
ARTICLE 4. SITE WORK AND EARTHWORK

- 4.0 GENERAL PROVISIONS.** In general, site work requirements within Jackson County are covered by the Jackson County UDC. All work covered under this section shall comply with OSHA 29 CFR Part 1926, Subpart P, latest revision. The requirements of this section are the minimum required for JCWSA Water and Sewer Projects but do not waive any UDC requirements. In the event of a conflict between this Specification Section and any portion of the UDC, the contractor shall bring this to the attention of the JCWSA prior to commencing construction.
- 4.1 GENERAL.** Site work shall consist of demolition and removal of structures and obstructions; clearing and grubbing; over lot grading; subgrade preparation; removal of topsoil; site preparation; excavation and embankment; excavation, trenching, bedding and backfill of pipelines and service lines; excess excavation; borrow; and restoration and cleanup. All site work and excavation shall comply with the requirements of these Standard Specifications, the Jackson County UDC, and appropriate GDOT Specifications where applicable.
- 4.1.1 DISPOSAL.** The contractor shall make all necessary arrangements for suitable disposal locations. If disposal will be at other than established dump sites, the Authority may require the contractor to furnish written permission from the property owner on whose property the materials will be placed.
- 4.1.2 COMPACTION TESTING.** Compaction testing shall be performed by a consulting engineering or geotechnical firm at the contractor's expense. Final soils compaction reports shall be prepared and signed by a Registered Professional Engineer who is registered in the State of Georgia. Reports shall be submitted to the Authority within one (1) week of testing.
- 4.2 MATERIALS**
- 4.2.1 PIPE BEDDING MATERIALS.** Bedding material for pipelines shall be as shown in the standard details.
- 4.2.2 STRUCTURE BACKFILL MATERIAL.** Imported structure backfill shall be as recommended in the geotechnical engineering report.
- 4.2.3 ASPHALT PAVING.** Asphalt pavement shall conform to Section 10 of the Jackson County UDC and applicable GDOT Specifications. The following general installation procedure for utility installations is required as a minimum:
- A. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
 - B. No base course shall be placed on a frozen or muddy subgrade.
 - C. The compacted base shall have sufficient stability to support construction traffic without pumping.
 - D. Apply tack coat.
 - E. Asphalt Concrete Pavement Patching

1. Remove and replace defective areas.
2. Cut-out and fill with fresh, hot asphalt concrete.
3. Compact by rolling to specified surface density and smoothness.
4. Remove deficient areas for full depth of course.
5. Cut sides perpendicular and parallel to direction of traffic with edges vertical.

4.3 DEMOLITION AND REMOVAL OF STRUCTURES AND OBSTRUCTIONS.

4.3.1 GENERAL. Where demolition is required for utility installation, the contractor shall remove, wholly or in part and satisfactorily dispose of all foundations, structures, fences, old pavements, abandoned pipelines, and any other obstructions that are designated for removal. All salvageable material will be clearly marked by the Authority and shall be removed without unnecessary damage, in sections or pieces that may be readily transported. Materials so removed shall be stored in locations approved by the Authority. Materials to be salvaged may include, but shall not be limited to, manhole frames and covers, inlet grates, fence material, and appurtenances. The contractor will be required to replace any materials lost from improper storage methods or damaged by negligence.

Where portions of structures are to be removed, the remaining parts will be prepared to fit new construction. The work will be done in accordance with plans and in such a manner that materials to be left in place will be protected from damage. The contractor at his expense will repair any damage to portions of structures that are to remain in place. Reinforcing steel, projecting from the remaining structure, will be cleaned and aligned to provide bond with new extension. Dowels are to be securely grouted with approved grout. Depressions resulting from the removal of structures, footings, and other obstructions, shall be filled and compacted with clean fill materials so as to eliminate hazards of cave-in, accumulation and ponding of water.

Immediately following demolition and removal of rubbish from the site, the contractor shall grade the site by filling, compacting, and leveling the site to existing adjacent grades. All demolished materials must be disposed of offsite at the contractors expense unless otherwise approved by the Authority.

