Appendix D

Phelps County

Road Regulations for Road Construction

STATE OF MISSOURI)
)
COUNTY OF PHELPS)

FOR THE COUNTY COMMISSION OF PHELPS COUNTY, MISSOURI

ORDINANCE TO ESTABLISH REGULATIONS FOR THE CONSTRUCTION OF ROADS AND FOR ROAD USE.

Effective Date of Regulation June 1, 2007

Comes now the County Commission of Phelps County, Missouri and does hereby order, adopt and ordain the following: It is identified that regulations for the construction of roads (Road Specifications) for the County road system and road use on County roads are hereby established. These regulations supersede all previous regulations, policy, and direction used on road construction, reconstruction and use within the County Road System.

Road and Right-of-Way Dimension
All Right-of-Way accepted by the County shall be at least 50 feet in width. If construction slopes extend beyond 50 feet, additional right-of-way will be dedicated to the County to insure that all construction slopes will be within the County right-of-way. In situations where slopes extend beyond the normal 50-foot right-of-way, the right-of-way will extend two feet beyond the toe of the slope or two feet beyond the top of the cut.
See typical road cross-section sheet.

Roads with no outlet (dead end roads) shall terminate in a cul-de-sac with a right-of-way diameter of 100 feet and a surfaced diameter of 80 feet.

Any road to be accepted by the County will have a roadway surface (traveled way) of 24 feet. Each roadway edge will have a shoulder of 3 feet in width.

Grade
The maximum grade of a County road shall be 12 feet vertically in 100 feet horizontally (12%). The maximum grade of a road with no outlet (dead end road) shall be 8 feet vertically in 100 feet horizontally (8%).

Construction Methods
Subgrade: All organic, spongy, unsuitable materials and any portion of the subgrade that will not compact when rolled shall be removed and replaced with stable material. All rock, boulders, roots, downed timber, slash and debris in the roadbed shall be removed from the subgrade, and all construction debris shall be removed from the right-of-way to be dedicated to the County. The prepared, stripped subgrade shall be compacted using rolling equipment applied uniformly over the entire road surface. Subgrade compaction shall not be accomplished while the subgrade material is frozen, or when the moisture content is to high to prevent achieving 95 % density based upon AASHTO T-99. A Registered Professional Engineer shall inspect the

density of the subgrade for compliance. The subgrade will have a crown of one-half inch per foot from the centerline of the roadway.

Embankment: All embankment fills shall be constructed using the same construction methods identified for subgrade. Lifts shall not exceed 8 inches.

Base Course

The base course shall be composed of a compacted depth of six inches of crushed limestone, and derived from the crushing of parent rock with no clay or silt added. The Plastic Index of the minus #200 fraction shall be between 4 and 9 and have a maximum liquid limit of 35. The LA Abrasion test (AASHTO T96) shall be less than 40% passing. The crushed limestone shall conform to the following gradation.

Passing Sieve	Percent by Weight
1-1/2 inch	100%
¾ inch	65-90 %
#4	30-65 %
#16	15-30 %
#200	8-20 %

The base course shall be rolled with a pneumatic or steel wheel roller weighing at least 8 tons once final grading has been completed. Rolling shall progress gradually from side to side toward the center, rolling parallel to the centerline. Rolling shall continue until the entire road surface has been rolled and a compaction of 95% AASHTO T99 has been achieved, and shall be inspected by a Registered Professional Engineer. The finished road surface shall have a crown of one-half inch per foot.

Surface Course

The asphalt surface course shall meet the requirements of Section 401, Plant Mix Bituminous Base and Pavement of the Missouri Standard Specifications for Highway Construction, latest edition, and shall be designed by a registered professional engineer. The asphalt shall be placed in a compacted layer of not less than two inches. The asphalt binder shall be identified in the paving design information provided to the County for approval. The aggregate used for the asphalt shall conform to BP-1 gradation requirements in the identified specifications. Chip and Seal surface course may be used upon approval of the County Commission. Approval for chip and seal surface coarse will be based upon anticipated roadway traffic, thoroughfare traffic, the classification of connecting County roads, and other relevant items identified by the requesting party. The chip and seal surface course shall be designed by a registered professional engineer.

Curb and Gutter

Curb and gutter may be constructed with the approval of the County. Concrete curb and gutter shall be constructed according to the lines and grades established by the design. The concrete shall meet the requirements of the Missouri Department of Transportation. The curb and gutter shall be designed by a registered professional engineer, and the final design shall be approved by Phelps County. The forms to construct the curb shall be of metal, free of marks or out of alignment, and shall be rigidly held in position. The final position of the forms shall be approved

by a registered professional engineer prior to placement of concrete. Concrete shall be placed in the forms in a manner to prevent segregation, and tamped or vibrated sufficiently to prevent voids in the concrete. The concrete shall be finished with a smooth surface and even in conformity with the lines and grades of the design. The finish surface shall be worked with rollers or floats. Expansion joints shall be provided every 30 feet and false joints every 10 feet. The curb and gutter is not part of the roadway width.

