ITEM 4

MOISTURE TREATMENT

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4.1 DESCRIPTION

This work consists of removing, moisture conditioning, replacing, compacting, and shaping the existing expansive subgrade with moisture and density control to the extent shown on the plans. The purpose is to provide a zone of low swelling, strain absorbing material between the expansive subgrade and the pavement section. The depth of removal and replacement with moisture treated subgrade shall be consistent with the plans regardless of cut, fill or backfill.

4.2 EQUIPMENT

The **CONTRACTOR** shall provide equipment in good operating condition that is specifically designed and manufactured for the purpose of excavating, hauling, mixing, watering, leveling and compacting subgrade materials. Mixing and watering equipment shall be capable of achieving a uniform moisture content without wet or dry zones. Compaction equipment shall be adequately designed to obtain compaction requirements without adverse shoving, rutting, displacement or Loosening of subgrade material. The equipment shall be available to perform the work specified within the time frames required and to be coordinated with the other activities. The equipment shall be operated by skilled workman at a normal production rate for the specified type of work.

Equipment shall be approved by the **AGENCY**. All equipment and machinery shall be kept in good working order, free of leaks and properly muffled. All taxes, licenses and fees shall have been paid and proper licenses and permits shall be posted as required by law.

4.3 CONSTRUCTION METHODS

A. Compaction Method

The existing subgrade shall be removed, moisture treated, mixed, replaced and compacted. Each layer shall be compacted to 95 percent Standard Proctor density as determined by AASHTO T 99 at 1 to 3 percent above optimum moisture content. The thickness of layers, prior to compaction, shall depend upon the type of sprinkling, mixing and compacting equipment used. However, maximum depth (8 inches loose) shall not be exceeded.

After each layer of fill is complete, tests may be made by the **AGENCY**. When the material fails to meet the density or moisture requirements or should the material lose the required density or moisture or finish before the next course is placed or the project is accepted, the layer shall be reprocessed. Reprocessing shall be done at the **CONTRACTOR's** expense.

The **CONTRACTOR** may be required to excavate an area of the layer in order to facilitate the taking of density tests. Replacement and compaction of the removed material in the area shall be at the **CONTRACTOR's** expense.

B. Subgrade Stabilization

Moisture treatment will leave a soft yielding subgrade unsuitable for paving. Stabilization in accordance with Item 5, Chemical Stabilized Subgrade shall be performed to the depths and limits shown on the plans and shall be paid for under Item 5, Chemical Stabilized Subgrade.

4.4 TOLERANCES

The tolerances shall be as follow

A. Grade Tolerances

Any deviation in excess of 1/2 inch in cross section and 1/2 inch in 16 feet measured longitudinally shall be corrected by loosening, adding or removing the material, reshaping and recompacting by sprinkling and rolling. Deviations in excess of this tolerance shall be corrected by the **CONTRACTOR**, at the **CONTRACTOR's** expense, in a manner satisfactory to the **AGENCY**.

B. Density Tolerances

Density below the specified minimum set in Item 4.3A shall be corrected by recompaction. Inadequate compaction shall be corrected by the **CONTRACTOR**, at the **CONTRACTOR's** expense, in a manner satisfactory to the **AGENCY**.

C. Moisture Tolerances

Any loss of moisture below the limits set in Item 4.3A shall be corrected by moisture conditioning and recompaction. Loss of moisture shall be corrected by the **CONTRACTOR**, at the **CONTRACTOR's** expense, in a manner satisfactory to the **AGENCY**.

4.5 MEASUREMENT

Moisture treated fill will be measured by the cubic yard in its final position as the volume of fill computed in place based upon the areas and volumes shown on the plans. Shrinkage or swell factors will not be considered in determining the calculated quantities.

If no adjustment of quantities is required by the **AGENCY**, additional measurements or calculations will not be required

4.6 TESTING AND INSPECTION

Testing of moisture treated soils shall be performed in accordance with:

TABLE 4.6-1
SCHEDULE FOR MINIMUM MATERIALS SAMPLING AND TESTING

In Place Soil Density and Moisture Content	AASHTO T 191 ASTM D 2167 AASHTO T 238	One test for each 200 lane feet (not less than one test per day)
	AASHTO T 191 and ASTM D 2216	Shall be performed every tenth nuclear method density test.
	AASHTO T 239	
Liquid Limit	AASHTO T 89	One test per soil type.
Plastic Limit	AASHTO T90	One test per soil type.
Moisture-Density Relationships	AASHTO T99 AASHTO T180	One test per soil type.

4.7 PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement will be paid for at the unit bid price for "Moisture Treatment." This price will be full compensation for all excavation, moisture treatment, mixing, compacting, shaping, and finishing of subgrade; for hauling and disposing of excess excavated material; for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.

Item	Description	Payment
4.7-1	Moisture Treatment	$/yd3
4.7-2	Water	$/gal