

**BOARD OF COUNTY ROAD COMMISSIONERS  
COUNTY OF BAY, MICHIGAN**

**RULES, STANDARDS AND SPECIFICATIONS  
FOR  
PLAT ROAD DEVELOPMENT**

**Gerald M. Redmond, Chairman  
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## SECTION I DEFINITION OF TERMS

<b>A.A.S.H.T.O.</b> .....	American Association of State Highway and Transportation Officials
<b>Alley</b> .....	A public or private right-of-way providing a secondary access to a lot, block or parcel of land
<b>Approval</b> .....	Any approvals or disapprovals mentioned herein shall be written. Applications for approval shall be filed in duplicate
<b>A.S.T.M.</b> .....	American Society of Testing and Materials
<b>Board</b> .....	The Board of County Road Commissioners of the County of Bay Michigan
<b>County</b> .....	The County of Bay.
<b>County Drain Commissioner</b> ..	The Drain Commissioner or his designated representative for the County of Bay.
<b>County Engineer</b> .....	A registered professional engineer, or a designated representative, in the employ of the Board acting as its agent
<b>Engineer</b> .....	The Registered Professional Engineer or Registered Land Surveyor employed by the proprietor of the plat. The plans shall be signed by the Engineer or Land Surveyor.
<b>Governing Body</b> .....	The elected municipal board of the township, village, city, etc.
<b>Local Road</b> .....	Part of the existing local road system as defined in Act 51, of the Public Acts of 1951 as amended
<b>M.D.O.T.</b> .....	The Michigan Department of Transportation
<b>Master Right-of-Way Plan</b> ...	The right-of-way plan adopted by the board
<b>May</b> .....	As used within; permissive in nature, no requirement for design or practice intended
<b>Plat</b> .....	As defined in the Subdivision Control Act (P.A. 288 of the Public Acts of 1967)
<b>Primary Road</b> .....	Part of the existing primary road system as defined in Act 51, P.A of 1951 as amended
<b>Private Road</b> .....	An easement or dedicated right-of-way dedicated to the use of a specific group separate from the public
<b>Proprietor</b> .....	A person, firm, association, partnership, corporation or a combination of, which may hold any ownership interest in land whether recorded or not
<b>Proprietor's Engineer</b> .....	An Engineer or firm in the employ of the proprietor supervising design and construction of a subdivision
<b>Public Road</b> .....	An easement or dedicated right-of-way which has been dedicated to the use of the public and accepted into the County Road System by The Board of County Road Commissioners
<b>Road Commission/</b>	
<b>County Road Commission</b> ...	The Board of County Road Commissioners of the County of Bay Michigan
<b>Shall</b> .....	As used within; a mandatory requirement of this department
<b>Should</b> .....	As used within; something that would be encouraged but not required by this department
<b>Subdivision</b> .....	The partitioning of a parcel or tract of land pursuant to the Subdivision Control Act
<b>Subdivision Control Act</b> .....	Act 288, Public Acts of 1967, Michigan, as amended

## **SECTION II GENERAL REQUIREMENTS**

- A. The following minimum requirements for roads and alleys apply to all proposed plats lying outside of incorporated municipalities, or along County roads which lie within incorporated municipalities.
- B. The Board reserves, in its sole discretion, the right to reject any plat which does not comply with the Subdivision Control Act.
- C. The Standard Design addresses the requirements for subdivision development in the County. The Alternate Design addresses special requirements for subdivision development in the County using an alternate roadway cross-section which, upon approval of the Board, is an acceptable option for roadway development.
- D. In the event any section, clause, or portion of these Standards and Specifications for Plat Road Development are declared invalid, all other sections, clauses or portions of these Standards and Specifications for Plat Road Development shall remain valid and in effect.
- E. A non-refundable fee in the amount of one percent (1%) of the County Engineer's estimate of the total cost of construction shall be paid to the Bay County Road Commission prior to the start of any construction. This fee is to cover administrative costs and inspections made by the Road Commission in relation to the plat. Payment shall be made in cash or certified check.
- F. The Proprietor may submit a concept drawing or "Pre-Preliminary Plat" of a proposed subdivision to the Engineer. This drawing should include basic information about the proposed subdivision for discussion and review before starting with final design on a project.
- G. Any street or roadway on unplatted land that is going to be dedicated to the use of the public and accepted into the Bay County Road System shall conform to the Board's current policy for Site Condominium & Land Division Projects.
- H. A Proprietor may request a variance from the Board to any of the requirements contained herein. Such requests shall be submitted in writing to the County Engineer for presentation to the Board. The Board may deny any or all requests for variance which the Board considers to be not in the best interest of the public. Conversely, the Board may waive any of these requirements in specific instances.
- I. When a subdivision proposes to incorporate an existing county road which is not up to the current standards of the Bay County Road Commission, said road shall be reconstructed by the Proprietor, and at the Proprietor's expense, as required to improve the road to the standards applicable for its intended use.
- J. Permits, including approach permits, must be obtained by the Proprietor from the Board before performing any work within the right-of-way of any existing county roadway. Any work, including plans for such work, within any proposed right-of-way must be reviewed and approved by the County Engineer prior to construction.

- K. The Board encourages the Proprietor to install any public and private utilities crossing the road right-of-way before constructing the base or subbase of the proposed road. Once accepted into the County Road System, open cutting any roadway for the installation of utilities will not be permitted. Utilities that run parallel to the road will not be allowed within the road right-of-way with the exception of water main, storm and sanitary sewer systems. All work required to bring utilities into the subdivision will require a permit for work in existing road right-of-way.
- L. The Board reserves the right to add, delete, or modify any existing requirements in its authority to maintain the proposed streets in a manner reasonably safe and convenient for public travel.
- M. When a proposed lot is bordered by an interior subdivision street and an existing county road, access will only be allowed from the interior street.
- N. It shall be understood and agreed that any approvals, reviews, or inspections of any nature by the Bay County Road Commission, its officers, agents, and employees, shall not be construed as a warranty or assumption of liability on the part of the Commission or Board. It shall also be expressly understood and agreed that any such approvals are for the sole and exclusive purposes of the Commission or Board acting in a governmental capacity as authorized by Public Act 288 of the Public Acts of 1967. Any approvals, reviews or inspections made shall not relieve the Proprietor of any of the obligations hereunder unless an expressed variance has been requested and granted. Such approvals, reviews or inspections shall not be construed as a guarantee as to the propriety of the plans or construction performance.

**SECTION III  
ORDER OF PROCEDURE**

- A. The following will be the procedure of the Board in considering any plat:
  1. Submission of Pre-Preliminary Plat (optional – see Section II General Requirements)
  2. Submission & Approval of a Preliminary Plat. (See Section IV)
  3. Submission & Approval of Road & Drainage Plans and Specifications. (See Sections V & VI)
  4. Inspection and Construction of Roads and Drainage Systems. (See Section VII)
  5. Final Inspection and Approval. (See Section VIII)

**SECTION IV  
PRELIMINARY PLATS**

The Engineer shall submit 2 copies of a preliminary plat to the County Engineer or Chairman of the County Road Commission if the proposed subdivision includes or abuts roads under the Commission’s jurisdiction. This plat may be at any convenient scale not smaller than one inch equals two hundred feet.

The preliminary plat layout shall distinctly show and meet each of the following requirements:

- A. The type of subdivision (i.e.: commercial, residential, etc).
- B. Limits of property, for which approval is being requested, shown with descriptions (bearing and distance) of each line.
- C. The property from which the proposed subdivision is being split in phase development.
- D. The owners of land within 300 feet of the subdivision limits, including government agencies, along with the recorded liber and page number and tax number where applicable. All public or private streets within this radius shall show the type and size of any existing road right-of-way.
- E. Show the location and names of proposed streets with arrows indicating the general drainage flow as planned along either side of the roadway, traceable to a destination, e.g.: detention basin, retention basin, stream, etc.
- F. Any conditions which may affect design of the subdivision such as:
  - 1. Adjoining subdivisions.
  - 2. State highways.
  - 3. Rivers, streams, lakes, etc. along with 100 year flood plain datum, natural water courses, existing drainage facilities – both public and private.
  - 4. Contour lines of the existing site at five-foot intervals (maximum).
  - 5. Railroads, cemeteries, buildings or similar cultural features that must be preserved.
- G. The proposed right-of-way shall be a minimum of sixty-six feet wide on interior residential roadways, and eighty feet wide on all industrial/commercial interior roadways. If the proposed subdivision is a part of phased development, conceptual drawings showing the master plan of development shall be submitted as well. The road right-of-way shall be described as parallel to the proposed highway centerline. The use of "Eyebrows" or "Elbows" or other irregularities in the proposed roadway used to create road frontage for additional lots will not be allowed.
- H. The road layout shall fit the pattern established by area roads. All existing public roads or alleys which terminate at the plat boundaries must be connected with the road system of the proposed plat. The layout of roads and alleys in the proposed plat shall provide a continuous circuit for travel except when, in the opinion of the Board, the lands to be subdivided are limited in area or are subject to a natural barrier. In such cases, a dedication that provides access to a public highway at one end only will be acceptable; provided, however, that a cul-de-sac as shown on Illustration No. 4 shall be dedicated at the terminus of such a road. However, the use of cul-de-sacs shall be kept to an absolute minimum. Street length on dead end streets shall be not less than 300 feet or greater than 600 feet measured from the center of the intersection to the end of the proposed pavement in the cul-de-sac. Cul-de-sacs located in the interior of a subdivision shall not have more than four parcels fronting on the right-of-way for the cul-de-sac. The Board reserves the right to reject a preliminary plat, or not accept into the county system, any subdivision whose roadway layout proposes an excessive use of cul-de-sacs. The Board also reserves the right to reject a preliminary plat which proposes the use of cul-de-sacs for reasons other than the physical limitations presented by the site being developed.

- I. The Bay County Road Commission will accept roads located in trailer parks and apartment complexes only if the proposed road shall be used to connect to another road in the County Road System & they meet with the County Road Commission's "Standards and Specifications for Plat Road Development." Lot sizes will be of adequate design to provide for off street parking or parking provided for at a central location within the development. Interior roads which circle or loop through such areas will not be accepted by the Road Commission for maintenance.
- J. Any proposed roadway which is an extension of, or in a direct line with, an existing street shall carry the name of the street that is in existence at the time the proposal is made. Other streets or roads shall be given a name of the owners choice subject to the approval of the Board. Proposed names will be checked against the Bay County Road Commission road inventory for potential conflicts that may be confusing to emergency services within the county.
- K. Alleys will not be permitted except in business or industrial areas (as defined by the applicable zoning board) and then only by special permission of the Board.
- L. Right-of-Way
  - 1. The following minimum widths of rights-of-way will be required:
    - Alleys – 20 feet (by special permission).
    - Roads – 66 to 76 feet in residential subdivisions.
    - Roads – 80 feet in commercial subdivision.
    - Roads – 50 feet each side of section lines, quarter lines or centerline of other important roads.
  - 2. Greater widths of right-of-way will be required by the Board when considered necessary.
  - 3. Section line and quarter line roads shall be centered on these lines unless an exception is approved by the Board.
  - 4. Half-width roads or alleys will be acceptable only when the boundary of the proposed plat coincides with the boundary of a recorded plat on which a half-width road or alley is presently dedicated.
  - 5. Deeded right-of-way shall be required for parcels which are excluded from the plat and which are under the control of the Proprietor.
- M. Where the proposed subdivision lies entirely along a road which is maintained by the Board or along a county road within an incorporated municipality, Sections VI D-1(a) & D-2(a) may be omitted. All other Sections shall apply as to their effect on an existing county road.
- N. Private roads in recorded plats shall meet all requirements of public roads.
- O. It is the intent of the Board to encourage individual lot access from interior subdivision streets as a matter of safety. In no case will there be more than 1000 feet of frontage platted along an existing local road without an intersection. If the shape of the parcel mandates a subdivision one lot deep relative to the existing roadway, then provisions will be made for future development by means of an outlot.

