

BOARD OF LAPEER COUNTY ROAD COMMISSIONERS



Policy On:

CONSTRUCTION OF COMMERCIAL DRIVEWAYS, PRIVATE ROAD APPROACHES, AND PUBLIC ROADWAYS

Adopted: December 19, 2005
Revised: October 21, 2009

INTRODUCTION

The County of Lapeer, Michigan has adopted these *Road Standards* in order to:

1. Set specific and uniform road design criteria for developers and other private parties which require County approval to construct or improve roads or facilities in the right-of-way.
2. Guide the County's own construction and reconstruction of County roads
3. Support the County's growth and development while maintaining the general safety and needs of the traveling public.

While developing this publication, the Board of Lapeer County Road Commissioners gave great consideration to public safety, ease of travel, pleasant appearance, proper drainage and economical maintenance.

These standards are subject to change as necessary.

The contents of this publication do not supersede, but are in compliance with the Land Division Act 288 1967 (section 560) as amended and the Condominium Act of 1978 (section 559) as amended.

The following *Road Standards* are in compliance with Part 91, Soil Erosion And Sedimentation Control Of The Natural Resources And Environmental Protection Act, 1994, PA 451, as amended.

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I. QUALIFICATION

The County encourages roadways with multiple outlets. The County shall determine which proposed public roads, if any, it intends to accept to the County Road System at the plan approval stage of a proposed development. Any roads not intended to be added onto the County road system shall be privately developed and maintained in accordance with the Road Commission, Local Municipality, and any other influenced governing agency's standards and ordinances.

Any work (public or private) in the Lapeer County Right-of-Way shall conform to these *Road Standards*. It shall be understood that the private streets, roads, and alleys shall **NOT** receive maintenance of any kind from the Road Commission.

The County will review permit applications for general compliance with the *Road Standards*. An approval by the County does not relieve the Proprietor, Proprietor's Engineer, Developer, and Contractor from final responsibility of insuring that the calculations, plans, specifications, construction, and as-built drawings are correct and in compliance with this title.

Once accepted by the Engineer, new roads may be added to the County Road System by approval and resolution passed by the Board of Lapeer County Road Commissioners. Prior to acceptance, the applicant shall construct all roads proposed in any development to the required standard with no liability or obligation for such construction to be maintained by the County.

II. LCRC SPECIFICATIONS

All roads, streets and highways under the jurisdiction of, or about to come under the jurisdiction of the Board, shall be designed and constructed according to the current version of the Standards and Specifications listed below.

1. Lapeer County Road Commission *Road Standards*
2. Lapeer County Road Commission *Permit Procedures*
3. Lapeer County Road Commission *Erosion and Sediment Control Procedures*
4. Lapeer County Road Commission *Work Zone Signing Policy*
5. Institute of Transportation Engineers *Trip Generation*
6. Institute of Transportation Engineers *Transportation Impact Analyses for Site Development*
7. Oakland County Drain Commission *Simplified Retention Basin Design Procedure*
8. Lapeer County Soil Erosion and Sedimentation Control Department Policies and Procedures
9. Michigan Department of Transportation *Standard Specifications for Construction*. **Note:**
Where there is a conflict or apparent conflict between the Lapeer County Road Commission's *Road Standards* and the MDOT *Standard Specifications for Construction*, The Lapeer County Road Commission's *Road Standards* shall apply.
10. Michigan Department of Transportation *Road and Bridge Standard Plans*
11. AASHTO *A Policy on Geometric Design of Highways and Streets*
Note: Where there is a conflict or apparent conflict between the Lapeer County Road Commission's *Road Standards* and the AASHTO *A Policy on Geometric Design of Highways and Streets*, The Lapeer County Road Commission's *Road Standards* shall apply.

A. Road Right-of-Way:

Roads are defined as, but not limited to, all roads, streets, highways and alleys under the jurisdiction of the Board, or about to come under the jurisdiction of the Board, and as referenced within this publication. The minimum widths of right-of-way for each type of road and the definition of each type of road are as follows:

- **Primary Roads – 50 Feet from Road Centerline**
An existing major road or highway that provides accessibility to areas throughout Lapeer County
- **Local Roads – 33 Feet from Road Centerline**
An existing minor road that provides accessibility to areas throughout Lapeer County
- **Subdivision Roads – 33 Feet from Road Centerline**
A residential road or system of roads located off of a primary or local road.
Note: Where curb and gutter is used, 30 feet from road centerline is acceptable.
- **Cul-de-Sac – 140 Foot Diameter**
A short street having one end open to traffic and the other temporarily or permanently terminated by a vehicle turnaround.
- **Eyebrow – 140 Foot Diameter for full length of Eyebrow**
A bulb or semi-circular extension of a curb on one side of a street or at an intersection to provide more frontage for additional lots.
- **Round-Abouts –**
Constructed according to an Informational Guide from the U.S. Department of Transportation Federal Highway Administration Publication No. FHWA-RD-00-0067, June, 2000 as amended. Right-of-way width will also be according to the guide.
- **Drainage Easement – 20 Foot Minimum with Approved Outlet**
- If the Road Commission determines additional right-of-way is required for proper construction because of special circumstances, the Proprietor will be notified. The need for additional right-of-way may not become clearly apparent until construction plans are reviewed by the Road Commission.

Note: A 50 foot from road centerline right-of-way will also be required along the entire frontage of a development for existing roads with an expected 20 year ADT of 1500 or greater.

B. Utilities:

Note: It is required that the contractor notify Miss Dig (contact either 811 or 1-800-482-7171) at least 3 business days prior to the start of Construction.

- It is recommended that all underground utilities, public or private, be installed prior to the surfacing of the road. Such utilities shall be located in a private easement outside of the public right-of-way. If a private easement is not possible, then the utilities shall be located in the outside five (5) feet of the road right-of-way. A permit must be obtained from the Road Commission prior to the installation of any utility in the road right-of-way. Any lot or house service that can not be installed prior to road construction shall be installed by tunneling or boring. All utility excavations within the right-of-way shall be backfilled in accordance with this document. The developer shall

be responsible for assuring that the utility company completes restoration including all backfill, compaction, topsoil, seed and mulch in accordance with this document.

Note: A 48 hour notice must be given to the Road Commission prior to placement of any underground utilities in the road right-of-way.

i. Sanitary Sewer, Watermain & Storm Sewer:

Sanitary sewer, watermain, and storm sewer installation shall be completed prior to placing curb and gutter or any material which is part of the pavement section. Sanitary sewer and watermain systems must be pressure tested and approved by the appropriate governing body prior to placing concrete pavement or asphalt surfacing. All structures constructed with these systems shall be located outside of the pavement unless otherwise approved by the Road Commission. Longitudinal runs of the main trunk line under the pavement are not acceptable.

ii. Location of Utilities:

1. Storm Sewers - West side, 12 feet from right-of-way line
South side, 12 feet from right-of-way line
2. Sanitary Sewers- East side, 7 feet from right-of-way line
North side, 7 feet from right-of-way line
3. Watermains- West side, 7 feet from right-of-way line
South side, 7 feet from right-of-way line

Note: Storm Sewer, Sanitary Sewer, and Watermain shall maintain a minimum horizontal separation of 10 feet and a vertical separation of 1.5 feet. If that separation is not possible by the above locations, the utilities shall be placed in a location approved by the LCRC Engineer.

