

APPENDIX A

DESIGN SPECIFICATIONS FOR NEW ROAD CONSTRUCTION

1. GENERAL SPECIFICATIONS

- 1.1 **Specifications:** Plans shall be prepared by a professionally registered engineer duly authorized to conduct business in the State of Missouri.
- 1.2 **All Roadway Construction:** All newly constructed roads, sidewalks and storm drainage shall conform to the typical drawings shown in **Appendix B-1**. The geometric requirements for roadway construction can be found in **1.10, Table A** of this section. See **Appendix A-1** for Construction and Materials Specifications and **Appendix D** for Plan Submittal Requirements.

All new road systems shall be constructed with roadways intersecting at no less than 80 degrees and no more than 100 degrees to each other.

All roadways without curb & gutter shall have a 24-inch v-bottom ditch (minimum depth, based on a 15-inch diameter CMP) with 3:1 in slopes (minimum) and 3:1 back slope (minimum). All ditch flow lines with grades of 3% or greater must have erosion control blanket installed. Blanket must be centered on flow line. If ditching is unnecessary on a section of roadway, the slope from the edge of the roadway or shoulder shall be no less than 3:1. This rule shall also apply to the slope beginning at the back of curb on curb and gutter roadways, which do not require sidewalks.

All roadways where the slopes are less than these minimums may require guardrail. The design engineer shall refer to figure 5.1 on page 5-3, Chapter 5 of the 1996 AASHTO Roadside Design Guidelines to determine whether guardrail is necessary based on slope and height of embankment. If guardrail is necessary it shall be placed such that the face of the guardrail is at either the back of curb or the edge of the shoulder and a 2 foot clear zone shall exist with the same slope as the shoulder or curb section behind the guardrail assembly.

All newly constructed roadways with no outlet shall end in a cul-de-sac, either permanent or temporary, unless the road is less than 100 feet long and less than 2 subdivision lots in depth. Roadways that are to be extended may end in temporary cul-de-sacs at the discretion of the Director. See **Drawings 110.08 –110.11** for cul-de-sac information.

- 1.3 **Alleys:** Alleys, where allowed by the Boone County Subdivision Regulations, shall be 22 feet in width with a thirty-foot minimum right-of-way. In all other respects, alleys shall conform to the pavement cross-section and geometric requirements for a local road.

- 1.4 **Sidewalks:** Sidewalks, where required by the Boone County Subdivision Regulations, shall be built according to **Appendix A-1, Section 234** and **Appendix B, Drawings 420, 430, 431, 432, 433 and 435.**
- 1.5 **Mailbox/Structures/Obstructions/Objects Within Right-of-Way:** No mailbox or newspaper delivery box (hereafter referred to as mailbox) or structures / objects will be permitted within the Boone County right-of-way which interferes with the safety of the traveling public or the function, maintenance, or operation of the roadway system.
- 1.5.1 **Mailbox Location:** No mailbox shall be located in a place where vehicular access to it is prohibited by law or regulation. Mailboxes shall be located on the right-hand side of the roadway in the direction of the delivery route. The bottom of the box shall be set at an elevation established by the U.S. Postal Service, usually between 42" and 48" above the roadway surface. The roadside face of the box shall be offset from the edge of the traveled way or face of curb, a minimum distance of 8" and shall not exceed 12". Notwithstanding these requirements the location and construction of mailboxes shall conform to the rules and regulations of the U.S. Postal Service. A mailbox installation that does not conform to the provisions of the regulation is an unauthorized encroachment under section 229.030, RSMo.
- Mailbox installation that conforms to the following criteria will be considered acceptable unless in the judgement of the Boone County Director of Public Works the installation interferes with the safety of the traveling public or the function, maintenance, or operation of the roadway system.
- 1.5.2 **Shoulder and Parking Area Construction:** It will be the responsibility of the postal patron to inform the Boone County Public Works Department of any new or existing mailbox installation where shoulder construction is inadequate to permit all-weather vehicular access to the mailbox.
- 1.5.3 **Removal of Nonconforming or Unsafe Mailboxes / Structures / Obstructions / Objects Within Right-of-Way:** Upon notification by the Boone County Public Works Department, the owner of property containing a mailbox or other structure, object or vegetation that is found to violate the requirements of these standards or otherwise obstruct the public right of way shall be considered an unlawful encroachment and shall be subject to removal by the Department. At the discretion of the Boone County Public Works Director and based on an assessment of hazard to the public, the Director or his designee shall give the property owner or other person responsible for the unlawful encroachment not less than 24 hours, nor more than 30 days, written notice to remove or eliminate such encroachment from the right of way. If such encroachment

is not removed or eliminated within the time specified in the notice, the Department may remove the encroachment from the right-of-way.

