1301S.1 Description

This standard specification item shall govern furnishing and placing red granite gravel surfacing for hike and bike trails. The granite gravel surface shall be constructed in a single layer on an approved and properly prepared base course, conforming to typical sections and to the lines and grades indicated on the drawings or established by the engineer or designated representative.

This specification is applicable for projects or work involving either inch-pound or SI units. Within the text the inch-pound units are given preference followed by SI units shown within parentheses.

1301S.2 Submittals

The submittal requirements of this specification item may include:

A. Sample of decomposed red granite gravel surface material along with source identification and gradation and plasticity test results for approval, quality assurance and color;

B. Sample of red road base material or approved equivalent along with source identification and gradation and plasticity test results for approval, quality assurance and color;

C. Optimum moisture-density characteristics for decomposed red granite gravel and red road base sources;

D. Proposed trail/path construction sequence and equipment; and

E. Field density test results for in-place compacted red granite gravel and red road base.

1301S.3 Materials

The surface and base layer materials shall be tested by the City's designated laboratory and approved by the Engineer or designated representative prior to being hauled to the Project.

The decomposed red granite gravel and red road base materials or approved equivalent shall be tested according to the following TxDoT standard test methods:

a) Preparation for Soil Constants and Sieve Analysis	Tex-101-E
b) Moisture Content	Tex-103-E
c) Liquid Limit	Tex-104-E
d) Plastic Limit	Tex-105-E
e) Plasticity Index	Tex-106-E
f) Sieve Analysis	Tex-110-E
g) Laboratory Compaction	Tex-113-E
h) Field Density	Tex-115-E

The surface layer material shall be from a source approved by the City and shall be composed of a mixture of Texas decomposed unwashed granite aggregate and red clay fines that meets the following requirements:

Sieve Designation		% Passing	
US	SI		
5/8"	19 mm	100	
#40	425 μm	40 to 45	
# 200	75 μm	15 to 25	
Plasticity Index			12 to 18

The red road base material or approved equivalent shall be from a source approved by the City and shall consist of a hematite, hydrated hematite or limonite “iron” ore, occurring with or without sand, as found at or near the ground surface, which, when loaded at from the material pit, shall not contain an excess of free clay. Material containing gravel or hard pieces of ore exceeding the maximum specified size in their largest dimension shall be broken up and uniformly mixed with the remainder of the material/.

When properly slaked and tested by TxDoT methods the red road base material or approved equivalent shall meet the following requirements.

Sieve Designation		% Passing	
US	SI		
1 3/4"	45 mm	100	
7/8"	22.5 mm	65 to 90	
#40	425 μm	15 to 50	
Liquid Limit			35 maximum
Plasticity Index			12 maximum.

1301S.4 Construction

A. General

Prior to commencement of this work, all required erosion controls and tree protection measures indicated on the Drawings shall be in place. All existing utilities shall be located and protected as specified in the Standard Contract Documents, Section 00700, "General Conditions" and/or as specified on the Drawings.

Areas within the construction limits shall be cleared of all obstructions, abandoned structures, and other items as defined above. All vegetation, except trees or shrubs indicated for preservation, shall also be removed. Trees and shrubs, which are scheduled for preservation, shall be carefully trimmed as directed by the engineer or designated representative and shall be protected from scarring, barking or other injuries during construction operations in accordance with Standard Specification Item No. 610S, " Preservation of Trees and Other Vegetation". All exposed cuts over 2 inches (50 millimeters) in diameter, exposed ends of pruned limbs or scarred bark shall be treated with an approved asphalt material within 24 hours of the pruning or injury.

Construction equipment shall not be operated nor construction materials stockpiled under the canopies of trees, unless otherwise indicated on the Drawings and/or specified in the

Contract Documents. Excavation or embankment materials shall not be placed within the drip line of trees until tree wells are constructed.

B. Subgrade Preparation

The subgrade shall be excavated and shaped in conformity with the typical sections shown on the drawings and to the lines and grades as established by the Engineer or designated representative. The subgrade shall be tested by “proof rolling” and shall conform to Standard Specification Item No. 236S, except that a 10-ton roller will be used prior to placement of the red road base material. Any unstable or spongy subgrade areas identified by proof rolling shall be corrected either by additional re-working, drying and compaction, or by removal and replacement of unsuitable materials.

If required the subgrade shall be wetted, reshaped and rolled to the extent directed in order to place the subgrade in an acceptable condition to receive the red road base material. The surface of the subgrade shall be finished true to line and grade as established by the Engineer or designated representative in conformity with the typical section shown on the drawings. Material excavated in the preparation of the subgrade shall be utilized in the construction of adjacent shoulders and slopes or otherwise disposed of as directed by the Engineer or designated representative. Additional material required for completion of the shoulders and slopes shall be secured from sources approved by the City of Austin.