- P. There will be no access permitted nor permits issued to individual lots or homes for any subdivisions along an existing county primary road or major local thoroughfare. The site will be laid out in such ways that all individual access points shall be to roadways that are interior to the proposed subdivision.
- Q. When a subdivision is proposed along undeveloped land, provisions shall be made for future development by outlots located not more than 1000 feet from the furthest intersection. Said outlots shall extend from the right-of-way line of the proposed roadway and extend to the limits of the subdivision. These outlots shall be of the same width as required for the subdivision and shall be laid out in a fashion that will allow for the construction of a roadway intersecting the proposed street at 90°.
- R. Prior to recording the Final Plat, the Proprietor shall warrant and convey to the Board an easement for public highway purposes for each outlot within the Plat. Said easements shall describe the entire outlot and dedicate its use as being for public highway purposes.
- S. There shall be a private easement for public utilities twelve feet wide minimum located outside and contiguous to the road right-of-way.
- T. Intersections shall be laid out so they meet the following criteria:
  - 1. The minimum separation between interior intersections shall be 250 feet. This will hold true regardless of their orientation to one another (i.e.: same side or opposing).
  - 2. The maximum distance between intersections (block length) shall be 1300 feet within the subdivision.
  - 3. The streets used for access to the interior of the subdivision from an existing public highway shall not be less than 660 feet apart and where possible shall be located directly opposite existing approach intersections.
- U. The location of any soil borings taken on the site of the proposed subdivision shall be shown on the preliminary plat along with a log describing the soil conditions and water table found at each location.
- V. Show the location of the subdivision relative to the existing County Road System.
- W. Show the drainage district limits to be dedicated to the Bay County Drain Commission.
- X. The tributary area for each discharge location.
- Y. Title block at the lower right corner of the drawing naming the Proprietor and corporate name, Proprietor's Engineer, scale, etc.
- Z. Typical cross section showing pavement width and structure for the proposed subdivision.

The preliminary plat shall be filed with the County Engineer for consideration by the Board. The Board will give approval or disapproval of the preliminary plat within thirty days from receipt of same. If a preliminary plat is rejected by the Board, reason(s) for rejection will be provided to the Proprietor so corrections may be made and the proposed subdivision resubmitted.



The Board's approval of a preliminary plat will become void two years after the date of approval unless this expiration date is extended, in writing, by the Board.

VARIANCE PROCEDURES – A variance may be allowed by the Board only in cases involving practical difficulties or unnecessary hardship and when the record on the appeal to the Board supports the following affirmative findings:

1. That the alleged hardship or difficulties, or both, are exceptional or peculiar to a given site.
2. That the Board's failure to grant the variance will result in substantially more than an inconvenience or an inability to attain a higher financial return, or both.
3. That allowing the variance will result in substantial justice being done, considering the public benefits and the individual hardships that will be suffered by a failure of the Board to grant the variance.
4. That the conditions and circumstances, which are the basis of the variance request, shall not be self-imposed.

If a variance has been granted and the construction authorized with the variance has not commenced within one year from the date of its approval, the grant of the variance shall be automatically withdrawn.

## **SECTION V CONSTRUCTION PLANS**

### **A. GENERAL**

After the preliminary plat is approved, the Proprietor's Engineer shall submit to the County Engineer, two copies of plan and profile construction drawings and proposed cross section plans for approval. These plans must encompass all phases of construction related to the proposed subdivision and shall conform to the current Bay County Road Commission Specifications for Plat Development or the 1990 M.D.O.T. Specifications for Highway Construction, whichever is applicable. The construction plans shall show all pertinent data required to layout and construct the proposed subdivision. The plans shall be submitted on a standard sheet size of 24 inch by 36 inch and be drawn to a scale of not less than one inch equal to fifty feet horizontally and one inch equal to five feet vertically. Each drawing will have linear reference markings (stations) in units of one hundred feet for both plan and profile perspectives.

Included in the plans as a cover sheet, or an interior sheet, shall be a copy of the approved preliminary plat. Requirements of this section must be completed and construction begun within one year or preliminary approval will be invalidated.

All dead end streets shall be provided with a cul-de-sac. The size, location, and drainage treatments for cul-de-sacs shall be as detailed in these specifications.

Included in the plans shall be a typical street cross section showing the proposed pavement structure.

The following information must be clearly shown on each page of the plan and profile sheets:

1. North arrow and scale of drawing.
2. Benchmarks to U.S.G.S. Datum – A minimum of one benchmark shall be labelled on each sheet. The Proprietor's Engineer is encouraged to set permanent vertical control points in the field at a rate of once per street. At least one permanent benchmark for each subdivision, located within the boundaries of the subdivision, will be required.
3. Horizontal control information for each circular curve along the roadway centerline. The label for each curve shall include all the information required for layout (e.g.: degree of curvature – deflection of tangents (delta) – radius of curve – point of curvature – point of tangent – length of chord – tangent length).
4. Vertical control information shall include existing and proposed centerline or top of curb elevations plotted and labelled every fifty feet. Vertical curve information showing the point of curvature – point of tangent – point of vertical intersection and elevation – length of curve – percent of tangent grade in feet per hundred feet.
5. Proposed public and private utility locations:
  - a. The location, type, class, and size in both plan and profile of all proposed underground drainage.
  - b. Drainage structure location and type of structure, (manhole, catch basin, inlet, etc.).
  - c. Pertinent vertical control information clearly pointing out the top of structure, top of casting (rim) or top of curb, sump or footing elevation, invert or flow line elevation of each pipe, including edge drain and under drain, in the structure.
  - d. Elevations at each end of the proposed sewer run as well as the grade of the sewer run in feet of fall per hundred feet (percent of grade). Road crossings in an open ditch section will only require the inlet and outlet elevations labelled and the ending location relative to station and centerline offset.
6. Offsite drainage facilities and locations – Preliminary construction plans indicating the use of offsite drainage facilities or drainage courses will not be approved without the Proprietor first obtaining a recorded easement describing the drainage course and dedicating its use to the proper governing body and its intended purpose. The liber and page number of the instrument as recorded at the Bay County Register of Deeds shall appear either on the plan sheet depicting its use or on the construction plan copy of the preliminary Plat.
7. Existing topographical features such as trees, buildings, roads (public or private) etc., along with the location, length, and size of existing drainage facilities.
8. Title block showing the subdivision name, engineer or firm, scale, page number, etc.

All roadways shall be provided with facilities for adequate drainage. This may be accomplished by the use of roadside ditches, county drains, natural watercourses, or a constructed tributary to the above. See page 13 for specific requirements on drainage design. The Board strongly recommends the use of underground

drainage facilities whenever possible and reserves the right to require the use of underground drainage systems or, parts of systems, within any proposed subdivision. Underground storm drainage will be required in easements between lots outside the road right-of-way.

With the exception of facilities located within the proposed road right-of-way, the drainage system shall be made a part of the county drain system through proper legal procedures of the Bay County Drain Commissioner. After construction, said system shall meet all requirements regarding right-of-way, easements, and use of land, prior to acceptance into the County Road System.

Construction on any portion of a subdivision shall not begin until the construction plans have been approved by this department and until permits have been obtained for all work required in an existing county road right-of-way.

When the plans are approved or disapproved, such action or reasons for such action, shall be given to the Proprietor in writing. Revised plans shall be resubmitted to this office showing all of the required revisions and approved prior to construction. Any major items of work that are to be incorporated into the subdivision must be indicated on the plans submitted for approval.

## **SECTION VI DESIGN REQUIREMENTS**

### **A. ALIGNMENT**

All horizontal alignment and intersection design shall follow the American Association of State Highway and Transportation Officials (AASHTO) manual entitled "A Policy On Geometric Design of Highways and Streets" 1990 edition.

The design speed on all interior subdivision streets shall be thirty-five miles per hour unless the subdivision intends to make use of an existing local collector or, by way of the development, there is a collector type or through roadway created warranting a greater safety margin. The Board reserves the right to require a greater design speed in the interest of safety, where warranted. Along with the alignment, adjustments to the typical cross section may be required in these instances as well.

#### **1. Horizontal alignment:**

Minimum centerline radius: 230 feet. See Section V regarding construction plans for annotation requirements. Excessive use of reverse curves for reasons other than topographical limitations should be avoided.

Minimum cul-de-sac radius at edge of pavement: 50 feet. The use of center islands in cul-de-sacs will be allowed with an adequate drainage system. The fillet radius from cul-de-sac to tangent sections shall be a minimum of 50 feet (see Illustration 4).

#### **2. Vertical alignment:**

The percent of grade in an open ditch cross section shall not be less than 1.0 % (one foot rise per hundred feet of ditch) or more than 5.0 % where ditch grades are centerline dependent. See the section on drainage design criteria (page 13) for specific requirements on ditch length, volumes, etc.

The percent of grade in curb and gutter sections shall not be greater than 6.0 % or less than 0.30 %.

A standard parabolic vertical curve shall be computed and half station elevations shown on the plans whenever the algebraic difference between the grade approaching the point of vertical intersection and that departing the P.V.I. (in percent) is greater than 2.5. The minimum length of vertical curve shall be 100 feet. Refer to page 421 of the AASHTO manual for further information.

### 3. Intersections:

All interior street returns shall have a minimum radius at the edge of pavement of thirty feet. All intersections approaching an existing county highway shall have as a minimum a thirty-five feet paved radius (see Illustration 6).

All intersections shall meet at right angles and shall be designed such that the first sixty-five feet in any direction shall be straight-line sections. Boulevard entrances shall have concrete curb and gutter around the island.

The Board requires that an approach permit, issued in accordance with its regulations adopted pursuant to Public Act 200 of the Public Acts of 1969 as amended, be obtained for any new street connection to an existing county highway. A left-turn passing lane may be required as a condition of this permit. Acceleration, deceleration, and left-turn passing lanes shall conform to the general layout shown in illustrations 9 & 10. The table on page 17 illustrates the volume warrants for passing lanes. Other situations may warrant special use lanes at a particular site.

## B. STANDARD DESIGN

1. Pavement design shall conform to dimensions and details shown in Typical Cross Section 1.
2. Curb and gutter is required with grades shown on the plans. Catch basins shall be provided at the low points and in sufficient number to adequately handle storm water runoff within the subdivision. Commercial subdivisions shall use detail C-4 curb and gutter while residential subdivisions may use mountable curb and gutter detail.
3. Curb and gutter designs shall be based on the curb details as shown in Illustrations numbers 5 & 5A.

The edge of metal to edge of metal width shall be twenty-seven feet (27') and the pavement cross slope rate shall be .02 feet per foot.

Drive openings, to be provided in detail C-4 curb and gutter, shall be a minimum width of twenty-six feet (26') for residential applications. Commercial drive openings shall conform to the requirements outlined in the "Permit, Rules, Standards & Specifications" of the Bay County Road Commission.

C. ALTERNATE DESIGN

1. Pavement design shall conform to dimensions and grades shown in Typical Cross Section 2.
2. Drive opening at road edge may vary with length of culvert pipe installed. Length of pipe shall be twenty feet (20') plus six times the difference between the elevation of the edge of the road at the driveway, and the elevation of the ditch, or twenty-four feet (24') for each single driveway if headwalls are allowed to be constructed.

D. ROAD SPECIFICATIONS

All road construction shall be on the right-of-way centerline.

1. Standard Design

- a. All road construction shall have an all-weather paved surface with curb and gutter. The Proprietor's Engineer shall design the typical cross section in according to the January 1989 revision of the "AASHTO Interim Structural Pavement Design Procedure".
- b. The following shall be considered to be the minimum requirements of the Board with respect to pavement requirements on proposed roadways:
  - 1) A minimum six inch (6") thick sand subbase shall be placed with the construction of either a bituminous or reinforced concrete surface. The sand subbase shall meet the following gradation requirements for Granular Material Class II as detailed in the 1990 MDOT Standard Specifications for Construction:

100% passing 3"	0 - 30% passing No. 100
60 - 100% passing 1"	0 - 7% loss by washing

Sand subbase shall be placed as described in the current MDOT Standard Specifications for Roadway Earthwork, using the controlled density method.

- 2) A six inch (6") reinforced concrete surface may be placed directly on the sand subbase, while six inches (6") of compacted 23A crushed aggregate base shall be placed on the sand subbase prior to the placement of a bituminous surface course.

The aggregate base material shall meet the following gradation requirements for 23A Course Aggregate as detailed in the 1990 MDOT Standard Specifications for Construction:

100% passing 1"	25-60% passing No. 8
	9-16% loss by washing
60-85% passing 3/8"	100% Crushed Limestone

- 3) The bituminous surface shall meet or exceed current MDOT Specifications for Bituminous and Concrete Base Courses and Pavements, and Bituminous Mixtures - Plant

Mixed for Bituminous Mixture 36A Wearing & 13A Leveling. The rate of application shall be a total of 330 lbs./sq. yd. minimum over a properly cured prime coat. Asphalt-Cement shall be 120-150 pen.

The reinforced concrete surface shall meet or exceed current MDOT Specifications for Concrete and Steel Reinforcement. The size and weight of reinforcing shall be approved by the County Engineer prior to the start of construction.

The Proprietor's Engineer may submit an alternate design with an equivalent structural number based on the design criteria contained in the AASHTO Guidelines. With an alternate section proposed, or in the case of a deep strength bituminous pavement design, the minimum thickness allowable for aggregate base will be four inches. In NO case will placing bituminous pavement directly on a sand subbase be allowed.

