

CHAPTER 94: SPECIFICATIONS FOR STREETS, SIDEWALKS,
DRAINAGE STRUCTURES

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§ 94.01 REPAIR OF ALL CUTS EXISTING FOR REPAIR OF UNDERGROUND UTILITY.

All cuts in existing pavement for the repair of any underground utility shall be made and repaired as shown below.

(A) The opening shall be no larger than necessary to make the required repairs. When ground conditions are unstable and there is danger of widespread caving, sheeting shall be driven and, if so ordered by the Engineer, the sheeting shall be left in place. The opening shall be made by sawing with a concrete saw.

(B) After the required repairs are made, the excavated hole shall be backfilled with bank run gravel in six-inch layers, solidly tamped to the subgrade of the street base, and compacted to obtain 95% density.

(C) The exposed sides of the cut in the pavement shall be wire-brushed or blown free of all loose particles and dust. Concrete with a low slump shall then be placed in the opening and tamped tightly to within two inches below the surrounding surface to permit asphalt topping.

(D) The fresh concrete shall be properly protected until thoroughly cured. ('67 Code, Appendix B.)

§ 94.02 SETTING FORMS ALLEYS, STREETS, AND SIDEWALKS.

(A) That portion of the subgrade or subbase which will support the forms shall be firm and shall make complete contact with the form bottoms for their entire width and length. If there are imperfections or variations below a true surface under these forms, they shall be corrected by filling in with lifts of not more than 1/2 inch and each lift thoroughly tamped or rolled. The building of earth pedestals or shimming will not be permitted. Those variations above a true surface shall be trimmed as necessary. The surface on which forms are to rest will be checked by the Engineer just prior to setting the forms. After the forms are set to line they shall be thoroughly tamped to grade, both inside and outside. An approved mechanical form-tamper will be permitted.

(B) If distance permits, forms shall be kept set at least 500 feet ahead of concrete placement. If material under the forms becomes unstable before concrete is placed, the forms shall be removed, the surface corrected and the forms reset.

(C) The length and number of pins in any section shall be sufficient to hold the section true to line and grade. No settlement or springing of forms under equipment operating thereon will be permitted. ('67 Code, Appendix B)

§ 94.03 FINE-GRADING ALLEYS, STREETS, AND SIDEWALKS.

(A) After the forms have been set and staked, the subgrade between the forms should be graded with a suitable planer. This may be a motor patrol grader or a planer of some type that rides on the side forms. It should be set to cut the subgrade to the desired cross section. After this final grading, any loose material should be recompact by rolling or tamping, and the elevation of the subgrade should be checked with a scratch templet. This is a series of spikes that projects down to the correct subgrade level from a bridge spanning the space between the forms. The templet should be checked often to avoid error from sagging and warping.

(B) Just before paving, the subgrade should be uniformly dampened to prevent it from absorbing water from the concrete mix. On projects where concrete is placed from ready-mix trucks, sprinkling can be done with a hose from the water tank on the truck. ('67 Code, Appendix B)

§ 94.04 GRADING AND PREPARATION OF SUBGRADE FOR SIDEWALKS.

(A) The subgrade shall be constructed to the required elevation below the proposed finished surface of the sidewalk and shall be well compacted with a mechanical tamper and finished to a firm, smooth surface. Minimum compaction shall be 95% dry density.

(B) The finished subgrade shall receive a 2-inch layer of bank run gravel, be thoroughly compacted by tamping or rolling until it is brought to a firm, unyielding, and smooth surface to conform to the grade of the walk when finished, and where ordered by the engineer, a compacted stone or gravel base may be required. The sidewalks, together with the lawns, shall be graded to the width shown on the plans and the lawns dressed off with the fine earth, and left perfectly smooth. ('67 Code, Appendix B)

§ 94.05 LIQUID-MEMBRANE CURING, CURING OF CONCRETE, STREET PAVING SLAB, SIDEWALKS, ALLEYS, DRIVEWAYS.

(A) White pigmented compound conforming to the specifications of the ASTM Designation C-309-53T or Revisions shall be used. This liquid shall be applied in a continuous uniform film by means of an automatic, self-propelled pressure sprayer equipment at the rate directed by the engineer, but not less than one gallon per 200 square feet of surface. When applied to a new concrete surface at the specified rate of application, the compound shall present a uniform white appearance and shall effectively obscure the original color of the concrete.

(B) Hand-operated equipment will be allowed only sidewalks, alleys, or driveways. ('67 Code, Appendix B)

§ 94.06 REINFORCED AND PLAIN CONCRETE PAVEMENTS FOR STREETS AND ALLEYS; LIQUID-MEMBRANE CURING.

Longitudinal keyed center joints shall be of steel or bituminous material equipped with opening to receive ½ inch def. bars 4 feet in length, 5 feet O.C. Keyed center joint strips shall be securely held in place by metal pins as designated. The length and spacing of these pins shall be sufficient to hold the strips true to line and grade. ('67 Code, Appendix B)

§ 94.07 REINFORCED AND PLAIN CONCRETE STREET PAVEMENTS.

