CHAPTER 12 – RIGHT OF WAY PERMITTING AND CONSTRUCTION STANDARDS FOR FACILITIES LOCATED IN PUBLIC RIGHT OF WAY

12.1 GENERAL

12.1.1 Purpose

The purpose of this chapter is to:

- Provide instructions on how to prepare and submit plans and other documentation for Right-of-Way Permits;
- Describe processes, policies and requirements; and
- Define roles and responsibilities of all parties.

12.1.2 Introduction

All contractors and public utility agencies must obtain a Right-of-Way Permit for any work performed within the public rights-of-way of the Larimer County. The storage of materials and equipment within the public rights-of-way also requires a Permit.

To preserve the original investment of the roadway systems within Larimer County, minimize the disruption and maximize the safety to the traveling public caused by construction, and reduce future maintenance problems, it is the policy of Larimer County to require the installation of new utilities across existing roads to be done by boring or tunneling. Open cutting of existing roads for the installation of new utilities will be permitted only when it can be proven it is not possible to use boring or tunneling techniques.

Applicants for Right-of-Way Permits must plan for adequate time for review and approval by the County and any other involved agencies. Generally, the greater the scope of work, the longer the permit review and approval process will take.

NOTE: THE COUNTY RESERVES THE RIGHT TO VARY FROM THESE STANDARDS BASED UPON CONDITIONS SPECIFIC TO THE LOCATION WHERE THE WORK WILL OCCUR. THE "SPECIAL CONDITIONS" SECTION OF THE PERMIT WILL OUTLINE ANY VARIATIONS FROM THE COUNTY-WIDE SPECIFICATIONS.

12.1.3 Applicability

These standards shall apply to all area within the unincorporated area of Larimer County.

12.1.4 Specific Conditions

12.1.4.1 Traffic Flow During Peak Hours

No interference with traffic flow on arterial or collector roads shall be permitted during the hours of 7:00 a.m. to 8:30 a.m. or from 4:30 p.m. to 5:30 p.m. unless authorized in writing by the Engineer.

12.1.4.2 End of Day Lane Conditions

a. **ASPHALT ROAD** - When work is stopped for the day, all lanes of an arterial or collector road shall be opened to traffic unless approved by the Engineer. A traffic lane shall be considered satisfactorily open only if it is paved with hot or cold mix asphalt paving, except when an alternative temporary surface is allowed by the County as a condition of the permit.

b. **CONCRETE ROAD** - When work is stopped for the day, all lanes of an arterial or collector road shall be opened for traffic. A traffic lane shall be considered satisfactorily open only if it is surfaced with a temporary asphalt surface. In the event the road surface has been replaced in the same day as the excavation was made, the repaired areas should be properly barricaded to protect the concrete during the curing stage.

12.1.4.3 Inspection Requests

It shall be the responsibility of the person performing the work authorized by the permit to notify the Engineer that such work is ready for inspection. The Engineer requires that every request for inspection be received at least twenty-four (24) hours before such inspection is desired. Such requests may be in writing or by telephoning or faxing the Engineer.

12.1.4.4 Minimum Concrete Removals / Replacements

Removal and replacement shall be to existing joints.

12.1.4.5 Road Closures

Road closures will only be allowed at the approval of the Engineer.

12.1.5 Permit Fees

The County's permit fees are established under appropriate enabling resolutions and/or ordinances and are subject to change periodically. A complete fee schedule for Larimer County can be found on the County's website.

http://www.larimer.org/engineering/index.htm

An additional fee may be charged for any excavation work that may affect the accuracy of the County's Survey Monumentation System.

12.1.6 Insurance Requirements

The Permit Applicant is required to submit certificates of insurance for Commercial General Liability and Automobile Liability. These requirements can be obtained at the Engineering office or at the County's website.

http://www.larimer.org/engineering/index.htm

12.2 PERMIT APPLICATION PROCESS

12.2.1 Permit Forms

Blank permit forms and instructions for completing the forms can be obtained at the Engineering office or at the County's website.

http://www.larimer.org/engineering/index.htm

12.2.2 Submissions of Plans

12.2.2.1 Required Plans

Drawings or plans that clearly indicate the proposed work must be attached to the permit application. These drawings must be to a working scale and must show position and location of work, road names/numbers, widths of roads, property lines, topographic and man-made features, existing drainage patterns, etc. Plans shall show the relative position of proposed work to existing utilities and existing improvements and shall be drawn to a scale of one (1) inch = fifty (50) feet or larger and shall include a north reference.

12.2.2.2 Exceptions

Minor maintenance projects may be exempt from submitting formal construction plans. In such cases however, sketch plans must accompany the permit application. Utility companies may be exempt from the requirement of a professional engineer's signature and stamp on the construction plans if the project is of a nature that would not warrant design by a registered professional engineer. Requirements for submitting plan and profile sheets may be waived upon written request of the utility company.

12.2.2.3 Supporting Documentation

Specific project supporting documentation may be requested by the County as part of any permit application. This may include, but is not limited to, design and construction specifications, geotechnical investigations, traffic impact studies, etc.

12.2.3 Submissions of Traffic Control Plans

Traffic Control Plans shall show in detail the proposed work area location and the traffic control devices being proposed. Such plan shall be on paper at least 8 1/2 inches by 11 inches and may be faxed, mailed or brought to the County Engineering office prior to, or with the completed permit application. Traffic Control Plans may require more detail than normal at the discretion of the Engineer due to unique or unusual conditions. Traffic control shall also include construction traffic routing requirements. Plans must be prepared by a certified Traffic Control Supervisor (TCS).

12.2.4 Other Permits

Permit Applicants are responsible for obtaining separate permits or permission as may be required. Examples may be when work is proposed within a state highway, railroad or irrigation company right-of-way, or private property.

12.3 CONSTRUCTION DETAILS

12.3.1 General Conditions

The following general conditions apply to all work done within the public rights-of-way such as utility line installation or repairs performed by any contractor or utility department, public or private.

