SECTION 02220

TRENCHING

PART 1 GENERAL

1.01 DIVISION OF RESPONSIBILITIES TERMINOLOGY: **NOT USED**

1.02 SUMMARY: The Contractor shall provide utility trench excavations; compacted bedding under fill, over utilities to subgrade elevations; backfilling and compaction; and compliance with State trenching act and laws, trench safety engineering design and OSHA standards.

1.03 RELATED WORK: Section 03310- Concrete Floor Preparation

1.04 REFERENCES:

A. ANSI/ ASTM C136- Method for Sieve Analysis of Fine and Coarse Aggregates

B. ANSI/ ASTM D698- Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2 49) kg) Rammer and 12 inch (304.8 mm) Drop.

C. ANSI/ ASTM D1556- Test Method for Density of Soil in Place by the Sand-Cone Method.

D. ASTM D2922 and ASTM D3017- Nuclear Method.

1.05 TRENCHING: Trench safety design shall be in compliance with applicable City and State codes and in compliance with Federal Regulations Part 126 of OSHA, Sub-part P is incorporated by reference.

PART 2 PRODUCTS

2.01 FILL MATERIALS: Fill materials shall have a plasticity index not less than 4 and not greater than 15. All select fill shall be compacted to a dry density of at least 95 percent ASTM 698; slope all trenches to drain.

PART 3 EXECUTION

3.01 EXCAVATION:

A. Excavate subsoil as required for sanitary sewer, water and gas piping to municipal utilities.

B Cut trenches sufficiently wide to enable installation of utilities and allow inspection.

C Excavation shall not interfere with normal 45 degree bearing force splay of foundations.

D. Hand trim excavation for bell and spigot pipe joints. Remove all loose matter.

E. Removed lumped subsoil, boulders, and rock up to 1/3 cubic yard as measured by volume.

F. Correct any over-excavated or unauthorized excavations at no cost to PETCO.

G. Stockpile excavated material in a designated on-site location if scheduled for re-use, and remove excavated material from site that is not to be re-used.

3.02 BEDDING FILL: Support all piping during the placement and compaction of bedding fill.

3.03 BACKFILLING:

A. Backfill trenches to the indicated contours and elevations. The top surface of general backfill shall be within 1" of the required elevations.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Granular Fill: Place and compact materials in continuous layers not exceeding 8 inches compacted depth.

D. Maintain optimum moisture content of backfill materials to attain required compaction density.

3.04 FIELD QUALITY CONTROL: *(for work requiring Testing Agency, if applicable)*

A. Field testing including tests and analysis of fill material will be provide by the Testing/ Inspection Agency per ANSI/ ASTM D698 and as specified in Section 01410- Construction Quality Control Services.

B. Compacting testing will be provided by the Testing/ Inspection Agency in accordance with ANSI/ ASTM D1556, Nuclear ASTM 689, ASTM D2922, ASTM 3011 and Section 01410- Construction Quality Control Services

C. If tests indicate that the fill material or work does not meet specified requirements, the Contractor shall remove the deficient fill material, replace and re-test fill material at no cost to PETCO.

3.05 PROTECTION OF FINISHED WORK: The Contractor shall provide additional fill and re-compact all fill areas which are subjected to the Contractor's or any subcontractor's vehicular traffic, until the Date of Final Completion.

3.06 CONCRETE SLAB INFILL AT BUILDING FLOOR SLAB TRENCHING:

A. The Contractor shall provide reinforced concrete at interior trenching per Section 03300- Cast in Place Concrete. Provide welded wire fabric reinforcement for concrete slab and trenching infill, and reinforcing dowels where the new concrete slab for trenching infill abuts existing concrete slab.

B. Moisture/ Vapor Barrier: Provide a moisture/vapor barrier, located under a 3-inch layer of approved, granular self-draining compactable fill under the subsequently placed concrete slab. The moisture/vapor barrier shall consist of "Visqueen" or equal manufactured polyethylene sheeting product, 6 mils minimum thickness, with all joints taped and sealed per ASTM D2130.

C. Reinforcement of Concrete Slab Topping shall be in accordance with the following minimum standards, or as may be superseded by the local jurisdiction; or as may be otherwise specified by the building shell architect/ engineer:

1. Slab on Grade Trench Construction: 3000 psi Concrete slab on grade; reinforced with ASTM A185 Welded Wire Fabric; and placed on vapor barrier and prepared subgrade.
2. Structural Slab: As specified by the building shell engineer.
3. Dowels: Provide ASTM A615, Grade 60, 1/2" diameter x 8" deformed reinforcing dowels spaced 32" on center maximum, 4" epoxy embed into existing concrete slab.

D. Epoxy Adhesive: The Contractor shall provide epoxy product equal to Rawl Dowel-Fast, two-component, non-sagging (ASTM C-881 Types I, II, IV and V/ Grade 3 Classes B and C) epoxy by Powers Fastening Inc , New Rochelle NY (914-235-6300)

1. Compressive Strength (ASTM D-695): 10,000 psi.
2. Tensile Strength (ASTM D-638): 3500 psi at 7 days
3. Flexural Strength (ASTM D-790): 5300 psi.
4. Bond Strength (ASTM C-882): 2000 psi concrete to concrete, 2-day moist cure; 2000 psi steel plate to concrete, 2-day moist cure.

E Finish of Concrete Slab Topping shall be per Section 03310- Concrete Floor Preparation

END OF SECTION