(A) The inspector will collect delivery tickets from each truck showing:

- (1) Number of cubic yards of concrete,
- (2) Time loaded,
- (3) Time unloaded,
- (4) Weights of coarse and fine aggregates, cement, water, and additives, if any,

and

(5) Gallons of water added at the job site.

(B) Trucks must be unloaded within one hour of the loading time or the load will be rejected. ('67 Code, Appendix B)

§ 94.08 DETAILS AND SPECIFICATIONS FOR ASPHALT PAVING USING COMPACTED AGGREGATE BASE.

(A) Preparation of subgrade. The subgrade, as shown on the plans, shall be graded to a smooth and true surface to the required depth below the surface of the pavement when completed as indicated by the profile and stakes set by the engineer, and all soft and spongy places not affording a firm foundation will be dug out and refilled with bank run gravel. Depressions in the grade shall be filled with gravel or other suitable material and reworked until surface is solid, uniform, and parallel with grade and cross section of the finished pavement. All trenches shall be back-filled with bank run gravel. The entire area shall be so compacted as to meet a proctor dry density of 95% or better. Gravel back run shall have the approval of the engineer. No silica sand or fine granular material will be allowed. The subgrade shall be rolled with a three-wheeled or tandem roller weighing not less than 10 tons, or with a pneumatic-tire roller. In areas inaccessible to the compacting equipment above, a single-shoe vibrator or other approved compacting equipment shall be used.

(B) Base course. This item consists of a base course of dense graded aggregate of the types set out herein, constructed on a prepared subgrade, subbase, or existing surface to be used as a base, all in compliance with these specifications and conforming in all respects with lines, grades, quantities, or thickness as shown on the plan or otherwise specified.

(C) Material and mixing. The compacted aggregate base shall be plant-mixed material having sufficient water added to the aggregate to produce a mixture with an optimum moisture content which is expected to range from 7 to 9% of the dry aggregate by weight.

(1) The material shall be Indiana State Highway Commission specified Class A or Class B, Size No. 53 per 1963 specifications.

(2) The mixing unit shall be either a single or twin shaft pugmill or other approved mixer, capable of producing a constant, uniform mixture. The discharge height of the mixer unit shall be such as will prevent segregation of material when discharged into the hauling trucks.

(3) The conveyor, feeder, or attachments shall be fed from receiving hoppers equipped with adjustable metering gates or other devices capable of regulating a constant flow of material into the mixing unit.

(4) The water pump and meter shall supply a spray bar capable of assuring an even wetting of the aggregate and shall be mounted at the entrance of or above the pugmill. A regulating device such as a pump or water meter shall regulate the flow through the spray bar at

the present rate and shall be used to introduce water into the mix.

(5) The mixture shall be handled and transported so as to prevent segregation and loss of moisture. On long hauls, or in windy or hot weather when appreciable quantities of moisture might be lost by evaporation, tarpaulins or suitable covers may be required.

(6) The compacted depth shall not be less than 2 nor more than 4 inches. The mixture shall be spread in uniform layers and to such a depth as will produce the compacted thickness specified with an approved self-propelled spreading and leveling device which will spread the material to the required line and grade. In areas inaccessible to mechanical spreading equipment, approved hand-spreading methods shall be used.

(7) Each lift shall be smoothed and compacted with a three-wheel or tandem roller weighing not less than 10 tons. Vibrating compactor shall be used to facilitate deep compaction. The compacted aggregate base shall be compacted to 100% or better of theoretical density.

(8) Payment shall be on a per ton basis compacted in place and accepted. It shall be for the contract unit price and be full compensation for furnishing, processing, hauling and placing of all materials, including necessary water.

(9) Payment for combination reinforced concrete curb and gutter shall be on a lineal foot basis.

(10) Indiana State Highway Commission specifications for #53 stone:

Percent passing sieves having square openings

1- 1/2 inches	100%
1 inch	80 - 100%
3/4 inch	70 - 90%
1/2 inch	55 - 80%
No. 4	35 - 60%
No. 8	25 - 50%
No. 30	15 - 30%
No. 200	5 - 10%

The crushed particles shall be of completely crushed material and contain fines from crushing only.

(D) Eight-inch compacted aggregate base: Note: 8-inch depth of compacted aggregate base as shown on cross section for residential thoroughfares only. For primary or secondary thoroughfares, the depth of compacted aggregate shall be increased as directed by the city engineer.

This kind of pavement shall be constructed if confined within the limits of straight concrete curb , combination curb and gutter, or a concrete header. ('67 Code, Appendix B)

§ 94.09 CONCRETE SIDEWALKS.

(A) Drainage. When required, suitable drainage shall be installed and connected with sewers as indicated by the plans.