4. It is suggested that other utilities such as gas, telephone, electric, and fiber optics be placed in a joint trench outside of the right-of-way. If this method is not possible, the utilities shall be placed in a location approved by the LCRC Engineer.

C. Drainage:

Storm drainage systems shall be designed for a ten (10-yr) year anticipated storm runoff from the development as well as all offsite contributory areas. If the Local Municipality's requirements are more stringent, then the Local Municipality's requirements shall be followed.

i. Soil Erosion and Sedimentation Control (SESC):

- A SESC plan in accordance with Part 91, Soil Erosion and Sedimentation Act shall be submitted to the Road Commission with the construction plans. All SESC measures and locations shall be identified on the plans. A copy of the SESC Permit obtained from the Lapeer County SESC Department shall be submitted to the Road Commission before permit issuance.
- All SESC measures capable of being installed prior to the start of construction shall be installed before any development work begins. During all phases of construction, proper soil erosion controls must be installed and maintained by the contractor and/or developer. Prior to Road Commission acceptance of the proposed roadway(s), temporary vegetation must be established.
- Permanent Topsoil, Seed, and Mulch: No road will be accepted by the Road Commission where erosion or sedimentation is evident. Existing roadside ditches disturbed during construction

shall have an established growth of vegetation (or other treatment as required by the Road Commission). The seed shall be rooted and established to such a length and density that washing action will be of no concern.

ii. Retention and Detention Basins:

- Retention and Detention basins shall be designed in accordance with the requirements of the Lapeer County Drain Commission and/or the Local Municipality. Road Commission review of these facilities will be with regard to the potential effect on the road and road drainage systems, both existing and proposed. The Road Commission will not approve Construction Plans which include drainage basins with the potential of adversely affecting any existing or proposed road and road drainage facility. The Road Commission shall require the Local Municipality's approval of the drainage system and the rest of the proposed project prior to permit issuance.
- The Road Commission will not accept the responsibility for maintenance of any retention or detention basin, and this shall be stated on all applicable construction plans. All such facilities shall be located outside of road right-of-way areas and should outlet to natural drainage areas. It should be noted that road ditches are generally considered unacceptable outlets for retention basins.

iii. Storm Sewer and Underdrain:

- Current MDOT *Standard Specifications for Construction and Standard Plans* shall be adhered to for the following:
 - Materials for storm sewer, underdrain, rip-rap, end-sections and all applicable appurtenances
 - Class of storm sewer
 - Inlet, catch basin and manhole design, including velocities and flow line calculation
 - Equipment and construction procedures for the installation of storm sewers, underdrain, and appurtenant structures
- The Road Commission may require enclosed storm sewers as needed to maintain drainage flow and control erosion.
- Manholes shall be spaced:
 - A maximum of 300 feet apart on storm sewer lines of 30 inch diameter or less and a maximum of 500 feet apart on storm sewer lines larger than 30 inches of diameter.
 - At all changes in the storm sewer's alignment, grade or size.
 - At the junction of sewer lines.
- Catch basins shall be spaced:
 - A maximum of 300 feet apart
 - So that the runoff does not exceed the intake capacity of the cover.
 - At all low points in the gutter grade.
 - Behind curbs to drain low spots.
 - At any location where there is apt to be a heavy concentration of runoff.
- It is desirable that all catch basins and inlets located in the gutter be positioned at lot lines or in the middle of lots to avoid conflict with future driveways.
- Leaching basins will not be recognized as an acceptable method of providing adequate drainage.

- All manholes, catch basins and inlet castings shall have complete bearing on their respective structures and shall be placed so as to insure full accessibility to the structure.

iv. Cross Road Culverts:

- The design submitted for cross road culverts shall be of the material and class (amount of cover) specified in the MDOT *Standard Specifications for Construction*, designed to handle a HS-20 live load. All projects requiring DEQ and Drain Commission approval shall have obtained approval and a permit from those agencies prior to construction.
- The minimum size for cross road culverts shall be 18 inches in diameter (for reasons of maintenance). All cross road culverts shall have end sections. Corrugated metal pipe (CMP) or arches, and concrete culverts (designed to the proper MDOT class) with the appropriate end sections/grates can be used with the LCRC Engineer's approval.

v. Drive Culverts:

- All driveway culverts shall be a minimum 16 gage corrugated metal pipe (CMP), a minimum diameter of 12 inches, and a minimum length of 30 feet for roads with a design speed of 35 MPH or greater. For roads with a design speed of less than 35 MPH, the minimum culvert length shall be 24 feet. All culverts with a diameter of 15 inches or larger shall have steel end sections.

vi. Roadside Ditches:

- The maximum drainage flow to an existing county road drainage system shall not exceed the assumed agricultural rate prior to development. Drainage from areas which did not previously contribute to the road drainage system will not be accepted unless specifically authorized by the LCRC Engineer. If any drainage is to outlet to a existing county ditch, the construction plans must provide the following in order to obtain LCRC Engineer approval:
 - An overall topographic map showing the existing general drainage scheme for the proposed development. Existing drainage districts shall be clearly identified and the direction of surface runoff indicated by drainage arrows. The plan shall also indicate any drainage originating outside of the proposed development which had previously flowed onto or across the proposed development as well as any natural watercourses, wetlands or County Drains that traverse the proposed development. The plans shall clearly indicate how proposed storm drainage will be provided and where it will be outletted. The proposed drainage shall outlet to a County Drain, natural watercourse or wetland. If this cannot be achieved, then the proposed drainage shall conform to the natural drainage basin that existed prior to development.
 - Hydraulic calculations in accordance with the following design criteria for subdivision drainage.
- The minimum ditch grade shall be 0.4%.
- **SESC Note:** Existing roadside ditches disturbed during construction shall have an established growth of vegetation or other treatment as required by the Road Commission so that the ditches shall be stabilized and free of sedimentation and erosion. Grades from 2% to 4% shall require sodding or stabilized using straw mulch blankets. Grades over 4% shall be rip-rapped and have stone check dams placed (in accordance with Part 91, Soil Erosion and Sedimentation Act), to prevent erosion. All other ditches shall have an established growth of vegetation provided by seeding and mulching.

vii. Design Criteria for Subdivision Drainage:

- The following design criteria shall be used for subdivision drainage.