4.3.2 REMOVAL OF PIPE. Any temporary water or sewer line put in by the developer, whether for the developer or the Authority, for any reason will be removed after the use of the line is complete. If the developer wishes to leave the line in place they will need to have the temporary line surveyed into the as-builts for that area and take sole ownership and responsibility for the temporary line. This may include but is not limited to responding to locate requests by Utilities Protection Center or any other party requesting information on the temporary line.

Where wastewater lines are to be abandoned in place, the ends will be filled with concrete. The ends of wastewater mains are to be sufficiently filled to prevent future settlement of embankments.

When removing manholes, satisfactory bypass service must be maintained during such operations for any live wastewater line connected.

- 4.3.3 REMOVAL OF PAVEMENTS, SIDEWALKS, AND CURBS.** Concrete or asphalt that is to remain shall be cut to straight, true line with a vertical face. Concrete or asphalt shall be cut with a saw. The sawing shall be done carefully, and the contractor at his expense shall repair all damage to the concrete or asphalt that is to remain in place. The minimum depth of saw cuts in concrete shall be two (2) inches.

The contractor shall be responsible for the cost of removal and replacement of all over breakage as determined by the inspector.

4.4 SITE PREPARATION

- 4.4.1 GENERAL.** The contractor shall complete all work necessary to satisfactorily prepare the site as shown on the accepted drawings and as specified herein. Following this preparation, the site shall be in such a condition as to easily continue with the next operation. Site preparation includes clearing, grubbing, grading, tree and shrub removal, and native grass stripping and removing and disposing of all debris. This work will also include the preservation from injury or defacement of all vegetation and objects not designated for removal.

- 4.4.2 CLEARING.** All objects, trees, stumps, roots and other objects designated for removal shall be removed to a minimum of two (2) feet below subgrade.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted.

The contractor shall strip areas where excavation or embankment is to be made. Stripping shall include the removal of material such as brush, roots, sod, grass, residue of agricultural crops, sawdust, and other vegetable matter from the surface of the ground.

Clearing shall be performed in a careful and orderly manner that protects adjoining property, the public and workmen. Damage to streets, parking lots, utilities, plants, trees, buildings or structures on private property, or to bench marks, survey monuments and construction staking due to clearing operations shall be repaired and restored to its original condition by the contractor at his expense.

- 4.4.3 TOPSOIL.** The contractor shall salvage within the project limits, or acquire when needed, loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, toxic substances or other material which would be detrimental to the proper development of vegetative growth.

Topsoil shall not be placed until the areas to be covered have been properly prepared and grading operations in the area have been completed. Topsoil shall be placed and spread at locations and to the thickness shown on the plans and shall be keyed to the underlying material.

4.5 EARTHWORK

- 4.5.1 GENERAL.** This work shall consist of excavation, fill, backfill, disposal, shaping or compaction of all material encountered within the limits of the project. Work shall be performed to the line and grade indicated on the approved plans. Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility

of undermining or disturbing the foundation of any existing structures or any work previously completed.

Refer to Article 4.6, Trench, Backfilling and Compacting, of this Article for requirements for trenching, backfilling and compacting.

The Authority may require the contractor to provide an earthmoving diagram and haul routes.

4.5.2 DEFINITIONS.

Bedding Material shall mean material that is installed under and around pipelines.

Borrow shall mean backfill or embankment material which must be acquired from designated borrow areas.

Proof Rolling shall mean the application of test loads over a subgrade surface by means of a heavy pneumatic-tired vehicle to locate weak areas in subgrade.

Rock shall mean rock formations that cannot be excavated with a D-9 tractor in good repair with a single hydraulic ripper.

Stabilization Material shall mean material that is to be placed in areas of over excavation, of unsuitable insitu material, or in areas of high water table to stabilize the insitu material.

Structure Backfill shall mean earthen material that is installed around and over any structure.

Structure Excavation shall mean excavation materials over an area extending three (3) feet out from the outer most bottom edge of a proposed structure, up to existing grade or top of proposed grade.

Suitable Material shall mean any earthen material consisting of on-site or similar nonorganic sands, gravels, clays, silts and mixtures thereof with a maximum size of six inches (6"). Bedrock that breaks down to specified soil types and sizes during excavation hauling and placement may be considered suitable material.

Unclassified Excavation shall mean excavation of all materials encountered.

