

CHAPTER 8 - ROADWAY INSPECTION AND TESTING PROCEDURES

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CHAPTER 8 ROADWAY INSPECTION AND TESTING PROCEDURES

8.1 GENERAL

- 8.1.1** Colorado Department of Transportation Standard Specifications for Road and Bridge Construction most recent edition, special provisions and revisions thereto and as amended by the Arapahoe County Infrastructure Design and Construction Standards to include the latest MGPEC Standards (noted separately) where applicable shall apply to roadway testing and inspection requirements.
- 8.1.2** All test and inspection results performed by the testing firm in the employment of the owners/developers shall be submitted to the Engineering Division Manager or his field representative at the time of testing or within fifteen working days after the testing or retesting date.
- 8.1.3** Any work performed within Arapahoe County ROW and associated easements shall be tested by an approved materials testing firm. The materials testing firm must employ a full time registered professional engineer in the State of Colorado who directly supervises work of the firm. For more information see Items 0.2, 0.3, 0.5.1 and 0.5.2 of the MGPEC Standards. All testing reports must be certified by the supervising professional engineer. The costs of testing and associated reporting are paid by the owner/developer.
- 8.1.4** The testing of all materials and construction shall be in conformance with the appropriate AASHTO or ASTM specifications. A partial list of approved testing methods includes:

TEST PROCEDURES	AASHTO	ASTM
Atterburg Limits (LL & PL)	T 89 & T 90	D 4318
Gradation Analysis (except hydrometer)	T 27	D 422
CBR (as modified in Section 5.2.4.1)	T 193	----
R-value (subgrade & base)	T 190	D 2844
Marshall Stability	T 245	D 1599
R _t Value	T 245	D 1560
Compaction Curve (standard)	T 99	D 698
Compaction Curve (modified)	T 180	D 1557
Compaction Curve (CTAB)	T 134	----
Field Density Test (Sand Cone)	T 191	D 1556
Field Density Test (Nuclear) 2992/D 3017	T 238/T 239	D
Field Density Test (Balloon)	T 205	D 2167
Concrete Slump	T 119	C 143
Concrete Air Content	T 152	C 231
Concrete Compressive Strength	T 22	C 39
Concrete Sampling	T 141	C 172
Strength of Soil-Lime Mixtures	T 220	----
Asphalt Flow	T 245	D 1559
Air Voids	T 245	D 1559
Making and Curing Concrete Test Specimens in the Field	T 23	C 31
Texas Gyratory		
Superpave Gyratory		
Colorado Swell Consolidation Test		

8.2 ANCILLARY STRUCTURE TESTING

8.2.1 Utility Trenches and Public Storm Sewer Facilities

8.2.1.1 Materials, Placement and Compaction. All utility trenches within Arapahoe County ROW shall be placed and compacted in accordance with Table 3.4.2.4 in the MGPEC Standards.

8.2.1.2 Test. Field moisture-density testing shall be performed during backfill operations beginning 1 foot above the top of the pipe & extending to the finished subgrade elevation. A sufficient number of tests shall be taken at various depths to confirm that backfill compaction and moisture content specifications are met. As a minimum, one test shall be taken for each 10 cubic yards of backfill. At least 20 percent of the tests shall be taken within 1 foot of manholes, water valves or other obstacles.

8.2.1.3 Acceptance. The results of field density tests shall be submitted and reviewed by the Engineering Division. Provide all tests are acceptable; the next phase of roadway construction can begin. Any failures must be reworked, retested and resubmitted for review and approval.

8.2.2 Curb, Gutter, Sidewalks, Crosspans, etc.

8.2.2.1 This item shall consist of furnishing all materials, equipment, labor and other necessary items for the construction of curbs, gutters, sidewalks, ramps, local depressions and driveways of the form and dimensions prescribed by the plans and/or County Staff as required per MGPEC Standards, Appendix Item 6.

8.2.2.2 A Proof Roll of the subgrade for all curb, gutter, sidewalk, crosspans, etc. shall be required.

8.2.2.3 Subgrade compaction tests of all curb, gutter, crosspans, etc. shall be required.

- MGPEC Item 6.4.1 states that subgrade shall be thoroughly moisture conditioned and rolled or hand tamped until the subgrade from the front of curb to back of sidewalk reaches the compaction required for the adjacent roadway.

