

SECTION 3735 - BEDDING AND BACKFILL FOR SEWER FORCE MAINS

PART 1 - GENERAL

1.1 SCOPE OF WORK:

Provide all labor, materials, equipment and services required for bedding and backfill of sewer force mains and appurtenances.

PART 2 - EXECUTION

2.1 GENERAL REQUIREMENTS:

- A. Backfilling of pipeline trenches shall be accomplished in accordance with these specifications and as shown on the detail drawings.
- B. In all cases walking or working on the completed pipelines except as may be necessary in tamping or backfilling will not be permitted until the trench has been backfilled to a point one foot above the top of the pipe. The filling of the trench and the tamping of the backfill shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipeline will not be disturbed and injurious side pressures do not occur.
- C. Before final acceptance, the CONTRACTOR will be required to level off all trenches or to bring up to grade. The CONTRACTOR shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction.
- D. In the event that pavement is not placed immediately following trench backfilling in streets and highways, the CONTRACTOR shall be responsible for maintaining the trench surface in a level condition at proper pavement grade at all times.

2.2 BEDDING AND BACKFILLING:

- A. Bedding Material:
 - 1. All bedding material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, or other material that in the opinion of the ENGINEER is unsuitable. No stones or rock may be placed directly on the pipe.
 - 2. Special Pipe Bedding (Foundation Aggregate) - In wet, yielding mucky locations where pipe is in danger of sinking below grade or floating out of line or grade, or where backfill materials are of such a fluid nature that such movements of the pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective. When ordered by the ENGINEER, yielding and mucky material in subgrades shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe. Foundation Aggregate, where required, shall be installed according to Section 3725, Paragraph 2.2 G.

- B. Bedding Under Pipe and Backfilling Around Pipe:

For pipe 4" to 16" nominal diameter:

Pipe shall generally be bedded on undisturbed ground. From the bottom of the pipe, fittings and appurtenances to a depth of one foot (1') above the top of the pipe, backfill shall be placed and lightly consolidated by hand or by approved mechanical methods. Backfill material shall be deposited in the trench for its full width on each side of the pipe, fitting, and appurtenance simultaneously. The CONTRACTOR shall use special care in placing this portion of the backfill so as to avoid injuring or moving the pipe. The method of placing and consolidation shall be approved by the ENGINEER.

If, in the opinion of the ENGINEER, the existing trench material is of suitable quality, the sewer force main may be bedded on and backfilled with existing trench material. No separate payment shall be made for bedding when existing trench material is used. However, when, in the opinion of the ENGINEER, the pipe, fittings, and appurtenances are laid at subgrade in rock in accordance with Section 3725, Paragraph 2.2 I or in poor soil in accordance with Section 3725, Paragraph 2.2.G, they shall be bedded by hand or approved mechanical methods from 6" below the pipe to 12" above the pipe with granular material (per Paragraph 2.2.E of this section) placed in layers of three inches (3") and compacted by tamping. Payment for this bedding shall be made at the unit bid price for granular bedding per linear foot as measured along the centerline of the pipe.

For pipe larger than 16" nominal diameter:

The force main pipe, fittings, and appurtenances shall be bedded by hand, or approved mechanical method, from 6" below the pipe to 12" above the pipe with granular material (per Paragraph 2.2.E of this section) placed in layers of three inches (3") and compacted by tamping. Bedding material shall be deposited in the trench for its full width on each side of the pipe, fitting, and appurtenance simultaneously. The CONTRACTOR shall use special care in placing this portion of the backfill so as to avoid injuring or moving the pipe. The method of placing and consolidation shall be approved by the ENGINEER. This bedding shall be performed at no additional cost to the OWNER. Cost of this bedding shall be included in the unit bid price for the pipe.

C. Backfilling to Grade:

From twelve inches (12") above the pipe to the grade shown on the drawings or specified herein, excavated trench material containing stones up to six inches (6") in the greatest dimension may be used as backfill material, unless otherwise specified. No material shall be used for backfill that contains frozen earth, debris, or earth with an exceptionally high void content. The CONTRACTOR shall use mechanical equipment to place and compact the backfill. The backfill material shall be placed in 6 inch loose layers and each layer shall be compacted to not less than 95% of maximum dry density. The moisture content shall be not greater than 3 percentage points above optimum as determined by ASTM D698. No compacting of the backfill with mechanical equipment, such as wheeled vehicles, will be permitted unless sufficient cover is provided over the pipe to prevent damage to the pipe.

D. Bedding and Backfilling in Freezing Weather:

Bedding and backfilling shall not be done in freezing weather except by permission of the ENGINEER, and no bedding or backfill shall be made with frozen material. No fill shall be made where the material already in the trench is frozen.

E. Granular Material Bedding and/or Backfill:

All granular material used for bedding or backfill shall conform to Section 1180 of these specifications.

F. Granular Material Backfill:

Full-depth granular backfill shall be placed where excavated trench material is unsatisfactory for backfill, where the roadside edge of the trench is less than five feet (5') from the edge of pavement, or where otherwise directed by the ENGINEER, and shall be in accordance with Section 1180 of these specifications.

G. Backfill in New Subdivisions:

Backfill in new subdivisions shall be according to the Butler County Engineer's Office compaction requirements for all trenches within the public right-of-way and the utility easement behind the right-of-way.

2.3 BEDDING AND BACKFILLING UNDER PAVEMENT:

1. When a pipeline is constructed within the road, street, driveway or parking lot, bedding and backfilling shall be performed per Section 1165, "Pavement Replacement".
2. Granular backfill (Section 1180 of these specifications) is required for backfill where the trench is outside of the pavement but the nearest trench wall is within five feet (5') of the edge of pavement.

2.4 SETTLEMENT OF TRENCHES:

The CONTRACTOR shall be responsible for any trench settlement which occurs within one year from the time of final acceptance of the work. If paving or other restoration shall require replacement because of trench settlement within this time, it shall be replaced by the CONTRACTOR at no extra cost to the OWNER. Repair of settlement damage shall meet the approval of the ENGINEER, the OWNER, and the authority having jurisdiction within the right-of-way.

PART 3 - BASIS OF PAYMENT

Bedding and backfill according to these specifications shall be included in the unit prices bid for the sewer force main pipe, fittings, and appurtenances. Whenever special pipe bedding or backfill (foundation aggregate, granular bedding [pipes 16" diameter and smaller, only], or granular backfill) is deemed necessary under the provisions of the detailed specifications, said materials will be paid for at the contract unit prices shown on the proposal forms, furnished and placed as specified, unless payment is specifically included in another pay item. The CONTRACTOR shall furnish the ENGINEER with duplicate weigh slips for all such material delivered to the project.

END OF SECTION