12.3.1.1 Protection of Existing Improvements

a. The Contractor shall at all times take proper precautions and be responsible for the protection of existing road and alley surfaces, driveway culverts, road intersection culverts or aprons, irrigation systems, mail boxes, driveway approaches, curb, gutter and sidewalks and all other identifiable installations that may be encountered during construction.

b. The Contractor shall, at all times, take proper precautions for the protection of existing utilities, the presence of which are known or can be determined by field locations of the utility companies. The Contractor shall contact **UNCC (One Call) at 1-800-922-1987** for utility locates a minimum of two (2) working days prior to his proposed start of work.

c. Existing improvements to adjacent property such as landscaping, fencing, utility services, driveway surfaces, etc. that are not to be removed shall be protected from injury or damage resulting from the Contractor's operations.

d. The Contractor shall at all times take proper precautions for the protection of property pins/corners and survey control monuments encountered during construction. Any damaged or disturbed survey markers shall be replaced by a registered land surveyor at the Contractor's expense.

e. The repair of any damaged improvements as described above shall be the responsibility of the permit holder.

f. The Contractor shall make adequate provisions to assure that traffic and adjacent property owners experience a minimum level of inconvenience

12.3.1.2 Temporary Surfaces Required

When the final surface is not immediately installed, it shall be necessary to place a temporary asphalt surface on any road cut opening. The temporary surface installation and maintenance shall be the responsibility of the Permit holder or Contractor until the permanent surface is completed and accepted. It shall be either a hot mix or cold mix paving material. Temporary surfaces shall be compacted, rolled smooth and sealed to prevent degradation of the repair and existing structures during the temporary period. Permanent patching shall occur within two (2) weeks except as outlined by the County in the Permit.

12.3.1.3 Pavement Patches

All permanent pavement patches and repairs shall be made with "in kind" materials. For example, concrete patches in concrete surfaces, full depth asphalt patches with full depth asphalt, concrete pavement with asphalt overlay patches will be expected in permanent "overlaid" concrete roads, etc. In no case is there to be an asphalt patch in concrete roads or concrete patch in asphalt roads. Any repair not meeting these requirements will be removed and replaced by the Contractor at his expense. Refer to Section 4 for details.

12.3.1.4 Work to be Done in Expedient Manner

All work shall be done in an expedient manner. Repairs shall be made as rapidly and consistent with high quality workmanship and materials. When repair is contemplated, use of fast-setting concrete or similar techniques is encouraged whenever possible without sacrificing quality of repair. Completion of the work including replacement of pavement and cleanup shall normally be accomplished within two (2) weeks after the repair work. Extension of time for completion shall be

with the written approval of the Engineer. If the repairs are not completed in the allotted time, the County has the right to repair the road at the Contractor's expense.

12.3.1.5 Removal and Replacement of Unsatisfactory Work

Removal and replacement of unsatisfactory work shall be completed within fifteen (15) days of written notification of the deficiency unless deemed an emergency requiring immediate action. In the event the replacement work has not been completed, the County will take action upon the Contractor's bond to cover all related costs.

12.3.1.6 Tolerances

As a standard of practice, all utility services shall be extended beyond the pavement surface or to the right-of-way line to facilitate connections at a future date. All manhole lids, access covers, valve boxes, etc. shall be placed ¼-inch to 1/2-inch below the adjacent finished road surface.

12.3.2 Excavation

1. Excavation shall consist of removal of all material necessary for the construction of the roadway section to the subgrade elevation, line, and grade shown on the plans or as specified in the contract documents. Unacceptable material defined as any earthen material containing vegetable or organic silt, topsoil, frozen material, trees, stumps, certain man-made deposits, or industrial waste, sludge or landfill, or other undesirable materials will be removed from the site and disposed of in accordance with applicable County, State and Federal requirements. All tree stumps and roots shall be removed to a minimum of two (2) feet below subgrade.
2. Any work on trees, including roots, must be reviewed by the County.
3. Excavation shall be performed in a careful and orderly manner with due consideration given to protection of adjoining property, and the public. Any damage to roads, parking lots, utilities, irrigation systems, plants, trees, buildings or structures, private property, construction stakes or bench marks, due to the negligence of the Contractor, shall be repaired and restored to its original conditions by the Contractor at his expense. Those areas that are to be saved will be clearly fenced off by the Contractor per the owner's instructions. It will be the Contractor's responsibility to ensure that these areas are not damaged during the construction process. Following completion of construction, should any of these trees, shrubs or irrigation facilities, etc. require replacement, it shall be done at the Contractor's expense.
4. All materials determined acceptable by the Engineer acquired from roadway excavations may be used for embankment fill and backfill as needed. The entire area in the vicinity of the construction where excavation and filling has been performed shall be raked clean of all trash, wood forms, and debris, after completion of the work with no additional cost to the Owner. Material removed in excavation and not acceptable or not required for embankment fill of backfill shall be disposed of by the Contractor. It shall not be wasted on private property without written permission of the property owner. Waste banks shall be left with reasonable smooth and regular surfaces.
5. The construction of any repair activity within the road or alley rights-of-way shall be accomplished by open cut, jacking, boring, tunneling or a combination of

these methods as approved by the permit. The Engineer shall approve any change from the approved permit.

6. Trenches shall be excavated along the lines and grades established and in no case shall be more than two hundred (200) feet in length, or be trenched or backfilled in non-continuous sections unless approved by the Engineer. Failure by the Contractor to comply with these requirements may result in an order to stop the excavation in progress until compliance has been achieved.
7. All excavated material shall be stockpiled in a manner that does not endanger the work or workers and that does not obstruct sidewalks, roads and driveways. No stockpiled materials shall be allowed on the asphalt surface or adjacent walkways. The work shall be done in a manner that will minimize interference with traffic and/or drainage of the road. The Contractor at the end of each day shall barricade all excavations and ditch lines, remove excess material from travel ways, and thoroughly clean all road, alleys and sidewalks affected by the excavation. If it becomes necessary, all roads, alleys (if asphalt or concrete) and sidewalks shall be swept or washed as required by the Engineer.
8. Materials encountered during excavation such as rubbish, organic, or frozen material, and any other material that is not satisfactory for use as backfill in the opinion of the Engineer, shall be removed from the site and disposed of daily by the Contractor at his expense. Stones, concrete or asphalt chunks larger than six (6) inches or frozen material shall be considered unsatisfactory backfill and removed by the Contractor.
9. All excavation, shoring and trenching shall comply with OSHA's "Construction Industry Standards" as well as all applicable Federal and State regulations.
10. No tracked vehicles shall be allowed on asphalt or concrete unless approved by the Engineer.
11. Crossings under sidewalks or curbs may be made by tunneling only when approved by the Engineer. If the Contractor elects to remove a portion of the sidewalk or curb, the applicable County standards shall be followed.
12. Grading shall be done as necessary to prevent surface water from entering the excavation; any other water accumulation therein shall be promptly removed. Surface drainage flowing from adjoining areas shall be kept unobstructed.
13. When soft or unstable material or rock is encountered in the trench subgrade, that will not uniformly support the pipe, this material shall be excavated to additional depths directed by the Engineer and backfilled with Type B material, as described in Subsection 12.3.7.2.