8.2.2.4 Portland Cement Concrete shall conform to the requirements detailed in Section 8.7.1.

8.2.2.5 Concrete tests of all curb, gutter, crosspans, etc. shall be required.

8.3 ROADWAY SUBGRADE PREPARATION

8.3.1 Excavation construction operations shall be consistent with the requirements detailed in the MGPEC Standards, Appendix Item 2.

8.3.2 Embankment construction operations shall be consistent with the requirements detailed in the MGPEC Standards, Appendix Item 3.

8.3.3 Moisture Treatment construction operations shall be consistent with the requirements detailed in the MGPEC Standards, Appendix Item 4.

8.4 STABILIZED SUBGRADE

8.4.1 Materials

Treated subgrade shall be used only where a mix design has been previously submitted and approved by the Department of Public Works and Development Division. The requirements of the MGPEC Standards, Appendix Sections 5.2 and 5.5 shall apply.

8.4.2 Construction

Construction of treated subgrade shall be in accordance with the requirements of MGPEC Standards, Appendix Sections 5.6 and 5.7.

8.4.3. Testing

Treated subgrade shall be observed and tested on a full-time basis and paid for by the owner/developer. The MGPEC Standards, Appendix Sections 5.9, 5.9.1 – Thickness, 5.9.2 – Grade, 5.9.3 – Strength, 5.9.4 – Stabilizing Agent Percentage and Table 5.11 are required.

8.4.4 Acceptance

The test results shall be submitted and reviewed by the Engineering Inspection Section and a proof roll will be scheduled and performed. Provided all tests are acceptable, the subgrade will be approved and the next paving course can be placed. Should these tests fail to meet project specifications see the MGPEC Standards, Appendix Section 5.10, conformity with plans and specifications. MGPEC Standards, Appendix Sections 5.11 – Measurement and 5.13 –

8.4.5 Other

Other subgrade Materials and treatments not addressed in the MGPEC Standards will be subject to the approval by the Engineering Division Manager.

8.5 AGGREGATE BASE COURSE

8.5.1 The description of the work to be performed shall follow the MGPEC Standards, Appendix Section 7.1.

8.5.2 Materials. Aggregate Base Course materials must be from a currently approved source and conform to the requirements of the MGPEC Standards, Appendix Sections 7.2 – Materials and Table 7.2. MGPEC Standards, Appendix Section 7.3 – Equipment shall not be inclusive as part of the Aggregate Base Course requirements. The owner/developer shall, upon request, provide verification of material properties.

8.5.3 Placement and Compaction. Materials shall be placed on an approved subgrade, which has been proof rolled within the past 24 hours and found to be stable and non-yielding. Should weather conditions change, such as freezing, precipitation, etc., aggregate base materials shall not be placed until the subgrade is reapproved.

8.5.3.1 Subgrade shall be prepared in accordance with the MGPEC Standards, Appendix Section 7.4.1 – Subgrade Preparation.

After proper placement and compaction, a prime coat or “tack coat” shall be applied to the aggregate base material. Prime coat material shall conform with Colorado Department of Transportation’s Colorado Highway Specifications Section 407 and 702 and Section 8.6.2.3 of these Standards.

8.5.3.2 Aggregate base course shall be placed in accordance with the MGPEC Standards, Appendix Sections 7.4.2 – Spreading and Moisture Conditioning and 7.4.3 – Compaction.

8.5.3.3 A proof roll shall be completed in accordance with the MGPEC Standards, Appendix Section 7.4.4 – Proof Roll.

8.5.4 Acceptable tolerances shall meet or exceed the requirements detailed in the MGPEC Standards, Appendix Section 7.5.

8.5.5 Material properties shall be in accordance with the MGPEC Standards, Appendix Section 7.5.4 and Table 7.5.4.

8.5.6 Testing and inspection shall be in accordance with the MGPEC Standards Appendix Section 7.8.

8.5.7 MGPEC Standards, Appendix Sections 7.6, 7.7 and 7.9 shall not be inclusive as part of the aggregate base course requirements.