Drainage Structures

Ditches, cut and fill slopes shall conform to the standard cross-section drawings identified in the Road Specifications for Phelps County. The minimum slope for a ditch line is 1 %. The length of the culvert shall be determined by the dimensions of the roadway cross-section at the location of the culvert. Additional length may be necessary if riprap is required, if the culvert is skewed, or if the road cross-section is side cast construction. Culvert pipe diameters and lengths shall be identified in the storm water drainage plan for each subdivision. Roads that are not part of a subdivision the culvert pipe shall be sized based upon passing the 10-year storm without overtopping the road. The design shall be based upon the methods described in the Missouri Department of Transportation Project Development Manual, latest edition.

Culverts 48 inches or smaller shall be dual wall, high-density polyethylene (NDPE) pipe (ADS N-12 or approved equivalent). Culverts greater than 48 inches in diameter may be either polyethylene (HDPE) or corrugated metal pipe. The minimum allowable culvert diameter shall be 15 inches, and the minimum cover over the installed culvert shall be 12 inches. All culverts shall be laid on a prepared, compacted subgrade and shall be properly backfilled to support the pipe. Culverts at driveways shall be a minimum of 15 inches in diameter. Riprap or other erosion control measures shall be place around the downstream end of each culvert to control erosion. Riprap or other erosion control measures shall be placed in roadside ditches to control erosion as directed by the County Engineer.

Dual wall, high density polyethylene (HDPE pipe must meet or exceed the material requirements of the latest editions of AASHTO M294 and be installed as required by ASTM D2321. A metal or concrete end section must be used at each end of the culvert. Polyethylene pipe must be backfilled with crushed rock at least 4 inches above the crown of the pipe. All installations shall meet the manufacture's recommendations for handling and installation. The minimum trench width for culvert pipe shall be two times the pipe diameter for pipes less than 24 inches in diameter and for pipes greater than 24 inches in diameter the trench width shall be the diameter of the pipe plus 24 inches.

Corrugated metal pipe shall be galvanized or aluminized. Corrugated metal pipe shall meet or exceed Section 1020, Corrugated Metallic-coated Steel Culvert Pipe, Pipe-arches and End Sections of the Standard Specifications for Highway Constructions, latest edition published by the Missouri Department of Transportation. The minimum wall thickness for corrugated metal steel pipe shall be 14-gage (0.079 inches). Each culvert design and location must be approved by the County Highway Superintendent prior to construction.

Storm Water Drainage Control
Prior to acceptance of any subdivision roads for County maintenance, a storm water drainage plan for all subdivision runoff will be designed by a registered professional engineer. The storm water conveyance system shall be designed to accommodate flows from a 10-year design storm using the methods identified in Project Development Manual, latest edition published by the Missouri Department of Transportation. The drainage improvement system shall be designed to pass the 100-year design storm without damage to the conveyance system. If the subdivision storm water drainage plan indicates that flows from the subdivision will adversely impact the county drainage systems, either a storm water retention system with the subdivision will be required, or replacement of the County drainage system that is identified as inadequate to pass the increased runoff will be part of the storm water drainage plan. The cost of the County drainage system to be upgraded will be the responsibility of the subdivision developers.

Storm water drainage facilities located within the subdivision lots and common land areas shall be the maintenance responsibility of the property owner or subdivision trustees. The storm water drainage system within the subdivision shall be separate and independent of the sanitary sewer system.

Road Closure and Vacation Policy
Closure of County Maintained Roads-A County maintained road or access points to a County maintained road may be closed to the Public when in the judgment of the County Commission the road is no longer used by the traveling public. Such roads have a history of county maintenance, but road use has change to access for private ingress and egress. Roads so identified by the County Commission may be closed to public use, except for authorized persons. County maintenance on closed roads will be discontinued. The purpose of a road closure is to initiate the statutory vacation by means of abandonment. The closure of a County maintained road shall not affect the title to real estate unless and until the road is vacated.

Vacation of County Roads-County roads shall be vacated as authorized by law and the applicable regulations of Phelps County. The County shall notify all public and private utility service providers known or discovered to use the right of way proposed for vacation prior to final action. County roads will be vacated with the title reverting to the adjoining roadway property owners of record on the date of the action of vacation. County roads may be vacated in accordance with the following procedures:

Subdivision Roads-Roads and right of way located in platted subdivisions may be vacated in accordance with the requirements of subdivision regulations of Phelps County or the Revised Statutes of Missouri.

Other Public Roads-Other County roads located in the unincorporated areas of Phelps County and not located within a platted subdivision shall be vacated in accordance with the provisions of Section 228.110 Revised Statutes of Missouri upon petition or by means of abandonment due to non-use by the public under Section 228.190 Revised Statutes of Missouri.

Registered Professional Engineer

All references to an Engineer in these regulations requires the use of a Registered Professional Engineer in the State of Missouri. All bridges, cast-in-place culverts and critical structures shall be designed by a Registered Professional Engineer. The developer shall provide a signed and sealed design drawings and specifications to the County prior to beginning construction. Where inspection is required the engineer must provide the required certification. Prior to acceptance by the County, the engineer shall provide certification to the County that construction was completed in compliance with the plans, specifications, and all county requirements. No roads will be accepted or titles exchanged until all certifications and construction have been reviewed and accepted.

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Presiding Commissioner County
Attorney

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Commissioner

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Commissioner