12.3.3 Blasting

The Contractor's blasting procedures shall conform to Federal, State, and local ordinances. The Contractor shall obtain all required permits prior to the start of blasting.

Blasting for excavation will be permitted only after securing the approval of the Engineer. The Engineer will fix the hours of blasting. The Contractor shall use the utmost care to protect life and property. All explosives shall be safely and securely stored in compliance with local laws and ordinances, and all storage places shall be clearly marker "Dangerous Explosives". No explosives shall be left unprotected where they could endanger life or property

When blasting in trenches, the Contractor shall cover the area to be shot with earth backfill or approved blasting mats. Prior to blasting, the Contractor shall station flaggers and provide signals of danger in suitable places to warn people and stop vehicles. The Contractor shall be responsible for all damage to property and injury to persons resulting from blasting or accidental explosions that may occur in connection with the use of explosives.

12.3.4 Equipment

1. The use of trench digging equipment will be permitted in places where its operation will not cause damage to existing structures or features, in which case hand methods shall be employed.
2. No tracked vehicles shall be permitted on roads unless approved by the Engineer. When tracked vehicles are allowed, existing facilities will be restored to original condition at the Contractor's expense.
3. Construction equipment and material delivery routing will be made a condition of the Permit.

12.3.5 Dewatering

Where ground water is encountered in the excavation, it shall be removed to avoid interfering with the work. It is the Contractor's responsibility to comply with all Federal, State and local permitting requirements prior to beginning any dewatering operations.

12.3.6 Removals

12.3.6.1 Roads, Paved

a. Bituminous pavement shall be saw cut to clean, straight lines and should be perpendicular or parallel to the flow of traffic. (See Section12.4.2.2.a)

b. In existing pavement, all excavations within 36" of the edge of the asphalt shall require removal and replacement from the edge of asphalt to the excavation edge.

c. Concrete pavement, cross pans, driveways, roads and alleys shall be removed to neatly sawed edges cut to full depth.

12.3.6.2 Roads, Gravel

a. When trenches are excavated in roads or alleys which have only a gravel surface, the Contractor shall replace such surfacing on a satisfactory compacted backfill with gravel conforming to CDOT Class 5 or Class 6 aggregate base course. Gravel replacement shall be one (1) inch greater in depth to that which originally existed, but not less than four (4) inches. The surface shall conform to the original road grade. Where the completed surface settles, additional gravel base shall be placed and compacted by the Contractor immediately after being notified by the County, to restore the roadbed surface to finished grade.

b. Some roads may have been treated with a special surface treatment to control dust and/or bind the aggregates together. In these cases, the Contractor is responsible for restoring the gravel surface to its existing stabilized condition. Such surface treatments shall be of the same chemical

composition as what existed prior to the excavation work. The Engineer shall note on the permit the surface treatment that will be required.

12.3.6.3 Concrete Curb, Gutter and Sidewalk

Concrete shall be removed to neatly sawed edges to full depth for sidewalks and curb and gutter and shall be saw-cut in straight lines either parallel to the curb or perpendicular to the alignment of the sidewalk or curb. Removal shall be done to the nearest joint or as directed by the Engineer. Replaced sections may require doweled connections as directed by the Engineer.

12.3.7 Backfill

12.3.7.1 Flowable-Fill

FLOWABLE-FILL WILL BE REQUIRED AS UTILITY TRENCH BACKFILL FOR ALL TRENCHES UNLESS OTHERWISE APPROVED BY THE ENGINEER.

Refer to Section 5 for compaction requirements. This requirement applies to all pavement and gravel locations. Flowable-fill vibration may be required.

The recommended mix for flowable-fill is shown in Table 12-1 below. Concrete backfill will not be allowed within the public right-of-way. Other alternatives to flow fill may be used if approved by the Engineer. Refer to CDOT specification 206.

Table 12-1
Recommened Mix for Flowable Fill

INGREDIENTS	POUNDS/CUBIC YARD
Cement	42 (0.47 sack)
Water	235 (39 gallons or as needed)
Coarse Aggregate (Size No. 57)	1700
Sand (ASTM C-33)	1845

The maximum desired 28-day strength is 60 psi. The above combination of material, or an equivalent, may be used to obtain the desired “flowable-fill”.

Flowable-fill is prohibited as a temporary or permanent road surface. Trenches shall initially be backfilled to the level of the original surface. After the flowable-fill has cured, the top surface of the flowable-fill shall be removed and the temporary or permanent surface shall be placed.

Bridging and cutback requirements as described in these standards may still be required if the road failures indicate a clear need.

Repair of failed trenches will be the responsibility of the party requiring the trench.

12.3.7.2 Conventional Backfill (Other than Flowable Fill)

When "non flowable-fill" backfill material has been pre-approved by the Engineer, backfill in existing or proposed roads, curbs, gutters, sidewalks and alleys is divided into three (3) categories: initial, intermediate and final lifts as defined below:

a. The INITIAL LIFT, designated as Class B and generally comprised of a washed, clean gravel material**,** consists of the section from the bottom of the excavation to a point six to twelve (6 - 12) inches above the top of the installation. Placement and compaction of the initial layer shall be as specified by the utility to protect their installation.
b. The INTERMEDIATE LIFT, generally comprised of native material, consists of the section above the initial layer to a point within six (6) inches of the ground level or the bottom of the pavement section whichever is greater. Excavated material may be used in the intermediate layer provided that it is deemed suitable by the Engineer.
c. The FINAL LIFT includes both road base and asphalt surfacing. Road base material shall be CDOT Class 5 or 6 aggregate base course or as specified by the Engineer.
d. Maximum dry density of all soil types used will be determined in accordance with AASHTO T 99 or AASHTO T 180. These densities will be determined prior to placement of backfill.
e. When a hydro-hammer or drop hammer compaction machine is used for compaction of fill in trenches, the maximum layer shall be 30 inches.

12.3.7.3 Compaction Testing Requirements

See "Testing" Section 12.5

12.3.7.4 Embankment and Slopes

a. The Engineer shall approve all fill material.
b. All cut slopes shall conform to OSHA standards.