8.6 HOT MIX ASPHALT PAVEMENT (HMAP)

8.6.1 Design Intent

MGPEC Standards, Appendix Section 9.1 – Design Intent shall be applicable to all types of plant mixed hot mix asphalt pavements.

8.6.2 Materials

All asphalt, aggregate, fillers and additives shall be combined to form a mix design in accordance with the MGPEC Standards, Appendix Sections 9.4.1 – General Requirements and 9.2 – Materials. The mix design must be submitted to and approved by the Engineering Division prior to use.

8.6.3 Mix Design and Plant Produced Mixture Requirements

MGPEC Standards, Appendix Section 9.3 shall be utilized to enforce Mix Design and Plant Produced Mixture requirements.

8.6.3.1 MGPEC Standards, Appendix Section 9.3.1 – Marshall Mixture Design Method shall not be inclusive as part of the HMAP requirements.

8.6.3.2 MGPEC Standards, Appendix Section 9.3.2 – Superpave Mixture Design requirements shall be inclusive in these standards.

8.6.4 Mixture Design Submittals

Mixture Design Submittals shall conform to the requirements set forth within the MGPEC Standards, Appendix Section 9.4 – Mixture Design Submittals.

8.6.5 Equipment

Minimum equipment standards shall conform to the requirements set forth in the MGPEC Standards, Appendix Section 9.5.

8.6.6 Manufacture

Minimum Manufacture standards shall conform to the requirements set forth in the MGPEC Standards, Appendix Section 9.6.

8.6.7 Tack coat

A Tack Coat shall be applied to all surfaces that the HMAP will come into contact with per the requirements of the MGPEC Standards, Appendix Section 9.7.

8.6.8 Placement

Hot mix asphalt shall be placed in accordance with the MGPEC Standards, Appendix Section 9.8.

8.6.9 Longitudinal Joints

Hot mix asphalt shall be applied in accordance with MGPEC Standards, Appendix Section 9.9.

8.6.10 Transverse Joints

Hot mix asphalt shall be applied in accordance with MGPEC Standards, Appendix Section 9.10.

8.6.11 Segregation

Hot mix asphalt shall be placed to ensure segregation is prohibited per MGPEC Standards, Appendix Section 9.11.

8.6.12 Compaction

Compaction of the hot mix asphalt shall conform with MGPEC Standards, Appendix Section 9.12.

8.6.13 Production Tolerances

Production Tolerances shall meet or exceed the requirements of the MGPEC Standards, Appendix Section 9.13.

8.6.14 Conformity with Plans and Specifications

MGPEC Standards, Appendix Sections 9.14, 9.14.1, 9.14.2, 9.14.2.1 when the lot is Represented by fewer than three tests, 9.14.3 and tables 9.14.1 and 9.14.2 shall not be inclusive in the requirements for Hot Mix Asphalt. The excluded sections listed above shall be replaced with the requirements detailed in section 8.6.15 of these Standards.

8.6.15 After completion of the paving, the final pavement thickness shall be determined using pavement thickness rings, coring or other acceptable methods. Pavement thickness testing shall be made at random locations at intervals of approximately 500 feet in each travel lane. A dated map depicting the core locations along the traveled lanes to include names of roadways, north arrow, lane distances along roadway stations and distances from flowline shall be submitted for approval to County. Charts showing design depths of asphalt, base course, etc., shall be on the map in addition to actual core depths.

8.6.15.1 Criteria used to determine satisfactory work shall include all of the following:

- a. 90% of core tests must meet or exceed design HMAP thickness.
- b. Average of all core tests must meet or exceed design HMAP thickness.
- c. All core thicknesses must exceed design HMAP thickness minus ½ inch.
- d. 100% of all cores must pass ~~95~~4% +/-2% design pavement density.

If all these criteria are not met, additional core tests or approved nondestructive testing at the expense of the owner/developer may be required to further delineate area(s) of unsatisfactory work. This unsatisfactory work will require correction prior to acceptance.

8.6.16 Testing and Inspection

Testing and inspection requirements shall conform to the MGPEC Standards, Appendix Section 9.15, excluding minimum frequency for thickness core, which shall conform to Section 8.6.15.1 of these Standards.

8.6.17 Measurement

MGPEC Standards, Appendix Section 9.16 shall not be inclusive in the requirements for HMAP.

