and replacement material included in the CONTRACTOR's sum will be addressed either by unit price or allowance.
- D. Proof roll sub-grade with fully loaded, 20 yd (min.) tandem dump truck to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated sub-grades. The testing agency geotechnical engineer must be present for proof roll.
- E. Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as recommend by the testing agency geotechnical engineer and and directed by OWNER/ENGINEER.

3.9 UNAUTHORIZED EXCAVATION

- A. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the testing agency geotechnical engineer and the OWNER/ENGINEER.
- B. Unauthorized excavation, as well as remedial work directed by the testing agency geotechnical engineer and the OWNER/ENGINEER shall be at CONTRACTOR's expense.
- C. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete or LSM fill may be used when approved by the testing agency geotechnical engineer and the OWNER/ENGINEER.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by the testing agency geotechnical engineer and the OWNER/ENGINEER..
 - 2. Consists of material removal beyond indicated subgrade elevations or dimensions without specific direction of the testing agency geotechnical engineer and the OWNER/ENGINEER.

3. Correct unauthorized excavation, as well as remedial work as directed by the testing agency geotechnical engineer and the OWNER/ENGINEER, at no additional cost to OWNER.
4. Backfill and compact other unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by the testing agency geotechnical engineer and the OWNER/ENGINEER.

3.10 ADDITIONAL EXCAVATION:

- A. When excavation has reached required subgrade elevations, notify soils testing laboratory for examination of conditions.
- B. If unsuitable bearing materials are encountered at required subgrade elevations, excavate deeper and replace excavated material as directed by soils testing laboratory.
- C. Removal of unsuitable material and its replacement as directed will be paid on basis of Contract conditions relative to changes in Work. Proof rolling is to be included.

3.11 COLD WEATHER PROTECTION

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F. (1-degree C.).

3.12 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials when and where directed by the testing agency geotechnical engineer and the OWNER/ENGINEER. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water away. Cover stockpiles to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 2. Prevent saturation of soil above the optimum moisture content.
 3. Install silt fence/ silt sock around periphery of any topsoil stockpiles

3.13 BACKFILL

- A. Place and compact backfill in excavations promptly, or within time as specified by the Contract Documents, but not before completing the following:
 1. Construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for record documents.
3. Inspecting and testing underground utilities.
4. Concrete and masonry have cured 28 days and is adequately braced.
5. Removing concrete formwork.
6. Removing trash and debris.
7. Removing temporary shoring and bracing, and sheeting.
8. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.14 FILL

- A. Preparation: remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 8 H to 1 V so fill material will bond with existing material. Bench into the existing slope per ODOT Document GB2 Special Benching and Sidefill Embankment Fills and in addition as follows:
 - a. Scalp the existing slope according to ODOT Item 201.
 - b. Cut horizontal benches in the existing slope to a sufficient width to blend the new embankment with the existing embankment and to accommodate placement, and compaction operations and equipment.
 - c. Bench the slope as the embankment is placed and compact in layers.
 - d. Begin each bench at the intersection of the existing slope and the vertical cut of the previous bench. Recompact the cut materials along with the new embankment.
- C. Place and compact fill material in layers to required elevations at locations as follows:
 1. Under grass and planted areas, use satisfactory screened topsoil.
 2. Under walks and pavements, ODOT 304 Aggregate Base and if subgrade is deficient provide engineered fill. Extend five (5) beyond the pavement edge and shall include the support slopes to their full width.
 3. Under steps and ramps, use structural fill.
 4. Under building slabs, use structural fill unless noted otherwise on structural drawings. Extend five (5) beyond the building edge and shall include the

support slopes to their full width.

5. Under footings and foundations, use structural fill unless noted otherwise on structural drawings.
6. Drainage fill material shall be proof rolled to a uniform stable condition prior to placement of vapor retarder.
7. Do not place fill on frozen ground

3.15 MOISTURE CONTROL

- A. Uniformly moisten or aerate sub-grade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove & replace, or scarify & air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 % and is too wet to compact to specified dry unit weight

3.16 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure. Take care to prevent wedging action of backfill against structures by carrying material uniformly around structure to approximately same elevation in each lift.
- C. Compact soil to not less than the following percentages of maximum dry unit weight according to Std. Proctor test ASTM D 698.
 1. Unless specified elsewhere in the Geotechnical Report, under structures, building slabs and steps the compaction should be a minimum of 100 percent of the optimum density.
 2. Under walkways, scarify and re-compact top 6 inches below subgrade and compact each layer of backfill or fill material at 98 percent (Standard Proctor).
 3. Under lawn or unpaved areas, scarify and re-compact top 6 inches below sub-grade and compact each layer of backfill or fill material at 95 percent.
 4. Top 12” of sub-grade under roadways, drives, parking areas, foundations, backfill, footings, pads, paved pedestrian walks and courts, loading docks and

paving primarily for vehicle traffic, the compaction shall be a minimum of 100 percent.