C. Red Road Base

The Contractor shall not place red road base or approved equivalent until the subgrade has cured to the satisfaction of the Engineer or designated representative, regardless of whether or not the subgrade has been successfully proof rolled. As a minimum, this will be when the surface displays no damp spots and there is no evidence of “sponginess” in the subgrade.

The base material shall be delivered in approved vehicles of uniform capacity and it shall be the responsibility of the Contractor to deliver at each 100-foot (30-meter) station the required amount of specified material to yield the compacted thickness shown on the drawings. Material deposited upon the subgrade shall be spread and shaped the same day unless directed otherwise by the Engineer in writing. All areas and "nests" of segregated coarse or fine material shall be corrected or removed and replaced with well-graded material.

In the event inclement weather or other unforeseen circumstances render impractical the spreading of the base material during the first 24-hour period, it shall be scarified and spread as early as possible as directed by the Engineer or designated

representative. If it becomes evident that insufficient material was placed, additional material as necessary shall be delivered and the entire course scarified, mixed and compacted.

The base layer shall be sprinkled as required to bring the material to optimum moisture content, then compacted in accordance with Standard Specification Item No. 210S, “Flexible Base” to the extent necessary to provide not less than 90% of the optimum density. In no case shall the material be worked at more than 2 percent above or below optimum moisture as determined by TxDoT Test Method Tex-113-E. Field density determinations shall be made in accordance with TxDoT Test Method Tex-115-E. In addition to the requirements specified for density, the full depth of base material shall be compacted to the extent necessary to remain firm and stable under construction equipment.

After each section of flexible base material is completed, tests, as necessary, will be made by the Engineer or designated representative. As a minimum, three in-place density tests per section. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements. All initial testing will be paid for by the City. All retesting shall be paid for by the Contractor. Throughout the entire operation, the surface of the material shall be maintained by blading and, upon completion, shall be smooth and shall conform to the typical section indicated on the Drawings and to the established lines and grades.

If the base material, due to any reason or cause, loses the required stability, density or finish before placement of the red granite gravel surface layer, it shall be recompacted and refinished at the Contractor's expense.

D. Red Granite Gravel Surface

Construction methods for the succeeding red granite gravel layer shall be the same as prescribed for the red road base layer with the exception of the compaction requirements. The surface layer shall be sprinkled as required to bring the material to optimum moisture content, then compacted in accordance with Standard Specification Item No. 210S, "Flexible Base" to the extent necessary to provide not less than 92% of the optimum density. In no case shall the material be worked at more than 2 percent above or below optimum moisture.

When the thickness of a particular lift of the flexible base is in question, the Contractor shall check the surface of for conformity to the lines and grades by setting "blue tops" at intervals not exceeding 50 feet (15 meters) on the centerline, the edge of the trail/path, and at other points that may be indicated on the Drawings

If the base material and/or surface layer due to any reason or cause, loses the required stability, density or finish prior to acceptance of the project, the base layer and/or surface layer shall be recompacted and refinished at the Contractor's expense.

1301S.5 Measurement

"Granite Gravel Hike and Bike Trail" will be measured by the cubic yard (cubic meter: 1 cubic meter equals 1.196 cubic yards), complete in place, as indicated in the Contract Documents.

1301S.6 Payment

This item will be paid for at the contract unit bid price for "Granite Gravel Hike and Bike Trail". The unit bid price shall include full compensation for all work specified herein, including the protection of existing trees, property and public right-of-way, traffic control measures, the furnishing, hauling, placing and compacting of all materials; for rolling, proof rolling, recompacting and refinishing; for all water required; for retesting as necessary; and for all equipment, tools, labor and incidentals necessary to complete the Work.

Payment will be made under the following:

Pay Item No. 1301S-A:	Granite Gravel Hike and Bike Trail	Per Cubic Yard.
Pay Item No. 1301S-B:	Granite Gravel Hike and Bike Trail	Per Square Yard.

End

SPECIFIC CROSS REFERENCE MATERIALS
Specification 1301S, “Granite GravelHike and Bike Trail”

City of Austin Standard Contract Documents

Designation	Description
Section 00700	General Conditions

City of Austin Standard Specifications

Designation	Description
Item No. 201S	Subgrade Preparation
Item No. 210S	Flexible Base
Item No. 236S	Proof Rolling
Item No. 610S	Preservation of Trees and Other Vegetation

Texas Department of Transportation: Manual of Testing Procedures

Designation	Description
Tex-101-E	Preparation of Soil and Flexible Base Materials for Testing
Tex-103-E	Determination of Moisture Content of Soil Materials
Tex-104-E	Determination of Liquid Limit of Soils
Tex-105-E	Determination of Plastic Limit of Soils
Tex-106-E	Method of Calculating the Plasticity Index of Soils
Tex-110-E	Determination of Particle Size Analysis of Soils
Tex-113-E	Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials and Cohesionless Sands
Tex-115-E	Field Method for Determination of In-Place Density of Soils and Base Materials

City of Austin Standard Details

Designation	Description
1301S-1	Granite Gravel Trail