8.6.18 Payment

MGPEC Standards, Appendix Section 9.17 shall not be inclusive in the requirements for HMAP.

8.7 PORTLAND CEMENT CONCRETE PAVEMENT

Portland Cement Concrete construction shall conform to the requirements detailed in the MGPEC Standards, Appendix Item 11 except as described below.

8.7.1 Materials

Concrete shall conform to the following requirements:

Min. 28 day Field Compressive Strength	4000 Psi
Min. Cementitious Materials	610 lbs./cu. yd.
Max. Water/Cement Ratio	0.48 lbs H2O/lbs cement
Air Content % Range	5-8
Maximum Slump	4"
Max. Fine Aggregate % of total Aggregate	50%

8.8 HOT MIX ASPHALT PAVEMENT PLANING/ROTOMILLING

Hot Mix Asphalt Pavement Planing/Rotomilling shall conform to the requirements detailed in the MGPEC Standards, Appendix Item 12.

8.9 JOINT AND CRACK SEALANT

Joint and Creak Sealant operations shall conform to the MGPEC Standards, Appendix Item 13.

8.10 FOG SEAL

Fog Seal operations shall conform to the MGPEC Standards, Appendix Item 14.

8.11 CHIP SEAL

Chip Seal operations shall conform to the MGPEC Standards, Appendix Item 15.

8.12 SLURRY SEAL

Slurry Seal Operations shall conform to the MGPEC Standards, Appendix Item 16.

8.13 TRENCH BACKFILL COMPACTION

8.13.1 General

No pavement cuts will be permitted for any County roadway granted probationary acceptance or overlaid within the previous 24 months (2 years). Emergency repairs for broken pipes, cables, etc. will be allowed according to the requirements of Chapter 10. If a contractor makes a cut into new pavement as defined in this paragraph which is not an emergency cut, the contractor or owner of the infrastructure shall be liable for additional costs as defined in by Director, Public Works & Development. The County routinely advises all utility companies, at least six (6) months in advance, of impending roadway overlays in the annual reconstruction program.

8.13.1.1 Existing asphalt pavement shall be cut so the joint line (along depth of cut) between existing and replacement pavement is straight and neat – i.e., within 5° of vertical and free from horizontal irregularities. All pavement cuts shall be square or rectangular in appearance with all surface within 5°

of a right angle. The cut depth shall be sufficient to permit pavement removal without damage to remaining pavement.

- 8.13.1.2** Removed pavement becomes the property of the excavator (unless otherwise specified in a contract document) and shall be hauled away as soon as possible and disposed of in a proper manner (recycle or waste facility).
- 8.13.1.3** Base course material may be removed and stockpiled for reuse during backfilling if it meets specifications. If not, it is to be hauled away as soon as possible from the ROW and disposed of in a proper manner.
- 8.13.1.4** Subbase material is to be stockpiled parallel and uphill to the trench alignment; in such a manner that encroachment upon the non-disturbed portion of the roadway and/or pedestrian walkways is kept to a minimum. It shall be removed from the site at the time permanent backfill is placed.
- 8.13.1.5** Safety standards relating to the shoring and stabilization of trench sidewalls should be maintained as prescribed by appropriate safety regulatory agencies (OSHA, State of Colorado).
- 8.13.1.6** The trench construction shall not be opened for a distance of more than three hundred (300) feet at any one time, unless specifically authorized by the Director, PWD or his designated representative.
- 8.13.1.7** The trench width shall be confined to those minimum dimensions, which will permit proper installation and acceptable pipe loading, as established by current acceptable engineering practices and all OSHA requirements.
- 8.13.1.8** No cuts shall be left in an open condition overnight, except for the portion necessary to commence work the following morning. This open condition shall be covered with a steel plate, braced and thick enough to withstand a CDOT HS-20 loading at the center of the span. Warning signs, barricades and lights, in conformance with the Manual of Uniform Traffic Control Devices (MUTCD), shall be used in areas where trenching operations are in public roadways. Any trenching remaining open overnight shall have flashing lights used with warning barricades. All such barricades, signs and warning devices shall be installed in accordance with the approved Construction Traffic Control Plan.
- 8.13.1.9** In trenching across the road, no more than one-half (1/2) of the traveled way is to be closed to traffic at one time. The trenched roadway shall be completely backfilled and a suitable driving surface restored before trenching the other half of the road. Final pavement restoration shall be accomplished at one time within a maximum of 7 working days after the installation unless specifically authorized by the Director or his designated representative.
- 8.13.1.10** Closure of any street, road approaches, or other access points will not normally be permitted (in excess of 10 days only by approval of the Arapahoe County Commissioners). Upon trenching across such facilities, steel, running plates, planks or other safe methods shall be used to provide for traffic to enter or leave the road to adjacent property. Refer also to Section 9.6 – Road Closures