- c. Sidewalk, when called for on plans, shall be not less than four inch (4") thickness except at driveways where the thickness shall be six inches (6"). Current MDOT Specifications will apply. Width shall be five feet (5'). All handicap ramp requirements outlined in the "Americans with Disabilities Act Accessibility Guidelines" (ADAAG) shall be complied with.
- d. Other items, such as bituminous curb, not included in these specifications shall be approved by the County Engineer prior to design completion or start of construction.
- e. The suggested location of underground utilities shall be as follows:

Sanitary Sewers	-	28' from Road Centerline North or East Side
Gas Mains	-	22' from Road Centerline South or West Side 34' - Alternate Design
Water Mains	-	27' from Road Centerline South or West Side 32' - Alternate Design
Hydrant	-	32' from Road Centerline South or West Side 37' - Alternate Design
Storm Sewers	-	22' from Road Centerline North or East Side 26' - Alternate Design
Utility Pole	-	32' from Road Centerline South or West Side 37' - Alternate Design
Other	-	By approval of the County Engineer

Final location of underground utilities shall be as approved by the County Engineer. No utility shall be placed under the roadbed except for crossings. All watermains placed under the roadbed shall be installed in a steel encasement pipe per the Road Commission's "Permit Rules, Standards and Specifications".

Where utilities are contemplated prior to complete acceptance of the plat, they shall be shown on either the road plans or on a separate utility plan submitted with the road plans.

- f. Soil erosion and sedimentation control measures shall be indicated on the plans. The Proprietor's Engineer shall specify the location and type of control to be used throughout the subdivision during construction. No part of these specifications are intended to supersede any of the requirements of the Michigan Department of Environmental Quality or the Bay County Drain Commission with respect to soil erosion control or wetlands use and protection.

## 2. Alternate Design

- a. All road construction shall have a bituminous paved surface with 23A crushed aggregate sealed shoulders.
- b. A minimum six inch (6") thick sand subbase shall be placed with the construction of the bituminous surface. The sand subbase gradation requirements and placement procedures for Granular Material Class II will be the same as the Standard Design.

Surfacing shall consist of a bituminous surface course placed on a six inch (6") compacted 23A crushed aggregate base. The bituminous surface and aggregate base material shall be the same as the Standard Design.

- c. Any special construction items not included in these specifications shall be approved by the County Engineer prior to design completion or start of construction.
- d. The standard location of underground utilities shall be as listed in Section VI, D-1(e).

## E. DRAINAGE SPECIFICATIONS – STANDARD & ALTERNATE DESIGNS

Any subdivision whose road right-of-way is to be dedicated to the Bay County Road Commission shall have petitioned for it a drainage district through the office of the Bay County Drain Commissioner. Said district shall meet all the requirements of the Bay County Drain Commissioner's Subdivision Control Procedures, current edition, including supplements, or its current equivalent.

The Drain Commissioner's standards stated above are hereby established by this department as governing the design of all drainage systems that are to be incorporated in the construction of subdivisions whose streets and roadways are to be dedicated to the use of the public and maintained by this department. When the construction plans are submitted for approval, the Proprietor's engineer shall submit copies of all worksheets used to design drainage facilities for a subdivision.

1. All roads, including existing County roads, shall be designed to provide adequate surface and sub-surface drainage through the use of a closed storm sewer and edge drains as shown in Typical Cross Section 1, or through the use of properly graded subbase and swale ditching as shown in Typical Cross Section 2. When swale ditch depth exceeds three and one-half feet (3 ½'), enclosed storm drain and edge drain shall be used.
2. Storm sewers shall be concrete pipe at least twelve inches (12") in diameter meeting or exceeding current MDOT specifications for reinforced concrete pipe (min. acceptable C-76-III).
3. Storm sewers shall be provided with a minimum of thirty inches (30") of ground cover.

4. Edge drains shall be six inch (6") perforated pipe with geotextile wrap, installed with appropriate fittings and backfilled with Granular Material Class I to a minimum of twelve inches (12") above and six inches (6") around & below the edge drain. Granular Material Class I shall meet the following gradation requirements:

100% passing 2"	5-30% passing No. 30
45-85% passing 1/2"	0-5 % loss by washing
20-85% passing No. 4	

5. Sufficient catchbasins and manholes shall be installed to adequately provide for surface drainage and for maintenance of the system. Catchbasins shall be precast, minimum three feet (3') in diameter and manholes shall be precast, minimum four feet (4') in diameter.
6. Where drains pass under road surfaces, the crossing shall be made with reinforced concrete pipe meeting or exceeding current MDOT Specifications for reinforced concrete pipe.
7. Where drains or ditches cross private property, the Proprietor of the subdivision shall furnish a recorded easement thirty feet (30') wide for ditches or fifteen feet (15') wide for closed drains, to allow for maintenance and/or future construction. All easements shall be submitted to the Board before the plat will be approved and signed by the Board.
8. The general drainage scheme of the subdivision shall be shown indicating the source of storm water and how it will be handled and discharged. Any drainage originating outside the subdivision limits which has previously flowed onto or across the subdivision shall also be considered in the proposed design.
9. Should the proposed subdivision be a partial development of a larger area, the proposed subdivision will be designed to be self-sufficient and self-draining from the standpoint of surface drainage and not be dependent upon work planned in the overall development.
10. Culverts in driveways and other areas subject to vehicular traffic shall meet the current MDOT Specifications for Class "A" culverts and shall be a minimum of twelve inches (12") in diameter. End sections and/or concrete bag headwalls shall be constructed at the ends of all culverts. The Engineer will be responsible for assuring adequate depth of cover for drive culverts when ditch grading is calculated.

**F. RETENTION/DETENTION BASINS**

Any proposed subdivision shall be designed with detention or retention facilities as required by the Bay County Drain Commission Standards.

**G. SIGNS**

1. Road name signs, as approved by the County Engineer, shall be provided by the plat developer, owner and/or owner's contractor at each road intersection in the plat; letters shall be of minimum four inches (4") height, Scotchlite.



2. Traffic Control Signs shall be provided by the plat developer, owner and/or owner's contractor where designated by the County Engineer. All signs shall conform to the Michigan Manual of Uniform Traffic Control Devices.
3. Materials and installation for road name and traffic control signs may be provided by the Road Commission forces upon request. All costs to be paid by the developer.

H. INSURANCE REQUIREMENTS

The Proprietor, before performing any work within existing county highway right-of-way, shall secure and maintain through the completion of construction Certificates of Insurance to ensure that claims for damage or personal injury can be met. General liability insurance carried by an applicant or contractor is acceptable. Insurance amounts shall be as shown in the following chart which also includes acceptable amounts for automobile liability, worker's compensation and employer's liability. The Road Commission, its agents, servants and employees shall be named as additional named insured.

Type of Insurance	Limits	
Commercial General Liability	\$1,000,000	General Aggregate
	\$1,000,000	Products-Comp/Ops Aggregate
	\$ 500,000	Personal & Advertising Injury
	\$ 500,000	Each Occurrence
	\$ 50,000	Fire damage (any one fire)
	\$ 5,000	Medical Exp. (any one person)
Automobile Liability	\$ 500,000	Combined Single Limit
Worker's Compensation & Employer's Liability	\$ 100,000	Each Accident
	\$ 500,000	Disease – Policy Limit
	\$ 100,000	Disease – Each Employee

I. SIGHT DISTANCE REQUIREMENTS

The following tables shall be used as a guideline for determining sight distance requirements. In all cases the Board reserves the right to require the higher of the values in the guidelines based on conditions specific to a given site or on conditions of the best interest of the public. The line of sight at the applicable heights for the observer's eye and object height shall remain unobstructed at all times within the distances used.

1. Intersection Sight Distance – The following sight distances, according to posted speed limits, are required for a clear vision area. The values listed as standard represent the minimum requirements within a plat or the minimum requirements for sight distance where conditions along an existing highway will permit. In no case will access to an existing county highway be permitted with less than the minimum allowable sight distance. Corner sight distance shall be measured from a point located not less than fifteen feet from the travelled way or existing pavement at a height of 3.50

feet above grade (or proposed grade) sighting an object 4.25 feet above the grade (or proposed grade) of the road approached.

Corner Sight Distance at Proposed Intersections

Speed Limit	Standard	Minimum Allowable
30 or below	475	350
35	575	400
40	700	450
45	825	500
50	975	550
55	1150	600

2. Stopping Sight Distance – In accordance with the following table shall be maintained throughout a proposed subdivision. This table is excerpted from the 1990 edition of the A.A.S.H.T.O. Policy on Geometric Design for Streets and Highways and is intended as a guide for design purposes.

Minimum Stopping Sight Distance Requirements

Speed Limit	Minimum Allowable
30 or below	225-250
35	275-325
40	325-400
45	400-475
50	450-550
55	525-650

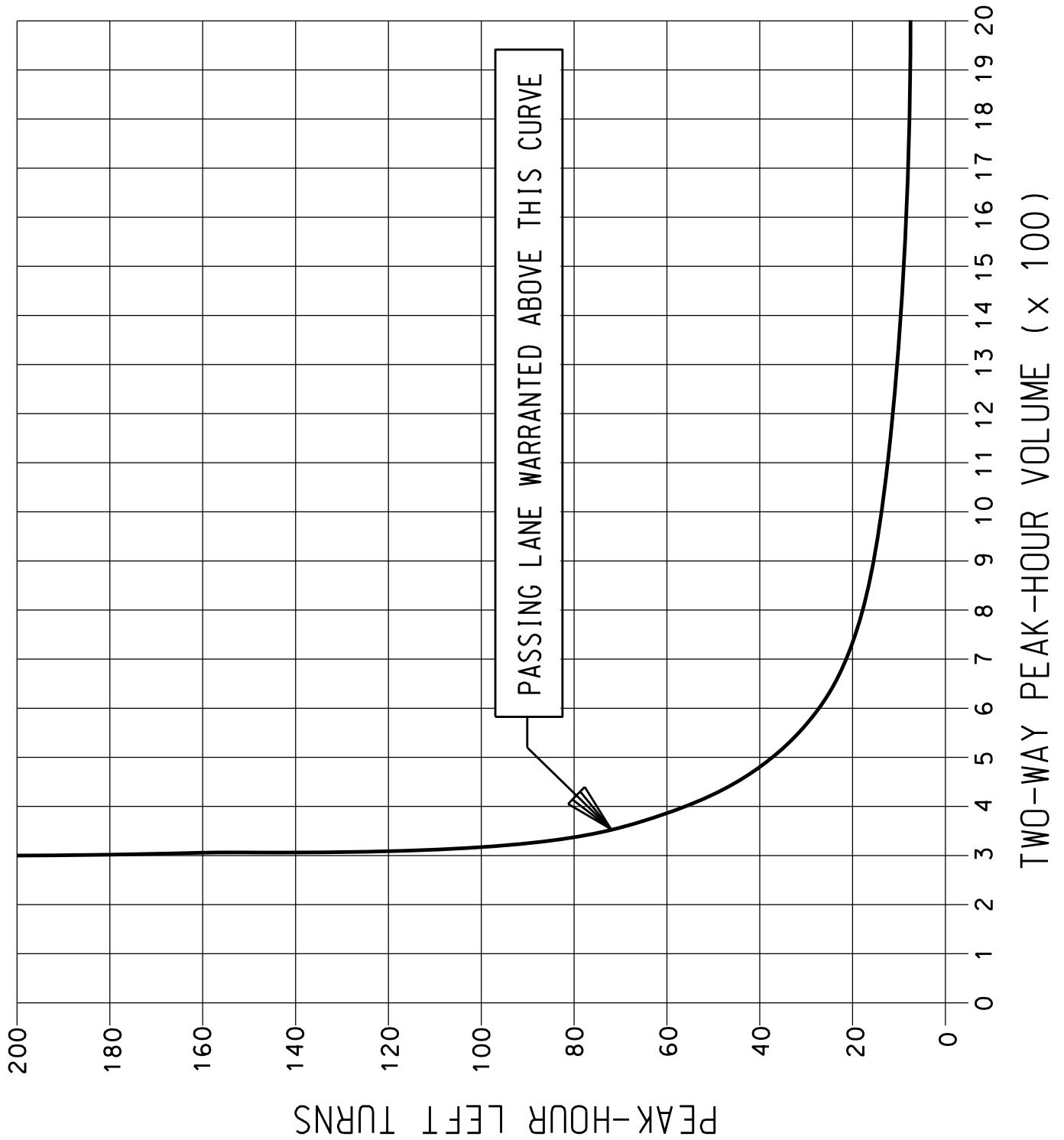
Minimum Vertical Curve Length For Stopping Sight Distance

Stopping sight distance shall be measured from a height of 3.50 feet above the proposed grade sighting an object with a height of 0.50 feet above proposed grade. The stopping sight distance along existing county highways shall be maintained from the center line of the proposed intersection each way for the distance as determined by the operating speed. Within this area stopping sight distance shall be maintained without obstruction.