No structure, object or vegetation which impedes sight distance from traffic or regulatory signs shall be permitted in the area between the curb and sidewalk, or edge of a roadway or its shoulder and ditch line, or otherwise placed or planted within the right-of-way.

1.5.4. Maintenance Repairs/Reconstruction: Persons who own or are responsible for the placement of mailboxes or other structures, objects, trees and other landscaping within the right of way shall be obligated to relocate or remove or eliminate any such item if necessary for performance of right of way maintenance or repairs or reconstruction. The Boone County Public Works Department shall give such persons a minimum of 48 hours notice to remove any of the above-mentioned items before work begins unless work is deemed an emergency.

1.6 Unauthorized Use of County Maintained Road Right of Way:

The deposit without prompt clean-up or removal of mud or debris, or the storage of equipment or construction materials on county maintained roads without a right of use permit is prohibited. Any person who engages in this prohibited activity, may be issued a Notice of Violation (NOV) by the Public Works Department and thereafter the responsible party shall remove such mud, debris, equipment, or construction materials specified in the NOV within 24 hours unless violation is deemed an emergency, then removal shall occur immediately. In addition to any other remedy which may be provided by law or regulation, noncompliance with such notice may result with the Boone County Maintenance Division removing or having removed such mud or debris and the cost of such removal shall be paid by the responsible party. If the responsible party cannot be identified, the owner of property from which mud or debris originated (if identifiable) will be held responsible and will be issued a NOV. If mud or debris is deposited on street due to erosion, the owner of property, developer, or both, shall be deemed responsible and may be issued a NOV.

If contractor(s) wish to use county right-of-way or roadway as a staging area during construction activities, a Right of Use Permit will be required as per **Appendix C** of this regulation. A Right of Use Permit will be issued if it is determined that the activity will not interfere with the safety of local traffic. A Contractor issued such a permit must comply with directions of permit or permit will be canceled and NOV will be issued.

- 1.7 Minimum Pipe Size:** All storm water culvert pipes shall be a minimum of 15 inches in diameter. All storm water culvert pipes under roadways shall be a minimum of 18 inches in diameter.

1.8 **Materials Allowed (Culverts):** Reinforced Concrete Pipe (RCP), Corrugated Metal Pipe (CMP) and High Density Polyethylene (HDPE) .

Roadway Culverts RCP and CMP. CMP shall be both zinc and polymeric coated.

Storm Sewer Culverts RCP, CMP and HDPE.

All pipes shall be used and installed in conformance with the manufacturer’s specifications and guidelines. All roadway and storm water pipes shall have mitered ends. Erosion control blanket shall be applied at all roadway inflows and outflows of each pipe if rip-rap is not required. The Erosion Control Blanket shall be the width of material and a minimum of 6- feet in length. See **Section 260 of Appendix A-1** for Culvert Construction and Material Specifications. For driveway procedures, see **Appendix B**.

1.9 **EROSION, SEDIMENT AND STORMWATER CONTROL PLAN**

1.9.1 **Introduction** - This section sets forth the requirements of submitting an erosion and sediment control plan in dealing with the control of non-point source (NPS) pollution. All development and road plans submitted for approval to Boone County must be accompanied by an erosion and sediment control plan as set forth in these regulations.

1.9.2 **Definitions**

1.9.2.1 **Certified Contractor** - An individual who has received training and is licensed by (State or Local Environmental Agency) to inspect and maintain erosion and sediment control practices.

1.9.2.2 **Clearing** - Any activity, which removes the vegetative surface cover.

1.9.2.3 **Drainage Way** - Any channel that conveys surface runoff throughout the site.

1.9.2.4 **Erosion Control** - Measures that prevent erosion.

1.9.2.4 **Erosion and Sediment Plans** - A set of plans prepared by or under the direction of a licensed professional engineer

1.9.2.5 **Control Plan** - indicates the specific measures and sequencing to be used controlling sediment and erosion on a development site before, during and after construction.

1.9.2.6 **Grading** - Excavation or fill of material, including the resulting conditions thereof.

