CHAPTER 12 - ROADWAY CONSTRUCTION

12.1 GENERAL

This Division covers roadway construction, including work consisting of pulverizing existing asphalt, earthwork and roadway excavation. It also includes imported granular borrow, subgrade preparation, untreated base course, asphalt surface and raising manholes and valve boxes to grade.

12.2 MILLING / PULVERIZING

The limits of the area to be milled / pulverized will be as shown on the improvement drawings. The existing asphalt edges where the milling / pulverizing terminates shall be saw cut following or prior to being milled / pulverized.

Millings / Rap may only be used as granular borrow with approval of City Engineer.

When used as granular borrow, the Developer/Contractor shall pulverize the existing asphalt and road base to a depth of 6 to 8 inches. The Developer/Contractor has the option of methods he feels will result in the least work and best product in breaking up the existing asphalt, provided that the maximum size for a single piece of asphalt does not exceed 3 inches. Placing, grading and compacting of this material shall comply with the requirements of borrow.

12.3 EARTHWORK

The earthwork needed for roadway construction shall meet the requirements of Chapter 8, Earthwork.

12.4 ROADWAY EXCAVATION

The roadway shall be excavated to the lines and grades shown on the improvements drawings or to the minimum standard depths shown and/or described in these Standards and Drawings. All materials not meeting gradations and specifications described herein shall be removed from the road section.

12.5 SUBGRADE PREPARATION

This work shall consist of the shaping and compacting of the subgrade in accordance with these specifications and in conformity with the lines, grades, and typical cross sections shown on the Drawings or as established by the City Engineer / Public Works Representative.

Following roadway excavation the existing subgrade shall be proof rolled by running moderate-weight rubber tire-mounted construction equipment uniformly over the surface at least twice. During the rolling operation moisture content of the subgrade layer shall be maintained at not less than 97% or more than 105% of the optimum moisture content. Rolling shall be continued until the entire roadbed is compacted to the specified density to a minimum depth of 8 inches.

It is the Developer/Contractor's responsibility to stabilize the existing subgrade material by whatever means are necessary to create a stable foundation upon which the roadway may be constructed. These means and methods must be approved by the City Engineer / Public Works Representative prior to placement.

12.6 GRANULAR BORROW

Granular borrow (foundation or roadway) material shall consist of three-inch to four-inch (3"- 4") well-graded engineered fill meeting A-1-a, (AASHTO M 145 or ASTM D3282). Recycled concrete will not be allowed in the public right-of-way.

Sieve	Percent Passing by Weight
4”	100
2”	75 -90
1”	50- 80
3/8”	40 – 70
No. 4	25 – 55
No. 10	20 – 50
No. 40	10 – 30
No. 200	2 - 15

The granular borrow material shall be compacted to not less than 95% maximum dry density as determined by AASHTO T-180 (Modified Proctor) or as determined by ASTM D1557 (Modified Proctor). Surfaces shall be true to the established grade with thickness being not less than 1-inch from the required layer thickness and with the surface elevation varying not more than 1-inch in ten feet from the true profile and cross section.

Submittals or proctor test, gradation and sieve analysis shall be required every 500 tons of material imported.

12.7 UNTREATED BASE COURSE

Base for all streets shall meet current APWA Untreated Base Course Class A specifications (APWA 32 11 23) and meet A-1-a soil classification. Recycled concrete will not be allowed in the public right-of-way.

The material shall be deposited and spread in a uniform layer, without segregation of size, with such depth that when compacted the layer will have the required thickness as stated below.

Each layer shall be compacted for the full width and depth. Alternate blading and rolling will be required to provide a smooth, even and uniformly compacted course true to cross section and grade. Places inaccessible to rolling shall be compacted with mechanically operated hand tampers.

The base course shall be compacted to not less than 95% maximum dry density as determined by AASHTO T-180. Surfaces shall be true to the established grade with thickness being not less than 1/4-inch from the required layer thickness and with the surface elevation varying not more than 3/8-inch in ten feet from the true profile and cross section.

12.8 ASPHALT PAVEMENT

Over the dry, dust-free compacted base course the Developer/Contractor shall place and compact asphalt pavement. The asphalt pavement shall meet current APWA Asphalt Concrete standards (APWA 32 12 05).

