

SECTION 02220

BACKFILLING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Backfilling and compaction requirements

1.02 RELATED WORK

- A. Section 02215 - Excavation
- B. Section 02221 - Trenching

1.03 REFERENCES

- A. ANSI/ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates.
- B. ODOT Item 613, Type 1

PART 2 PRODUCTS

2.01 SELECT FILL MATERIALS

- A. Type A - Coarse Stone: Gravel: Pit run, angular, crushed, washed natural stone; free of shale, clay, friable materials and debris; graded in accordance with ANSI/ASTM C136 within the following limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
2 inches (50 mm)	100
1 inch (25 mm)	95
3/4 inch (19 mm)	95 to 100
5/8 inch (16 mm)	75 to 100
3/8 inch (9 mm)	55 to 85
No. 4	35 to 60
No. 16	15 to 35
No. 40	10 to 25
No. 200	5 to 10

- B. Type B - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter; 1/4 inch minimum to 5/8 inch maximum size; graded in accordance with ANSI/ASTM C136.

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- C. Type C - Sand: Natural river or bank sand; washed, free of clay, shale, organic matter; graded in accordance with ANSI/ASTM C136 within the following limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
No. 4	100
No. 14	10 to 100
No. 50	5 to 90
No. 100	4 to 30
No. 200	0

- D. Type C – Pipefill: ODOT 603 Type 2 (formerly known as 310).

2.02 COMMON BACKFILL

- A. When the type of backfill material is not indicated on the drawings or specified, the Contractor may backfill with the excavated material, provided that such material consists of loam, clay, sand, gravel or other materials that, in the opinion of the Engineer, are suitable for backfilling. If excavated material is indicated on the drawings or specified for backfill, and there is a deficiency due to a rejection or part thereof, the Contractor shall remove and dispose of the rejected material and shall provide acceptable fill material, all under pay item “Furnish and install bedding and backfill material in areas where excavated material is not suitable, including removal of excavated material, per C.Y.”
- B. All backfill material, unless otherwise specified, shall be free from cinders, ashes, refuse, vegetable and organic material, boulders, cobbles, rocks or stone or other material that in the opinion of the Engineer is unsuitable. For PVC pipe, Common Backfill will not be allowed in the initial backfill area from the bottom of the trench to 12 inches above the top of the pipe. For ductile iron pipe, Common Backfill containing smooth rock or stone up to 6 inches in its largest dimension may be used from the bottom of the trench to 12 inches above the pipe. For both PVC and ductile iron pipe, the remaining backfill may be Common Backfill containing no stones or rock larger than 75% of the trench width in its largest dimension.

2.03 LOW STRENGTH MORTAR BACKFILL

- A. Low strength mortar backfill shall be used for pavement repairs made to county highways in accordance to the detail in the detail drawings. Low strength mortar backfill shall meet the requirements of ODOT Item 613. The mixture must be of flowable consistency.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify stockpiled fill to be reused is approved.
- B. Verify areas to be backfilled are free of debris, snow, ice, or water and ground surfaces are not frozen.
- C. Verify underground tank anchoring to foundation slab to avoid flotation after backfilling.
- D. All disturbed areas shall be restored to at least preconstruction conditions.

3.02 PREPARATION

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- A. When necessary, compact subgrade surfaces to density requirements for backfill materials.
- B. Cut out soft areas of subgrade not readily capable of insitu compaction. Backfill with Type A and compact to density equal to requirements for subsequent backfill material.

3.03 BACKFILLING AROUND STRUCTURES

- A. Backfill areas to contours and elevations. Use unfrozen materials.
- B. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- C. Place and compact select fill materials in continuous layers not exceeding 6 inches loose depth.
- D. Place and compact common fill material in continuous layers not exceeding 12 inches loose depth.
- E. Maintain optimum moisture content of backfill materials to attain required compaction density.
- F. Remove surplus backfill materials from site.
- G. Leave stockpile areas completely free of excess fill materials.

3.04 BACKFILLING TRENCHES

- A. For PVC pipe: All trenches shall be backfilled from the bottom of the trench to 12 inches above the top of the pipe with Select Fill Material, Type C, placed in layers of six inches and compacted by mechanical tamping. Backfilling material shall be deposited in the trench for its full width on each side of the pipe, fittings, and appurtenances simultaneously. The Contractor shall place the backfill around the pipe in such a manner as to confirm there are no void spaces and subsequently compact the fill by flooding if necessary. The Contractor shall use special care in placing this portion of the backfill so as to avoid damaging or moving the pipe. The remainder of the trench shall be backfilled with Common Backfill, placed in 12 inch layers and mechanically tamped.
- B. For Ductile pipe: All trenches shall be backfilled from the bottom of the trench to 12 inches above the top of the pipe with Common Backfill, placed in layers of six inches and compacted by mechanical tamping. Backfilling material shall be deposited in the trench for its full width on each side of the pipe, fittings, and appurtenances simultaneously. The Contractor shall place the backfill around the pipe in such a manner as to confirm there are no void spaces and subsequently compact the fill by flooding if necessary. The Contractor shall use special care in placing this portion of the backfill so as to avoid damaging or moving the pipe. The remainder of the trench shall be backfilled with Common Backfill, placed in 12 inch layers and mechanically tamped.
- C. For A and B above, if the native material is not acceptable for use as Common Backfill, the replacement material shall be paid as "Furnish and install bedding and backfill in areas where excavated material is not suitable, including removal of excavated material, per C.Y."

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- D. When the trench crosses a driveway or other access, the Contractor shall backfill the trench immediately to restore access. He shall check all such areas every day to see if any settlement has occurred and if so, shall backfill again to maintain a smooth surface.
- E. All concrete or asphaltic driveways and entrances, as well as parking areas, consisting of crushed stone, gravel, concrete, or asphaltic surfaces, including those in public rights-of-way, damaged by the construction shall be repaired and replaced with like material to the original grade. All damaged curbs and sidewalks shall also be replaced with like material to the original grade. All trench backfilling, replacements and repairs shall be included in the unit price of the pipe unless pay items are provided in the Bid Schedule.
- F. Secure piping to prevent floatation or movement during placement of low strength mortar backfill. Do not place additional fill material over low strength mortar backfill until surface water is gone.
- G. All areas disturbed by construction shall be restored to at least the original preconstruction conditions, and to the satisfaction of the Engineer.
- H. One year from substantial completion of the project the Contractor shall return to the site and backfill or smooth out any settlement that has occurred in the entire length of the pipeline. Any areas thus repaired shall be provided with supplemental topsoil and shall be seeded, mulched and fertilized according to the original restoration requirements..

END OF SECTION