(B) Forms. Forms may be of wood or steel. They shall be straight, free from warp, and of sufficient strength to resist springing during the process of depositing concrete against them. If of wood, they shall be of at least 2 inch surfaced plank. The height shall be equal to the full depth of concrete walk - 5 inches. The use of 2 inch x 4 inch side forms is prohibited and sidewalk so built will not be accepted. The height of steel forms shall also equal the depth of sidewalk. All forms shall be thoroughly cleaned and oiled before concrete is placed against them. Curved forms shall be used on curves to conform to the planned radius.

(C) Concrete. Class "A" concrete, as elsewhere defined, shall be used in all sidewalk construction, and shall conform to the concrete specifications which meets the following conditions:

(1) Concrete. Ready mix concrete, conforming to specification ASTM C-94-55 or revisions. The slump shall not exceed 3 inches.

(2) Cement. Air-entrained portland cement shall be used with 6 bags or 564 lbs. Per cubic yard. The entrained-air cement shall be 4 to 7% of the total proportion.

(3) Aggregates. Both fine and coarse aggregates shall have the approval of the State Testing Laboratory and conform to the proportion as determined by them.

(D) Dimensions. Unless otherwise specified, all sidewalks shall be of the width shown on the plans and not less than 5 inches thick at all points. The surface shall be graded $\frac{1}{4}$ inch to the foot toward the street, and longitudinally as directed or shown on the plans.

(E) Surface finish. After the concrete is placed and thoroughly vibrated or puddled, the surface shall be troweled in a rough rosette pattern, producing an even, gritty finish. Final finish by brooming is also permissible.

(F) Joints. Joints shall be made at intervals of 5 feet as nearly as possible. All joints shall be made only with proper joint-cutting tools or metal division plates. Dummy joints shall be straight and clean cut.

(G) Expansion joints. Expansion joints and joint filler shall conform to the requirements for such joints in street or alley pavements. Longitudinal expansion joints $\frac{1}{2}$ inch thick shall be placed along abutting buildings, concrete yard walks, curb walks and intersection sidewalks. Transverse expansion joints $\frac{1}{2}$ inch thick shall be placed not more than 5 feet apart between intersections. Joints $\frac{1}{2}$ inch thick shall be placed between sidewalk and street curbing.

(H) Protection. The contractor shall erect and maintain suitable barriers to protect the walk from traffic. Any sections damaged prior to its acceptance shall be replaced by the contractor at

his own expense.

(I) Condition and acceptance. Before the contract will be considered completed and the sidewalk ready for acceptance, all equipment, surplus materials, and construction debris of every description shall be removed, and the entire area put in a neat and orderly condition, as stated under the preceding provisions on grading. All manholes, catch basins, or other structures, disturbed or adjacent thereto, shall be examined, and any debris caused by the contractor shall be removed therefrom.

(J) Repair or replacement of sidewalks. In the repair or replacement of sidewalks, the following conditions shall apply, in addition to the foregoing specifications:

(1) All broken concrete or other old material must be removed and taken away.

(2) If the old base is soft, spongy, or otherwise unstable, it shall be removed, and specifications under "grading" in §§94.03 and 94.04 shall be complied with.

(3) No single square of old sidewalk shall be patched; the entire square shall be removed and replaced.

(K) Backfilling. After the forms have been removed, the space on each side of the sidewalk shall be filled to the required elevation, firmly compacted, neatly graded, and all adjacent shoulders and slopes finished to the required grade and cross section. If extra fill material such as bank run gravel is needed, it must have the approval of the engineer. ('67 Code, Appendix B)

§ 94.10 CURING OF CONCRETE SIDEWALKS.

(A) Immediately upon completion of the finished process the concrete shall be cured in one of the following ways:

(1) Curing blankets shall be placed on the concrete. The edges of the blanket shall be securely fastened down outside the paved area with dirt or other weights.

(2) Plastic sheets such as visqueen or other polyethylene material shall be placed over and securely fastened down around the paved area.

(3) By the use of a liquid membrane-forming compound, conforming to the specifications of the ASTM, designation C-309-53T or revision. This liquid shall be sprayed in an even coat over the entire paved area immediately after brooming. The compound shall be applied in a continuous, uniform film by means of an automatic, self-propelled pressure sprayer equipment at the rate directed by the engineer, but not less than one gallon per 200 square feet of surface.

(B) Failure to comply with the requirements of curing will result in the rejection of the work. ('67 Code, Appendix B)

§ 94.11 TEMPERATURE CONDITIONS FOR CONCRETE SIDEWALKS.

(A) No concrete shall be placed during the period from November 1 to May 1 without authorization. Concrete placed when the temperature is 40°F. or less shall be cured and protected from cold weather.

(B) When the temperature falls below 50°F., the mixing water or the aggregates, or both, shall be heated to a temperature of not less than 70°F. nor more than 150 °F. The heating of the water and the aggregates shall be controlled so that there will not be any large differences from batch to batch.

(C) The use of calcium chloride to accelerate the hardening of concrete will be authorized when the temperature of the air is 45°F., at the rate of one pound of calcium chloride per sack of cement; and for temperatures below 40°F. the rate of application shall be 2 pounds of calcium chloride per sack of cement.