Unsuitable Material shall mean any earthen material containing vegetable or organic silt, topsoil, frozen materials, trees, stumps, certain man made deposits, or industrial waste, sludge or landfill, or other undesirable materials.

4.5.3 GRADING TOLERANCES. All earthwork shall be carried out in such a manner that final grades shall conform to those indicated on the approved plans. Final grades shall not vary from the design elevations by more than 0.1 feet. In addition, positive surface drainage shall be provided on the entire site so that no depressions or ponds are formed, regardless of depth. It shall be the contractor's responsibility to insure that all portions of the site drain as shown on the accepted plans.

Grading shall be performed in conjunction with all of the necessary clearing, grubbing, stripping, filling, and compacting operations to the satisfaction of the Authority.

Grading shall be done by approved means. Areas adjacent to structures and other areas inaccessible to heavy grading equipment shall be graded by manual methods.

4.5.4 EXCAVATION.

- 1. GENERAL.** Excavated areas shall be graded in a manner that will permit adequate drainage, will not disturb material outside the limits of slopes and will be within the tolerances noted in Article 4.5.3, Grading Tolerances, of this Article. Suitable material removed from the excavation shall be used for the construction of embankments, for backfilling, and for other approved purposes.

The Contractor shall dispose at his expense of all unsuitable or surplus material. Water pumped or drained from the work shall be disposed of in an approved manner.

- 2. STRUCTURE SUBGRADES.** If the material at or below the depth to which excavation for structures would normally be carried is unsuitable for the required installation, it shall be removed to such widths and depths as directed by the Authority and shall be replaced with stabilization material.

Unauthorized over excavations shall be refilled to subgrade with Class 57 stone.

If the surface of the subgrade is in an unsuitable condition for proceeding with construction, the contractor shall, remove the unsuitable material and replace it with concrete, structure backfill, or other approved material.

- 3. PROTECTION OF EXISTING STRUCTURES AND UTILITIES.** Existing poles, pipes, wires, fences, curbs, property line markers, and other structures that must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. In case of damage, the contractor shall notify the property owner. Unless property owners wish to make the repairs themselves, the contractor shall repair all damage.

The utility company shall locate all utility lines well ahead of the work. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground.

All existing utility services shall be supported by suitable means to prevent damage during construction activities. Any damage to any utility shall be the responsibility of the contractor.

- 4. EXCAVATED MATERIAL.** Excavated material shall be stockpiled in locations to minimize the impact on traffic, driveways and adjoining properties. Excavated material shall not be deposited on private property unless written consent of the property owner(s) has been filed with the Authority.

Excavated materials shall not be removed from the site or disposed of by the contractor except as approved by the Authority. Suitable excavated material shall used as backfill, fill for embankments, or other parts of the work.

Surplus material shall be disposed of as directed by the Authority.

- 5. PROOF ROLLING.** Proof rolling may be required to determine whether certain areas of subgrade meet compaction requirements. Where required by the Authority, proof

rolling shall be carried out as designated, with a heavy rubber tired proof roller with a minimum weight of fifty (50) tons or a single axle dump truck loaded to provide an equivalent wheel loading.

Subgrade found to be unacceptable during proof rolling shall be scarified, and recompacted at the proper moisture content.

4.5.5 FILLS AND EMBANKMENTS.

1. **GENERAL.** Earth fills shall be constructed in accordance with this Section, including placing and compacting of all embankment material, and all related work required to ensure proper bond of materials with previously placed embankment.

Material shall not be placed in any section of embankment until the foundation for that section has been cleared, stripped, and dewatered and compacted in accordance with these Standard Specifications.

The suitability of each part of the foundation for placing embankment material thereon and of all materials for use in the embankment construction shall be as determined by the Authority. Materials shall be placed and compacted in approximately horizontal layers of the specified thickness. The thickness of each layer shall not exceed six inches (6") before compacting.

2. **PLACEMENT OF FILL MATERIAL.** After subgrade has satisfactorily been prepared, the fill material shall be placed and compacted thereon and built-up in successive layers until the required elevation is reached. Fill materials shall be a homogenous mixture of stockpiled suitable material. Fill shall be placed within the lines and grades shown on the accepted plans.

The contractor shall maintain the embankment in a manner satisfactory to the Authority until the Authority has given final acceptance of all work.

Excavated materials too wet for immediate compaction, shall be dried to the proper moisture content.