- 8.13.1.11** Access to private driveways shall be provided at all times except during working hours when construction operations prohibit provision of such access.
- 8.13.1.12** Unobstructed access must be provided at all times to fire hydrants.
- 8.13.1.13** The contractor shall notify the property owners at least 48 hours in advance of beginning work, or in accordance with right-of-way easements which set forth ingress/egress requirements, prior to any excavation to be made in County easements through private property.

The Contractor shall take precautions to limit the removal of, or damage to existing pavements, sidewalks, curbs, lawns, shrubbery, trees, hedges, walls, fences, buildings, or other existing improvements and shall replace or restore such improvements to their original location and condition after the excavation has been backfilled and compacted.

- 8.13.1.14** It shall be the responsibility of the contractor to be familiar with all specific conditions contained in private easements. He shall perform all of his work in accordance with the stipulations contained therein.
- 8.13.1.15** Where trenching excavation occurs within the roadway surface, the minimum allowable remaining pavement section shall not be less than four feet (not including the curb and gutter or concrete pavement). All asphalt cuts or trenching within four (4) foot of edge of asphalt shall be extended to the edge of asphalt. See Trench Detail SP-18 in Appendix A.

8.13.2 Backfilling

- 8.13.2.1** The permittee shall advise the Engineering Division of the proposed trench backfill date before commencing work. A minimum of 48 hours advance notification is required. Typically, backfill will take place on the same day of trenching; if this is not the case, the Engineering Division must be given the same 48 hours prior notice as required for commencing trenching.
- 8.13.2.2** The bottom of the trench shall be prepared to provide a firm foundation for the pipe or facility in accordance with the bedding conditions specified by the geotechnical engineer or Special District for the type of pipe or facility to be installed. The subgrade of the trench shall be kept free of standing water. Where the trench subgrade material is found to be unsuitable and does not afford a solid foundation, the contractor shall excavate to such depth as necessary to construct a stable foundation. A stable foundation shall be constructed by placing crushed rock or other CDOT or Arapahoe County approved granular material under the pipe.
- 8.13.2.3** Backfilling shall be placed so that the pipe will not be displaced or damaged. Bedding requirements for utilities shall meet the minimum requirements of the utility provider.
- 8.13.2.4** For trenching within the limits of the roadway including areas of curb, gutter and sidewalks, trench shall be backfilled with approved materials, immediately after the utility authorized by the permit has been placed in the trench. Allowable materials are defined as flowable backfill from 12" above the top of pipe or the upper five-feet of backfill to grade or compacted and tested native backfill. See MGPEC Standards, Appendix Sections 18.2, 18.2.2, 18.2.3 for flowable backfill material requirements.

8.13.2.5 For trenching outside the roadway, the subgrade shall conform to the lines, grades and cross-sections as shown on the approved plans. The subgrade shall be compacted in successive layers not to exceed eight (8") inches thick and shall be finished and maintained in a smooth compacted condition. The compacted surface shall be free from rutting or other objectionable irregularities.

8.13.3 Base Course

8.13.3.1 Base material shall conform to the lines, grades, cross-sections, and thickness shown on the approved plans and shall be finished and maintained in an acceptable condition at least one day in advance of placing prime coat.

8.13.3.2 Base material shall consist of hard, durable particles or fragments of stone or gravel crushed to the required size and an AP-filler of sand or other finely divided mineral matter. When produced from gravel, not less than 60% by weight of the aggregate retained on a No. 4 sieve shall consist of particles having at least one fractured face. Base material shall be free from vegetable matter and lumps or balls of clay and which when placed and compacted will result in a firm, dense, unyielding foundation. Base material shall meet the grading requirements set forth in MGPEC Standards, Appendix Item 7.2 and Table 7.2.

