SECTION XII. SURFACING AND PAVING

A. GENERAL REQUIREMENTS

This section covers the requirements for bituminous surface paving on roads. All streets shall be surfaced in accordance with the following: All items not mentioned within these standards and specifications related to road work will be performed in accordance with the most recent edition of "State of Utah Standard Specifications for Road and Bridge Construction", by the Utah State Road Commission.

1. Grades: Grades of streets shall not be in excess of eighteen percent (18%) on short unsustained stretches of street, nor in excess of eight percent (8%) on sustained grades, unless otherwise approved by City. Grades of roads shall be a minimum of one-half of one percent (0.5%). Streets shall be leveled to a grade of less than four percent (4%) for a distance of at least one hundred feet (100') approaching all intersections; and at the intersection a grade of four percent (4%) shall be a maximum, unless otherwise approved by the City. All changes in street grade shall be connected by vertical curves of a minimum length equivalent to fifteen (15) times the algebraic difference in the rate of grade for major streets and collector streets and one-half (½) of this minimum for all feeder streets.

a. Curvature On Center Line: Minimum radii of curvature on center line shall be as follows: major streets, five hundred feet (500'); collector streets, three hundred feet (300'); and feeder streets, one hundred feet (100'); unless otherwise approved by the City.

b. Intersection Angles; Curb Radii: In general, streets should intersect at right angles, feeder streets should approach the major or collector street at an angle of not less than eighty degrees (80°), and curb corners should have radius of not less than twenty five feet (25'). Where streets meet at acute angles, the radii should be forty feet (40').

B. BASE COURSE

1. Gradation of Base: Base for all streets shall consist of select material, either natural or crushed, and shall be graded as follows:

Sieve Size	Percent Passing
1 inch	100
¾ inch	70-100
½ inch	55-75
No. 4 Sieve	35-60
No. 40 Sieve	15-30
No. 200 Sieve	5-15

2. Moisture; Thickness: The material shall be deposited and spread in a uniform layer at optimum moisture content, without segregation of size, with such depth that when compacted layer will have the required thickness.

3. Blading And Rolling: Each layer shall be compacted for the full width and depth by rolling with a pneumatic roller. 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.

4. Base Compaction: The gravel base shall be compacted to not less than ninety five percent (95%) maximum dry density as determined by ASTM D-1556. Surfaces shall be true to the established grade within plus or minus one-half (½”) from the required layer thickness and with the surface elevation varying not more than one-half inch (½”) in ten feet (10') from the true profile and cross section.

C. BITUMINOUS SURFACE COURSE

1. Gradation Of Aggregate: Over the dry dust free compacted course, the contractor shall place and compact a bituminous surface course. The surface course shall consist of a mixture of mineral aggregate and binder. Gradation of aggregate shall conform to the following:

Sieve Size	Percent Passing
½" inch	100
No. 4	50-70
No. 10	30-50
No. 200	5-10

2. Gradation Requirements: The contractor shall establish a mix gradation and the amount of bituminous material shall be subject to approval and shall meet the requirements of the gradations selected. Regardless of the bituminous content, there shall

not be more than three percent (3%) voids in the aggregate.

3. Material For Surface Course: The bituminous material for the surface course shall be 85-100 penetration asphalt cement conforming to the requirements of ASTM M20-60.

4. Mixing: The bituminous surface course shall be mixed at a mixing plant and spread and compacted on the prepared base in conformance with the lines and dimensions shown on the plans and in accordance with these specifications.

D. CONSTRUCTION METHODS AND EQUIPMENT

The methods employed in performing the work, all equipment, tools and machinery and other appliances used in handling the materials and executing the work shall be the responsibility of the contractor. The contractor shall make such changes in the methods employed and in the equipment used as are necessary whenever the bituminous mix being produced does not meet the specifications herein established.

E. SPREADING AND COMPACTION

1. Spreading: The bituminous mixtures shall be spread with self-propelled mechanical spreading and conditioning equipment capable of distributing at least twelve foot (12') 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 course shall be off-set at least six inches (6") transversely to avoid a vertical through more than one course.

2. Temperature: The temperature of the bituminous mix shall be between two hundred fifty degrees Fahrenheit (250°F) and three hundred twenty five degrees Fahrenheit (325°F) when placing.

3. Rolling: After the mixture has been spread, the surface shall be rolled in the longitudinal direction commencing at the outside edge or lower side and preceding to the inner or higher side. Each pass of the roller shall overlap the preceding pass at least one-half (½) the width of the roller. Rolling shall continue until ninety five percent (95%) of the laboratory density as determined in accordance with ASTM Designation D-1559 for the bituminous mixture being used has been obtained. Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller.

4. Crown And Grade: The surface of the pavement, after compaction, shall be uniform and true to the established crown and grade. When tested with a ten foot (10') straight edge placed parallel to the center line of the pavement, the surface of the pavement at any point shall not deviate from the lower edge of the straight edge by more than one-half inch (1/2”). 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.

5. Traffic: All traffic shall be kept off the completed surface for a minimum period of twenty four (24) hours.

F. WEATHER LIMITATIONS

No bituminous surface shall be placed when the temperature of the air or road bed is fifty degrees Fahrenheit (50°F) or below, during rainy weather, when the base is wet or during other unfavorable weather conditions. The air temperature shall be measured in the shade.

G. RESTORING PAVEMENTS

1. Cutting And Removing: The pavement shall be cut vertically in neat lines with necessary tools by the contractor in such manner as not to damage the adjacent pavement. It shall be cut along straight lines forming the edges of the trench. If any pavement outside the lines of the trench is damaged, it shall be removed and restored as hereinafter provided at the contractor's expense. Concrete driveways, sidewalks and curb and gutter shall be removed in a similar manner. All waste material resulting from the above operations shall be immediately removed from the site of the work and all costs to the contractor for removing and disposing of said material shall be included in the unit prices bid under the appropriate items in the schedule.

2. Temporary Pavement:

a. Between or at street intersections, backfilling shall be built up slightly above the surface of the pavement, oiled and maintained in good condition until the contractor is ready to place the new pavement, when the backfilling shall be removed to the sub-grade elevation or bottom of the pavement. This work shall be done accurately to the proper elevation and all loose material removed. If any material is removed below the established sub-grade elevation, said space shall be filled with similar material to that used for pavement base, at the contractor's expense; after which the new pavement shall be placed according to the City's specifications for the type of pavement that was removed, or such other type as may have been ordered to replace it.

b. Such temporary bridges as may be required to properly handle the traffic during the progress of the construction shall be built, maintained and removed at the contractor's expense.

3. Non-connecting Streets; Turnarounds: At all temporary ends to streets on non-connecting streets, provisions shall be provided by the developer for a turnaround for snow plows, garbage trucks and other service/emergency vehicles. Turnarounds must be paved with hot mix asphalt.

4. Driveways, Sidewalk Or Curb And Gutter: Where a trench is located under private driveways, sidewalk or curb and gutter, the sub-grade shall be prepared in the same manner as described for pavement, and the concrete driveway, sidewalk or curb and gutter shall be rebuilt according to the City's Standards and Specifications.

5. Repairing Damage: If any pavement, concrete driveway, sidewalk or curb and gutter has been damaged outside the lines of the trench, while trenching, damaged areas shall be removed along straight lines and at right angles, and all cut surfaces shall be vertical, and removal and rebuilding of the damaged portions shall be done by the contractor, at his own expense.