(D) Immediately after the finishing of the concrete, the concrete shall be covered with waterproof paper blankets and not less than one foot of loose, dry straw or hay over the paper.

(E) No concrete shall be deposited on a frozen subgrade. ('67 Code, Appendix B)

§ 94.12 ASPHALT PAVING.

All bituminous mixing plants shall be required to meet the ASTM Specifications D995-55, AASHTO Specifications M-156-55 or revisions, and/or also have the approval of the board of public works.

(A) Asphalt cement. Where asphalt cement is specified, it shall conform to the ASTM Specifications D946-47T or revisions. Unless otherwise specified, it shall have a normal penetration of 60.70.

(B) Asphaltic concrete. Where asphaltic concrete is specified, it shall conform to ASTM Specifications D947-55 or revisions. The grading requirements will be specified on the plans. ('67 Code, Appendix B)

§ 94.13 RESURFACING.

(A) Preparation of old pavement.

(1) Surface shall be thoroughly cleaned by sweeping with wide brushes, either hand or mechanically operated, by flushing, or with compressed air, so that all dust, dirt, debris, and loose material, either masonry or asphalt, is removed; all cracks shall be thoroughly cleaned of loose or deleterious materials. All work shall be done in such a manner as to ensure a perfect bond between the existing pavement and the asphalt surface to be applied.

(2) Where the old pavement base is in bad condition, all holes, openings, and depressions shall be filled to grade with binder or concrete, depending on depth. In case of large

broken areas of old broken material, the engineer may order complete removal and replacement of old asphalt wearing surface.

(3) Proper crossings shall be maintained at all street and alley crossings.

(4) The public convenience shall always be a condition of primary consideration.

(B) Tack or seal coat.

(1) As ordered by the city engineer or testing laboratory, the tack or seal coat shall consist of liquid asphalt RC-3 or RC-4. The amount may vary from 0.05 to 0.15 gallon per square yard. The present flow line of gutters shall be maintained as shown on the attached cross-section sketch, the city reserving the right to change the cross section at any time.

(2) As the gutter line approaches the catch basin, the contractor shall feather out the gutter grade in order to prevent an abrupt drop. Feathering should extend 5 to 10 feet each side of the catch basin. All manhole frames and covers, curb boxes, valve boxes, and catch basins shall be reset to conform to new grade when necessary, or when ordered by the engineer.

(C) Manholes and catch basins. All manholes and catch basins shall be raised to new grade with brick or concrete rings. This requirement shall not be interpreted to exclude the use of cast iron rings for manholes or cast iron frames for catch basins. The use of welded steel rings or frames to bring manholes or catch basins to grade is not permitted. ('67 Code, Appendix B)

§ 94.14 MEASUREMENT AND PAYMENT.

Quantities will be determined after the work is complete and payment made in accordance with the price set in bid, and according to delivery tickets stating tonnage, collected from drivers by the inspector on project. ('67 Code, Appendix B)

§ 94.15 WEATHER LIMITATIONS.

(A) Unless otherwise authorized by the board, no asphalt mixtures shall be placed prior to May 1 or later than October 15.

(B) Bituminous aggregate mixture shall not be produced or placed during rainy or threatening weather or when the moisture on the surface to be treated would prevent satisfactory bond, or when the air temperature is less than 40°F., except by the approval of the engineer. ('67 Code, Appendix B)

§ 94.16 CORING PROVISIONS.

(A) These provisions as to coring will apply to any work undertaken by any contractor whether city paid, Barrett Law financed, or constructed by private contract if the work is to be accepted by the city for perpetual maintenance.

(B) Cores shall be taken at intervals of not more than 150 feet, and at least one core shall

be taken from each section (a section being defined as one continuous unbroken length of pavement, curb or wall of the particular type).

(C) The cores as taken from the pavement will be measured for depth. Asphalt cores will be chemically analyzed. If the cores as measured and tested fulfill the requirements of the specifications, the pavement will be accepted. ('67 Code, Appendix B)

§ 94.17 ASPHALT PAVING.

(A) Composition limits for binder mixture No. 4 Binder Course

Passing	Retained on
<u>Sieve Size</u>	Percent
	<u>Sieve Size</u>
	<u>Min. Max.</u>
.....	1-1/2 inch
1-1/2 inch	0
	1 inch

1 inch	5 25
	1/2 inch

1/2 inch .....	..... 25
No. 4	5 55
	No. 30
	No. 6

No. 6	0 5
	No. 8

No. 8	0 5
	No. 16

No. 16	3 12
	No. 50

No. 50	5 20
	No. 100

	2 10

<u>Passing</u>	<u>Retained on</u>
<u>Sieve Size</u>	<u>Percent</u>
	<u>Sieve Size</u>
	<u>Min. Max.</u>
	<u>No. 200</u>
No. 100	0 4
No. 200	0 2
Total retained on No. 6	60 75
Bitumen AP-5	4 6

(B) Composition limits for binder No. 9.