A. DETERMINATION OF SURFACE RUNOFF:

1. The Rational Method of design shall be used, $Q=CIA$.
2. The 10-year storm frequency of $I=175/(T+25)$ shall be used.
3. A realistic coefficient of runoff, C , shall be used according to the following:

Land Use	C Value
Farm Land/Pasture	0.20
Forested/Wooded	0.15
Parks / Lawn Area	0.25
Residential	
Single Family > 2 acres	0.40
Single Family < 2 acres	0.50
Attached Condominium	0.60
Apartments	0.70
Industrial	
Light	0.85
Heavy	0.95
Pavement/Sidewalks/Roofs	1.00

4. An initial time of concentration of 20 minutes shall be used for all residential developments.

B. SELECTION OF PIPE SIZE:

1. The Manning Formula shall be used: $Q = 1.486AR^{2/3}S^{1/2}/n$
2. The following “ n ” factors shall be used:
 - Concrete Pipe, $n = 0.013$
 - Corrugated Metal Pipe, $n = 0.025$

C. DETERMINATION OF CHANNEL SIZE:

1. The Rational Method shall be used to determine the Q , and then the Mannings Formula will be used to size the open channel or ditch.
2. A minimum “ n ” value of 0.035 shall be used for the roughness coefficient unless special treatment to the bottom and side-slopes is provided, such as sodding, rip rap or paving.

D. DETERMINATION OF CULVERT SIZE:

1. The Rational Method shall be used to determine Q , and then either: 1) the Mannings Formula, or 2) the inlet headwater control or outlet tailwater control nomographs shall be used to determine the size.
2. For each development, a drive culvert shall be sized by the above method for each proposed lot. The calculations shall be provided on the plans and a summary provided for each proposed lot and proposed culvert diameter in a tabular format.

E. DETENTION:

The Proprietor’s Engineer shall provide a hydraulic analysis of the proposed storm drainage outlet to its ultimate outlet. Minimum data to be provided shall be 1) Proposed outlet flow; 2) Depth of flow in the channel or ditch; 3) Velocity of flow in the channel; 4) Hydraulic grade line; and, 5) the capacity of any downstream restrictions such as culverts, etc.

A plan view along with a profile view with elevations every 50-feet along the proposed drainage outlet shall be provided by the Engineer with the above information provided along the route.

If the proposed storm drainage outlet is incapable of handling the developed runoff, then the LCRC will require detention.

The allowable outflow from a detention basin shall be restricted to agricultural runoff, which shall not be greater than 0.20 cfs per acre.

The volume of detention provided shall be equal to or in excess of that required by the Oakland County Drain Commissioner's, "Simplified Retention Basin Design Procedure" for a 100-year storm frequency.

All detention basins must have a positive method in which to be de-watered, such as a gravity outflow.

Detention volume provided on a gravity outflow detention basin shall be defined as the volume of detention provided above the invert of the outlet pipe.

Detention volume must be provided for all acreage contributing to the detention basin, including that acreage off site.

Provisions for maintenance of the detention basin shall be made by the Proprietor with the Homeowner's Association or local municipality. The LCRC will not accept responsibility for the maintenance of any detention basin.

All detention basins shall have provision for an overflow.

The bottom of the detention basin shall be graded in such a manner as to provide positive flow to the outlet.

One foot of freeboard shall be provided above the 100-year storm water elevation.

viii. Heat Pump and Sump Pump Discharge:

- The proprietor shall insure that no heat pump or sump pump discharges to the road right-of-way.

D. Road Requirements:

i. Clearing, Grubbing and Tree Removal:

- All headwalls, stumps, brushes, trees, fences and other debris shall be removed within the proposed right-of-way. All entrance walls shall be placed outside of the right-of-way. Any other beautification, landscaping items, or development signs may be allowed in the right-of-way, including inside islands and roundabouts, by permit from the LCRC Engineer. Existing county road right-of-way shall be cleared to allow for proper sight distance.

ii. Sight Distance:

- Sight Distance will be measured from an eye height of three and one half (3.5) feet at a point thirty-one (31) feet from the centerline to an object height of three and one half (3.5) feet on the centerline of the existing county roadway.
- For the safety of the motorist, the proposed road shall be constructed (See intersection criteria below) as to provide the most favorable vision and grade conditions possible. Sight distance will be determined in accordance with the current AASHTO Design Policy.

- Minimum sight distance for proposed roads will be in accordance with the following table:

<u>Speed Limit (MPH)</u>	<u>Min. Sight Distance (FEET)</u>
25	280
30	335
35	390
40	445
45	500
50	555
55	610

Note: If the proposed road can not meet the above-mentioned sight distance requirements, the application will only be accepted pending approval by the LCRC Engineer.

iii. Alignment:

- Large land divisions and plats may require the Proprietor's Engineer or Land Surveyor to design and develop the horizontal and vertical curves using the current AASHTO Geometric Design Guide and the MDOT Super Elevation plan (R 107). All curves shall be designed to a speed of 30 MPH (or greater) with a centerline horizontal curve radius of not less than 285 feet.
- Wherever possible, the construction centerline shall coincide with the right-of-way centerline and the physical centerline of the roadway. Any changes from this will be at the discretion of the LCRC Engineer.
- Wherever possible, the alignment shall coincide with the monument boxes.

iv. Approach Criteria:

- It is recommended that all proposed subdivisions have a minimum of two (2) points of ingress/egress. In general, one access point is adequate for a single business. If multiple commercial access points are requested, the LCRC may require a traffic impact study which justifies the need for the multiple access points.
- Minimum spacing (centerline to centerline) between adjacent access points shall be as follows:

<u>Speed Limit (MPH)</u>	<u>Min. Approach Spacing (FEET)</u>
25	130
30	185
35	245
40	300
45	350
50	455
55	455

- Approaches should align with other approaches located on the opposite side of the roadway. If offset approaches can not be avoided, the above approach spacing criteria should be provided to allow space for left turns.
- No approach shall be located within 300 feet (centerline to centerline) of an at-grade intersection or railroad.
- It is desirable that intersecting streets meet at approximately a 90 degree angle. The allowable range shall be from 75 degrees to 105 degrees.

- An approach shall not be situated within the functional boundary of at-grade intersections. This boundary includes the longitudinal limits of auxiliary lanes. An access point may be allowed within the above boundary if the entire property frontage is located within this boundary.
- A driveway shall not be located or constructed along acceleration or deceleration lanes and tapers unless no other reasonable access point is available.
- It is encouraged that a passing flare or left-turn lane be provided at major points of ingress/egress to all proposed subdivisions with 20 or more lots, as well as where deemed necessary by the Road Commission. If an additional lane is not provided at a location such as above, the LCRC Engineer shall require a traffic study to be supplied by the Proprietor. The traffic study shall be used by the Road Commission to determine if the criteria are met to require an additional passing flare lane. If the criteria are met, the passing flare lane will be required. The Road Commission reserves the right to accept or reject the recommendations of the traffic study.

Threshold guidelines for requiring a traffic study, as well as study area limits, can be found in *Trip Generation*, current edition or *Transportation Impact Analyses for Site Development*, current edition – both by the Institute of Transportation Engineers. The traffic impact study shall be in accordance with these documents and shall include the ADT to be generated by the development, AM/PM peaks at the approach, and AM/PM peaks at adjacent crossroads and intersections within the study area limits. All traffic studies shall be signed and sealed by a Registered Professional Engineer.

Note: If needed, the additional land for the passing flare shall also be deeded to the Road Commission at the time of acceptance.