Posted Speed Limit (mph)	*K Value for Crest Vertical Curves	*K Value for Sag Vertical Curves
30 or below	40-50	50-50
35	60-80	60-70
40	80-120	70-90
45	110-160	90-110
50	150-220	100-130
55	190-310	120-160

\*K Value is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve that will provide the minimum required stopping sight distance.

# LEFT TURN PASSING LANE WARRANT (BASED ON TOTAL DEVELOPMENT)



**SECTION VII  
INSPECTION AND MATERIAL REQUIREMENTS  
FOR  
PLAT DEVELOPMENT**

**A. GENERAL**

The Proprietor shall be responsible for all testing and documentation with respect to construction of any subdivision. All testing shall be done under the direct supervision of a professional engineer licensed in the state. The 1990 edition of the Michigan Department of Transportation (M.D.O.T.) Standard Specifications for Construction and supplemental specifications are hereby established as governing all methods, materials, and equipment used in the construction of new roadways to be dedicated to the public and maintained as a part of the Bay County Road System. All construction shall be carried out in accordance with:

1. Special details shown on the plans
2. M.D.O.T. Standard Plans if applicable
3. M.D.O.T. Standard Specifications for Construction

The Proprietor's Engineer shall use the current edition, including any supplements, of the M.D.O.T. Construction Manual as the source guide for inspection procedures, frequency and documentation for all newly constructed (public) roads except as herein provided. All materials used in the construction of roads or streets to be dedicated to the use of the public shall be physically tested, come from sources on which representative samples have been tested, or come from manufacturers of materials whose name appears on the most current list of "certified suppliers" contained in the M.D.O.T. Materials Sampling Guide.

The Bay County Road Commission shall have access to inspect any and all phases of construction on roadways that are to be dedicated to the public. Any inspections made by the Bay County Road Commission or its agents shall not relieve the Proprietor's Engineer of any of their obligations with respect to quality control, but shall be deemed to be a form of independent quality assurance for the County. If a dispute between the Proprietor's Engineer and the contractor arises with respect to conformance with specification, or the resulting product, the County Highway Engineer's determination on the matter shall be final in regards to what will or will not be acceptable for the use of the public. All documentation specified herein shall be made available upon demand to the County Highway Engineer or an appointed member of the Road Commission staff.

The County Engineer or an appointed member of staff, by authorization of the Board reserves the right to terminate all construction activities when, in the County Engineer's opinion, work in any existing right-of-way is not being constructed in accordance with these specifications or when there is a clear and immediate danger presented to the users of existing highway facilities. Inspections made, and actions ordered by this department do not represent an obligation to create a safe working environment or represent a source of documentation, but are made solely for the benefit of the Board.

**B. ROADWAY EARTHWORK – M.D.O.T. Section 2.08**

Earthwork shall be done entirely in accordance with Sec. 2.08 of the M.D.O.T. Standard Specifications and shall include the removal of unstable or frost susceptible soils, topsoil, muck, peat, marl, etc. from within the area of influence of the roadbed. Subgrade shall be trimmed to the grade and slope shown on the plans to a tolerance of  $\pm 0.10'$ . All base courses shall be trimmed to a tolerance of  $\pm 0.06'$ .

Line and grade shall be checked with a frequency that assures conformance to the standards above and documented for review by the BCRC. The subgrade shall then be visually inspected and be free from rutting or isolated soft spots before placing any base or subbase material. Any soft or wet spots shall be removed and repaired in accordance with the standards for subgrade undercutting.

Special attention shall be paid to embankment sections. Fill material shall be placed in layers not to exceed 12" in depth and extend from toe of slope to toe of slope. Successive layers of fill shall not be placed until the specified density has been attained. Refer to Section 2.08.11 for placement methods and density requirements.

#### C. SUBBASE – M.D.O.T. Section 2.11

Subbase shall be constructed in accordance with Section 2.11 of the 1990 M.D.O.T. Standard Specifications. Sand subbase shall meet the specifications for granular materials Class II. On all subbase sections, including under concrete curb and gutter, the Proprietor's Engineer shall perform density testing at a rate of not less than once for every 500 feet of roadway with more if failing tests warrant. The minimum allowable density for subbase material will be 95% of maximum unit weight. Grading shall be done to a tolerance of  $\pm 0.06'$  checked and documented with a frequency of not less than every 100' of roadway. Material obtained on site may be used for sand subbase provided it meets the physical requirements for Class II material. Any material obtained from within the roadbed shall be removed to subgrade elevation and either stockpiled for future use or placed at another location on the site. The Proprietor's Engineer shall perform mechanical analysis tests at a rate not less than once every 1500 cyds.

#### D. AGGREGATE BASE COURSES – M.D.O.T. Section 3.01

The methods of constructing aggregate base courses shall be in accordance with Section 3.01 of the 1990 M.D.O.T. Standard Specifications. Aggregate base courses shall meet the physical requirements of dense graded aggregates, Section 8.02. The material shall not be placed on a subbase that has become rutted or displaced in such a fashion as to affect the density of the underlying material. Grading and mechanical analysis requirements shall be the same as required for sand subbase. Density requirements will be as required for the type of surface treatment specified.

#### *NOTE: MAXIMUM UNIT WEIGHT*

With regard to soil density, all maximum unit weights shall be obtained from material directly adjacent to the test site for on site material. Laboratory proctor values representative of an entire site will not be acceptable. Similarly, where density test results vary by an excessive amount on processed material (i.e.: Class II, or dense graded aggregates), a new field proctor value will be obtained.

#### E. BITUMINOUS MIXTURES – M.D.O.T. Section 4.00

Bituminous mix designs shall be submitted to the County Highway Engineer and approved prior to use on any project. The Proprietor's Engineer shall conduct an extraction test a minimum of once every 1,000 tons of production but not less than once a day or once per mixture type. For small quantities (e.g. less than 100 tons) the basis of acceptance may be on visual inspection up to a maximum of 400 tons per project.

The Proprietor's Engineer shall issue a written "permit to place" for each approved section of grade and shall have a representative on site at all times during paving operations. Bituminous placement will be by a mechanical paver with an operating vibrator system. Bituminous surfacing shall not be placed on a base

that has become loose or displaced. *Minor* rutting from truck traffic shall be repaired by hand before the first course of asphalt. Temperature and seasonal limitations will be as dictated in the Standard Specifications but in no case will bituminous pavement be placed on frost.

The bituminous surface shall not be placed until a complete winter season has elapsed since placing the aggregate base unless approved by the County Engineer. Written approval is requested of and granted by the County Engineer. In addition to approval by the County Engineer, a maintenance bond in the amount of the cost for construction of the bituminous surface, plus (10%), must be supplied to the Road Commission by the developer. The bond shall remain in effect for a minimum of 12 months from date of acceptance of the plat by the Road Commission. A cash bond is acceptable.

#### F. CONCRETE – M.D.O.T. Section 6.09

Prior to the start of concrete operations, the Proprietor's Engineer shall submit to the County Highway Engineer, the mix design, and mechanical analysis reports for fine and coarse aggregates to be incorporated into the mix. The Proprietor's Engineer shall have a representative on site at all times during concrete construction operations. Concrete to be placed with a paver (slipform) shall not be placed until the guide string has been thoroughly inspected. Prior to placing concrete, the guide string will be free from irregular (broken) curves both horizontal and vertical; sags or dips occurring between catch basins that vary substantially from the intended grade, and checked for the proper offset to assure proper alignment (horiz. and vert.) on the approach to catch basins, manholes, etc. The Proprietor's Engineer shall issue a written "permit to place" for each approved section of grade. On inspection by the County, any concrete in place that is not substantially true to the planned line and grade shall be removed and replaced before acceptance into the County Road System.

During paving operations, the Proprietor's Engineer shall obtain the following tests:

1. SLUMP
2. AIR ENTRAINMENT – by means of an ASTM approved method, air indicators (chase meters) will not be allowed
3. TEMPERATURE – concrete and ambient
4. STRENGTH – flexure or compressive

All test methods and frequencies for concrete shall be in accordance with M.D.O.T. procedures.

#### G. UTILITIES – M.D.O.T. Section 5.13 – Sewers

Sewer of the type and class specified will be installed to the line and grade set by the Proprietor's Engineer. All sewer shall be placed on a bedding of granular material, "pea stone" or undisturbed earth. The bottom of the pipe shall set uniformly on the bedding material. The bell end of the pipe shall be accommodated by digging a recess for it. Alignment and grade shall be maintained during installation by the use of a laser and target type system on all sewer runs in excess of 100 feet. Concrete pipe shall have a strength designation C76 in accordance with A.S.T.M. specifications. The class of pipe shall be as required for the intended depth of the installation. Corrugated metal culvert shall be steel pipe having a minimum classification of A.S.T.M. – M-36. Smooth-Lined Corrugated Plastic Pipe shall meet the requirements of AASHTO M 294 Type S. These materials will be permitted as specified in the current edition of the 1990 Michigan

Department of Transportation Specifications for Construction. Composite pipe (plastic) will not be allowed within the influence area of the roadbed for storm sewer or culverts.

The Proprietor's Engineer shall have a representative on site at all times during sewer and water main installation. Mechanical analysis tests shall be conducted on Class III backfill material with a frequency of not less than once per 1,000 cyds. or once per project whichever is less. Density testing shall be done once every 250 foot per lift or once per lift on pipe runs less than 250 feet. Density records shall be available upon demand to the County Highway Engineer or his representative. Backfill of catch basins, manholes, valve boxes, etc. within the area of influence of the roadbed shall be in accordance with the requirements for structure backfill. All sewer systems including catch basins, manholes, etc., shall be cleaned before acceptance into the County Road System.

#### H. SANITARY SEWERS & WATER MAINS

Sanitary sewers & water mains shall meet design & material specifications according to the Bay County Department of Water & Sewer "Standards & Specifications for Construction". Plan review and approval by Department of Water & Sewer personnel will be required.

#### I. SUMP PUMP & LOT DRAINAGE LEADS

Individual sump pump & lot drainage leads must be connected to the storm sewer system at a manhole or catch basin, or connected to a header pipe paralleling the roadway & tapped into a manhole or catch basin.

Sump pump or lot drainage leads will be considered private and it will be the responsibility of individual lot owners to maintain them.

#### J. MISCELLANEOUS

Restoration and acceptance:

After construction and prior to final acceptance by the Board, the entire project shall be restored in accordance with the following requirements.

1. The site shall be graded within the road right-of-way in preparation for a topsoil surface on all areas disturbed during construction. All intersecting slopes shall be rounded over presenting a smooth and natural appearance.

Four inches (4") of topsoil along with the seed, fertilizer and mulch shall be placed on all disturbed areas. MDOT Specifications for Turf Establishment shall be used for placement of roadside seeding mixture. Ditches having grades exceeding 2.5% or velocity exceeding three feet per second shall be sodded.

2. Debris created during construction such as trampled brush, broken trees, large stones shall be removed from within the right-of-way.
3. Neither the Proprietor or any of their agents shall plant any trees within the proposed road right-of-way. Any landscaping done within the right-of-way shall be done with plantings that, if left unattended, shall have a mature height of less than eighteen inches. The use of rock gardens should be avoided however will be accepted only when the maximum size stone is less than six

inches and used as ground cover and are not arranged so that they present a hazard to the public. This determination shall be solely a matter of the Board's opinion based on its authority and responsibility to maintain the proposed streets in a manner reasonably safe and convenient for public travel.

4. The use of signs within the road right-of-way other than regulatory or guide signs authorized by the Michigan Manual on Uniform Traffic Control Devices is prohibited and shall be strictly enforced. Advertising or subdivision name signs located within the right-of-way shall be removed prior to acceptance.
5. All mailboxes installed within the public right-of-way shall follow the guidelines outlined in the Bay County Road Commission "Mailbox Policy". Masonry mailbox structures specifically will not be allowed and it shall be so stated on the final plat and in any plat restrictions.
6. All work not provided for elsewhere in these Specifications shall be done in a manner approved by the County Engineer, in his sole discretion.
7. In subdivisions where sidewalks are proposed, all hydrants shall be located behind the walk.

#### K. TEMPORARY TURNAROUNDS

Should the Proprietor desire to build a subdivision in phases, it will be necessary to construct a temporary cul-de-sac turnaround at the end of roadways which will be extended in future phases.

