ARTICLE XIV - TRENCH EXCAVATION AND BACKFILL

14.1 DESCRIPTION

This work shall include trench excavation and backfill for underground water utilities and specified under Article XXI - Water System.

14.2 GENERAL REQUIREMENTS

The provisions of Section 204 - Excavation and Backfill for Miscellaneous Facilities of the Standard Specifications shall apply except as hereinafter modified:

(A) Section 204.02 - Materials is amended as follows:

Backfill placed below water level shall consist of clean gravel, such as open graded gravel (ASTM C33, No. 67 Gradation), and shall extend to at least 12 inches above the water level.

Backfill placed above the high water level shall consist of aggregate base course or subbase course material. The excavated on-site base course and subbase course materials may be used as structural backfill.

(B) Section 204.04 - Method of Measurement and 204.05 - Basis of Payment are deleted.

14.3 STRUCTURAL EXCAVATION

(A) Localized soft spots encountered shall be overexcavated and removed and the resulting void backfilled with approved structural fill properly compacted in accordance with these Specifications.

(B) Structural excavation carried below specified levels shall be filled with approved structural fill compacted in accordance with these Specifications, to the proper level at the expense of the Contractor.

(C) Trenching for utilities and utility structures shall be made to the depths and profiles required to install the utility properly. Bottom of trenches shall be even, solid and free from loose material. Overexcavation shall be corrected as specified, for which no extra compensation will be allowed. Any rock or hardpan encountered during excavation shall be broken out to a minimum depth of 12 inches below the bottom of the utility structure.

14.4 STRUCTURAL FILL FOR UTILITY STRCTURES

(A) Backfill placed below water level shall consist of clean No. 3B fine gravel conforming to ASTM C33, No. 67 gradation and shall extend to at least 12 inches above water level. The material need not be placed in compacted lifts. The top of the gravel level shall be compacted to a level surface prior to placing additional structural fill.

(B) Backfill above water levels shall be placed in horizontal lifts not to exceed 8 inches in loose thickness and compacted to a minimum of 95 percent compaction as determined by ASTM D 1557. Excavated onsite granular materials to be re-used as backfill shall be free of deleterious materials and shall have a maximum particle size of 3 (three) inches. Excavated onsite soils may require aeration to reduce the moisture content prior to being used as backfill material.

(C) Areas that fail to meet the minimum density requirements shall be rescarified, recompacted and retested.

(D) Stabilization of Local Soft Spots: If soft and/or loose materials are encountered at the subgrades, the soft and/or loose material shall be overexcavated to a depth of 24 inches. The overexcavation shall be backfilled with open graded gravel (ASTM C33, No. 67 gradation) wrapped in a non-woven filter fabric (Mirafi 180N or approved equal). Excavated soft and/or loose materials shall not be re-used as backfill.

14.5 SUBMITTALS

(A) Soils Testing: The compaction of all fill and the subgrade shall be tested by an independent testing agency. All test results shall be attested to by a geotechnical engineer licensed in the State of Hawaii for more than 10 years and shall be submitted to the Construction Engineer for approval. The cost of soils density and laboratory testing shall be borne by the Contractor. One field density test shall be made throughout the area for each 1,000 square feet of each compacted layer. All test results must be approved before the Contractor can proceed with placing additional fill or the placing of base course.

14.6 MEASUREMENT AND PAYMENT

Trench excavation and backfill, including pipe cushion and gravel backfill, trench restoration, including asphalt concrete pavement, Portland cement concrete pavement, tack coat, prime coat, sidewalks, curbs, and gutters, non-woven filter fabric, stabilization of soft and/or loose materials, soil compaction testing, reinforcing steel, structural and all other work related to trench excavation and backfill will not be measured and paid for separately, but shall be considered incidental to the various water system construction costs in the Proposal Schedule.

END OF ARTICLE