- For safety reasons, all lots shall have drives and mailboxes that are internal to the development.

v. Vertical Grades:

- Subdivisions Streets with Curb and Gutter shall have a grade of 0.6% (min) to 8.0% (max).
- Subdivisions Streets with open ditches shall have a grade of 0.4% (min) to 6.0% (max).
- Intersections shall not exceed 3.0% for a distance of 100 feet from where the centerlines intersect.
- Where the change of two intersecting grades exceeds 0.8%, vertical curves shall be required.

vi. Guardrail:

- If a safety condition exists that requires guardrail, the Road Commission may require galvanized steel beam guardrail to be placed in accordance with MDOT *Standard Specifications for Construction* and *Standard Plans*.

vii. Standards Cross-Sections (See Detail, Attachment A):

- All backfill under the influence of the roadway shall be Class II Sand unless a suitable alternative is approved by the LCRC Engineer. In wet areas and areas of unstable soil, at a minimum the subgrade shall be excavated to a stable base and backfilled with suitable material as directed by the LCRC Engineer. Underdrain and/or other measures may be required at the LCRC Engineer's discretion. Aggregate 22A and 23A shall be compacted to a minimum of 98% and Class II Sand to a minimum of 95% of the material's maximum density.

- County standard for curb and gutter is MDOT Detail B2. For speed limits under 45 MPH, MDOT Detail F4 or MDOT Valley Curb D2 may be substituted. Bituminous curbs are prohibited. Concrete spillways are required at curb and gutter locations without catch basins.
- All concrete work shall be done in accordance with the current MDOT *Standard Specifications for Construction* and current *Standard Plans*. The concrete mix designation from an approved MDOT plant must be submitted for approval to the LCRC Engineer prior to the start of work. The Road Commission reserves the right to test any batch of concrete at their discretion.
- Bituminous pavement shall come from an MDOT approved plant. The mix designation shall be approved by the LCRC Engineer prior to placing pavement. Bituminous pavement shall be compacted to a minimum of 98% of the material's maximum density. Before subsequent courses of asphalt pavement are placed, the preceding course shall be swept clean of all dust, dirt, and other loose material by the use of a mechanical sweeper or other approved method. The Contractor shall then apply a bond coat of SS-1h to the bituminous surface at the rate of 0.10 gallons per square yard. Subsequent bituminous courses shall not be placed until the previously placed course has achieved density and sufficiently cooled.
- Damaged areas of bituminous pavement shall be replaced with the same type of material and compacted in place with a vibrating compactor.
- The Contractor shall saw-cut the edge of all existing county roads along the entire approach prior to placing the butt joints. Paper joints are acceptable for over-night construction.
- All manhole covers, monument boxes and other utility castings within the paved area shall be adjusted to final grade. If the top course is to be placed at a later date, it will be at the discretion of the LCRC Engineer whether or not to level the castings on the base course or to leave them until final grade.

viii. Cul-De-Sac Geometrics (See Detail, Attachment B):

- A proposed cul-de-sac roadway shall be either no longer than 1500 feet or shall have no more than 20 lots.
- Please note that the asphalt pavement cross-section for a Cul-de-Sac is different than the standard asphalt cross-section, and shall be constructed as shown.

ix. Typical Approach Geometrics (See Detail, Attachment C):

- Larger approach radii may be required at the LCRC Engineer's discretion.
- All approaches to paved existing county roads shall be paved.
- No paving shall come within (5) feet of the edge of an existing gravel county road.

x. Boulevard Approach Geometrics (See Detail, Attachment D):

- Larger approach radii may be required at the LCRC Engineer's discretion.
- All approaches to paved existing county roads shall be paved.
- No paving shall come within (5) feet of the edge of an existing gravel county road.

III. PRELIMINARY PLAN APPROVAL (OPTIONAL, BUT SUGGESTED)

A Preliminary Plan shall be submitted that shows all pertinent data necessary to develop Construction Plans. It is hoped that such submittals will avoid needless delays and wasted effort by acquainting the Proprietor and their agents with any plans of the Road Commission that may have a bearing on the development and to discuss any issues that may not be clear.

- Two (2) copies of the Preliminary Plan shall be submitted to the LCRC for review and approval.
- Along with the plans required above, the proprietor shall submit the required review fee and signed permit application. The LCRC or their designated representative will not review the Preliminary Plan without receipt of the required review fee and application.
- Prior to approval by the LCRC, the development must have received tentative zoning and planning commission approval from the appropriate Municipal Body such as the Township Planning Commission. Written notice of such approval shall be furnished to the LCRC prior to review and approval.
- The Proprietor's Engineer or Land Surveyor will be advised in writing of approval or rejection normally within thirty (30) days after receipt of the Preliminary Plan.
- The LCRC may at the discretion of the LCRC Engineer or Board require a traffic study (See Section II,D,iv – Approach Criteria). This study shall include adjacent roads and streets, connecting streets, and intersections as specified by this policy or the LCRC Engineer and must be completed prior to plan approval. The traffic study must be signed by a Registered Professional Engineer. The Road Commission shall require a minimum of two (2) weeks to review the study before approval or rejection.
- Preliminary Plan approval by the LCRC shall be void after one (1) year from date of approval, unless extended by the LCRC.

A. Checklist for Preliminary Plan Preparation:

- Submit two (2) copies of a drawing that shows the following items along with your completed permit application, proof of tentative Township Zoning and Planning Commission approval, and review fee.
 1. Drawing on proper sheet size (24" x 36"), Marked as Preliminary
 2. Statement Describing Planned Improvements
 3. Subdivision Name (If Applicable) and Street Names (Labeled Proposed Public/Private)
 4. Locate with reference to Township and Section, also show a Location Map (1":2,000')
 5. Plan Date/Revision Dates
 6. Engineer's Address and Telephone
 7. Proprietor's Address and Telephone
 8. Type of Development: (Residential, Commercial or Industrial)
 9. Contours - 2' Intervals (5' intervals if slope is greater than 10%)
 10. Permanent Benchmark Locations and Elevations
 11. North Arrow and Scale
 12. Topographical Survey Including all Features a Minimum of 100 Feet Beyond the Property Lines.

13. Adjacent and Adjoining Streets and Properties to Include Homes, Commercial and/or Industrial Buildings within 200 Feet of the Proposed Road.
14. Area of Development in Acres
15. Lineal Feet of Proposed Roads
16. Lot Layout
17. Watershed Areas, Wetlands, Floodplains and Floodways, Rivers
18. Existing Drainage Courses, Structures (Including Culverts, Manholes, Catch Basins, Etc)
19. Sight Distance at Existing County Road Approaches
20. If the Development is in Phases, Outline the Phase being Submitted for Approval
21. All Governing Conditions such as Railroads, Cemeteries, Parks, Easements, Structures

IV. CONSTRUCTION PLAN APPROVAL (REQUIRED)

Two (2) copies of Construction Plans shall be submitted for review. If Preliminary Plans were not submitted, a completed permit application, proof of tentative Township Zoning and Planning Commission approval, and review fee shall be submitted prior to review. The Proprietor's Engineer or Land Surveyor will be advised in writing of approval or rejection normally within thirty (30) days after receipt of the Construction Plans. Construction Plan approval by the LCRC shall be void after one (1) year from the date of approval, unless extended by the LCRC or the permit is issued. Please note that actual construction may **NOT** begin until the appropriate permit is issued.

