

SECTION 31 23 33

EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes the excavation, bedding, and backfilling of utilities necessary to perform work indicated on Drawings and Contract Documents.
- B. Comply with the City of Centerton, AR, standard water and sewer specifications for public water and sewer lines. If conflict should be found between this section and city standards for Public Utilities, city standards shall be the priority. It shall be the Contractor's responsibility to obtain city standard water and sewer specifications and comply with the minimum requirements.

1.2 RELATED REQUIREMENTS

- A. Construction Drawings
- B. Section 31 11 00 - SITE PREPARATION & CLEARING
- C. Section 31 23 23 - PIPELAYING
- C. Section 02 32 00 – GEOTECHNICAL SOILS REPORT

1.3 LOCAL REQUIREMENTS

- A. Contractor to verify with city officials that this specification meets or exceeds local requirements. Local requirements shall supercede requirements of this specification unless noted otherwise.

1.4 SUBMITTALS

- A. Shop Drawings or details pertaining to Site Utilities are not required unless use of materials, methods, equipment, or procedures contrary to Drawings or these specifications are proposed. Do not perform work until required shop drawings have been accepted by Owner.
- B. The Contractor shall contact all utility companies and determine if additional easements will be required to complete the project. Contractor shall provide written confirmation of the status of all easements to the Architect at the time of the preconstruction conference.

PART 2 PRODUCTS

2.1 BEDDING MATERIAL

- A. Processed sand and gravel free from clay lumps, organic, or other deleterious material, and complying with following gradation requirements:

U.S. Sieve Size	Percent Passing (by weight)
1 Inch	100
3/4 Inch	90-100
3/8 Inch	20-55
No. 4	0-10
No. 8	0-5

- B. Steel Casing Pipe: Comply with AWWA C-201 or C-202, minimum grade B, size and wall thickness as indicated on Drawings.

2.2 DETECTION TAPE

- A. Provide metallic detection tape located approximately 12" above pipe or conduit, where in ground utility lines are buried outside building footprint. Tape shall be continuous and be marked, indicating utility type (i.e. water, sewer, gas electric, etc.)

PART 3 EXECUTION

3.1 SUMMARY

- A. Set all lines, elevations, and grades for utility and drainage system work and control system for duration of work, including careful maintenance of bench marks, property corners, monuments, or other reference points.
- B. Maintain in operating condition existing utilities, active utilities, and drainage systems encountered in utility installation. Repair any surface or subsurface improvements shown on Drawings.
- C. Verify location, size, elevation, and other pertinent data required to make connections to existing utilities and drainage systems as indicated on Drawings. Contractor shall comply with local codes and regulations.

3.2 EXCAVATION, TRENCHING, AND BACKFILLING

- A. Perform excavation as indicated for specified depths. During excavation, pile materials suitable for backfilling in orderly manner far enough from bank of trench to avoid overloading, slides, or cave-ins.

- B. Remove excavated materials not required or not suitable for backfill or embankments and waste as specified. Any structures discovered during excavation(s) shall be disposed of as specified.
- C. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as required. Remove accumulated water in trenches or other excavations by pumping or other acceptable methods.
- D. Open cut excavation with trenching machine or backhoe. Where machines other than ladder or wheel-type trenching machines are used, do not use clods for backfill. Dispose of unsuitable material and provide other suitable material at no additional cost to Owner.

3.3 TRENCH EXCAVATION

- A. The local utility companies shall be contacted before excavation shall begin. Dig trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks as nearly vertical as practical and remove stones as necessary to avoid point-bearing. Over excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous and uniform bedding.
- B. All trench excavation side walls greater than 5 feet in depth shall be sloped, shored, sheeted, braced or otherwise supported by means of the sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to an exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.
- C. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length, except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make joint connection properly.
- D. Trench width requirements below the top of the pipe shall not be less than 12" nor more than 18" wider than outside surface of any pipe or conduit that is to be installed to designated elevations and grades. All other trench width requirements for pipe, conduit, or cable shall be least practical width that will allow for proper compaction of trench backfill.
- E. Trench depth requirements measured from finished grade or paved surface shall meet the following requirements or applicable codes and ordinances:
 - 1. Water Mains: 36" to top of pipe barrel or 6" below the frost line (established by the local building official), whichever is deeper.
 - 2. Sanitary Sewer: Depths, elevations, and grades as indicated on Drawings.
 - 3. Storm Sewer: Depths, elevations, and grades as shown on Drawings.

4. Electrical Conduits: 24" minimum to top of conduit or as required by NEC 300-5, NEC 710-36, codes, or the local utility company requirements, whichever is deeper.
5. TV Conduits: 18" minimum to top of conduit or as required by the local utility company, whichever is deeper.
6. Telephone Conduits: 18" minimum to top of conduit, or as required by the local utility company, whichever is deeper.
7. Gas Mains and Service: 30" minimum to top of pipe, or as required by the local utility company, whichever is deeper.

F. Please note that the trench depths listed above are minimum depths. Verify with local authority having jurisdiction for minimum trench depth requirements.

3.4 SHEETING AND BRACING

- A. Provide sheeting and bracing, when necessary, in trenches and other excavations where protection of workmen required. Sheeting may be removed after excavation has been backfilled sufficiently to protect against damaging or injurious caving.

3.5 PIPE BEDDING

- A. Accurately cut trenches for pipe or conduit that is installed to designated elevations and grades to line and grade 4" below bottom of pipe and to width as specified. Place 4" of bedding material, compact in bottom of trench, and accurately shape to conform to lower portion of pipe barrel. After pipe installation, place select backfill and compact in maximum 8" layers, measured loose, to the top of the trench.

3.6 TRENCH BACKFILLING

- A. Criteria: Trenches shall not be backfilled until required tests are performed and the utility systems comply with and are accepted by applicable governing authorities. Backfill trenches as specified. If improperly backfilled, reopen to depth required to obtain proper compaction. Backfill and compact as specified, to properly correct condition in an acceptable manner.
- B. Backfilling: After pipe or conduit has been installed, bedded, and tested as specified, backfill trench or structure excavation with specified material placed in lifts or layers not exceeding 8" of loose material. Compact to minimum density of 95% of optimum density in accordance with ASTM D 698 (or 92% of optimum density in accordance with ASTM D 1557).
- C. Compaction: Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.
- D. Compaction Testing: Independent testing laboratory shall perform test at intervals not exceeding 200'-0" of trench for each 8" of compacted trench backfill and furnish copies of test results as specified. Contractor is to pay for compaction testing.

- E. Finished Surface: After compaction and testing are complete, cap the trench with an assembly that is flush with and matches the existing construction in materials and method of application.

END OF SECTION