III. Construction Standards References

A. Materials

1. Sand:

   Sand shall consist of clean, hard, durable grains, free of lumps and organic material. All particles must pass a No. 8 sieve.

2. Crushed Rock Aggregate:

   The aggregate shall consist of durable particles of crushed stone, free from frozen materials or injurious amounts of salt, alkali, vegetable matter or other material either free or as adherent coating, and its quality shall be reasonably uniform throughout. It shall have a wear of not more than forty (40) percent when tested in accordance with TXDOT test method TEX-410-A.

   When tested by standard laboratory methods, crushed rock shall meet the following requirements for percentage by weight:

Fine Crushed Rock – Aggregate Grade 8	
Retained on the ½ in sieve	0%
Retained on the 3/8 in sieve	0% to 5%
Retained on the No. 4 sieve	35% to 60%
Retained on the No. 8 sieve	90% to 100%

Standard Crushed Rock – Aggregate Grade 4	
Retained on the 1½ in sieve	0%
Retained on the 1 in sieve	0% to 5%
Retained on the ½ in sieve	40% to 75%
Retained on the No. 4 sieve	90% to 100%
Retained on the No. 8 sieve	95% to 100%

Course Crushed Rock	
Passing the 1½ in sieve	100%
Retained on the 3/4 in sieve	100%

Rock for Foundation	
Passing the 5 in sieve	100%
Retained on the 2 in sieve	100%

Class “A” Embedment
The embedment consists of a Type “B” concrete cradle and a cap of select material or granular material.

3. Backfill

    a. Types “B” and “C”

        i. Type “B” backfill is imported sandy gravel material. Type “C” backfill is native material from trench excavations.

        ii. The liquid limit shall not exceed 35 when tested in accordance with ASTM Designated D 423. The plasticity limit shall not exceed 12 when tested in accordance with the ASTM Designated D 424.

    b. Flowable Backfill

        Flowable backfill shall consist of a mixture of native soils or manufactured materials, cement and/or fly ash, and water which produces a material with unconfined compressive strength of between 250 and 450 psi after 28 days. Any material used shall be primarily granular, with a plasticity index < 12 and with 100% passing a ¾ in. sieve. The flowable mixture must be allowed to set prior to the placement of any overlying material.

4. Flexible Base (Crushed Rock)

    a. The item shall consist of a foundation course for a surface course or other base courses.

    b. The soil binder shall meet the following testing requirements:

        i. The liquid limit shall not exceed 40 when tested in accordance with ASTM Designated D 423.

        ii. The plasticity limit shall be between 4 and 12 when tested in accordance with ASTM Designated D 424.

        iii. The preparation of samples for testing shall be in accordance with ASTM Designated D 2217

        iv. Material retained on the No. 4 sieve shall have a percent wear of not more than 45 when tested in accordance with ASTM Designation C 131.

        v. The material when tested under The Wet Ball for Determining the Disintegration of Flexible Base Materials, TXDOT Test Method TEX-116-E, shall not develop more than 50 percent soil binder.

c. The material shall be obtained from approved sources, consist of durable particles of stone mixed with approved binding material, and meet the following requirements:

Passing 1-3/4 inch sieve	100%
Passing No. 4 sieve	35 to 55%
Passing No. 40 sieve	15 to 40%

5. Concrete

Class of Concrete	Min Bags Cement Per C.Y.	Compressive Strength 28-Day PSI	Maximum Water/Cementitious Ratio
A	5.0	3000	0.58
C	6.0	3600	0.53

COARSE AGGREGATE GRADING

Grade No.2 – Maximum Normal Size 1-1/2 in.

Sieve	**Percentage Passing**
2 in.	100%
1-1/2 in.	95 to 100%
¾ in.	40 to 70%
3/8 in.	10 to 30%
No. 4	0 to 5%

Grade No.3 – Maximum Normal Size 1 in.

Sieve	**Percentage Passing**
1-1/2 in.	95 to 100%
¾ in.	60 to 90%
½ in.	25 to 60%
No. 4	0 to 5%

Grade No.4 – Maximum Normal Size 3/8 in.

Sieve	**Percentage Passing**
½ in.	95 to 100%
3/8 in.	70 to 95%
No. 4	0 to 25%

6. Hot Mix Asphalt Concrete

The HMAC shall be a mixture of aggregate and asphalt cement mixed hot in a mixing plant. The aggregate shall be composed of a coarse aggregate, a fine aggregate and mineral filter.

The course aggregate shall be type D with 50% retained on the No. 4 sieve.

The fine aggregate shall meet the following requirements:

	Percent by Weight
Passing the 3/8 in sieve	100
Passing the No. 10 sieve	75-100
Passing the No. 200 sieve	0-15

Mineral filter shall consist of dried stone dust, Portland cement, lime, fly ash, or other mineral dust. The filler shall meet the following requirements:

	Percent by Weight
Passing the No. 30 sieve	95-100
Passing the No. 80 sieve	75
Passing the No. 200 sieve	55

B. Construction Specifications

The specifications for construction are found in Chapter 2 through Chapter 8, North Central Texas Standards Specifications for Public Works Construction, latest version

END OF SECTION