12.3.8 Restoration

12.3.8.1 Bore Holes – Vertical and Horizontal

a. For openings less than or equal to 6" in diameter, bore holes shall be filled with patching material **(cold mix is not acceptable)** to prevent entry of moisture. Patching material used shall be in all cases compatible with the existing surface. Subgrade shall be replaced with flowable fill to provide necessary support to the surface. The sealing of bore holes is the responsibility of the Contractor or persons making the bore.
b. For openings greater than 6" in diameter, the limits of repair shall be identified in the permit.
c. The completed job shall be flush with the surrounding pavement and have no indentations, pockets, or recesses that may trap and hold water.

12.3.8.2 Subgrade

a. **Placement**. The subgrade for the pavement structure shall be graded to conform to the cross sections and profile required by the construction plans. Prior to the placement of aggregate base course or sub-course, the subgrade should be properly prepared. The subgrade should be scarified to a minimum depth of six (6) inches, moisture adjusted as necessary, and recompacted to not less than the following:

1) For cohesive soils, 90% maximum Modified Proctor dry density at 2% of optimum moisture content, or 95% maximum Standard Proctor dry density at 2% of optimum moisture content.
2) For non-cohesive soils, 92% maximum Modified Proctor dry density at 2% of optimum moisture content, or 97% maximum Standard Proctor dry density at 2% of optimum moisture content.
3) For expansive soils, 88% maximum Modified Proctor dry density at 3% or greater above optimum moisture content, or 93% maximum Standard Proctor dry density at 1% or greater above optimum moisture content. For highly expansive soils (swell potential 2% under 200 psf surcharge pressure), paving will not be permitted without a subgrade treatment approved by the Engineer.

b. **Compaction.** Prior to approval to place the base or sub-base course, all utility main and service trenches shall be compacted to not less than the above referenced densities required for the given soil classification. This density requirement also applies to all utility trenches within the public rights-of-way from a point four (4) feet beyond the edge of asphalt and descending at 1:1 outward.

12.3.8.3 Asphalt Surfacing

a. **Placement**. Any damage, even superficial, to the existing asphalt surface in the vicinity of the work shall be repaired at the expense of the Contractor, including but not limited to gouges, scrapes, outrigger marks, backhoe bucket marks, etc. A slurry seal type covering will be considered the minimum repair. Patching may be required, at the discretion of the Engineer.
   1) The depth of asphalt patches in asphalt roads shall typically be the depth of the existing asphalt surface plus two (2) inches or as specified by the Engineer.
   2) The asphalt patch area for road excavations that fall within the wheel path of the vehicular travel lane shall be increased in size to the center of the lane or adjacent lane. In no circumstance will the edge of a patch area be allowed to fall within the wheel path.
   3) Chip-sealed roads shall be treated as paved when considering an approach to repair and patching. As such, repair strategies shown in Section 12.4 shall be applied to chip-sealed roads. Full width repairs may be required by the Engineer to avoid rapid deterioration encountered with half-road patches.
   4) Minimum depth of patching.
      i. Chip-sealed road – 4 inches
      ii. Local road – 4 to 6 inches
      iii. Collector/Minor Arterial road – 6 to 8 inches
      iv. Arterial road – 8 to 10 inches
   5) All road cuts shall be patched as per the requirements of Section 12.4 below.
   6) For roads that are less then five (5) years old the County reserves the right to deny any road excavation or require repairs that are over and above these specifications.

b. **EXCEPTIONS** - There may be situations where the patching standards are considered inappropriate. For example, rebuilding half of a road today when the road is due for reconstruction at a different profile in 2-3 years would constitute the Engineer modifying the patching requirements. In these cases, the Permit Holder may be allowed to provide a more modest patch adequate to accommodate traffic for the 2-3 year period. In return, the Permit Holder may be required to make a financial contribution to the road maintenance, rehabilitation or reconstruction program to support the more permanent improvements that are anticipated. This determination shall be made by the Engineer.

c. **DISPUTE RESOLUTION** - Mutual acceptance of these standards is expected to evolve over time with experience in the field. Disagreements over requirements and cost sharing are inevitable. In cases where agreement cannot be reached, the dispute shall not relieve the Contractor from compliance to the specific Permit or standards provided by this document unless approved by the Engineer.

12.3.8.4 Concrete Surfacing and Patching

a. Concrete pavement shall be replaced with 4,000 psi concrete to match the finish and thickness of the existing pavement, but not less than eight (8) inches thick. All concrete construction shall be protected from vehicular traffic, including contractor vehicles, until the concrete has achieved eighty (80) percent of its ultimate strength. Concrete shall be coated and sealed with a uniform application of membrane curing compound applied in accordance with manufacturer's recommendations.

b. The use of quick curing concrete (3000 psi strength within 48 hours) shall be used on all arterial and collector roads when repair areas are less than 500 square feet or when temperatures are below 40° F. Quick curing concrete repairs may be opened to traffic within two (2) days or when the concrete has achieved eighty (80) percent of its design strength.

c. Where existing cracks or damage is adjacent to the area being repaired, the repair area shall include the cracked or damaged concrete. Pavement repairs shall include all areas of damage, including leak test holes, pot holes, equipment and/or material scaring of the exiting surface.

d. When repairing concrete, the removal perimeter shall be saw-cut and doweled prior to placement of new concrete as directed by the Engineer.

12.3.8.5 Joint Filling

a. **Asphalt.** Following placement of the asphalt surface, the joints where the new asphalt abuts the old shall be sealed with a fog or painted coat of bitumen cement.

b. **Concrete.** Joints shall be thoroughly cleaned of all foreign material then filled with a hot-poured elastic type joint filler conforming to M 173, ASTM D1190-80 or ASTM D1751-83, D1752-84, D3405-78, D3406-78, D3407-78 or silicone sealants or others as approved by the Engineer. Joint material shall be filled to within 1/2 inch of the surface. Excess material shall be scraped off to provide a smooth riding surface.

12.4 DEVELOPING A "QUALITY" APPROACH TO ROAD REPAIRS

12.4.1 General

Every road and road repair situation is unique. Design criteria and construction standards cannot address every situation but, in order to maintain some form of consistency, these standards have been developed. In most cases, they provide the minimum acceptable standards for construction or repair. Consequently, when strictly applied, they will provide the minimum acceptable product. Therefore, this criteria has been developed to maintain the same integrity of the road pavement and subsurface condition prior to its being cut for utility installations.