The paving asphalt material for local roadways shall be PG 58-28 or PG 64-22. For larger roadways (collectors / arterials) shall be PG 64-22 only. Gradation of aggregate shall conform to the DM-1/2-inch gradation limits as defined in these Specifications, unless otherwise approved by the City Engineer.

The asphalt mixtures shall be spread with self-propelled mechanical spreading and conditioning equipment capable of distributing at least a 12-foot width. The mixture shall be spread and struck off in such a manner that the finished surface shall result in a uniform smooth surface. The longitudinal joints in succeeding courses shall be offset at least 6 inches transversely to avoid a vertical joint through more than one course. The maximum compacted thickness of a single course of asphalt is 4”.

All cold transverse joints shall be paper-patched or saw-cut to a clean vertical edge before paving resumes.

The temperature of the asphalt mix shall be between 270° F and 325° F when placing.

After the mixture has been spread, the surface shall be rolled in longitudinal direction commencing at the outside edge or lower side and proceeding to the higher side. Each pass of the roller shall overlap the preceding pass at least one-half the width of the roller. Rolling shall continue until 95% of the laboratory density as determined in accordance with ASTM Designation D1559 for the asphalt mixture being used has been obtained. Density tests shall be done following the procedures of ASTM D2950. Complete compaction before temperature drops to 180° F.

Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller.

The surface of the pavement, after compaction, shall be uniform and true to the established grade. When tested with a ten-foot straight edge placed on the surface of the pavement, at any point, the surface shall not deviate more than one-eighth of an inch from the lower edge of the straight edge. All high and low spots shall be remedied immediately by removing the wearing course material over the affected areas and replacing it with fresh, hot wearing course and surface finish material and immediately compacting it to conform with the surrounding area.

It is the responsibility of the Developer/Contractor to control traffic. Insofar as possible, all traffic shall be kept off the completed surface for a minimum period of 24 hours.

No asphalt surface course shall be placed when the temperature of the roadbed is 45° F or below, during rainy weather, when the base is wet, or during other unfavorable weather conditions as determined by the City Engineer / Public Works Representative. The air temperature shall be 45° F and rising when measured in the shade.

A 2% minimum cross-slope and 4% maximum cross-slope is required. Any slopes higher or lower than the required range must be approved by the City Engineer or designee.

12.9 ADJUSTING MANHOLES AND BOXES TO FINAL GRADE & INSTALLING CONCRETE COLLAR

Covers shall be set to the finished grade and contour of the street. Rings and covers shall be protected during backfilling and compaction of the road base and during the placing or replacing of road surfaces. Any rings or covers damaged or broken shall be replaced by the Developer/Contractor at its expense. Prior to paving, the manhole ring and cover shall be GPS-located by the Developer / Contractor (shot at the center of the ring) and set below the finished road base elevation. After paving the asphalt shall be removed, and the manhole ring and cover shall be raised to match the grade and slope of the finished road surface and shall use the WHIRLyGIG manhole riser/collar system.

Road base around the manhole ring and cover shall be recompacted, and the concrete collar placed. Manholes and boxes placed in asphalt surfacing shall be constructed such that the cast iron ring is one-quarter inch (1/4”) lower than the pavement. The top of all concrete lids or cone sections shall be a minimum of eight inches (8”) and a maximum of twelve-inches (12”) below the finished road surface. Manholes and boxes must be cleaned of all debris after setting of collars.

12.10 ADJUSTING VALVE BOXES TO FINAL GRADE & INSTALLING CONCRETE COLLAR

Valve boxes shall be set to the finished grade and contour of the street. Valve boxes shall be protected during backfilling and compaction of the road base and during the placing or replacing of road surfaces. Any valve boxes damaged or broken shall be replaced by the Developer/Contractor at its expense. Prior to paving, the valve box shall be GPS-located by the Developer / Contractor (shot at the center of the valve box) and set six (6) inches below the finished grade. After paving the asphalt shall be removed, and the valve box shall be raised to match the grade and slope of the finished road surface.

Road base around the valve box shall be re-compacted, and the concrete collar placed. Valve boxes placed in asphalt surfacing shall be constructed such that the cast iron ring is one-quarter inch (1/4”) lower than the pavement. Valve boxes must be cleaned of all debris after setting of collars.