A. Checklist for Construction Plan Preparation:

- Construction Plans **shall include all Preliminary Plan items** as well as the following:
 22. Title Block
 23. Topography (Trees, Etc.)
 24. Typical Cross-Section for Each Road and Approach
 25. Layout Sheet – Paving and Drainage Plan, (1" : 100')
 26. Layout Sheet – Sanitary Sewer and Watermain Layout (1" : 100') – (If Necessary)
 27. Layout Plans in Detail with Plan and Profile Views(1" : 40 Min-Plan) (1" : 5' Profile)
 28. Approach Detail(s), (1" : 20') – Shall include existing and proposed ditch grades, ditch centerlines, drainage arrows, CMP culvert invert elevations and end sections, and proposed pavement spot elevations.
 29. Construction Details
 30. Proposed Right-of-Ways
 31. Road Alignment (Survey Data) – Vertical and Horizontal
 32. Plan and Profile Elevations and Grades
 33. Vertical Curves (Lengths, Elevations, and K Values)
 34. Treatment at Connection to Existing Roads (i.e. Butt Joint)
 35. Guard Rail (If Necessary)
 36. Overall Topographic Map Delineating Existing & Proposed Drainage Districts with Drainage Arrows
 37. Drive CMP Culverts Sized Hydraulically and Shown in a Table on the Plan Set
 38. Typical Signing Plan for Development
 39. Easements
 40. Retention/Detention Basin Calculations along with Storm Sewer calculations if necessary
 41. Engineer/Surveyor Seal
 42. Transmittal Letter Indicating Changes from Preliminary Plans or a Previous Review

Note: For a design variance from these standards, a written authorization from the LCRC Engineer will be required for approval.

V. PERMIT ISSUANCE

- Prior to a Public or Private Road Permit being issued, the following items must be on file at the LCRC office:
 1. A letter or other document from the appropriate Municipal Body such as a township indicating approval of the proposed development – including the date township approval was granted with reference to the approved drawing revision and date.
 2. A signed and completed Permit Application.
 3. Two (2) copies of the approved Construction Plans.
 4. Paid Permit Fee, Inspection Deposit, and Plan Review Fee.
 5. Cash Bond or Irrevocable Letter of Credit for each approach.
 6. Contractor's Certificate of Insurance showing the LCRC as additionally insured and matching or exceeding the limits set by the LCRC. Insurance must be kept in force until the permitted construction is complete and approved. Failure to do so will be just cause for immediate suspension and/or cancellation of the permit.
 7. A copy of the Soil Erosion and Sedimentation Control Permit.
 8. Copies of Permits issued by NPDES, DEQ, Drain Commission or any other agency that may pertain to the development.
- Inspection fees shall be on an hourly basis and shall be the fee designated each year by the Board (see current permit fee schedule). This fee shall be charged by the LCRC Inspector or the consultant representing the LCRC. Inspection fees shall be deducted from the Inspection Deposit. Any inspection fees exceeding the Inspection Deposit will be paid immediately after inspection. Any outstanding monies owed to the LCRC or extra monies from the inspection deposit shall be paid by or returned to, respectively, the person or firm on the Permit Application. (Refer to Pg. 17 for Inspection information).

VI. CONSTRUCTION OF ROADS

- Prior to construction, there shall be a mandatory pre-construction meeting. The Proprietor's Engineer, the Contractor, and the LCRC must be present. A representative or agent from the affected Municipal Body may also be present. It shall be the responsibility of the Proprietor's Engineer or Contractor to notify the affected Municipal Body. Prior to or at this meeting, the Proprietor's Engineer shall submit a Schedule and Construction Cost Estimate detailing the major items of work with the estimated cost for each item. In lieu of a Construction Cost Estimate, the Proprietor may submit a copy of the Contractor's bid, which shall detail the major items of work along including their associated costs.
- The roads and road drainage must be completed within two (2) years after Approval of the Construction Plans or (1) year after the permit was issued - whichever is less - unless otherwise agreed to by the LCRC.
- The Developer shall retain a Consulting Firm to test and certify the project is constructed to the Standards and Specifications cited earlier. The LCRC reserves the right at any time to test or verify any product or procedures used during construction.

- All complaints during the course of construction and prior to acceptance of the roads will be referred to and handled by the Proprietor.
- Upon approval from the LCRC, the contractor may place a temporary truck mat (minimum 12 inches of crushed concrete or open-graded stone placed on a geo-fabric) of a minimum size: 30' entering radius, 30' throat, 30' exiting radius. Under this option, the contractor shall ensure the mat is kept up to grade, the county roadway is not damaged, and that no material is tracked onto the roadway. If damage, tracking, or grade problems occur, no further traffic shall be allowed to use the drive until the approach is constructed in its entirety.
- During approach construction, all existing paved county roadways shall be sawcut (1) one foot from the edge of pavement along entire approach and repaved for a clean approach joint.
- Any existing farm tile or other unknown drainage pipes encountered during construction shall be maintained intact or replaced with CMP or schedule 40 PVC of the same diameter as the pipe being replaced. Pipe shall be joined with suitable couplings to provide an earth tight joint.
- The contractor shall maintain traffic along the existing county road in accordance with the Lapeer County Road Commission *Work Zone Signing Policy*. The contractor shall provide 48 hour notification to the Road Commission prior to any lane closures.
- The Proprietor shall pay the Road Commission for the labor and material costs of furnishing and erecting appropriate permanent road signs and traffic control devices as required by the LCRC Engineer. For a private road, the minimum signing shall be a street name sign (black writing on a white background) and a "Private Road Not Maintained by the Lapeer County Road Commission" sign. For a public road, the signs shall include but are not limited to "Stop", "Yield", "Speed Limit", "No Outlet", road name signs (white writing on a green background), End of Road Certification Marker, and curb marker posts. The amount to be paid to the Board will be determined by the Road Commission and payment shall be made prior to Final Approval. Payment shall be in the form of cash or certified check. All signs placed in the right-of-way shall meet MMUTCD standards.
- The roads shall be maintained by the Proprietor in a condition approved by the Road Commission until the roads are accepted by the Road Commission.
- Monument boxes and property corners shall be protected during construction.
- LCRC Engineer's approval shall be obtained for all field changes. Field changes shall be submitted in writing, with approval returned in writing from the LCRC Engineer.

A. Inspections:

- Inspections by the Road Commission shall not relieve the Proprietor's Engineer or the Municipal Engineer of their obligations for inspection. The Road Commission reserves the right to make spot inspections at any time to verify the proper construction of the roads in their various stages of construction.
- The Proprietor's Engineer shall set and check all grade and alignment within the proposed right-of-way and within drainage easements.
- The following inspections requiring LCRC presence must be scheduled by the Proprietor's Engineer two (2) working days prior to starting the next phase of construction.
 1. Prior to the commencement of any paving operation (Placement of Class II Sand, Aggregate Base, Curb and Gutter, Bituminous Paving, Concrete Paving, Etc.), the grade must be reviewed and

approved by the Proprietor's Engineer. MDOT material certification sheets shall be submitted to the Road Commission prior to material placement. A copy of the HMA or concrete load tickets shall also be submitted to the Road Commission.