To achieve the goal of "Quality" or "Excellence" in road repairs, these criteria shall be viewed as minimum standards when used in conjunction with good planning and judgment. This will restore the road to an acceptable condition with minimal patching failures. In most cases, it will be necessary to exceed the minimum standards to achieve a quality repair.

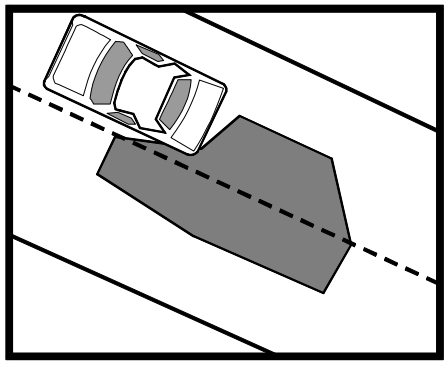
Issues that shall be considered in a quality approach to road repairs are as follows:

12.4.2 Appearance

Does the final appearance of the road suggest the repairs were planned, or that they happened by accident?

1. Consciously or not, the driving public "rates" the appearance of the road system, including road repairs, every day. Road repairs which are not done satisfactorily from a functional point of view may produce a negative reaction from the public if they give the appearance of being poorly planned or executed.
2. The public's perception of road repairs is based primarily on shape, size, and orientation -- the geometry of a patch. The following shall be considered minimum standards for the geometry of a quality patch:
   a. Existing pavements should be removed to clean, straight lines parallel and perpendicular to the flow of traffic. Do not construct patches with angled sides and irregular shapes.

NOT ACCEPTABLE



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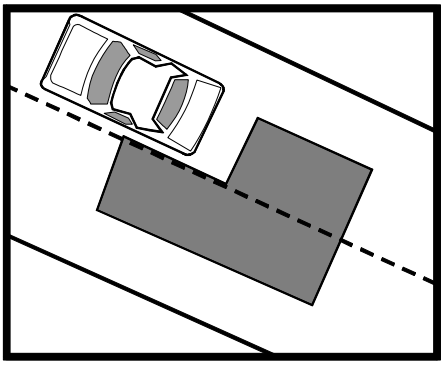
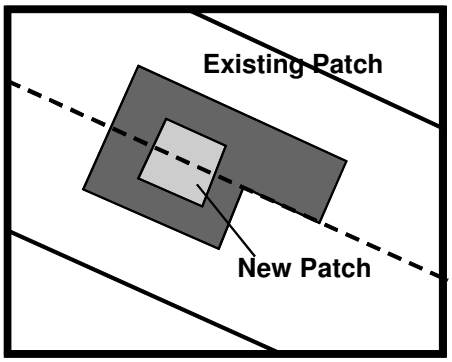


b. Avoid patches within existing patches. If this cannot be avoided, make the boundaries of the patches coincide.

NOT ACCEPTABLE



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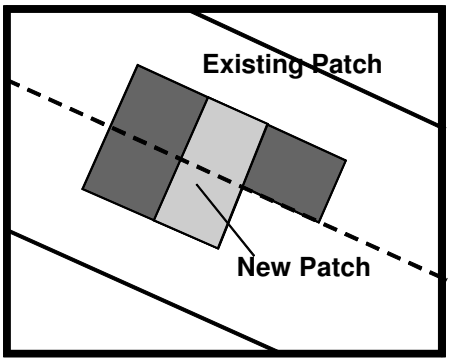
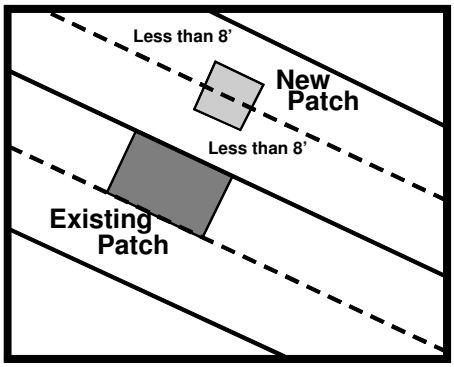


c. Do not "leave" strips of pavement less than one-half lane in width from the edge of the new patch to the edge of an existing patch or the lip of the gutter.

NOT ACCEPTABLE



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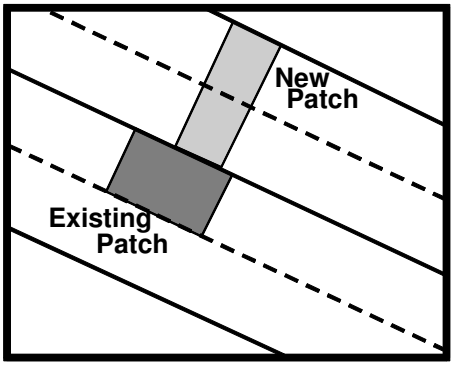
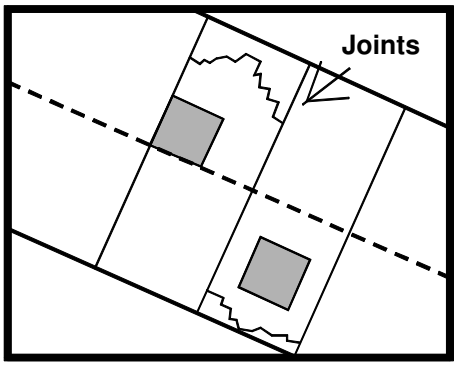
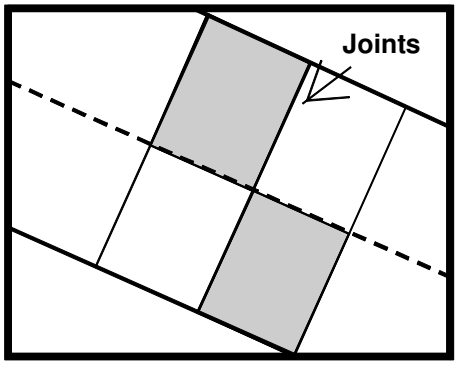


d. In concrete pavements, remove sections to existing joints – repair "panels". In damaged concrete, the limits of removal should be determined in the field by a representative or the Engineer.