3. **COMPACTION REQUIREMENTS.** Fills and embankments less than 10 feet in height shall be compacted to 98% of maximum density (AASHTO T 99). Fills and embankments 10 feet and greater in height shall be compacted to 100% of maximum density. Moisture content will be maintained within + two percent (2%) of optimum moisture during compaction.

4.5.6 STRUCTURE BACKFILL.

1. **MATERIALS.** Structure backfill material shall be used to backfill reinforced concrete structures. Structure backfill shall be as recommended in the geotechnical engineering report.
2. **PLACEMENT OF BACKFILL MATERIAL.** Backfilling shall consist of placing materials in horizontal, uniform layers brought up uniformly on all sides of the structure. The thickness of each layer of backfill shall not exceed six inches (6") before compacting to the required density.

Areas adjacent to structures and other areas inaccessible to mobile compaction equipment shall be compacted with suitable power-drive hand tampers or other acceptable devices.

Backfill material shall not be deposited against the back of concrete abutments, concrete retaining walls, or the outside of cast-in-place concrete structures until the concrete has developed its full 28 day strength.

Unless otherwise indicated on the approved plans, sheeting and bracing used in making the structure excavation shall be removed prior to backfilling.

- 3. COMPACTION REQUIREMENTS.** Structure backfill shall be compacted to a density of not less than (98%) of maximum density determined in accordance with AASHTO T 99 (Standard Proctor). When structure backfill occurs in roadways, backfill shall be compacted to 100% of maximum density.

- 4.5.7 BORROW.** In case an insufficient quantity of material is available on site for completion of the necessary embankment and structure backfill operations, the contractor shall furnish approved backfill material from off site.

4.6 TRENCHING, BACKFILLING AND COMPACTING.

- 4.6.1 GENERAL.** This work shall consist of furnishing all labor, materials, tools and equipment for trenching, bedding, backfill and compaction for all underground utilities. Excavations shall be made to lines and grades shown on the approved plans. Except as specifically approved by the Authority trench excavation shall be made by the open cut method to the depth required to construct the pipelines as shown on the approved plans. All trench excavation shall be unclassified.

Surface materials such as concrete and asphalt shall be disposed of separately from the underlying soil; base course and gravels that are to be salvaged shall be stockpiled and protected from contamination. Unsuitable materials shall be disposed of in accordance with these Standard Specifications.

Excavated material that meets the requirements for backfill material shall be stockpiled in a safe manner, at a sufficient distance from the banks to avoid overloading.

Excavation shall not be permitted to advance more than one hundred fifty (150) feet ahead of pipe laying and two hundred (200) feet in advance of the backfill operations. Trenches shall not be left open overnight.

- 4.6.2 CONNECTIONS TO EXISTING FACILITIES.** Prior to the connection of a new utility line to an existing facility, the contractor shall expose the existing facility at the point of connection to verify the elevation and materials of construction. The Authority shall be notified a minimum of two (2) working days before such an investigation is performed. The contractor shall also expose existing utilities that cross new construction to allow for verification of elevation and materials of construction.

- 4.6.3 TRENCH EXCAVATION FOR PIPELINES AND SERVICE LINES.** Trenches shall comply with the requirements of the Occupational Safety and Health Administration (OSHA) "Safety and Health Regulations for Construction". Sheeting and shoring shall be utilized where required to prevent any excessive widening or sloughing of the trench.

Excavated material shall not be placed nearer than two (2) feet from the sides of the trench. Heavy equipment shall not be used or placed near the sides of the trench unless the trench is adequately braced.

The width of the trench shall comply with the requirements set forth in these Standard Specifications and shall permit the pipe to be laid and joined properly. The allowable trench width at the top of the pipe shall not exceed the outside diameter of the pipe barrel plus twenty-four inches (24"), nor be less than the outside diameter of the pipe barrel plus twelve inches (12").

If the width of the lower portion of the trench exceeds the maximum width herein stated, the contractor, at his expense, shall furnish and install special pipe embedment or concrete encasement to protect the pipe from the additional loading. The pipe manufacturer shall determine the type and quantities of special pipe embedment, using trench-loading criteria based upon saturated backfill weighing 120 pounds per cubic foot and allowance for truck and other superimposed live loads.