This temporary turnaround shall be constructed within an easement whose outline is identical to the right-of-way required for permanent cul-de-sac turnarounds as shown in Illustration No. 4. The easement document shall be provided by the Proprietor & presented to the Road Commission. The easement will not be recorded unless the roadway extension does not take place within 2 years of acceptance of the subdivision by the Board.

In addition to the easement document, the Proprietor shall provide financial surety to the Board in an amount equal to 110% of the approved Engineer's estimate for construction of a permanent cul-de-sac. Approved types of surety are outlined in Section VIII. The Proprietor will have 2 years from completion of the initial or preceding phase of the subdivision to begin construction on the next phase, or the Road Commission will use the surety to contract for completion of the permanent cul-de-sac.

### **SECTION VIII FINAL INSPECTION AND APPROVAL**

- A. After construction of the roads and alleys is completed, the Proprietor shall furnish the Board with a letter requesting approval of the subdivision by the County Engineer. In addition, the Engineer shall certify (over his professional seal) that he has supervised and inspected all construction; that all roads and drainage have been built in accordance with the approved plans and specifications; and that all monuments are in place and in good condition; in conformance with the Michigan Registration Act for Architects, Professional Engineers and Land Surveyors, Act 240, Public Acts of 1937, as amended. All pertinent testing, field inspection, and material certification documents shall also be supplied to the County Engineer.



- B. The County Engineer shall inspect the work as soon as possible after the items in (A) are received. If the work is complete and acceptable, the Board shall grant its approval. If the work is not complete and acceptable, the Engineer shall be notified as to deficiencies.
- C. The County Engineer shall make a re-inspection of the work after being notified by the Engineer that deficiencies have been corrected. When all deficiencies have been corrected to the satisfaction of the County Engineer, the Board shall grant its approval.
- D. If construction is not completed at the time the Final Plat is submitted for approval, one of the following types of surety must be satisfied before the Final Plat can be approved by the Board. Approval of any single phase of construction does not guarantee acceptance of the roads, or approval of the Final Plat by the Board. Further, it will not relieve the Proprietor of responsibilities or liabilities incurred by the development of the project. If the Proprietor is granted Final Plat approval by the Board prior to construction, the Proprietor shall maintain all roads in the plat until the construction of said roads has been approved by the County Engineer and accepted by the Board. Maintenance of the roads shall include but not be limited to snow, ice, soil erosion and sedimentation control. The Proprietor shall indemnify and hold the Bay County Road Commission harmless from any claims which may be made against the Road Commission for damages arising from the use of roads which have not been accepted into the County Road System. During this period the Proprietor shall maintain liability insurance in which the Bay County Road Commission is named as an additional insured, and in an amount established by the Road Commission, which will insure the Bay County Road Commission against claims made because of the use of the road(s) prior to final acceptance.
  - 1. Construction Bond – The Proprietor shall submit a guarantee of construction in the amount of one hundred ten percent of the anticipated construction cost of remaining construction items to be completed based on the approved estimate submitted by the Proprietor’s Engineer. This requirement may be fulfilled with any of the sureties listed below. With the exception of cash deposits, the issuing agency shall notify the Bay County Road Commission sixty calendar days in advance of expiration, cancellation or termination of all financial guarantees.
    - a. Plat Bond – Furnished by the Proprietor and approved in form and content by the corporate counsel of the Bay County Road Commission. The bonding company must be approved by this department. The minimum bond shall be not less than \$10,000.00. The bond shall be for a period of not less than two years.
    - b. Cash Deposit – Using a certified check on an open and solvent bank made payable to the Bay County Road Commission.
    - c. Escrow Agreement – An escrow agreement approved in form and content by the corporate counsel of the Bay County Road Commission issued for a duration of not less than two years.
    - d. Irrevocable Bank Letter of Credit – Said bank must be approved by the Board. The letter shall be made payable to the Bay County Road Commission upon draft authorized by the Board. The letter of credit shall be approved in form and content by the corporate counsel of the Bay County Road Commission and shall be made for a duration of not less than two years. The letter shall have provisions in it stating that it cannot be cancelled, expire or otherwise be terminated without sixty days written notice to the County Engineer.

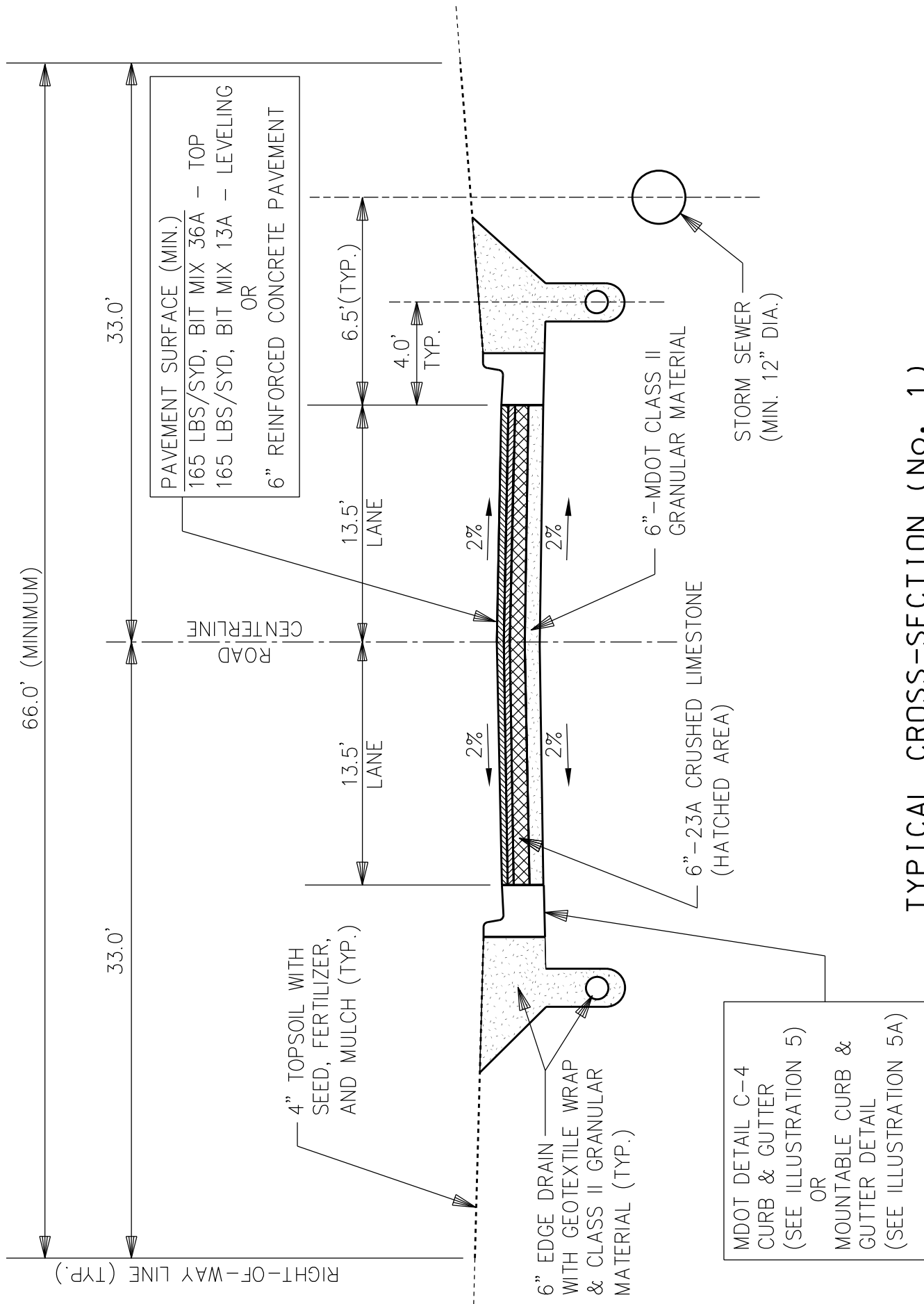
The surety shall be released as the work progresses based on verified progress estimates submitted to this department. Partial releases shall be equal to ninety percent of the work completed to date. The remaining ten percent shall be withheld until after construction has been completed, all the conditions of final review and acceptance have been met.

## **SECTION IX RECONSTRUCTION WITHIN EXISTING SUBDIVISIONS**

Any reconstruction work performed within existing subdivisions shall be completed with curb and gutter and new drainage construction shall be storm sewers. The curb and gutter and storm sewers shall be so constructed as to facilitate the future base and hard surface construction. Open ditches will not be allowed as a part of reconstruction within the existing subdivisions as accepted by the Bay County Road Commission.

## **SECTION X AUTHORITY**

- A. None of the provisions contained herein shall be construed so as to limit the authority of the Board, in its sole discretion, to refuse to issue approval when:
1. The conditions of the roads, streets, alleys and driveways are such that the contractor's operations would cause harm or injury to the highway and/or the travelling public.
  2. In the opinion of the Board, after considering public safety based upon traffic volumes, drainage requirements, the character of the use of land adjoining the highway, and other requirements in the public interest, the proposed roads, streets, alleys and driveways would cause harm or injury to the highway and/or the travelling public.
  3. Any of the requirements of these rules, standards and specifications are not met.
- B. The Board reserves the right, in its sole discretion, to add to or delete from the rules, standards and specifications contained herein, in specific instances, so long as any such additions or deletions are consistent with public safety and based upon traffic volumes, drainage requirements and the character of the use of land adjoining the highways and proposed roads, streets, driveways, alleys and highways, other requirements in the public interest.