NOT ACCEPTABLE

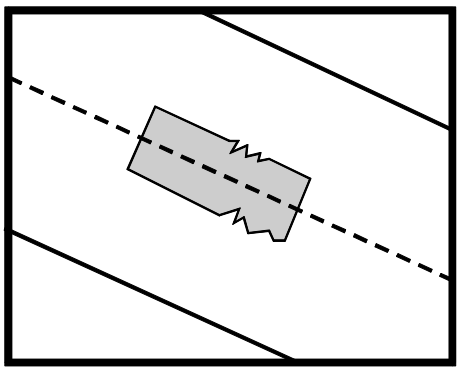


ACCEPTABLE



e. Asphalt and concrete pavements should be removed by saw cutting or grinding. Avoid breaking away the edges of the existing pavement or damaging the remaining pavement with heavy construction equipment.

NOT ACCEPTABLE



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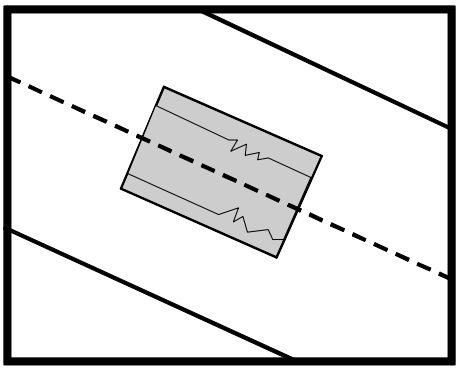
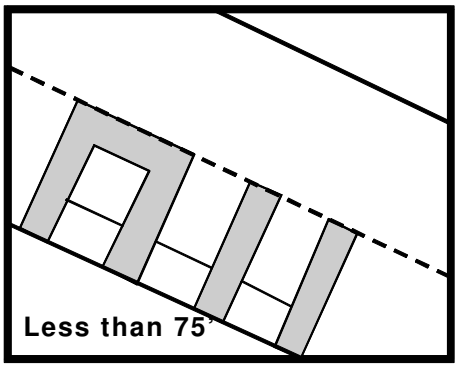


f. In the case of a series of patches or patches for service lines off a main trench, repair the pavement over the patches by grinding and overlay when the spacing between the patches is less than 75 feet (in cases where the existing pavement is in poor condition and may require overlay within the next few years, this requirement may be modified or waived by the Engineer).

NOT ACCEPTABLE



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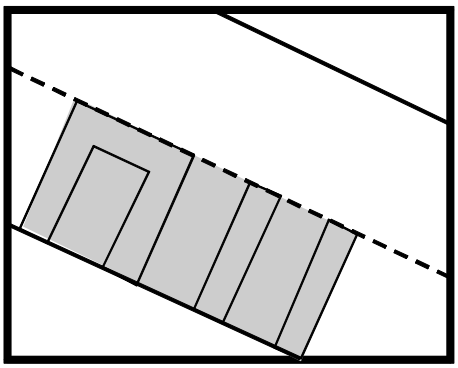

12.4.3 Rideability

Are the transitions on and off of the repair smooth? Does the patch itself offer a smooth ride? Are the joints located outside of the normal wheel path?

1. Completed road repairs should have rideability at least as good as, if not better than, the pavement prior to the repairs. A driver may be able to see a road repair, but in the case of a quality repair, they should not be able to "feel" it in driving normally down the road.

2. Do not place overlays with feathered edges on roads of any classification. Overlays should be placed by first removing the existing pavement to the desired depth by grinding, and then placing the pavement flush with the adjacent surfaces.

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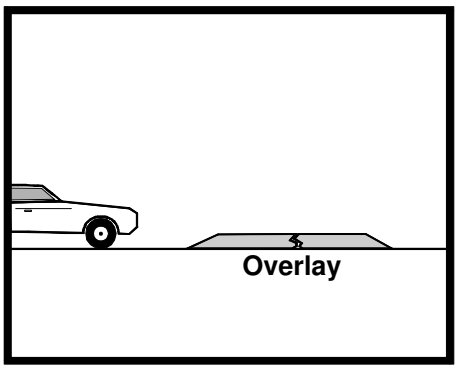

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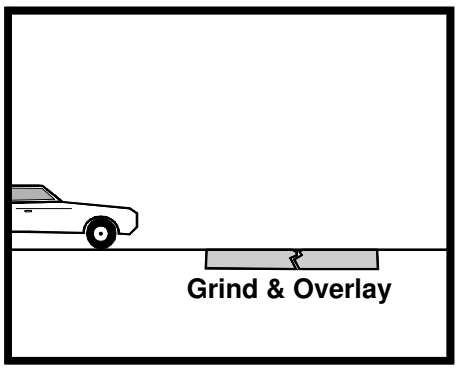
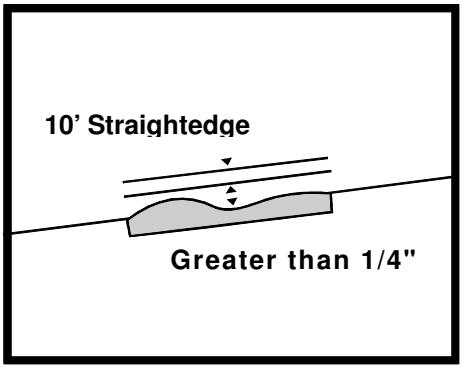


3. Surface tolerances for road repairs should meet the standard for new construction. That is, the finished surface of the road repair, when tested with a ten (10) foot straightedge parallel to the centerline or perpendicular across joints, will show variations measured from the testing face of the straightedge to the surface of the road repair which do not exceed one-quarter (1/4) inch.

NOT ACCEPTABLE



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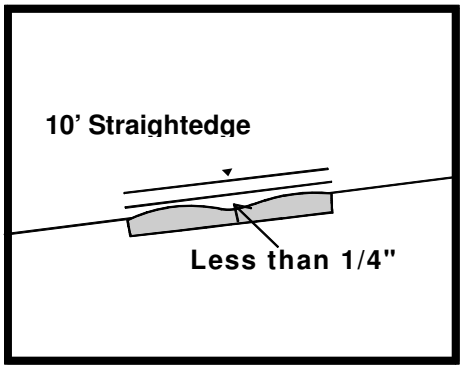


12.4.4 Pavement Management

Is the repair consistent with the long-term pavement management strategy for the particular road?