- 1.9.2.7 **Perimeter Control** - A barrier that prevents sediment from leaving a site either by filtering sediment-laden runoff, or diverting it to a sediment trap or basin.
- 1.9.2.8 **Phasing** - Clearing a parcel of land in distinct phases, with the stabilization of each phase before the clearing of the next.
- 1.9.2.9 **Sediment Control** - Measures that prevent eroded sediment from leaving the site.
- 1.9.2.10 **Site** - A parcel of land, or a contiguous combination thereof, where grading work is performed as a single unified operation.
- 1.9.2.11 **Stabilization** - The use of practices that prevent exposed soil from eroding.
- 1.9.2.11 **Start of Construction** - The first land-disturbing activity associated with a development, including land preparation such as clearing, grading and filling; installation of streets and walkways; excavation for basements, footings, piers or foundations; erection of temporary forms; and installation of accessory buildings such as garages.
- 1.9.2.12 **Watercourse** - Any body of water, including, but not limited to lakes, ponds, rivers, streams, and bodies of water which delineated by Boone County.
- 1.9.2.13 **Waterway** - A channel that directs surface runoff to a watercourse, or to the public storm drain.

1.9.3 Requirements of the Erosion and Sediment Control Plan

All persons who disturb land that would result in the requirement to obtain a Land Disturbance Permit per the Missouri Department of Natural Resources (MoDNR)- Water Pollution Control Program, must submit a copy of Form G- Application for Storm Water Permit and Form E- General Permit: Land Disturbance; along with the Storm Water Pollution Prevention Plan (SWPPP) to the Boone County Public Works department for review. If the MoDNR approves the application, a copy of the approval letter must be forwarded to the Boone County Public Works Department.

1.9.3.1 A brief narrative to include:

- 1.9.3.1.1 Project description (purpose, size of area to be disturbed, and location).

- 1.9.3.1.2 Before and after site description (topography, principal drainage way for the site, land cover condition, percent of impervious area, and the associated increase of runoff volume from a 25-year 24-hour storm event).
- 1.9.3.1.3 Adjacent property. (This should include the identification of land use and cover conditions.)
- 1.9.3.1.4 Soils descriptions.

1.9.3.2 Planned Best Management Practices to include:

- 1.9.3.2.1 Beginning and completion date of construction activities.
- 1.9.3.2.2 A sequence of all construction-related BMP and vegetative activities. Include any winter shutdowns.
- 1.9.3.2.3 A pre-construction conference is recommended and should be scheduled one week prior to land disturbance to orientate contractors to the erosion, sediment, and storm water control plan. Notice of the pre-construction conference date should be provided to Public Works one week prior to the meeting.
- 1.9.3.2.4 A listing of erosion and sediment control BMPs to minimize pollution during construction along with location and installation schedule for each.

1.9.3.3 Operation and Maintenance (O&M) plan for BMPs.

- 1.9.3.3.1 Temporary measures: a plan for the schedule of maintenance during construction along with any operational criteria.
- 1.9.3.3.2 Permanent measures: a plan for the long term maintenance and operation including entities responsible, financial obligations for continued O&M, designated access for maintenance, and schedule of O&M activities.
- 1.9.3.3.3 Maintenance during and after construction may include practice re-establishment, repair, sediment removal, mowing, etc.

1.9.3.4 Detailed drawings and specifications of BMPs with supporting calculations

- 1.9.3.4.1 Detailed drawings can be utilized along with standard engineering drawings of structures and measures so long as site specific elevations, dimensions, etc., are shown on drawings. A recommended resource is the field manual entitled "Protecting Water Quality", available through the MoDNR Technical Assistance Program.

- 1.9.3.4.2 Support data and calculations should be sufficient to allow reviewers to reproduce design procedure of structures and measures. Sources of information should be cited.
- 1.9.3.4.3 One permanent benchmark should be clearly labeled on drawings. If elevations are tied to a USGS benchmark, description and elevation of benchmark will be provided.
 - 1.9.3.5 **Vicinity USGS Quad Map** - This map should identify the location of:
 - 1.9.3.5.1 Land disturbing activity.
 - 1.9.3.5.2 Site storm water discharge.
 - 1.9.3.6 **Site Topographic Map** - This will provide pre-construction site topography while locating drains, property lines, construction work limits, and any utilities. Scale will be no less than 1"=60'. Trees to be preserved will be located on this map.
 - 1.9.3.7 **Site Development Map**- This map should identify the location of buildings and associated paved areas, raw materials or finish product stock pile areas, equipment storage areas, processing areas, construction entrances, access or haul roads, and finished grades on a duplicate of the site topographic map. See **Appendix E** for sample checklist for site plan map preparation.
 - 1.9.3.8 **Site erosion, sediment, and storm water control map** - This map should identify the location of all the BMPs (temporary and permanent) on a duplicate of the site topographic map along with the location of all permanent construction and associated paved areas and finished grades.
 - 1.9.3.9 **Name, address, and telephone number** of the contact personnel responsible for developing and implementing the plan.
 - 1.9.3.10 **A continuing education plan** for all employees to inform them of plan requirements is recommended.
 - 1.9.3.10.1 As work progresses and various subcontractors and/or new employees are brought into the work site, each should be familiarized with plan. At the beginning of each workweek, scheduled items of the plan to be implemented during that week should be brought to the attention of the impacted work force.