- 4.6.4 REMOVAL OF WATER.** The contractor shall provide and maintain at all times ample means and devices with which to remove and properly dispose of all water entering the trench excavation. Water shall be disposed of in a suitable manner without damage to adjacent property and in accordance with erosion and sedimentation control requirements of the State of Georgia. Water level in the trench shall be maintained a minimum of 6" below the pipe.

Well points, sumping or any other acceptable methods that will insure a dewatered trench shall be used to accomplish dewatering. All dewatering methods shall be subject to the approval of the Authority.

- 4.6.5 PREPARATION OF FOUNDATION FOR PIPE LAYING.** When the excavation is in firm earth, care shall be taken to avoid excavation below the established grade plus the required specified over depth to accommodate the pipe bedding material.

When soft or otherwise unsuitable foundation material is encountered in the bottom of the trench, the unsuitable material shall be removed and replaced with stabilization material to provide a suitable foundation for the pipe.

Stabilization material shall meet the gradation of "No. 4 Coarse Aggregate" as specified in Section 703.02 of the GDOT "Standard Specifications for Road and Bridge Construction".

- 4.6.6 BEDDING FOR PIPELINES AND SERVICE LINES.** Bedding material shall be placed to uniformly support the entire pipe barrel. Bedding material shall be placed as shown in the Standard Details.

- 4.6.7 BACKFILL FOR PIPELINES AND SERVICE LINES.** Trench backfill shall be placed in loose six-inch (6") lifts and each lift thoroughly consolidated by tamping or vibrating.

Hydro hammers shall not be used until the trench backfill has been placed and compacted to within three (3) feet of the finished grade by the lift method. Large rollers, tractor drawn equipment or hydro hammers, shall not be used within eighteen (18) inches of the pipe.

Flooding or jetting of trenches will not be permitted.

Bracing or shoring installed to prevent cave-ins will be withdrawn in a manner that will maintain the desired support during the backfill operations. Driven sheet pilings will be cut off at or above the top of pipe, and the portion below the cut-off line will be left in the ground.

Oversaturated backfill material (muck) will not be allowed to be used as backfill for pipelines or service lines.

- 4.6.8 COMPACTION.** Trench backfill shall be compacted to a density of not less than one hundred percent (98%) of maximum density determined in accordance with AASHTO T 99 (Standard Proctor). The moisture content shall be maintained within + two percent (2%) of optimum moisture during compaction.

Pipes outside the roadway prism or sidewalk and not subject to traffic loads or heavy loads for a period of two (2) years shall be backfilled in layers as described above but shall be compacted to approximately the density of the surrounding earth.

- 4.6.9 COMPACTION TESTING.** When directed by the Authority, trench backfill shall be tested at a rate of at least one (1) test per 200 cubic yards of backfill material, but not less than one (1) test per 250 feet of trench. The testing shall be performed at various depths and locations. Additional testing shall be performed around items such as structures, manholes, valve boxes. One compaction test shall also be performed for each four service lines. When required, compaction reports shall be submitted to the Authority along with written requests for inspection.

- 4.6.10 MAINTENANCE OF BACKFILL.** Backfill shall at all times during construction be maintained to the satisfaction of the Authority. Access across trenches for driveways and streets shall be maintained free of hazards to traffic or pedestrians.

- 4.7 PAVEMENT REPLACEMENT.** Pavement cuts shall be repaired using an approved hot mix asphalt concrete. If a permanent patch cannot be installed within twenty-four (24) hours, the contractor shall place a temporary, cold mix, asphalt patch immediately after completing backfill and compaction.

4.8 SITE RESTORATION

- 4.8.1 RESTORATION.** Notwithstanding the requirements of any approved Landscaping Plans, as a minimum the surface grade and condition of all un-surfaced areas disturbed by construction activities shall be restored immediately following construction. The contractor shall replace all sod, trees, shrubbery, sprinkler systems, fences, and any other items disturbed by construction activities. All other areas disturbed during construction grading operations shall re-vegetated with native grasses. Seeding shall be performed immediately upon completion construction. The contractor shall maintain all planted materials or seeding until its growth is established.

All roadway surfacing, curbing, sidewalks, and gutters will be restored or replaced to a condition equal to that before the work began.

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