TYPICAL CROSS-SECTION (NO. 1)  
 STANDARD DESIGN  
 NO SCALE

ILLUSTRATION No. 1

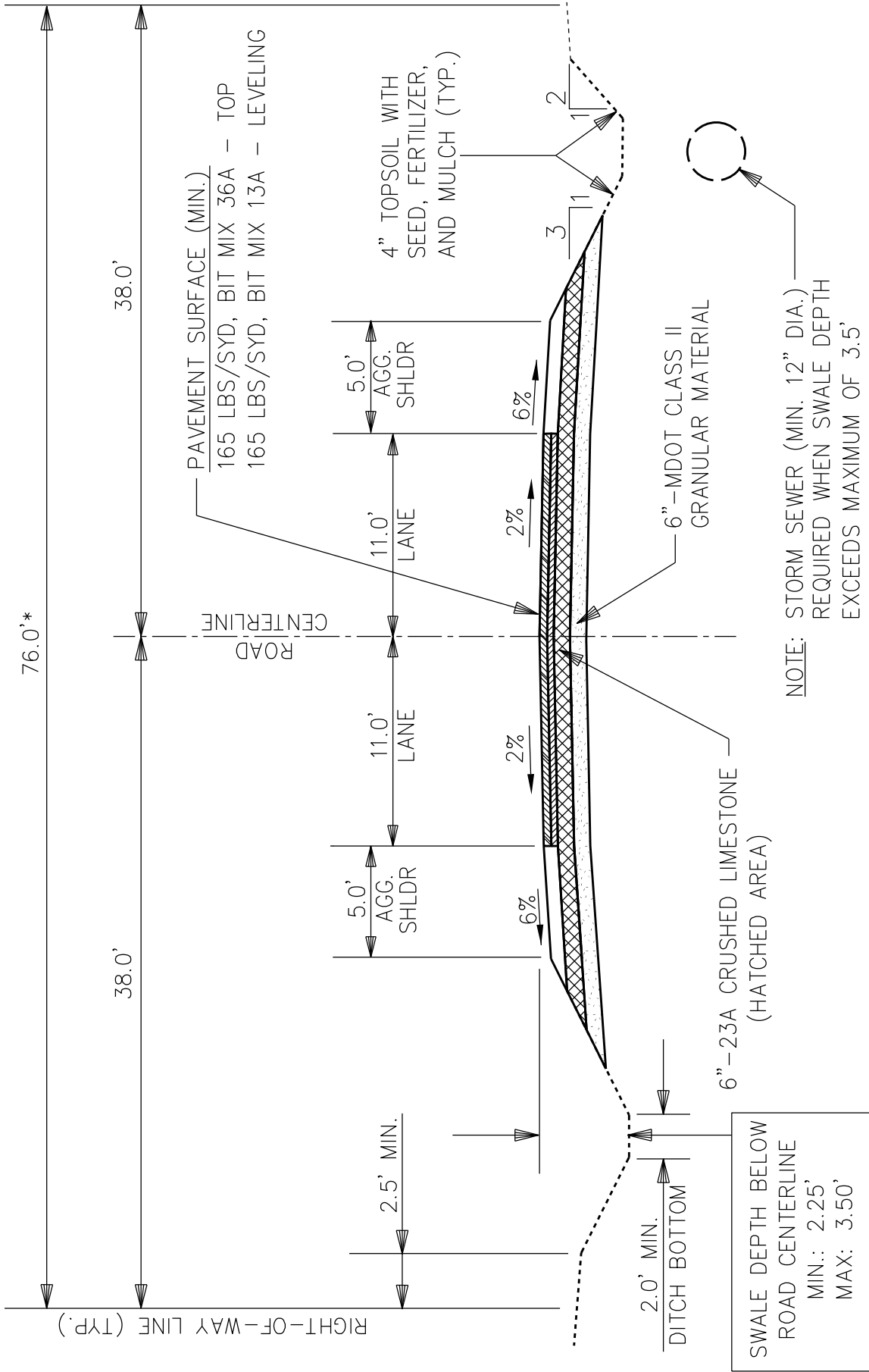


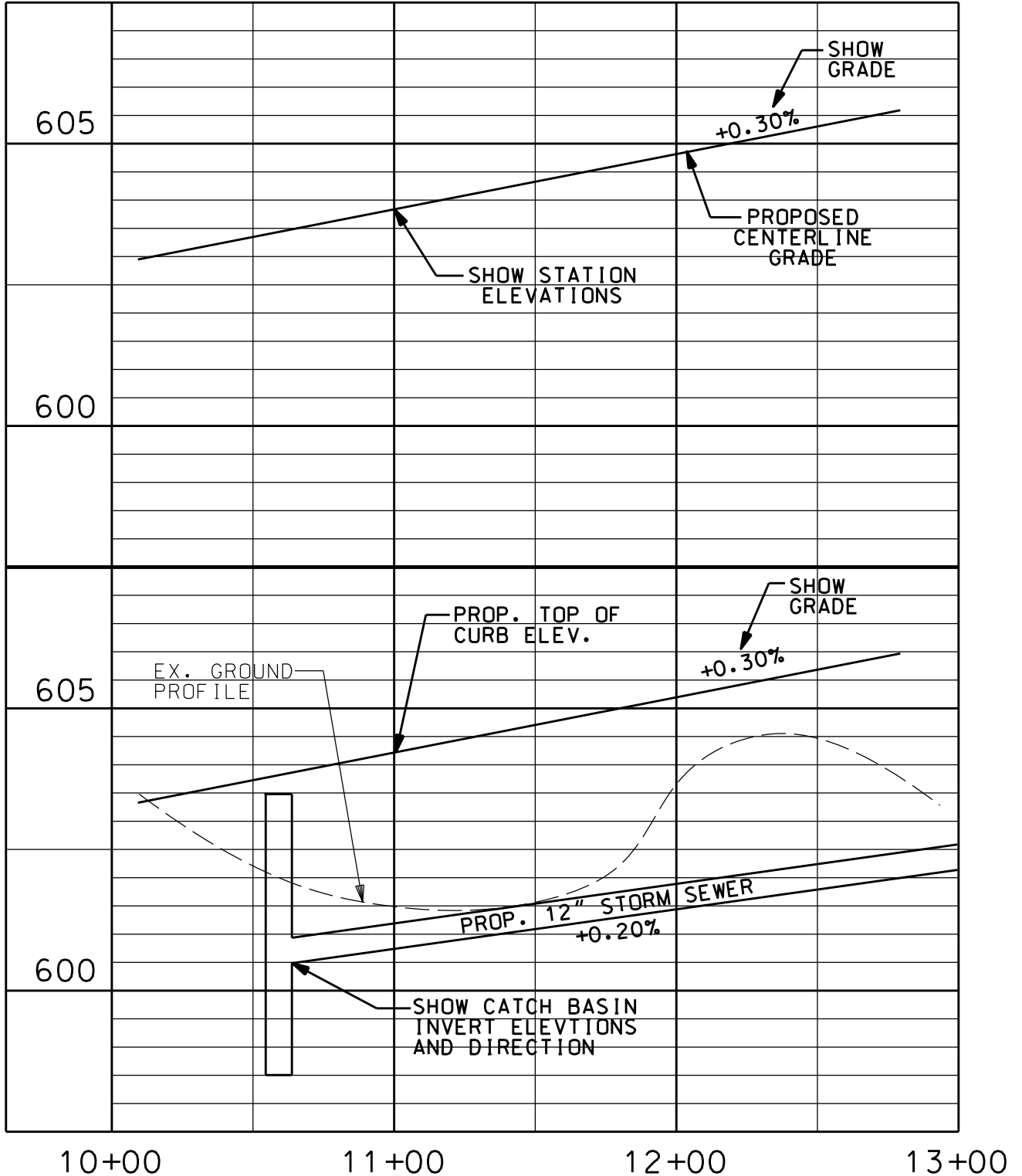
ILLUSTRATION No. 2

TYPICAL CROSS-SECTION (NO. 2)  
ALTERNATE DESIGN  
NO SCALE

\*RIGHT-OF-WAY WIDTH LESS THAN 76' MAY BE ACCEPTABLE WITH PRIOR BOARD APPROVAL.

# ILLUSTRATION No. 3

USGS DATUM

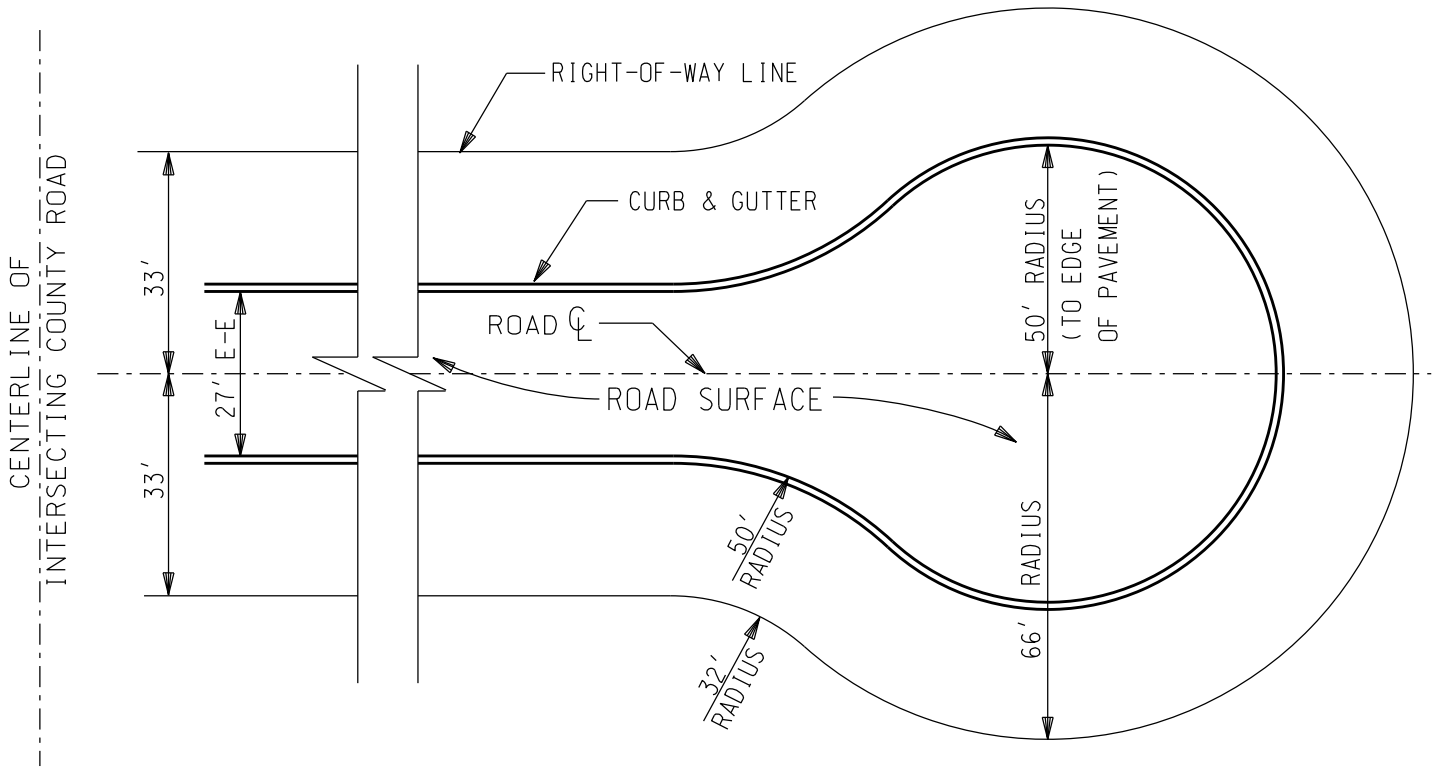


1. MINIMUM SCALE: HORIZ. 1"=50', VERT. 1"=5'
2. SHOW LEFT AND RIGHT CURB GRADES, CENTERLINE GRADE, AND OTHER PERTINENT DATA.
3. SHOW DITCH GRADES WHEN CURB & GUTTER ARE NOT BEING CONSTRUCTED.