- 1.9.3.10.2 For post construction assurance and responsibility, operation and maintenance training will be provided to personnel responsible for continued operation of the plan after the project is completed. This should include an annual review of schedule for maintenance activities.

1.9.4 Inspection

1.9.4.1 Boone County Public Works or designated agent shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the contractor wherein the work fails to comply with the erosion and sediment control plan as approved. The approved Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the Boone County Public Works Department shall be maintained at the site during the progress of the work. In order to obtain inspections, the contractor shall notify the department at least two (2) working days before the following:

1.9.4.1.1 Start of Construction

1.9.4.1.2 Erosion and sediment control measures are in place and stabilized.

1.9.4.1.3 Site Clearing has been completed

1.9.4.1.4 Rough Grading has been completed

1.9.4.1.5 Final Grading has been completed

1.9.4.1.6 Close of the Construction Season

1.9.4.1.7 Final Landscaping

1.9.4.2 The contractor or his/her agent shall make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved erosion and sediment control plan(s). The purpose of such inspections will be to determine the overall effectiveness of the control plan, and the need for additional control measures. All inspections shall be documented in written form and submitted to Public Works Department at the time interval agreed to at the pre-construction meeting. See **Appendix E** for a sample checklist for site inspection purposes.

1.9.4.3 Boone County Public Works or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed under Section 1.9.4.2 above.

1.9.5 Enforcement

1.9.5.1 In the event that any person holding a set of approved erosion and sediment control plans pursuant to these regulations, violates the terms of these regulations, or implements site development in such a manner as to materially adversely affect the health, welfare, or safety of persons residing or working in the neighborhood or development site so as to be materially detrimental to the public welfare or injurious to property or improvements in the neighborhood, Boone County Public Works Department or its designee, may suspend or stop the site development work progress.

1.9.5.2 No person shall construct, enlarge, alter, repair, or maintain any grading, excavation, or fill, or cause the same to be done, contrary to or in violation of any terms of these regulations. Any person, partnership, or corporation violating any of the provisions of these regulations, shall be subject to bearing all costs of penalties and damages associated with the applicable provisions prescribed by law.

1.10 **DESIGN CRITERIA FOR STORM WATER DRAINAGE FACILITIES**
See **Appendix F**

1.11 **ROAD CONSTRUCTION STANDARDS** - All new roads constructed within the unincorporated areas of Boone County shall be constructed in accordance with the specifications and standards as shown in **Table A** of this section.

TABLE A

ROAD CONSTRUCTION MINIMUM STANDARDS				
	Arterial	Collector	Local	Commercial / Industrial
ADT	>2500	750-2500	<750	By Land Use
Right of Way Width	100 ft.	66 ft.	50 ft.	66 ft.
Cul-de-sac R.O.W. Radius	N/A		47 ft.	66 ft.
Paving	Yes			
Curb and Gutter	See note #1			Yes
Design Speed	40 mph	30 mph	30 mph	30 mph
Minimum Pavement Radius at Intersecting Streets	30'			
Minimum Curve Radius	730 ft.	575 ft.	100 ft.	250 ft.
Maximum Grade	7%	8%	10%	7%
Minimum Grade	1 %			
Stopping Sight Distance	275-325 ft.	200 ft.		
K Value - Sag Curves	60-70	40		
Clear Zone	10 ft.			
Driveway Locations	See Appendix B-1, Drawings 410.01A & 410.01B			
Bridge Design Loading	HS20-44/3S2			
Roadway Cross-Sections	See Appendix B-1, Drawings 110.01-110.11			

NOTES:

1. **Curb and gutter** requirements for new subdivisions will be stated in the Boone County Land Use Regulations, Chapter I, Subdivision Regulations dated June 17, 1995 as amended.
2. **All Corner Lots** – Driveway approaches and sidewalks shall be placed according to these regulations before roadways will be accepted for maintenance.
3. **All utilities** to be located within Right of Way must be installed before roadways will be accepted for maintenance.
4. **All cul-de-sacs** shall be less than 1000 feet from the nearest street that has 2 outlets within the roadway system. Distance is measured from the centerline of the adjacent street to the center of the cul-de-sac.
5. **In cases** where the Subdivision Regulations and the Roadway Regulations conflict, the most stringent Standard shall apply