<u>Passing</u>	<u>Retained on</u>
<u>Sieve Size</u>	<u>Percent</u>
	<u>Sieve Size</u>
	<u>Min. Max.</u>
	<u>1/2 inch</u>
1 inch .....	..... 5
1/2 inch	50
No. 4	10 60
	<u>No. 6</u>
	0 5
No. 6	No. 8
	0 5
No. 8	No. 16
	3 12

<u>Passing</u>	<u>Retained on</u>	
<u>Sieve Size</u>	<u>Percent</u>	
	<u>Sieve Size</u>	
	<u>Min.</u>	<u>Max.</u>
No. 16	No.	50
	
	5	20
No. 50	No.	100
	
	2	10
No. 100	No.	200
	
	0	4
No. 200	0	3
Total retained on No. 6	60	70
Bitumen AP-5	4	6

(C) Surface course. Sheet asphalt surface mixtures, to be known as “City Mix” A-1, shall consist of asphalt cement, filler and sand, so proportioned that the resulting mixture will contain average proportions by weight of the entire mixture via extraction analysis as follows:

Passing 3/8 inch mesh, retained on	Percentage
No. 16 mesh	25-55
Passing 16 mesh, retained on	
No. 50 mesh	20-35
Passing 50 mesh, retained on	
No. 200 mesh	10-20
Passing No. 200 mesh	5-10
Bitumen, AP-5	7-9

(D) City Mix A-2. Sheet asphalt surface mixture shall consist of asphalt cement, filler and sand, so proportioned that the resulting mixture will contain average proportions, by weight, of the entire mixture via extraction analysis as follows:

Passing	Retained on	
<u>Sieve Size</u>	<u>Percent</u>	
	<u>Sieve Size</u>	

		<u>Min.</u> <u>Max.</u>	
3/8	.....		4
		
		.....	2
		12	
4	.....	20	40
8	.....	16	
		
		6	22
16	.....		50
		
		18	35
50	.....		100
		
		5	16
100	.....		200
		
		2	12

Passing

Retained on

Percent

Sieve Size

Sieve Size

Min. Max.

200	.....	5	10
Bitumen, soluble AP-5	.....	7	9

(E) City Mix A-3. The coarse aggregate shall be size No. 11, which, when combined with No. 17 sand, and mineral filler if required, shall be within the following limits:

<u>Passing</u>		<u>Retained on</u>	
<u>Sieve Size</u>		<u>Percent</u>	
		<u>Sieve Size</u>	
		<u>Min.</u>	<u>Max.</u>
1/2 inch	3/8 inch	2	14
3/8 inch		No.	4
		
No. 4		20	50
		No.	6
		
No. 6		0	11
		No.	8
		
No. 8		0	11
		No.	16
		
No. 16		5	20
		No.	50
		
No. 50		10	25
		No.	100
		
No. 100	No. 200	2	17
	1	5	
No. 200		3	5
Total retained on No. 6		45	55
Bitumen AP-5		5.5	7.5

('67 Code, Appendix B)

§ 94.18 PRIVATE CONSTRUCTION PAVEMENTS, NEW SUBDIVISIONS.

Pavements constructed by private developers in new subdivisions will not be accepted for maintenance by the city unless they meet the requirements of city specifications.

(A) Preparation of aggregates.

(1) Aggregates shall be delivered to the mixing plant, drained and ready for use.

(2) All aggregates which are produced wet and contain free water shall be drained for at least 12 hours just prior to being used unless some other satisfactory means are provided to remove all drainable water. In any case, the moisture content shall be reasonably low and uniform at time of use.

(3) Stockpiling for drainage shall not be so closely adjacent to the mixing plant that the aggregate can be put from the stockpiles into the mixing plant without rehandling.

(4) All aggregates shall be dried until they have no surface moisture and any aggregates which contain sufficient internal moisture to cause foaming or flushing shall be removed from the bins.

(5) The coarse and fine aggregates shall be deposited separately into the mechanical feeder to the drier at such rate that will insure a uniform temperature control of the heating and drying operations.

(6) When entering the mixer, the coarse aggregate, sand and filler, if used, shall be at a temperature between 300 and 350°F. Aggregate heated beyond 400°F. that may be in the mixer feeding unit, weigh-box, or mixer shall be removed and allowed to cool. Such aggregates, after cooling, may be reheated and used.

(B) Preparation of asphalt cement. Fluxing or blending of asphalt on the work will not be permitted, and no asphalt shall be used while foaming. The asphalt cement shall enter the mixer at a temperature between 200° and 300°F. and any heated beyond 325°F. prior to, or during, mixing with the aggregate shall be rejected.

(C) Mixing.

(1) Each size aggregate, and also the asphalt cement, shall be measured separately and accurately in the proportions required. Deviation in size of batches 20% below or 15% above the rated capacity of the mixer will be allowed, provided the quality of the mix is not impaired.