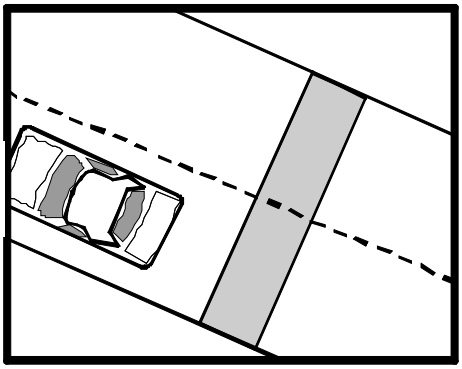
1. Road repairs should leave a pavement in a condition at least as good as, if not better than, the condition prior to the repairs.

2. In most cases, and particularly in the cases of extensive excavation and repairs, it is desirable to survey the existing pavement condition with a representative of the County prior to the work. After completion of the work, survey the pavement condition again to verify that the pavement condition has been maintained or improved.
   a. In the case of minor repairs, these pavement surveys can be made by visual observation.
   b. However, in the case of major projects that involve excessive haul of materials or unusually heavy construction equipment or activity, non-destructive testing of the pavement condition before and after construction may be required.
3. Consideration of pavement management issues may also identify opportunities for joint efforts between the utilities and the County.

   For example, if the repair of a utility line requires an overlay on half of a road, and that the condition of the remaining half of the road warrants an overlay, the County may decide to overlay the entire road, with County and the utility splitting the cost of the overlay. In such a case, the utility may be able to save the cost of grinding half the road. Coordination for these types of cooperative repairs should occur as far in advance of actual construction as possible.

   a. Transverse patches on arterial and collector roads shall be overlaid across the entire road width for a distance of two (2) feet minimum on all sides of the trench.

NOT ACCEPTABLE



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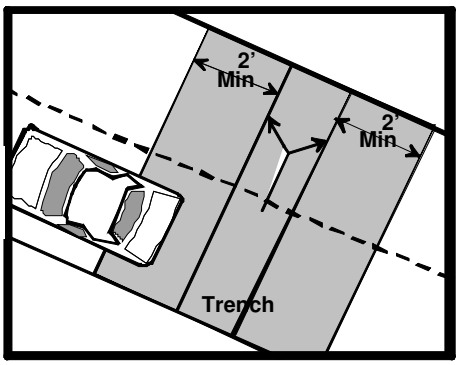
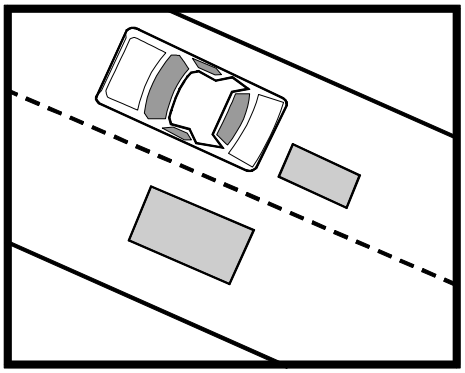


b. Do not allow the edges of patches to fall in existing wheel paths. The edges of patches parallel to the direction of traffic shall be limited to the boundaries of lanes or to the centerline of travel lanes.

NOT ACCEPTABLE



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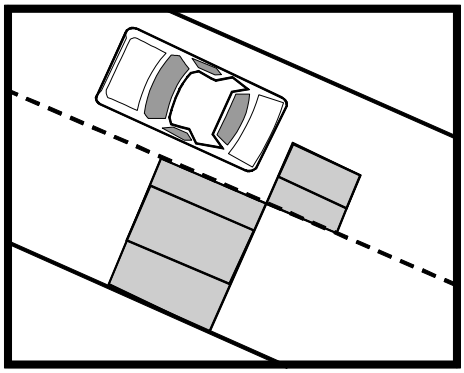
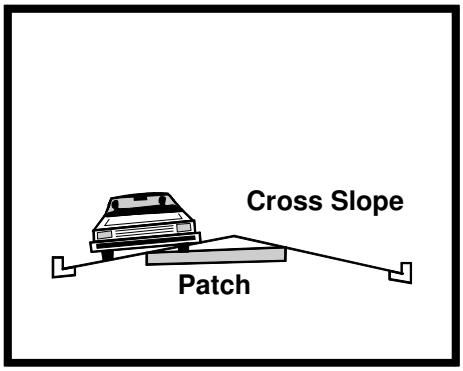


c. Patches should have a smooth longitudinal grade consistent with the existing roadway. Patches should also have a cross slope or cross section consistent with the design of the existing roadway.

NOT ACCEPTABLE



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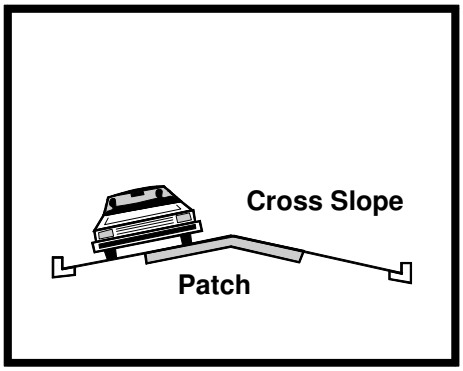

12.4.5 Future Maintenance

Will the repair pose any future maintenance problems or make future maintenance more difficult?

1. Excavations and road repairs, even when well constructed, shorten a pavement's life. Several types of road distress, settlement, alligator cracking, and potholes, often show up around patches. Quality road repairs should attempt to reduce the occurrence of these types of distress.

2. Avoid weakening or destroying the existing pavement around an excavation with heavy construction equipment, stockpiling or delivery of materials, etc. When damage does occur, remove the damaged pavement, extending the limits of the road repair, before replacing the pavement. Remember, no stockpiling of backfill or road building materials is permitted on the pavement.

   a. When the proposed excavation falls within ten feet of a section of failed pavement, the failed area shall be removed to sound pavement and patched. Scarring, gouging, or other damaged pavement adjacent to a patch shall be removed and the pavement repaired.