8.13.3.3 Base material shall be deposited and spread without particle segregation in loose layers not to exceed six inches in depth. Each layer shall be thoroughly and individually compacted to 95% proctor (AASHTO T-180) density. Re-working of the material may be required as necessary following review of all field test results. No base course shall be placed upon a soft, spongy, frozen base, flowable backfill or other subgrade that is determined as unsuitable by an Arapahoe County representative.

8.13.3.4 Deviation from the gradation limits may be permitted on unpaved roads provided it can be unequivocally demonstrated that the subbase or base course material is not conducive to rutting, raveling or forming a soft yielding surface in the presence of moisture. Compaction equipment must be on the job site before excavation is started. Compaction equipment must be capable of compacting within the trench width limits to prevent bridging caused by straddling the ditch. Any deviations must have approval from the Director, PWD.

8.13.3.5 If the existing base course is untreated, it shall normally be replaced with CDOT Class 6 aggregate base material and compacted in layers not to exceed six inches. The resulting total compacted base thickness shall be eight inches or to the thickness of the removed base plus two inches. If the existing base material is asphalt treated aggregate it shall be replaced by a minimum of 3" of acceptable asphalt base or the existing base thickness plus 1", whichever is greater. A replacement 2" thick asphalt surface wearing course shall also be used when replacing asphaltic treated aggregate.

NOTE: For the purpose of replacing a full depth asphalt pavement section, the top 2" may be considered the wearing course, with the remainder being the base course.

8.13.4 Trench Cover – Backfill

- 8.13.4.1** All open cut trenches within Arapahoe County Rights-of-Way shall be backfilled with either flowable backfill or native backfill compacted and tested to ensure 95% compaction or with compacted and tested native backfill.
- 8.13.4.2** After the compacted native backfill (compacted to 95%) or flowable backfill have been completed, it shall be cut and trimmed to the required depth and cross section. Flowable fill shall be used under all public improvements, i.e., curb, gutter, sidewalk, crossspan, ramps, etc.
- 8.13.4.3** All excess excavated material shall be removed and disposed of outside the legal limits of the highway as the work progresses, unless the approval from the Director, PWD is obtained to dispose of the material within the legal limits of the highway. All parts of the highway and various structures disturbed shall be restored to a condition equal to that which existed before starting the work.

8.13.5 Trench Cover – Asphalt

8.13.5.1 Temporary

- 8.13.5.1.1** All trenches across traffic lanes shall be provided with temporary trench cover.
- 8.13.5.1.2** A temporary patch of cold-mix shall be placed on all pavement surface cuts immediately after backfill and compaction is completed. On high traffic volume roadways or as directed by Arapahoe County, a temporary hot mix patch of sufficient depth may be required. Temporary patches shall be removed at the time permanent patch is made.
- 8.13.5.1.3** Minimum requirements for temporary trench cover shall be well-compacted surfacing, arterial conforming to “Road Mix Asphalt Surfacing Material” of the State of Colorado Standard Specifications and shall be a minimum of four inches thick. The mineral aggregate shall, with a tolerance of 5%, conform to the grading specified for 3/8” maximum aggregate. Bituminous binder to be mixed with the mineral aggregate shall be liquid asphalt. Grade MC 250 or MC 800 and shall have enough of a liquid asphalt content to perform the design function.
- 8.13.5.1.4** Temporary trench cover surfacing material shall be stockpiled on the job site and shall be placed after completion of trench backfill and compaction.
- 8.13.5.1.5** Temporary trench cover shall be properly maintained until permanent trench cover is placed. At a minimum, the responsible contractor shall evaluate the condition of the temporary patch on a daily basis.
- 8.13.5.1.6** Trench covered with temporary surfacing will be considered as open to traffic.

8.13.5.1.7 The surface of the temporary patch shall be smooth and at the same level as the adjacent undisturbed paved area.

8.13.5.2 Permanent

Unless otherwise specified, the replacement of pavement shall be as follows:

8.13.5.2.1 In the areas where the wearing surface is hot mix asphalt, replace the pavement with a full depth asphalt paving of a minimum thickness of five (5") inches but in all cases to a thickness of the old surface plus base course plus one (1") inch.