(2) If a batch-plant is used after the aggregate, and filler, if added separately, have been charged into the mixer, they shall be thoroughly dry-mixed for 15 seconds, or longer if directed. The asphalt shall then be introduced and the mixing continued 30 to 35 seconds, or longer, if necessary, to produce a uniformly coated mixture. If a continuous-plant is used, the minimum mixing time shall be 45 seconds, or longer if necessary to produce a uniformly coated mixture.

(D) Temperature requirements for mixtures. The temperature of the finished mixture at the plant shall be such as will produce a workable mixture when incorporated into the work, but in no case will it be acceptable if below 275°F. or higher than 310°F. when delivered to the spreader.

(E) Transportation of mixtures.

(1) The mixtures shall be transported from the mixer to the spreader in trucks that

have tight, clean, smooth beds. A minimum amount of approved thin motor or paraffin oil, or a soapy compound, may be used to prevent mixtures adhering to the beds. No such preventure will be permitted which will harm the mixture.

(2) No load shall leave the plant unless entirely covered with a waterproof canvas cover.

(3) All truck beds shall, unless otherwise permitted, be insulated with a wood liner having a minimum thickness of 3/4 inch, or other equivalent insulation. The insulation shall include the front end, end gate, sides and bottom. If the insulation is placed inside the truck body, the insulation shall be covered with sheet metal approved by the city engineer or his duly authorized representative. Maximum hauling distance shall be no greater than 10 miles from the city limits to avoid excessive heat loss of mixture.

(F) Spreading mixtures general requirements.

(1) Any surface on which a mixture is spread shall, at that time, be free from dirt, packed soil or any other foreign material.

(2) Binder, wedge, and leveling courses shall be allowed to cure before being subjected to traffic or before a subsequent course is replaced thereon, the time of curing to be as directed.

(3) All surface courses shall be spread with an allowance made for finished compaction approximately $\frac{1}{4}$ inch above forms, curbs or similar construction.

(4) If the required finished depth of any course is to exceed 2 times the top size of the aggregate used, as shown by actual screen analysis, the course shall be constructed in 2 or more lifts as directed.

(5) Except as may be otherwise permitted, lays shall be brought forward concurrently, within all practical limits, limiting the laying progress in one lane not to exceed one day's run before moving back to bring forward the adjacent lane.

(G) Machine-spreading.

(1) Except as hereinafter provided for hand-spreading, mixtures shall be spread with an approved mechanical spreader which, in general, shall:

(a) Be self-propelled;

(b) Be capable of spreading the mixture true to line, grade, and cross section;

(c) Be equipped with a hopper and distributing device of the reversing type, capable of placing the mixture evenly in front of the screed. The hopper shall be of such design as will prevent mixtures being dumped directly on the surface being covered;

(d) Have a quick-acting and efficient steering device, and reverse and forward traveling speeds;

(e) Have a satisfactory device to adjust the spreading to grade and confine the edges to a true line;

(f) Be capable of spreading the mixtures without segregation in layers of $\frac{1}{2}$ inch to not less than 3 inches in thickness;

(g) Be capable of spreading the mixtures to a maximum width of not less than 12 feet, and in varying lesser widths to a minimum of 8 feet;

(h) Be equipped with blending or joint-leveling devices for smoothing and adjusting all longitudinal joints between adjacent layers of the same thickness.

(2) The term “SCREED” includes any strike-off device operating by cutting, crowding or other practical action which is effective on mixtures at workable temperatures without tearing, shoving, or gouging, and which will produce a finished surface of the smoothness and texture required. The screed shall be adjustable for profile, shall be capable of being heated to prevent accumulation of bituminous material on the bottom face, and shall have an indicating level attached.

(3) The mixture shall be dumped into the center of the hopper, care being taken to avoid overloading and spilling. The spreader shall operate at such speed as will produce a uniform surface texture.

(4) Immediately after any lift has been screened, or before the roller passes over it, the surface shall be checked, all irregularities adjusted, and all “fat” spots in the surface removed and replaced with satisfactory material. Irregularities in alignment and grade along outside edges shall be corrected by the addition or removal of mixture, as necessary, before the edges are rolled.

(H) Hand spreading.

(1) In narrow, winding, deep, or irregular sections, intersections, driveways, or at other locations where it is impractical to use mechanical methods, the contractor may use acceptable hand methods for placing and spreading.

(2) Tines of rakes shall not be less than ½ inch longer than the loose depth of the mixture, and spaces between the tines shall not be less than the maximum size of the aggregate particles being raked; however, the spaces shall not be less than one inch.

(3) Loads shall not be dumped faster than the material can be properly handled by the shovelers, and the shovelers shall not distribute the dumped material faster than it can be properly handled by the rakers. The raking shall be carefully and skillfully done to avoid segregation and so that, after initial compaction, a minimum of back-patching will be required.

(I) Compacting rolling.

(1) After spreading, and as soon as the mixture will bear the weight of the roller without undue distortion, each lift shall be thoroughly and uniformly compressed by approved rollers weighing not less than 10 tons.