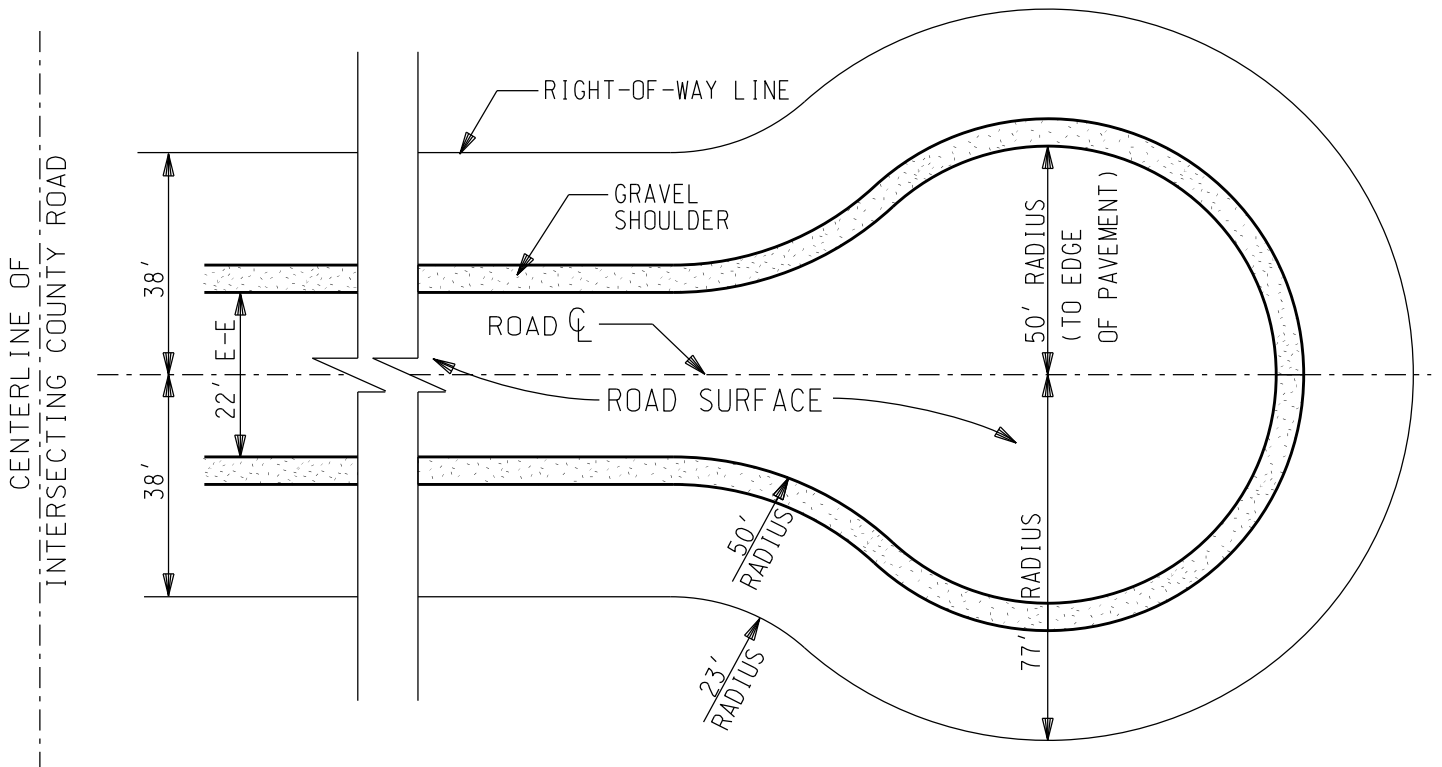
## TYPICAL PROFILE

NO SCALE

# ILLUSTRATION No. 4

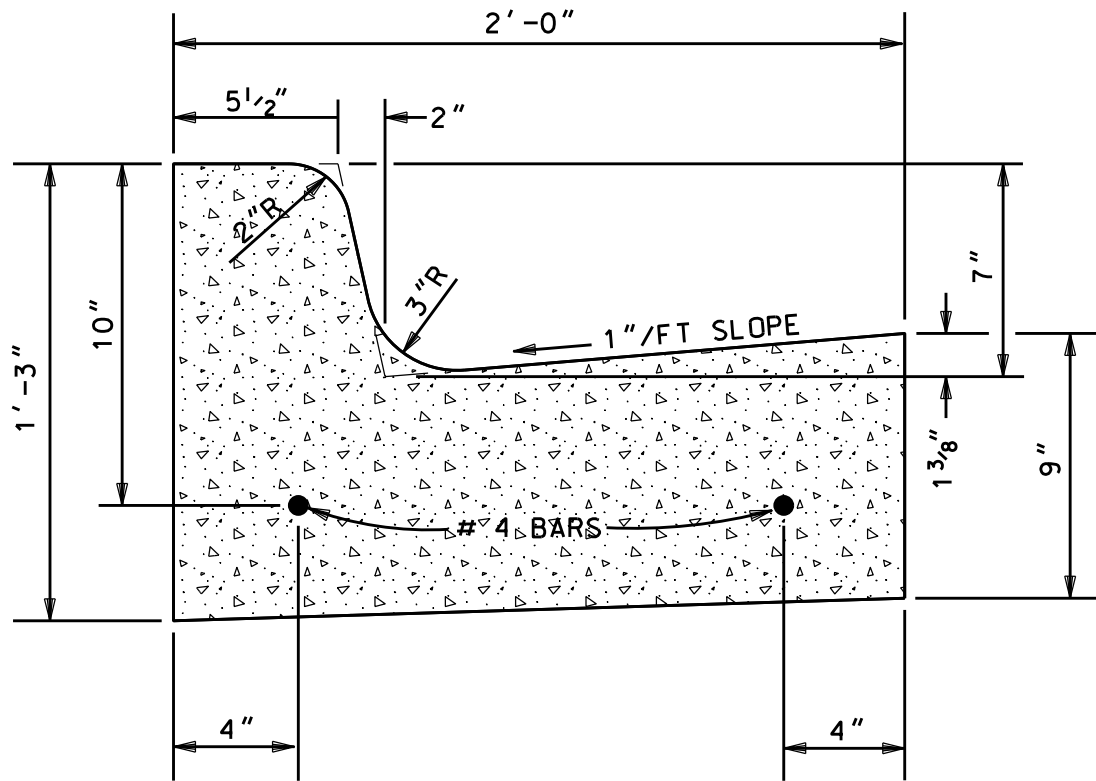


## CUL-DE-SAC AT ROAD TERMINUS STANDARD DESIGN



## CUL-DE-SAC AT ROAD TERMINUS ALTERNATE DESIGN

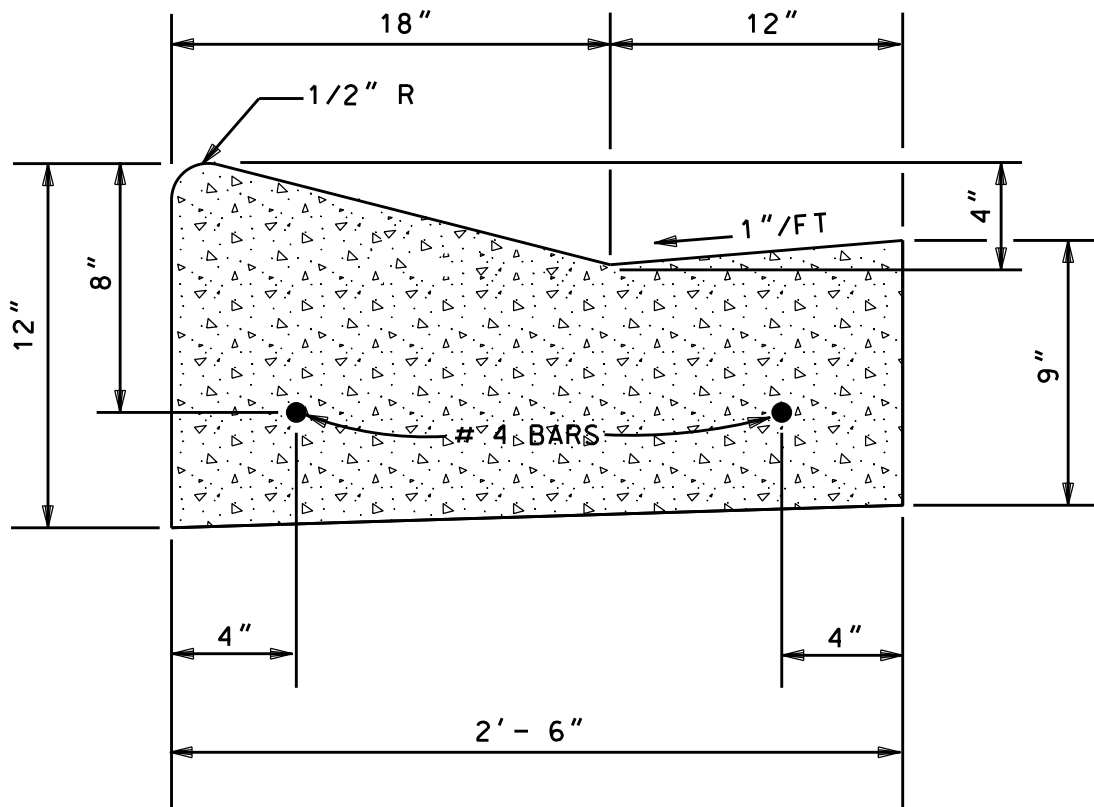
ILLUSTRATION No. 5



TYPICAL DETAIL FOR  
CONCRETE CURB AND GUTTER  
(M.D.O.T. DETAIL C-4)

NO SCALE

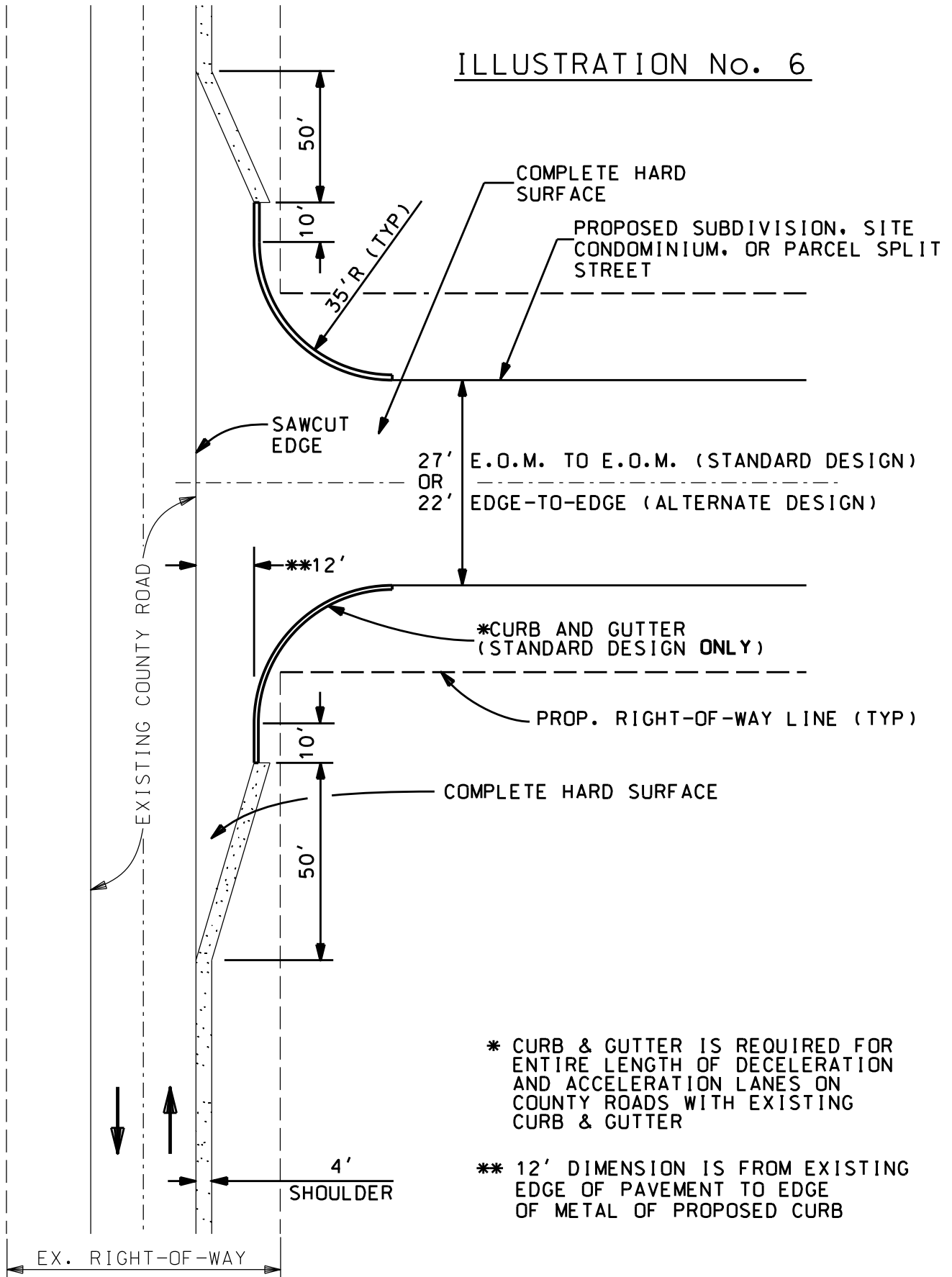
ILLUSTRATION No. 5A



MOUNTABLE  
CONCRETE CURB AND GUTTER DETAIL  
NO SCALE



ILLUSTRATION No. 6



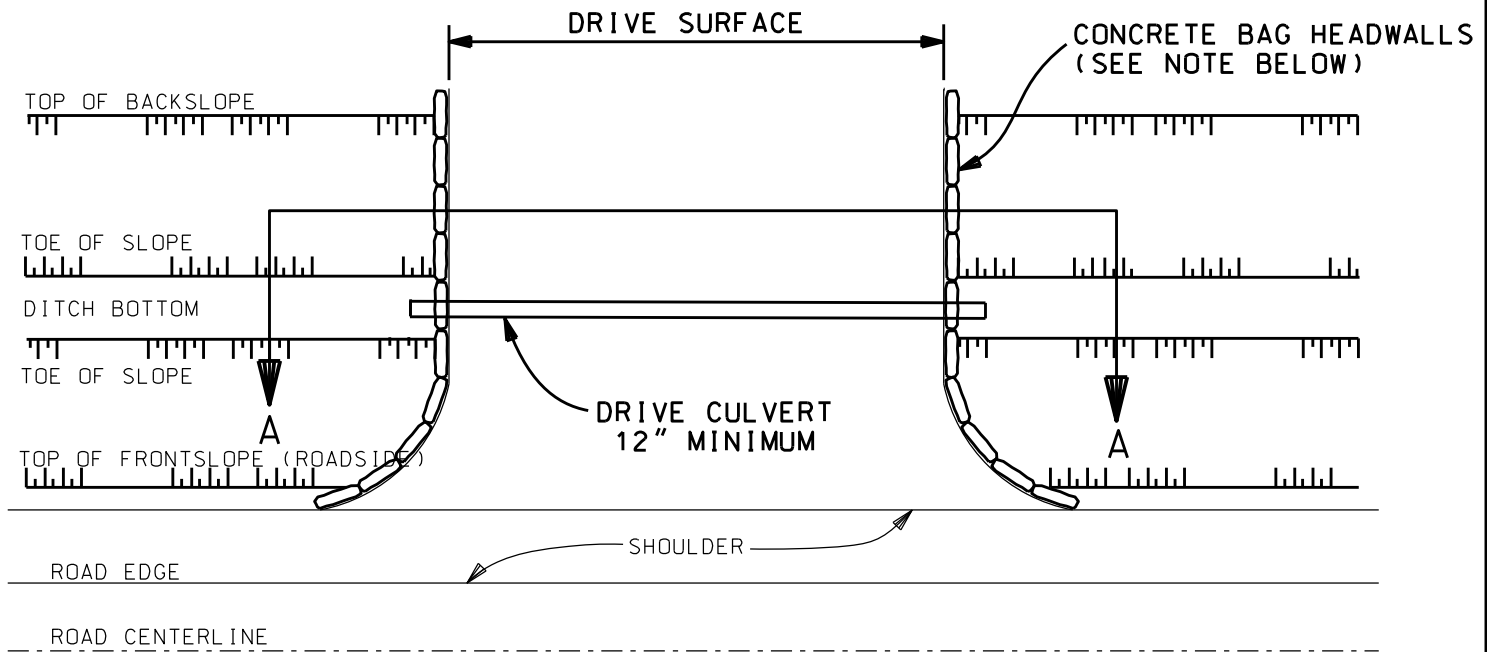
\* CURB & GUTTER IS REQUIRED FOR ENTIRE LENGTH OF DECELERATION AND ACCELERATION LANES ON COUNTY ROADS WITH EXISTING CURB & GUTTER

