

University of Houston Master Specification

<Insert Project Name>

<Insert U of H Proj #>

<Insert Issue Name>

<Insert Issue Date>

SECTION 32 1114 - FLEXIBLE BASE

Maintain Section format, including the UH master spec designation and version date in bold in the center columns of the header and footer. Complete the header and footer with Project information

Edit and finalize this Section, where prompted by Editor's notes, to suit Project specific requirements. Make selections for the Project at text identified in bold.

This Section uses the term "Engineer." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
 - 1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
 - 2. The University of Houston's *Supplemental General Conditions and Special Conditions for Construction*.

1.2 SUMMARY

- A. This Section includes a base course composed of crusher-run broken limestone or crushed concrete. The flexible base shall be constructed as specified in one or more courses in conformity with the typical section shown on the Drawings and to the line and grades established by the Engineer.

1.3 MEASUREMENT AND PAYMENT

- A. Payment for flexible base will be made at the unit price indicated in Section 01 2200 "Unit Prices." The price shall include preparing and rolling the sub-grade, furnishing and placing the base material, all royalty and freight, hauling and delivery on the street, spreading, shaping, dragging, sprinkling or drying, compacting and finishing; for all manipulation, labor, tools and incidentals necessary to complete the work. Payment will not be made for unauthorized work.

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1.4 INFORMATIONAL SUBMITTALS

- A. Furnish two copies of all test results performed by a pre-approved independent testing laboratory. The documentation shall be specifically for the material that is to be used on the Project.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The material shall meet the material requirements of TX DOT 247, Type A or D, Grade 1. Contractor shall be responsible for insuring that all materials delivered at the Project site meet the Specifications. If testing indicates the material to be unsatisfactory, Contractor shall be required to pay for those tests, as well as supply materials that comply with this Specification. The material shall be obtained from pre-approved sources, shall be crushed, and shall consist of durable particles of stone or concrete mixed with pre-approved binding materials. The processed material shall meet the following requirements:

- 1. Test Requirements: The processed flexible base shall meet the following requirements when tested in accordance with procedures as outlined in TX DOT Item 247.

Retained on 1-3/4 inch sieve	0 percent
Retained on 7/8 inch sieve	10 – 35 percent
Retained on 3/8 inch sieve	30 – 50 percent
Retained on 4 mesh sieve	45 – 65 percent
Retained on 40 mesh sieve	70 – 85 percent

- a. *Liquid Limit*: The portion of material passing the 40 mesh sieve shall have a liquid limit of 35 or less, in accordance with TEX-104-E.
- b. *Plasticity Index*: The portion of material passing the 40 mesh sieve shall have a plasticity index of not less than 4 nor more than 10, in accordance with TEX-106E.
- c. *Abrasion*: The crushed stone or crushed concrete shall have an abrasion loss of not more than 40 percent when subjected to the Wet Ball Mill Test, TEX-116-E with a maximum of 20 percent increase in passing the No. 40 sieve.
- d. *Triaxial Test*: The crushed stone or crushed concrete shall have a minimum compression strength of 45 psi at 0 psi lateral pressure and 175 psi at 15 psi lateral pressure in accordance with TEX-117-E.

2.2 EQUIPMENT

- A. All equipment shall be adequate for the purposes intended and proper execution of the Work, meeting the approval of the Engineer prior to the start of Work.

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2.3 TESTING REQUIREMENTS

- A. Contractor shall have field densities performed on the base for review by the Engineer. These tests shall be taken at points directed by the Engineer with a maximum of one test per construction station. The Owner will not pay for failing tests.
- B. Perform tests for required depth upon completion of each course to the lines and grades specified.

PART 3 - EXECUTION

3.1 EROSION PROTECTION

- A. Provide at all times adequate protection to newly graded areas to prevent soil erosion as specified in Section 31 2513 "Erosion and Sedimentation Control."
- B. Soil erosion that occurs prior to acceptance of the work shall be repaired at no expense to the Owner.

3.2 PLACING

- A. The flexible base course shall be placed upon a previously approved sub-grade. Immediately before placing the flexible base material, the sub-grade shall be checked for conformance with the Drawings and Specifications and any corrections of non-conforming Work shall be made.
- B. Take special care in working in the area of underground electrical and other conduit for pedestrian lights, street lights and security cameras.
- C. Material deposited upon the sub-grade shall be spread and shaped the same day. The material shall conform to the typical sections as shown on the Drawings. All areas and "nests" of segregated coarse or fine materials shall be corrected or removed and replaced with well-graded material. Contractor shall furnish and apply additional binder to the in-place material, if directed by the Engineer. Such binder material shall be carefully and evenly incorporated with the in-place material by scarifying, harrowing, brooming, or other pre-approved methods.

3.3 FINISHING AND COMPACTING

- A. The flexible base course shall be sprinkled as required and rolled until obtaining a uniform compaction and the required density.
- B. Compaction of the flexible base course shall be accomplished with a pneumatic-tired roller. Rolling shall continue until the base course material has been compacted to 95 percent of the modified density (ASTM D1557). The allowable deviation from optimum moisture content is to plus 4 percent.

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- C. The shape of the course shall be maintained by blading throughout the entire compacting operation. The completed surface shall be smooth and in conformance with the typical sections shown on the Drawings and to the established lines and grades. Completed surfaces that deviate in excess of 1/4 inch in cross-section and in a length of 16 feet measured longitudinally shall be corrected.
- D. The method of correction shall be by loosening, adding or removing material, and reshaping and recompacting by sprinkling and rolling. All irregularities, depressions or weak spots that develop shall be corrected immediately by scarifying the affected areas, adding suitable material as required, and reshaping and recompacting by sprinkling and rolling.
- E. When directed by the Engineer, the base course may be opened to traffic. Contractor shall direct and distribute the traffic uniformly over the entire width of the course. During the period traffic is being directed over the course, the surface shall be satisfactorily maintained by the use of blades, drags and other equipment. Maintenance operations shall continue until starting the application of the next course or the surface course.

3.4 DUST ABATEMENT

- A. Comply with applicable Federal, State, and local laws and regulations concerning the prevention and control of dust pollution.
- B. During performance of the work required by this Section, whether on right-of-way provided by the Owner or elsewhere, Contractor shall furnish all labor, equipment, materials, and means required and shall carry out proper and efficient measures as necessary to reduce dust and to prevent dust from damaging plants and structures or causing a nuisance to persons. Contractor will be held liable for damage resulting from dust originating from Contractor's operations.
- C. Dust control shall be accomplished by one of the following methods:
 - 1. When ordered by the Owner, apply calcium chloride over the traveled road surfaces that have not yet been fully restored. The material used shall be Regular Flake Calcium Chloride having a minimum chemical content of 77 percent calcium chloride. The rate of application shall be three pounds per square yard of surface covered.
 - 2. When ordered by the Owner, apply "Bituminous Surface Treatment" on traveled road surfaces in accordance with the current Texas Standard Specifications for Construction of Highways, Streets and Bridges.
- D. Include the cost of sprinkling or other methods of reducing the formation of dust in the Work.

END OF SECTION 32 1114

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