(2) The contractor shall provide competent roller operators and other necessary workmen, capable of correcting surface irregularities and defects. Special attention shall be given to this correction of each lift immediately following the initial rolling.

(3) There shall be provided and operated at least one roller for each 45 tons of

mixture placed per hour, however, if so directed by the engineer, additional rollers shall be provided to secure satisfactory compaction. One three-axle tandem roller may be substituted for 2 two-axle tandems.

(4) Tandem rollers may be two-axle weighing not less than 10 tons, or three-axle weighing not less than 15 tons.

(5) Rolling shall be longitudinally, starting at the edges and overlapping on each successive trip approximately one half the width of the rear wheels. Alternate trips shall end on different transverse lines.

(6) When rolling adjacent lanes, the roller shall compress the joint by starting partially in the cold lane, lapping from 6 to 10 inches over the hot material.

(7) If depressions are made by reversing the roller, or other cause, they shall be corrected immediately by raking and the addition of fresh hot material if necessary.

(8) To prevent adhesion of mixtures to the roller wheels, the wheels shall be kept moistened with water, but excess water shall not be permitted. Fuel or lubricating oil, kerosene or any other harmful liquid will not be permitted. Hot smoothing-irons shall not be used.

(J) Tamping. Along curbs, headers, manholes and similar structures, and at all other places not accessible to the roller, the mixtures shall be thoroughly compressed with the mechanical tamps or vibrators. Butt joints at all such contacts shall be carefully painted with hot asphalt cement, the cost of which, including that used in sealing any other joints, shall be included in the various pay items of the contract.

(K) Joints.

(1) Placing of mixtures shall be continuous insofar as possible. The roller shall pass over a transverse edge of freshly laid material only when laying is to be discontinued for an appreciable period. Joints as described below shall be formed at such locations.

(2) Longitudinal and transverse joints shall be well bonded and made in a careful manner.

(3) After a mixture has been placed by the paver along any adjoining edge of an existing pavement, curb, gutter or similar construction, just enough of the fresh mixture shall be carried back to fill any space left open. These joints shall be properly "set-up" with the back of a rake to the proper height to receive full compression.

(4) "Setting-up" joints shall be done by competent workmen who are capable of making correct, clean, and neat joints.

(5) When it is necessary to make a transverse joint, the finishing machine shall complete the spreading of the material at hand, the layer adjusted to a straight line perpendicular to

the center line, slightly “set-up” with the back of a rake and then slowly compressed with the roller. Before laying is resumed, the transverse edge of the previously laid material shall be cut on a perpendicular plane for the full depth of the layer just prior to resumption of laying and the new edge so formed painted with a thin coat of hot asphalt cement. After compression of the new material across the joint, the joint shall be checked with a 10-foot straight edge at intervals of 2 feet or closer and, if necessary, corrected. ('67 Code, Appendix B)

§ 94.19 SPECIAL REQUIREMENTS FOR PARKING LOTS.

(A) Install a guardrail not less than 24 inches above sidewalk grade adjacent to the street property line, or equivalent thereof, subject to approval of the board of public works.

(B) Lot to be graded and drained within the parking area.

(C) Pave the entire parking area within one year after approval of permit.

(D) Off-street parking lots may be constructed of plain or reinforced concrete, asphalt or water-bound macadam.

(E) Concrete parking lots. The joints shall be so constructed that there will be no seepage into the subgrade.

(F) Asphalt parking lots. For base and asphalt mix, the city's specifications shall be followed so that there will be no seepage into the subgrade.

(G) Water-bound macadam parking lot. City specifications shall be followed. If no asphalt surface coat is applied, base shall be treated with bitumen or other dust preventative, and must be so maintained at all times.

(H) Drainage of any off-street parking lot shall be contained within the limits of the lot, that is, drainage shall not be directed to any street, alley or adjoining property. If, however, this cannot be done owing to physical conditions, the city engineer may permit other arrangements for the disposal of storm water.

(I) Driveways, curbs, catch basins, inlets, sewer, or other drainage appurtenances shall conform to the city standards.

(J) All permits issued by the Clerk-Treasurer's office must be submitted to the city engineer's office for final approval before construction begins.

(K) Off-street parking, driveways, gasoline service stations, and shopping centers must provide for deceleration and acceleration lanes of 10 feet in width to facilitate the movement of through traffic, if ordered by the board of public works. Grade of deceleration and acceleration lane shall be so constructed as to meet and continue existing grade of pavement crown.

(L) Failure to comply with any of the specifications will result in an order to stop work

issued by the board of public works and safety. ('67 Code, Appendix B)

§ 94.20 CONCRETE CURB REPAIR.

(A) General. This item is to cover the monolithic repair of broken concrete curbs where there is an "out-lawn" or "park-strip" of unpaved ground immediately adjacent to and back of the curb. Although the design is primarily for the repair of concrete curbs, this method may be used in repairing old cut-stone curbs.

