SECTION 02710
FLEXIBLE BASE COURSE

PART I: GENERAL

1.1 GENERAL REQUIREMENTS
- A. Foundation course of crushed concrete or stone.

1.2 MEASUREMENT AND PAYMENT
- A. UNIT PRICES:
  1. Measurement for flexible base is on a square yard basis. Separate measurement shall be made for each different required thickness of base course.
  2. Refer to Section 01290 – Payment Procedures for unit price procedures.
- B. Stipulated Price (Lump Sum):
  1. If Contract is Stipulated Price Contract, payment for Work in this Section is included in Total Stipulated Price.

1.3 REFERENCES
- A. ASTM – American Society for Testing and Materials.
  1. ASTM D1556 – Density of Soil in Place by the Sand-Cone Method.
  2. ASTM D698 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12.44 ft-lbf/ft3).
  3. ASTM D2922 – Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  4. ASTM D361 – Test Method for Water Content of Soils and Rock in Place by Nuclear Methods (shallow depth).
  5. ASTM D3017 – Test Method for Water Content of Soils and Rock in Place by Nuclear Methods.
  6. ASTM D4318 – Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- B. CFTS – City of Friendswood Technical Specifications.
- C. TxDOT – Texas Department of Transportation.
  1. TxDOT Tex-101-E – Preparation of Soil and Flexible Base Materials for Testing.
  2. TxDOT Tex-110-E – Determination of Particle Size Analysis of Soils.

1.4 SUBMITTALS
- A. Submittals shall conform to requirements of Section 01330 – Submittals Procedures.
- B. Submit samples of flexible base course and soil binder for testing.

1.5 TESTS

A. Tests and analysis of soil materials shall be performed in accordance with ASTM C131, ASTM D698, ASTM D4318, Tex-101-E and Tex-110-E under provisions of Sections 01470 – Testing Laboratory Services and 01475 Quality Control Testing Procedures.

1.6 DELIVERY, STORAGE and HANDLING

A. Provide materials from stockpiles that are protected during storage from contaminates that would be detrimental to the flexible base course.
B. Load materials from same area of stockpile to maintain uniformity of each successive delivery to the project site.

1.5 QUALITY ASSURANCE

A. Provide manufacturer's affidavits that material was manufactured in compliance with standards referenced in this Section.

PART II: PRODUCTS

2.1 MATERIALS

A. Crushed Stone or Concrete: Material retained on the No. 40 sieve meeting the following requirements:
   1. Durable particles of crusher-run broken limestone, crushed concrete, crushed sandstone or granite obtained from an approved source.
B. Soil Binder: Material passing the No. 40 sieve meeting the following requirements when tested in accordance with ASTM D4318:
   1. Maximum Liquid Limit: forty (40).
   2. Maximum Plasticity Index: twelve (12).
   3. Maximum Lineal Shrinkage: seven (7) (when calculated from volumetric shrinkage at liquid limit).
C. Mixed Materials shall meet the following requirements:
   1. Minimum compressive strength of thirty-five pounds per square inch (35 psi) at zero pounds per square inch (0 psi) lateral pressure and one hundred seventy-five pounds per square inch (175 psi) at fifteen pounds per square inch (15 psi) lateral pressure using triaxial testing procedures.
   2. Grading in accordance with Tex-101-E and Tex-110-E within the limits specified in TABLE 4.1 – SIEVE ANALYSIS in this Section.

PART III: EXECUTION

3.1 EXAMINATION

A. Verify compacted subgrade is ready to support imposed loads.
B. Verify lines and grades are correct.

3.2 PREPARATION

A. Complete backfill of new utilities below future grade.
B. Prepare subgrade in accordance with requirements of Section 02115 – Embankment and Section 02135 – Excavation for Roadway or Section 022720 – Lime-Stabilized Base Subgrade.
C. Correct subgrade deviations in excess of plus or minus one-half inch (1/2 In) in cross section or in sixteen foot (16 Ft) length by loosening, adding or removing material, reshaping and recompacting by sprinkling and rolling.
D. Prepare sufficient subgrade in advance of base course operations.

3.3 PLACEMENT

A. Spread and shape in lifts to compacted thickness not to exceed six inches (6 In) in depth. Complete spreading, shaping and compacting on same day material is deposited.
B. Place base so that projecting reinforcing steel from curbs remain at approximate center of base. Secure a firm bond between reinforcement and base.
C. Start rolling operations as soon as possible after placement. Use sheepsfoot, steel or pneumatic rollers as approved. Roll longitudinally with subgrade starting from sides. Overlap successive strips by one-half (1/2) width of each rear wheel.
D. Maintain moisture between optimum and three percent (3%) above optimum moisture.
E. Compact to ninety-five percent (95%) of Proctor density in accordance with ASTM D698, unless otherwise indicated on the Drawings.
F. Finish to grade and compact lift before placing successive lift.
G. Maintain shape by grading throughout operation.
H. Provide total thickness indicated on the Drawings.

3.4 TOLERANCES

A. Completed surface shall be smooth and conform to typical section and established lines and grades.

3.5 FIELD QUALITY CONTROL

A. Testing shall be performed under provisions of Sections 01470 – Testing Laboratory Services and 01475 – Quality Control Testing Procedures.
B. Compaction Testing shall be performed in accordance with ASTM D698 or ASTM D2922 and ASTM 3017 at a random location near each depth determination core.
C. Rework and recompact areas that do not conform to compaction requirements.

3.6 PROTECTION

A. Sprinkle to prevent excessive loss of moisture.
B. Restrict construction traffic on finished base to equipment required to complete the work.

PART IV: TABLES

4.1 SIEVE ANALYSIS

Sieve	Percent Retained
1-3/4 inch	0 to 10
No. 4	45 to 75
No. 40	60 to 85

END OF SECTION