2. With the LCRC present, the subgrade and aggregate base shall be proof-rolled using a five-yard capacity or greater, single axle truck, heavily loaded. The grade will be monitored for deflection and for cracking. The finished subgrade shall also be free of all topsoil, stumps, organic matter, peat, muck, frost heave, or any other unstable material and shall be prepared in accordance with the current MDOT *Standard Specifications for Construction*. Repairs will be required for questionable areas, documented by the Proprietor's Engineer, and proof-rolled again with LCRC present. Stabilization, when required, shall be under the roadway plus two feet on each side from the edge of shoulder or back of curb.
 3. After all paving, seeding, sodding, clean-up, etc. has taken place, there shall be a Final Inspection by the LCRC. The LCRC will provide a punch list of items that are not complete, are deficient or are in need of correcting. This inspection will be made to assure the Board that all visible construction has been satisfactorily completed, including road and storm sewer cleanup and acceptable permanent vegetation establishment. All punch list items will need to be addressed and inspected again prior to acceptance.
- If corrections are required after any of the inspections, the LCRC Engineer will halt additional construction and notify the Proprietor of the deficiencies that need correcting. If the Proprietor refuses or fails to make the corrections within 30 days, the Township will be advised that the road does not meet County Road standards and will not be accepted as a public road.
 - It is recommended that all proposed public and private underground utilities in the road right-of-way be installed prior to surfacing of the roads. The Proprietor shall insure restoration of the right-of-way due to utility work, whether it is before or after Acceptance.
 - **Approval of any construction phase by the Road Commission does not guarantee acceptance of the roads by the Board or relieve the Proprietor of responsibilities or liabilities incurred by the development.**

VII. ACCEPTANCE AS A PUBLIC ROAD

- The Proprietor, having completed construction of the development, will be advised in writing after Final Inspection as to the requirements which shall be fulfilled, financial and/or otherwise, to obtain the LCRC Engineer's Approval. The following shall be required to be submitted to the LCRC prior to the Final Approval:
 - 1) Certification in writing by the Proprietor's Engineer that all work is completed and is in conformance with these requirements and specifications, the approved Construction Plans, and that they have directed the engineering supervision of all construction. The Engineer shall complete the Engineer's Certificate (Attachment E).
 - 2) Submission of As-Built Plans (i.e. revised construction plans with all field changes included), Two (2) copies of 24"x36" Mylars are required and compact disks containing the As-Built Plans in Auto-CAD format if possible. One copy of each shall be submitted to the Road Commission and the other shall be submitted to the Local Municipality.
 - 3) Copies of Right-of-Way easement descriptions. The Proprietor's Engineer shall have all proposed Right-of-Way easements recorded by the Lapeer County Register of Deeds prior to submission to the LCRC.

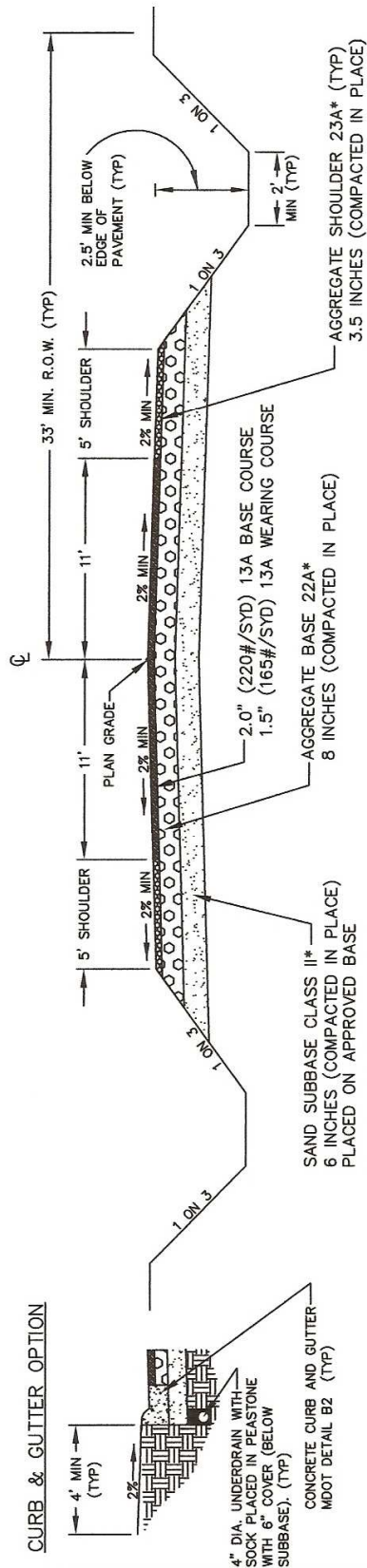
- 4) Copies of drainage easement descriptions. The Proprietor's Engineer shall have all proposed Drainage Easements recorded by the Lapeer County Register of Deeds prior to submission to the LCRC.
 - 5) Copies of any other access easement in the interest of the LCRC. The Proprietor's Engineer shall have these access easements recorded by the Lapeer County Register of Deeds prior to submission to the LCRC.
 - 6) Copies of all material certifications, cut sheets, shop drawings, and material testing reports.
 - 7) Copies of all Inspector's Daily Reports.
 - 8) Centerline description of all proposed roads. The description shall be in a meets and bounds style of distances and bearings including curve data if curves are included.
 - 9) Appropriate fees for signs erected by the LCRC.
 - 10) Appropriate fee to bond for final top course of bituminous pavement for up to two years if necessary. This fee shall be determined by the cost estimate provided by the Proprietor's Engineer or actual contract value provided by the Proprietor's Contractor.
- When all applicable procedures and requirements have been fulfilled, the development will be recommended for acceptance into the public road system by the LCRC Engineer. At this time the Board shall hold a hearing for public review of the proposed public road. The Board may take up to fifteen (15) days after the public hearing for a decision on acceptance into the public road system. The Board reserves the right to refuse to accept any road into the public road system which has not been constructed in accordance with the requirements contained in this publication. Acceptance of the proposed public roads and road drainage improvements will take effect upon the approval of the Board.