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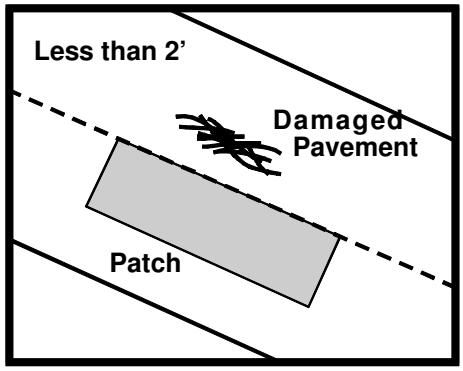

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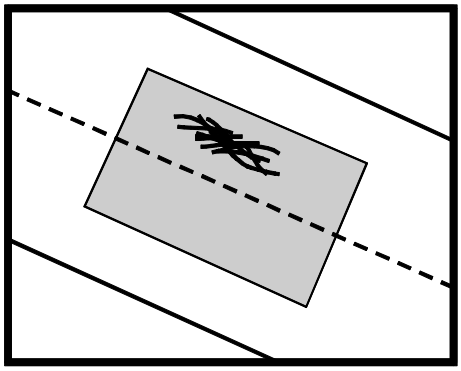

   b. In the case of older pavement where the likelihood of cracking and potholes next to the patch is greater, it may be necessary to extend the "shoulders" of the pavement beyond the two-foot minimum, and reinforce this area with a geotextile. "T" cutting is required for all repairs.

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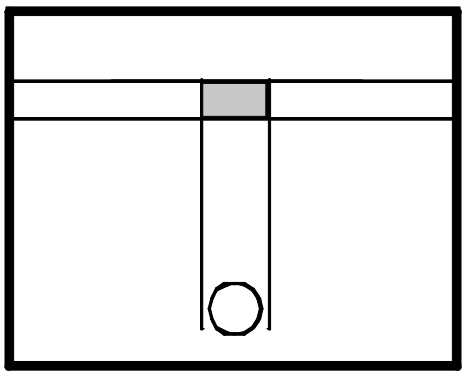

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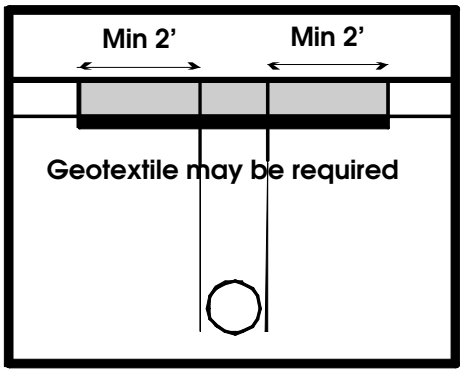
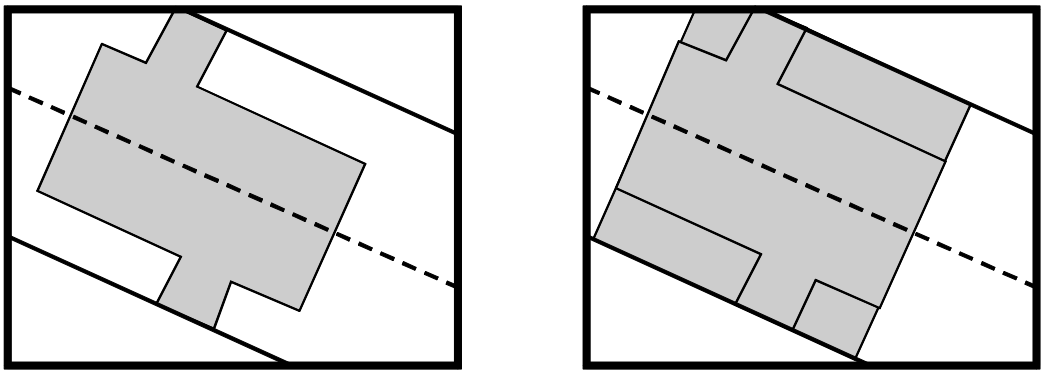


   c. For patches in asphalt, a tack coat shall be applied to all edges of the existing asphalt before placing the new pavement. After placing the new asphalt, all seams (joints) between the new and existing pavements shall be sealed with an asphalt tack coat or rubberized crack seal material.

d. Avoid frequent changes in width of patches to simply removal of adjacent pavement failures in the future.

NOT ACCEPTABLE **ACCEPTABLE**



12.5 *TESTING*

12.5.1 Description

The contractor is required to provide material testing for each phase of the work at no cost to the County. The independent Geotechnical Testing Firm chosen to perform this work for the Contractor must be qualified and identified on the Permit application.

12.5.2 Testing Frequencies

1. The number of density tests required may be increased if directed by the Engineer. The costs of any testing, as required, shall be borne by the Contractor. Proctors shall be determined prior to backfilling. Independent lab results shall be faxed to the County as soon as possible. The horizontal frequencies of density tests are as follows:
   a. Utility Mains - One test per 100 linear feet per lift.
   b. Service Lines - One test per each service per lift.
   c. Manholes and valve boxes per each lift.
2. Following are the minimum number of tests required for each construction activity. These tests must be submitted to the Engineer on a daily basis as acquired and shall be hand delivered or faxed to the County.
   a. Native or imported backfill - One (1) test for every two (2) vertical feet and every one hundred (100) feet horizontally, or some fraction thereof with at least one (1) test per each lift.
   b. Flowable-fill – Testing may be required at the discretion of the Engineer.
   c. Concrete pavement, curbs, gutters and sidewalks – Testing to be conducted for every 100 cubic yards or portion thereof, with a minimum of one. The types of testing required shall be as prescribed by the County.

d. Asphalt Pavement
    1) Asphalt content – One test per 500 tons or fraction thereof of mix produced, minimum of one test per job.
    2) Gradation – Aggregate: one test per 500 tons or fraction thereof of mix produced, minimum of one test per job.
    3) In-place density – One test per 500 tons or fraction thereof of mix placed, minimum of one test per job.
e. Aggregate base course materials –One test per 400 lane feet. No less than two (2) tests per excavation.

12.6 INSPECTION

All construction work within the public rights-of-way shall be subject to inspection by the Engineer and certain types of work may have continuous inspection. It shall be the responsibility of the Contractor to provide safe access for the inspector to perform the required inspections.

It shall be the responsibility of the person performing the work authorized by the Permit to notify the Engineer when the work is ready for inspection. The Engineer requires that every request for inspection is to be received at least twenty-four (24) hours before such inspection is desired. Such requests may be in writing or by telephoning or faxing the Engineer.

The Engineer may make or require other inspections of any work as deemed necessary to ascertain compliance with the provisions of these Standards. Any work performed without the required inspections shall be subject to removal and replacement at the Contractor's expense, regardless of the quality of the work.

Where large scale projects exceed the ability of the County to provide inspection, the Contractor or utility company will incur the cost of a private inspection firm. This inspection firm will be mutually agreed upon by the Permit applicant and the County prior to issuance of the Permit.