3.17 SUB-BASE AND BASE COURSES

- A. Under pavements and walks, place sub-base course on prepared sub-grade and as follows:
 - 1. Place base course material over sub-base.
 - 2. Compact sub-base and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 100 percent of maximum dry unit weight according to ASTM D 698 (standard proctor).
 - 3. Shape sub-base and base to required crown elevations and cross-slope grades.
 - 4. When thickness of compacted sub-base or base course is 6 inches or less, place materials in a single layer.
 - 5. When thickness of compacted sub-base or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.
- B. Pavement shoulders: place shoulders along edges of sub-base and base course to prevent lateral movement. Construct shoulders, at least 60 inches wide, of satisfactory soil materials and compact simultaneously with each sub-base and base layer to not less than 100 percent of maximum dry unit weight according to ASTM D 698.

3.18 GRADING

- A. See Section 31 22 00 Grading

3.19 PROTECTION

- A. Protecting graded areas: protect newly graded areas from traffic, freezing, and erosion. Keep all areas graded to drain, free of ruts, ponding water, trash, and debris. CONTRACTOR is to pump off all ponding water immediately. Keep free of trash and debris.
- B. Repair and reestablish grades to specify tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and re-compact.
- C. Where settling occurs before project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct

surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible, as satisfactory to the OWNER/ENGINEER.
- D. Protect areas with slopes exceeding 3 H to 1 V with erosion-control fiber mesh and with erosion-control blankets installed and stapled according to manufacturer's written instructions.
- E. Unless noted otherwise, protect areas with slopes not exceeding 3 H to 1 V by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

Anchor straw mulch by crimping into topsoil with suitable mechanical equipment, use tackifier, or erosion control netting. Maintain during construction

3.20 FIELD QUALITY CONTROL

- A. Testing agency: The OWNER will engage a qualified independent Geotechnical Engineering testing agency to perform field quality-control testing/compliance.
- B. Allow testing agency to inspect and test sub-grades and each fill/backfill layer. Proceed with subsequent earthwork only after field test results for previously completed work comply with requirements.
- C. Footing Sub-grade: at footing sub-grades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing sub-grades may be based on a visual comparison of sub-grade with tested sub-grade when approved by the Geotechnical Engineer.
- D. Testing agency will test compaction of soils in place according to ASTM D 698, ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved and building slab areas: at sub-grade and at each compacted fill and backfill layer, at least one test for every 2,000 S.F. or less of paved area or building slab, but in no case fewer than three tests. In each compacted fill layer, make one field density test for every 2,000 sq. feet of overlaying building slab or paved area, but in no case less than 2 tests. Field density tests shall be made at all walkway entrances and ramps into the proposed building.
 2. Foundation wall backfill: at each compacted backfill layer, at least one test for each 100 feet or less of wall length, but no fewer than two tests.

3. Trench backfill: at each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.
 4. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent evaluation and approval of each footing subgrade should be performed by Geotechnical Testing Agency.
 5. Lawns, athletic fields and areas receiving topsoil: Perform field density tests on a spot-check basis to assist the CONTRACTOR in determining if compaction is in accordance with the specifications.
- E. When testing agency reports that sub-grades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten, aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.21 TESTING AND INSPECTION

- A. INSPECTION AGENCY: Inspect and test construction of embankments, fills, backfills, trenches, and subgrades and report to the OWNER/ENGINEER conformance in all particulars to specification requirements.
- B. Scheduling:
1. Assign qualified personnel to be on site at all times when operations are scheduled.
 2. The CONTRACTOR should note that no earthwork operation shall be permitted in their absence.
- C. Responsibilities:
1. Evaluation of subgrade preparation and suitability.
 2. Moisture content and field density tests on all layers of fill and backfill material placed.
 3. Evaluation of degree of compaction attained for all fill and backfill material placed.
 4. Testing and evaluation of borrow material.
 5. Sources of borrow and of select fill.
 6. Footing subgrade suitability.
 7. Inspection of installation of subdrainage system.

D. Results of Tests:

1. Make results available to the OWNER?ENGINEER immediately upon completion of areas of layers.

E. Final Report: The Geotechnical Testing Agency shall prepare a written report that summarizes the work inspected during the course of the project. A discussion of all deviations from the contract documents and specifications, with their related impact on the final construction, shall be described in detail. The engineer of record shall review this final report and recommend corrective measures (as deemed necessary) that must be made prior to final acceptance of the work. Prior to final payment, a written report certifying that the work meets the requirements of the contract documents, specifications, and all governing agencies shall be prepared, submitted, and approved by the ENGINEER.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off-site.
1. Do not burn or bury removed materials on project site.
 2. If hazardous materials are encountered during clearing operations, notify the Engineer for additional instructions. Comply with laws and ordinances concerning removal, handling and protection against exposure or environmental pollution.

END OF SECTION 312000

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