VIII. APPEAL PROCEDURE/VARIANCE REQUEST

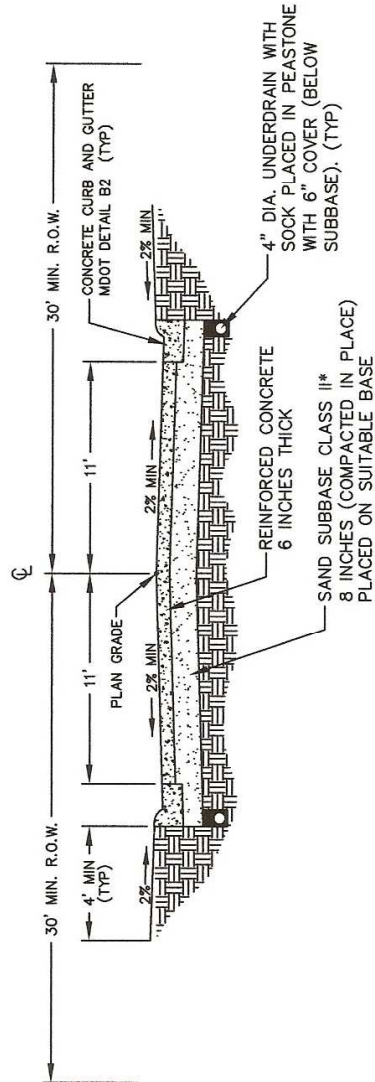
- During the process of developing a new plat, situations may arise which create difficulties in complying with the various requirements of this publication. The Appeal Procedure has been established for requesting a variance when the situation requires a change from the approved Construction Plans.
- Decisions regarding engineering design or construction standards and specifications will normally be made by the LCRC Engineer, with these recommendations forwarded to the Board of Road Commissioners for a final decision.
 - The Procedure begins with the submission of a letter by the Proprietor or his Engineer to the LCRC Engineer including the following:
 1. A statement of the situation
 2. Reference to the section(s) of these *Road Standards* for which the variance is being requested
 3. Reasons why the section cannot be complied with
 4. A specific statement of the variance being requested
 5. Supporting data from the municipality or other governing agency when appropriate
 - Written notice of the Board of Road Commissioners action will be mailed to the Proprietor and other affected parties.

Note: In general, this procedure may take 30 to 45 days. It is important to note that it is the Proprietor's obligation to substantiate their position or need. Therefore, care should be taken to insure that all supporting data, documentation, drawings, etc. are included with the letter of request. Any substantial variance from the previously approved plans may require an additional review and approval from the Local Municipality.

ASPHALT PAVEMENT CROSS-SECTION



CONCRETE PAVEMENT CROSS-SECTION



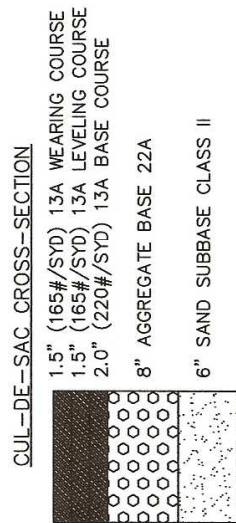
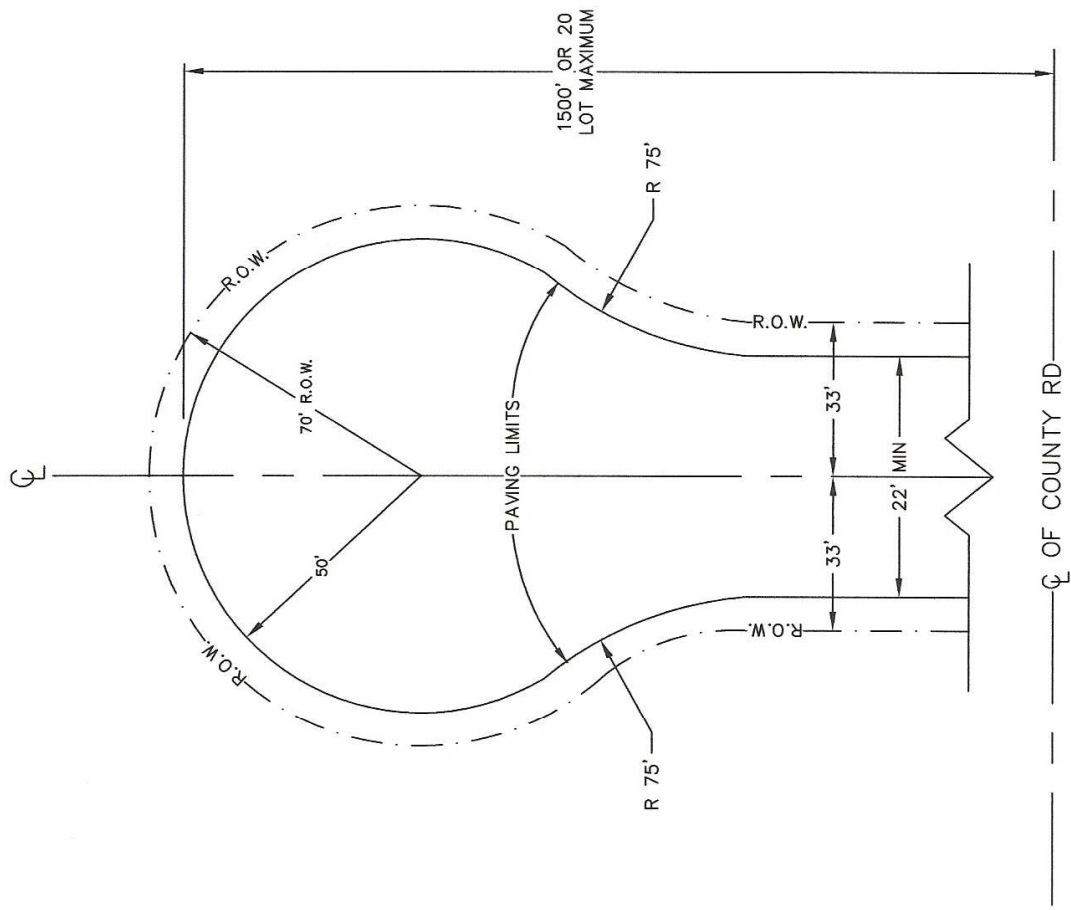
* ANY CHANGES MUST BE APPROVED BY THE HIGHWAY ENGINEER