8.13.5.2.2 In areas where the wearing surface is Portland cement concrete, pavement replacement shall be at a minimum of same class, and strength as the original pavement, but not less than six inches thick on alleys or residential streets, nor less than eight inches thick on major or secondary streets and highways.

8.13.5.2.3 In areas where the wearing surface is other than hot mix asphalt or Portland cement concrete, the contractor shall replace the pavement and base in kind. Said surface replacement shall be of materials and thickness conforming to the requirements of the governing authority.

8.13.5.3 Permanent Alternative

8.13.5.3.1 Where original surface was Portland cement concrete, Portland cement concrete shall be placed to a thickness of six inches or the thickness of the removed pavement, whichever is greater.

8.13.5.3.2 Where original surface was hot mix asphalt, bituminous treatment or mix, or oilmat, hot mix asphalt shall be compacted in layers not to exceed three (3") inches to a total compacted thickness of five (5") inches or the thickness of the removed pavement plus 1", whichever is greater. On oil mat surfaces or substandard asphalt surfaces, an overlay of Class "SX" asphaltic pavement 1 ½ inches thick shall be placed across the entire traffic lane disturbed by the trench and shall be finished as set forth below.

8.13.5.3.3 Immediately prior to placing the wearing surface, the abutting pavement edges shall be neatly cut.

8.13.5.3.4 The existing pavement shall be cleaned, removing all loose material and coated with hot liquid asphalt (grade AC-10) or asphalt emulsion applied cold (grade CSS-1H) to insure a bond with the new asphalt surfacing.

8.13.5.3.5 The restored pavement shall be finished to a smooth riding surface and to the grade of the surrounding undisturbed pavement.

8.13.5.3.6 Pavement placement shall commence not more than seven (7) calendar days after backfilling, unless the Director PWD or his representative permits otherwise.

8.13.5.4 In the event the trench edges fall in the wheel traveling portion of a traffic lane, existing or proposed, the applicant shall extend the finish surface paving to a point deemed satisfactory by the Director, PWD or his field representative. Finish surface paving shall be performed in such a manner as to provide a crown slope equal to that existing prior to excavation, with no ponding of run-off surface water either over the trench or at the joints between the new and original surfaces.

8.13.5.5 When road surface trench/cut involves more than one traffic lane, a full width paving lift may be required. Individual jobs may require negotiations with the Division of Operations and Maintenance, at the discretion of the Director, of Public Works & Development for partial participation in the cost of a full width overlay.

8.13.6 Repair to Gravel Roads and Shoulders

8.13.6.1 Restoration of Unpaved Areas

8.13.6.1.1 Where the original surface was crushed rock or gravel for the wearing surface and foundation material, Class 6 aggregated base course shall be used as replacement material and shall be placed to a minimum compacted thickness of 8-inches or the thickness of the removed material plus 2-inches whichever is greater.

8.13.6.1.2 Unimproved roads and area between edge of traveled roadway and property line: The trench shall be backfilled with the excavated material and compacted to the specifications provided in this chapter.

Note: Work area shall be restored to original or better condition.

8.13.7 Maintenance Period

8.13.7.1 For a period of one year following the acceptance of the backfilling of any trench in the County ROW and/or the permanent patching of the paved surface, the applicant shall be responsible for the condition of said trench backfill and pavement patches. During that time the applicant shall, at his own cost, repair any of the said patches, which become settled, cracked, broken, or otherwise faulty if requested by the Director, PWD or his representative. All work will be done to the satisfaction of the Director, PWD or his representative. Settlement of the replaced road surface of three-sixteenths inch (3/16") or more as measured with a ten foot (10') foot straight edge shall constitute evidence of improper backfill material, and shall be cause for repairs by the contractor.

8.13.7.2 The Director, PWD shall make such inspections as he may deem necessary of all work authorized by a permit. He is empowered to provide a full-time inspector if necessary to ensure compliance with the provisions of these standards.

8.13.7.3 All inspection costs shall be borne by the permittee. Such costs shall be based on a schedule of charges on file in the office of the Director, PWD.

8.13.7.4 The permittee shall notify the Director, PWD in writing upon completion of work accomplished under the provisions of the permit.