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STREET AND ALLEY CONSTRUCTION

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SECTION 310

SUBGRADE

310.01 DESCRIPTION: This work shall consist of preparing the subgrade for the immediate construction of subbase, base, and sand cushion, pavement or surface. The subgrade shall be constructed in accordance with one of the methods specified herein and as required in the specifications for the type of new construction proposed, or by the method indicated on the plans and in the proposal for the work.

310.02 TESTING: Following is the test schedule required to be accomplished for each project constructed under these specifications:

<u>DESCRIPTION</u>	<u>AASHTO METHOD OF TEST</u>	<u>QUANTITY OF ITEM REPRESENTED BY ONE TEST</u>
1. Soil Classification		As directed by the City Engineer
(a) Preparation of Soil Mechanical Analysis	T 87	
(b) Mechanical Analysis of Soils	T 89	
(c) Liquid Limit of Soil	T 89	
(d) Plastic Limit and Plastic Index	T 90	
(e) Soil Classification	AASHTO	
2. Standard Proctor Density	T 99	One each per subgrade material of similar character
3. Field Density		
(a) Subgrade	T 205 or T 238	800 sq. yd. of subgrade
(b) Trench under Paving	T 205 or T 238	200 l.f. of trench or at any transverse crossing

310.04 CONSTRUCTION METHODS: When an item under Section 311 is not included in the contract, any asphalt surfacing shall be removed and disposed of by the Contractor. The aggregate in place shall be used on, or incorporated in, the full width of the subgrade to provide a uniform subgrade as specified.

The subgrade shall be scarified or otherwise processed to permit uniform dispersion of moisture to a depth of approximately 6 inches. Areas of the subgrade through rock cuts that cannot be scarified or otherwise processed shall be shaped with soil meeting the requirements of select borrow, Section 401, unless otherwise specified, to conform to the planned profile and cross section. When the loosened soil has been pulverized, it shall be thoroughly and uniformly compacted with suitable equipment to at least 95 percent of Standard Density for a depth of approximately 6 inches.

Test rolling will not be required on the preparation of subgrade, unless specifically designated on the plans. Areas of the subgrade which are not accessible to rolling equipment shall be compacted to the required density with approved mechanical tampers. The surface of the finished subgrade will be tested by the Engineer using a 10-foot straightedge provided by the Contractor at selected locations. The variation of the surface from the testing edge of the straightedge between any two contacts with the surface shall at no point exceed

SECTION 310 - SUBGRADE

1/2 inch. Unless otherwise provided, points closer than 50 feet shall not vary more than 1/2 inch from the approved grade in place. All humps or depressions exceeding the specified tolerance shall be corrected in an acceptable manner. Unless otherwise indicated on the plans the completed section shall have a crown of at least 1/4 inch per foot.

Tests of the subgrade in place shall be made immediately in advance of placing the subsequent course and shall not vary more than the tolerances heretofore specified and any deficiency shall be corrected before material is placed for the subsequent course.

In the correction of the profile grade top conform to established elevations, excavation which cannot be wasted on inside slopes or ditch lines by lateral drifting with a motor grader will be measured and paid for as Unclassified Excavation in accordance with Section 401. Material required in excess of roadway excavation to raise the existing roadbed to established elevations will be measured and paid for as unclassified or select borrow as specified or directed in accordance with Section 401.

When the condition of the subsurface materials in excess of 12 inches below subgrade elevation prevents the satisfactory construction of the subgrade, all of the excavation required to remove the unstable material for an area and to a depth designated by the Engineer and then backfilled with acceptable material to subgrade elevation shall be done in accordance with Section 401.

Material unsuitable for backfill shall be wasted as directed by the Engineer and the backfill made with acceptable material obtained from borrow in accordance with Section 401.

Instability due to excess moisture in the top 12 inches will not be recognized as justification for removal of unstable material, and no payment is to be made for manipulation and aeration of materials in place, necessary to establish a satisfactory subgrade.

Measurement of the excavation required for removal of unstable material and excavation for borrow required for backfill with acceptable material as provided above shall be made in accordance with Section 401. When grading and surfacing operations are let in one contract, removal and replacement of unstable material will not be measured or paid for in fill areas.

Excavation required for removal of unstable material and excavation for borrow for backfill with acceptable material measured as provided above will be paid for at the contract unit price per cubic yard for Unclassified Excavation.

310.05 METHOD OF MEASUREMENT: Subgrade will not be measured for payment unless otherwise shown on the plans or in the proposal. All equipment, labor, water and incidentals as required shall be included in the unit bid price for some other item on the proposal.

SECTION 311

PROCESSING EXISTING BASE AND SURFACE

311.01 DESCRIPTION: This work shall consist of the removal, processing, reuse or disposal of existing aggregate surface course, or base course and asphalt surface. This work shall be done in accordance with one of the following methods as specified for the type of new construction proposed, in the method shown on the plans, or as indicated by a pay item on the plans and in the proposal.

311.04 CONSTRUCTION METHODS, GENERAL: The aggregate or other course in place shall be loosened by scarifying or other suitable method to its full depth and width. All loosened aggregate or asphalt shall be processed and broken into pieces which will pass a 3 inch sieve. The materials shall be windrowed on the subgrade or shoulder as the case may require. Care shall be exercised in loosening and removing, processing and storage of aggregate to avoid addition to excess amounts of soil or other foreign material which would render it unsuitable for the use hereafter specified. Damaged material resulting from carelessness of the Contractor will not be paid for.