STANDARD CROSS-SECTIONS

LAPEER COUNTY ROAD COMMISSION ROAD STANDARDS

DATE: DECEMBER 19, 2005

A



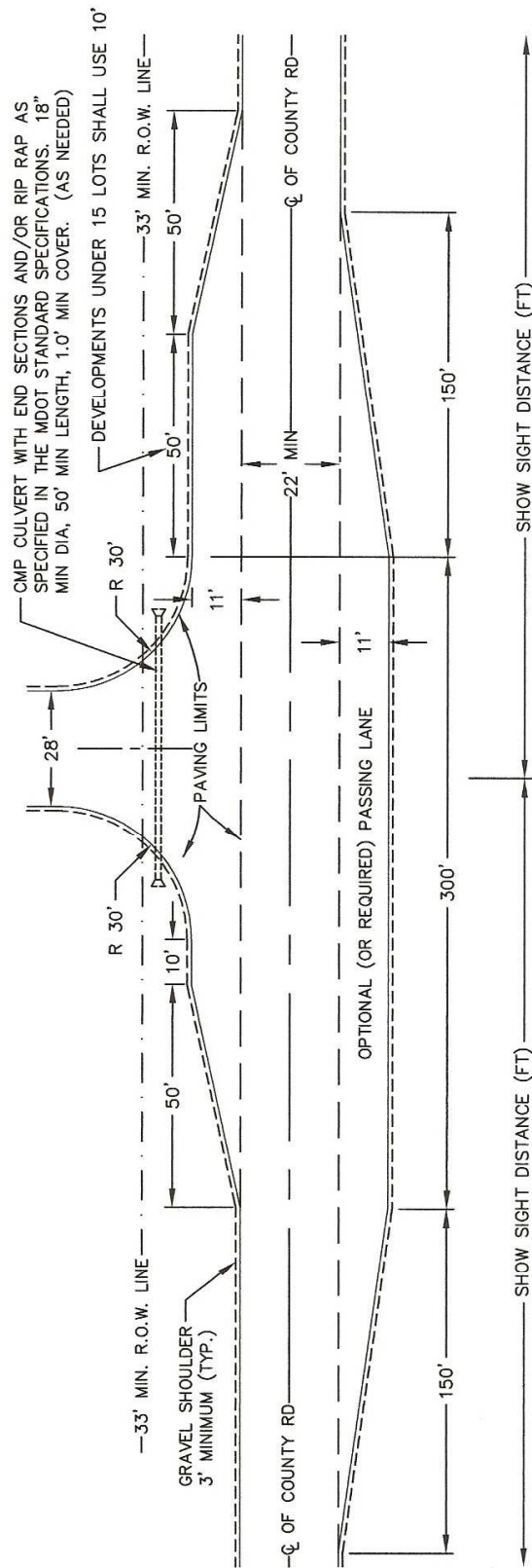
CUL-DE-SAC GEOMETRICS

LAPEER COUNTY ROAD COMMISSION ROAD STANDARDS

DATE: DECEMBER 19, 2005

B

NOTE: ENTIRE APPROACH
THROAT AND RADII SHALL BE
LOCATED ON PROPRIETOR'S
FRONTAGE.



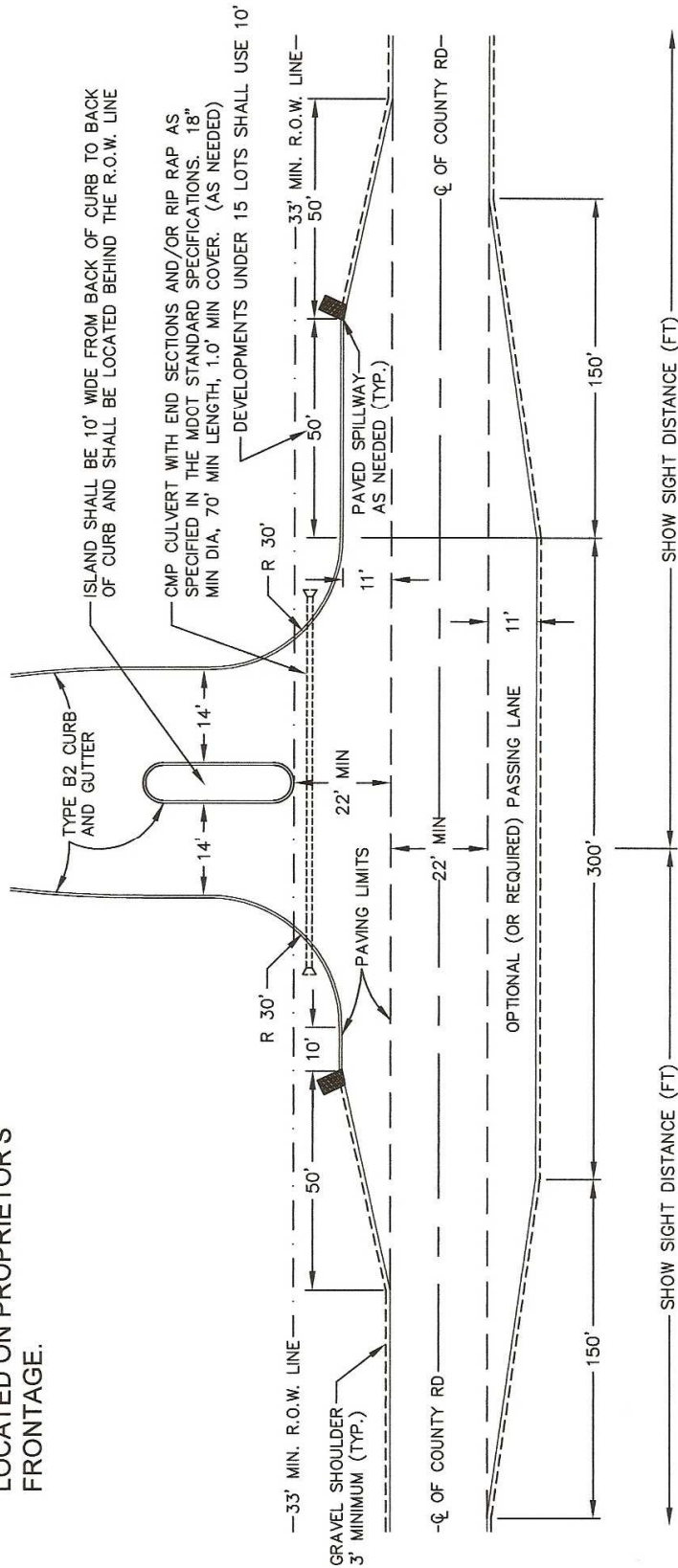
TYPICAL APPROACH GEOMETRICS

LAPEER COUNTY ROAD COMMISSION ROAD STANDARDS

DATE: DECEMBER 19, 2005

C

NOTE: ENTIRE APPROACH
THROAT AND RADII SHALL BE
LOCATED ON PROPRIETOR'S
FRONTAGE.



BOULEVARD APPROACH GEOMETRICS

LAPEER COUNTY ROAD COMMISSION ROAD STANDARDS

DATE: DECEMBER 19, 2005

D

ENGINEERS CERTIFICATE

Date:

Development Name:

Township:

Section:

I hereby certify that the construction of the following specified steps have been completed and that:

1. I have personally directed the supervision and inspection of the construction;
2. All improvements initialized have been installed in accordance with the approved construction plans and the Lapeer County Road Commission Road Standards and Specifications;
3. The reports of the material tests for the initialized steps have been filed with the Lapeer County Road Commission.

ITEM	Prop. Engineer SIGNATURE	Date	LCRC APPROVAL	Date
Preliminary Drainage	_____	_____	_____	_____
Utilities & their related Structures	_____	_____	_____	_____
Finished Subgrade	_____	_____	_____	_____
Completed Sub Base	_____	_____	_____	_____
Completed Base	_____	_____	_____	_____
Bituminous Paving	_____	_____	_____	_____
Concrete Paving	_____	_____	_____	_____
Concrete Curb and Gutter	_____	_____	_____	_____
Guard Rail and Posts (if applicable)	_____	_____	_____	_____
Topsoil Seed and Mulch	_____	_____	_____	_____
Monuments (as shown on Development)	_____	_____	_____	_____

**After receipt of the above Certificate, the Road Commission will have three (3) working days to complete the inspection and to notify the appropriate Engineer of the Acceptance and/or the Reason of the Failure, before the next phase of construction may be started.

I hereby certify that the construction of the above mentioned project is complete and final.

Signed:

Registered P.E.

Seal:

Attachment E