(B) Preparation. The broken curb above the pavement shall be sledged or broken off to a point below the surface of the adjoining pavement.

(C) Excavation. A trench shall be excavated to a depth of 6 inches below the outer edge of the broken-off curb and a sufficient distance out to permit a thickness of concrete not less than 4 inches outside the lower edge of the broken-off curb.

(D) Form. The back face of the monolithic repair section shall be formed in accordance with these specifications and attached plan.

(E) Concrete. Class "A" concrete, as specified under "concrete," shall be used with a slump of not over three inches.

(F) Placing concrete. Before placing concrete, the top of the old curb where it has been sledged off shall be brushed clean of all dust and loose material, and thoroughly wetted. After placing the concrete, it shall be thoroughly puddled and a good bond established with the old curb top and back.

(G) Joints. The contractor shall replace any expansion joint material that may be lost between the pavement and the new curb. Transverse joints in the old curb shall be replaced and extended through the new curb. If the repair section is 40 feet or more in length, and there are no intermediate joints in the old curb, ½ inch joint material shall be placed at each end of the repaired section.

(H) Curing. Extreme care shall be taken to thoroughly cure the new curb in accordance with current accepted methods and it shall be fully protected during this period. See curing of cement §94.05.

(I) Form removal and backfill. After the concrete is thoroughly cured, and in no case less than 24 hours, the forms shall be removed. The backfill may be of the material excavated and firmly tamped into place.

(J) Cleaning up. All debris, litter, and excess excavation shall be removed from the area, the street shall be swept clean and the area behind the curb raked and smoothed. Grass seed at the rate of ten pounds to the 100 square feet shall be distributed over the disturbed area.

(K) Measurement and payment. The measurement shall be made of the completed work

and payment made on the basis of the bid.

§ 94.21 GENERAL SPECIFICATIONS FOR ALL STREET CONSTRUCTION (DEPTH - CURB AND GUTTER).

(A) For purposes of this section, all streets are classified as either collector or local.

(B) A “LOCAL STREET” is any street whose sole function is to provide access to immediately adjacent land.

(C) A “COLLECTOR STREET” is any street that serves the internal traffic movement within an area of the city, such as a subdivision and connects the area with the city’s major arterial system.

(D) Unless otherwise specifically provided in this chapter, the minimum requirements for all street construction shall be the same as the requirements of the most current “standard specifications” of the Indiana State Highway Commission, as amended from time to time, and all such improvements shall be made and constructed in accordance therewith.

(E) The following are specifications for the three major types of construction materials for both types of streets:

	<u>Collector (Inches)</u>	<u>Local (Inches)</u>
<u>Rigid type pavement</u> (plain cement concrete)		
Uniform design thickness	7	6
<u>Flexible type pavement</u>		
Asphaltic surface course	1	1
Asphaltic binder course	3	3
Aggregate base	<u>14</u>	<u>10</u>
Total	18	14
<u>Deep strength asphalt</u>		
Uniform design thickness	9	8

(F) All curb and gutter construction shall be in conformity and compliance with the specifications shown in the following drawing and specifications, and methods, materials and workmanship, including subgrade, shall conform to all other applicable provisions of this chapter.

(G) Reinforcing bars shall be steel not less than ½ inch in diameter and overlapped a minimum of eight inches.

(H) Typical cross-section for combined curb and gutter. Six-inch curb back height with four-inch radium.

(I) All construction methods, materials, and workmanship including subgrade shall conform to the city or the Indiana State Highway Standard Specifications. (Ord. 1979-3, passed 1-16-79)

SEE DRAWING ON NEXT PAGE

§ 94.99 PENALTY.

If the average thickness of the cores from any asphalt surface is less than the required thickness, the following deductions will be made from the contract prices:

(A) If deficiency is more than 1/8 inch but not more than 1/4 inch, 10% will be deducted. If deficiency is more than 1/4 inch, but not more than 3/8 inch, 20% will be deducted. If deficiency is more than 3/8 inch, but not more than 1/2 inch, 25% will be deducted.

(B) If any core is more than 1/2 inch deficient in thickness, then cores will be taken from the surface at intervals of not less than ten feet nor more than 25 feet from deficient core until cores are found which are within the specified limits. The contractor will then remove that portion or portions of the surface from which the deficient core or cores were taken to the nearest point in each direction at which the pavement is within the specified limits, and will replace it in accordance with the specifications at his own expense.

(C) The average chemical analysis of two or more cores from any asphalt surface shall show the percentages as set out in the asphalt specifications under finished mixture. If the chemical analyses of such cores do not fulfill the requirements of the specifications, then the portion or portions of the asphalt surface which are deficient shall be taken up and replaced at the contractor's expense.

(D) The contractor will have the right to request that additional cores be taken from the pavement at intervals of not less than 15 feet on each side of any deficient core and these cores will be included in computing the average depth and strength of the pavement as a whole. Not more than two extra cores shall be taken for each deficient core. The contractor will pay the extra cost of extra cores drilled at his request. ('67 Code, Appendix B)