Method A (For Salvage and Stockpiling): The processed materials shall not contain detrimental amounts of subgrade or soil or other foreign material. The processed aggregate shall be loaded and hauled to storage locations indicated on the plans. All materials shall be stored in a neat and workmanlike manner. All grass, weeds and other rubbish shall be removed from storage area prior to stockpiling material.

Method B (For Use in Subgrade): The processed materials shall be windrowed on the shoulders during the shaping and conditioning of the subgrade. The materials shall then be spread uniformly over the full width of the section and compacted and completed with the subgrade.

Method C (For Use as Subbase): The processed materials shall be spread evenly on the previously completed and compacted subgrade and then compacted to the requirements specified for the method of subgrade preparation.

Method D (For Use in New Base Courses, Shoulders, or Ramps): The processed materials may be placed on the completed subgrade as a base course, shoulders or ramps, or it may be blended uniformly with new aggregate for any course. The suitability of the removed materials shall be determined by the Engineer and materials used as authorized. These materials shall be compacted to not less than 95 percent of Standard Density for shoulders, ramps and base courses.

311.05 METHOD OF MEASUREMENT: Processing existing base and surface will be measured by the station of 100 feet or fraction thereof measured along the center line of the roadbed.

311.06 BASIS OF PAYMENT: Accepted quantities for Processing Existing Base and Surface, measured as provided above, will be paid for at the contract unit price for:

- (A) Processing Existing Base and Surface, Method A-----STA.
- (B) Processing Existing Base and Surface, Method B-----STA.
- (C) Processing Existing Base and Surface, Method C-----STA.
- (D) Processing Existing Base and Surface, Method D-----STA.

which shall be full compensation for furnishing all equipment, tools, labor and incidentals necessary to complete the work as specified.

SECTION 312

TRAFFIC BOUND SURFACE COURSE

312.01 DESCRIPTION: This work shall consist of a surface course composed of hard durable particles of sand, gravel, mine chats, crushed stone or disintegrated granite of the type shown on the plans or in the proposal, constructed on the prepared subgrade in accordance with these specifications and in reasonably close conformity with the lines, grades and typical cross sections shown on the plans or established by the Engineer.

312.02 MATERIALS: Materials shall meet the requirements specified in Subsection 706.01. Material to be used on driveways, detours, and incidental areas may be selected by the Contractor provided it meets the requirements specified above.

312.04 CONSTRUCTION METHODS:

(A) Preparation of Subgrade: Prior to placing the surfacing material on the roadbed, the subgrade shall have been completed according to the requirements of Section 310.

(B) Hauling and Placing: The surfacing material shall be hauled in approved vehicles and shall be placed on the roadbed beginning at the end nearest to source of supply so that the hauling will aid in traffic binding the surface.

The material shall be deposited in windrows on the shoulders. The Contractor shall so space the unloading points that the required amount of material will be delivered in each 100-foot station, and he shall be responsible for its uniform distribution throughout the length of each station. Unless other methods are approved by the Engineer, the materials shall be dumped on the opposite side of the road from where the windrow is to be formed and the windrow shall be formed by moving the material across the road. The windrow shall be formed on the same day the material is hauled. Leaving dumped material in piles on the road overnight is prohibited. During the operation of moving the material across the road to form the windrow, or within 24 hours after depositing the material in the windrow, except for Type C, the Contractor shall spread a uniform layer not to exceed 2 inches in depth of the material over the subgrade and to the width required on the plans, unless the condition of the subgrade is such that additional time should elapse before spreading is started. It is intended in this operation that only enough material be left on the roadbed for proper maintenance.

(C) Shaping and Maintenance: The Contractor shall at all times maintain the road under traffic for the entire length of the project until final acceptance. After the material has been windrowed and the first layer spread as provided above, the remaining material shall be spread in such a manner and in such amounts as may be required for proper maintenance. The Contractor shall guard against an excess of loose material on the roadbed but shall pull in additional material from the windrow only as that previously placed on the roadbed is properly shaped and completed. Material placed in driveways and incidental areas adjacent to the roadway shall be properly shaped and compacted in a manner approved by the Engineer.

The Contractor shall fill ruts formed by traffic by blading at least once each day, and more frequently if necessary, to prevent traffic from cutting through the surfacing material into the subgrade. Holes, waves and undulations which develop shall be corrected by blading and by adding more material from the

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windrow. The shaping of the surface material shall be continued until it is well compacted, free from ruts, waves, and undulations and conforms to the cross section shown on the plans and until final acceptance.

Excess material not required for maintenance shall be left on the shoulders in neat symmetrical windrows.

(D) Protection: The road shall not be closed to traffic during this construction work and the Contractor shall so carry on his operations so as to interfere the least possible with the movement of traffic and he shall maintain sufficient warning signs and lights as required to safeguard against accidents. Windrows of material shall not be left on the traveled roadway overnight but must be placed on the shoulders.

312.05 METHOD OF MEASUREMENT: Traffic Bound Surface Course will be measured by the cubic yard.

312.06 BASIS OF PAYMENT: Accepted quantities of Traffic Bound Surface Course, measured as provided above, will be paid for at the contract unit price for:

- Traffic Bound Surface Course, Type A-----CU. YD.
- Traffic Bound Surface Course, Type B-----CU. YD.
- Traffic Bound Surface Course, Type C-----CU. YD.
- Traffic Bound Surface Course, Type D-----CU. YD.

which shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.