\*\* 12' DIMENSION IS FROM EXISTING EDGE OF PAVEMENT TO EDGE OF METAL OF PROPOSED CURB

TYPICAL DETAIL FOR A PUBLIC (OR PRIVATE) ROAD CONNECTION TO A COUNTY ROADWAY

NO SCALE

# ILLUSTRATION No. 7

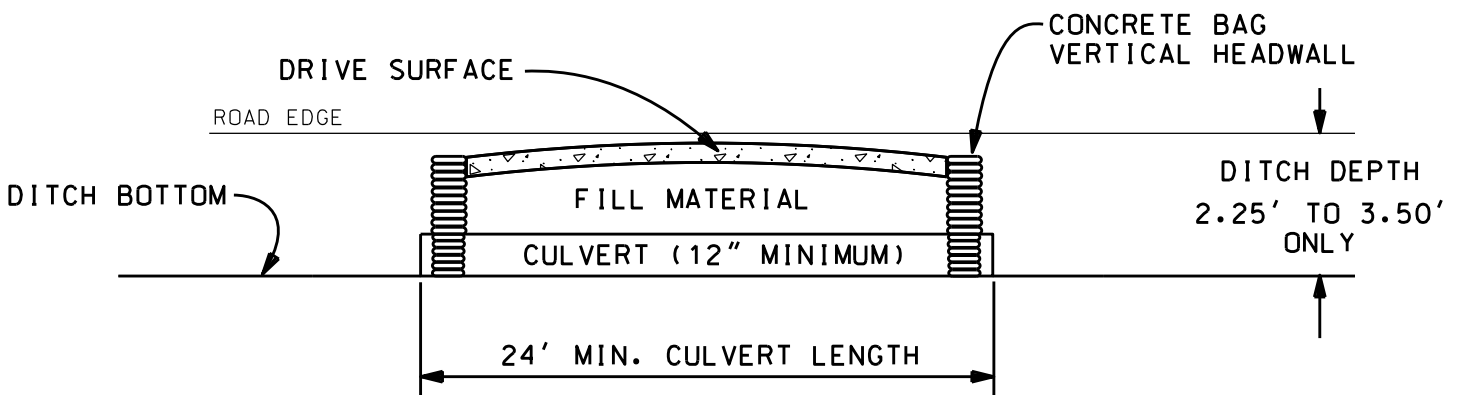


## PLAN VIEW

NO SCALE

### ROAD OR DRIVEWAY WITH HEADWALLS (MIN. REQUIREMENTS)

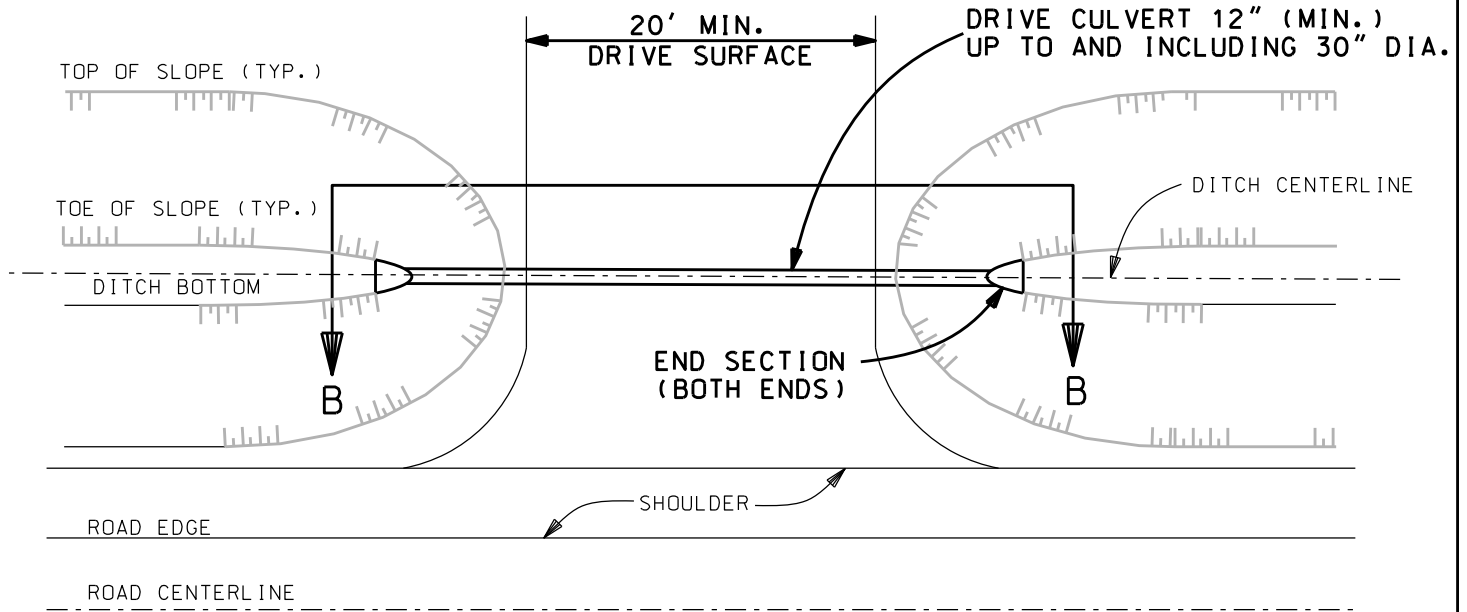
**NOTE:** VERTICAL HEADWALLS MAY ONLY BE CONSTRUCTED WHERE ROAD OR DRIVE CULVERTS INCLUDE OR EXCEED 31" IN DIAMETER. THE USE OF STACKED "QUIKCRETE" BAGS FOR VERTICAL HEADWALLS IS NOT ALLOWED.



## PROFILE VIEW

SECTION A-A

# ILLUSTRATION No. 8

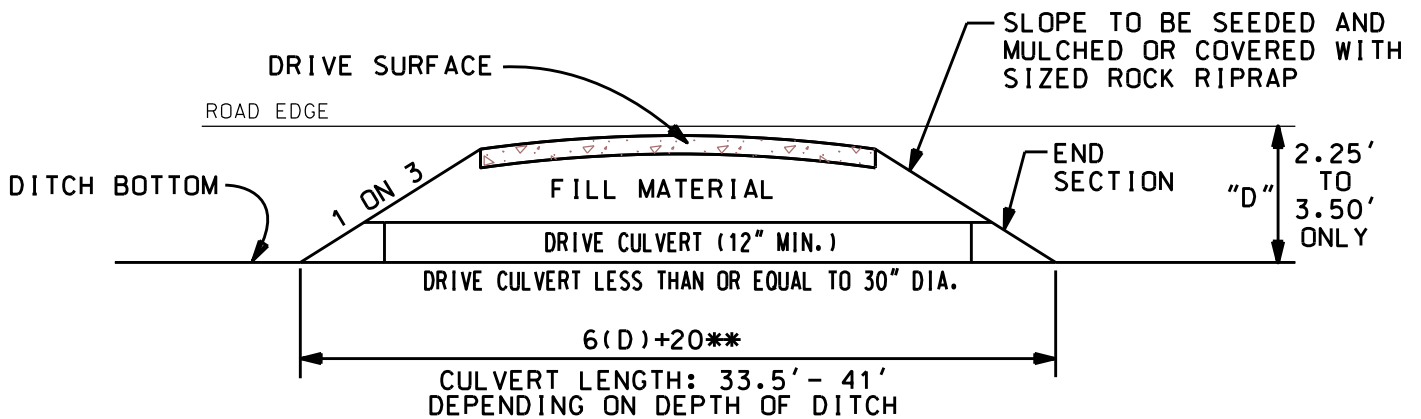


## PLAN VIEW

NO SCALE

### ROAD OR DRIVEWAY WITH HEADWALLS (MIN. REQUIREMENTS)

**NOTE:** VERTICAL HEADWALLS MAY NOT BE USED FOR ROAD OR DRIVEWAY CULVERTS LESS THAN OR EQUAL TO 30" DIA. END SECTIONS MUST BE USED.



**\*\*EXAMPLE:**

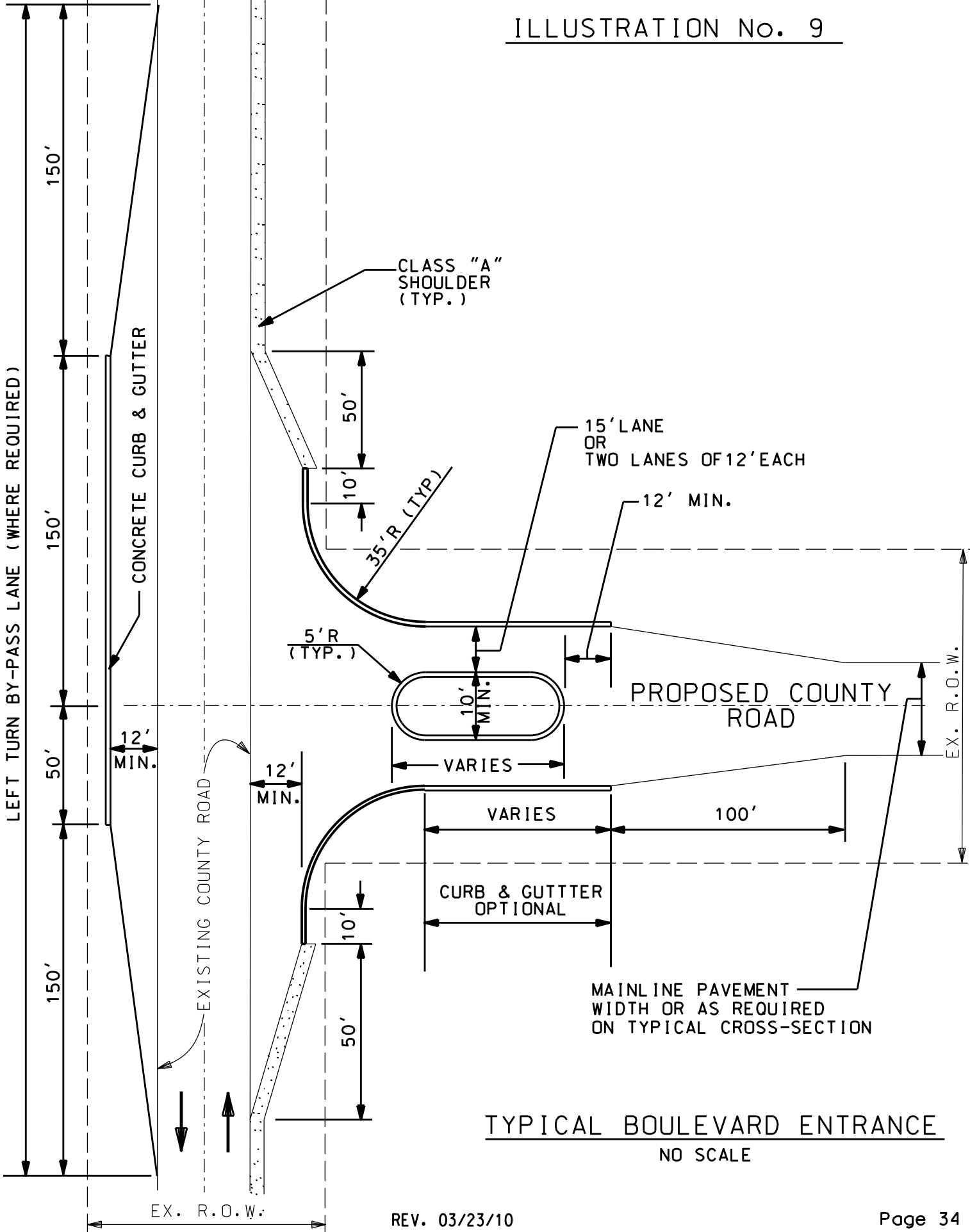
DITCH DEPTH (D) = 3.5'

$6(3.5)+20 = 41'$  MINIMUM LENGTH OF CULVERT & END SECTIONS

## PROFILE VIEW

### SECTION B-B

ILLUSTRATION No. 9



TYPICAL BOULEVARD ENTRANCE  
NO SCALE

