

ROAD DEVELOPMENT POLICY

VAN BUREN COUNTY ROAD COMMISSION

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I. Purpose and Scope

The purpose of this publication is to provide logical procedures to form adequate street systems with relation to public thoroughfares and new subdivision of lands. Requirements and specifications shall apply only to subdivision of lands located outside the corporate limits of any incorporated city or village in Van Buren County and to lands within incorporated areas when such lands are adjacent to public highways under the jurisdiction of the Van Buren County Road Commission.

The contents of this publication shall not supersede any part of Act 288, Public Acts of 1967 as amended and amendments thereto, and are to be in accordance with this act. All condominiums and site condominiums shall comply to the Michigan Subdivision Control Act (P.A. 59, Public Acts of 1978) as amended.

These published minimum requirements and specifications are subject to revision without notice, by the Board of County Road Commissioners of Van Buren County.

II. Variance Clause

Proprietors desiring variations from these requirements may submit their requests to the Van Buren County Road Commission. In cases considered meritorious, individual requirements may be waived in specific instances.

III. Definitions

- A. County Engineer shall mean the Engineer Manager of the Van Buren County Road Commission or an authorized representative.
- B. Developer shall mean the organization or individual in charge of initiating the Road Development. The word Proprietor shall fall under this category and be as defined in Section 102, Act 288, Public Acts of 1967, as amended.
- C. Professional Engineer shall mean the Professional Engineer, registered in the State of Michigan, and retained by the developer.
- D. Plan shall be the map of a development.
- E. VBCRC shall mean the Van Buren County Road Commission.
- F. MDOT shall mean the Michigan Department of Transportation. MDOT specifications are as found in the Department's most current edition of the Standard Specifications for Construction.
- G. County Primary Roads shall be all roads certified as a part of the Primary County Road System.

- H. County Local Roads shall be all roads certified as Local County Roads other than development streets.
- I. Development Streets shall be all roads within existing or proposed developments.
- J. MMUTCD shall be the Michigan Manual of Uniform Traffic Control Devices, 1994 or most current.

IV. Order of Procedure

- A. Below is the order of procedure to be followed by the Proprietor in preparing a development:
 - 1. Submit pre-preliminary development plans to the County Engineer for approval of the proposed road system layout and drainage systems.
 - 2. Submit preliminary plans to the County Engineer for approval.
 - 3. Submit road and drainage construction plans to the County Engineer for approval.
 - 4. Submit final plans to the County Engineer for approval.
 - 5. Pre-construction meeting with the VBCRC.
 - 6. Construct streets and drainage structures as per approved plans.
 - 7. Submit final "as-built" plans for final inspection and approval. No verbal agreements will be recognized unless confirmed in writing. No road developments will be approved until the VBCRC has received a complete Infrastructure Reporting Form.
- B. Details for preparing projects are supplied in subsequent sections. To aid in submitting this material, a check list of requirements and specifications for proposed road developments is supplied in Appendix B.

V. Pre-preliminary Development Plan Requirements

- A. Pre-preliminary development plans shall be legibly drawn and show the following:
 - 1. Location of property, township, and section.
 - 2. Name of proposed development.
 - 3. Map showing relationship to township section and connecting public or private roads and new developments.

4. Proposed layout and typical or general dimensions, showing proposed road system and road drainage.

VI. Preliminary Plan Requirements

- A. Four copies of preliminary plans must be submitted to the VBCRC for approval before construction plans are submitted. The preliminary plans must be prepared and signed and sealed by a Registered Professional Engineer. They must be drawn on 24"x36" sheets and to a scale not less than 1" = 200'. Within thirty days after their receipt, the preliminary plans will either be approved or rejected. Should they be rejected, the VBCRC will give its reasons in writing to the Proprietor or the Professional Engineer, and requirements for approval shall be given.
- B. Preliminary plans shall contain a situation sketch that shows the proposed road development, including the entire parcel from which the proposed development is to be taken, in relation to county roads and to township section and quarter section lines. This shall include street layout, street names, rights-of-way, streets, streams, railroads, cemeteries, county drains, and any other features, which might govern or influence development. Using USGS datum or WGS-84 datum converted to USGS datum, relief will be indicated at not more than two-foot contour intervals. To assure sufficient sight distance, the centerline profile of an intersecting county road must be shown for a minimum distance of 600 feet on each side of a proposed street.
- C. The street system shall provide a continuous circuit, without excessive street curvature and dead ends. Streets ending in permanent cul-de-sacs shall be kept to a minimum and must be approved by the County Engineer.
- D. A letter of approval for street names must be obtained from the VBCRC. A copy of the letter shall accompany the preliminary plans. An extension of a street shall retain the name of the existing street.
- E. The proposed road network must be properly drained by a storm drainage system. Development of the storm drainage system must be in coordination with the VBCRC and the Van Buren County Drain Commission. The VBCRC, in conjunction with the Van Buren County Drain Commission, will accept and maintain all storm drainage facilities constructed within the road right-of-way. All storm drainage systems must be approved by the County Engineer. If the County Engineer should require storm sewers to be installed, plans shall show sizes, types, locations, and lengths of all pipe. (See VII. - Construction Requirements; F. Drainage System Provisions).
- F. Approval of any plans by the VBCRC does not alleviate the Developer from meeting standards and obtaining permits required by other agencies.
- G. Section and quarter section line roads shall be centered on the section or quarter section line.

H. Minimum width of rights-of-way required are as follows:

Road Developments 66 Feet

Local roads 100 Feet

Primary roads 120 Feet

In special cases, the VBCRC may require greater widths.

- I. A 10 foot wide private easement for public utilities shall be located outside and contiguous to the road right-of-way.
- J. Road developments shall afford safe ingress and egress at all intersections. All intersected primary and local roads shall be upgraded to provide bypass and deceleration lanes and adequate turn radii. See Appendix A, Figure 1. All new road developments less than 10 lots will not require a by-pass lane but will require a 50 foot radius and a 50 foot taper in both directions and as approved by the County Engineer.
- K. Intersection legs shall meet at 90 degree angles and have a minimum straight-away length of 100 feet as measured from the centerline of the intersected street. Opposing 'T' intersections shall lie on the same centerline. If this is not possible, then they shall be a minimum of 200 feet apart for driver safety.
- L. Lot access will not be permitted onto a primary road and shall be held to a minimum on local roads.
- M. No out lots will be permitted. Access streets for development of adjoining parcels shall be required for future development.
- N. No driveway access shall be permitted to any dead-end street that does not have a cul-de-sac conforming to VBCRC requirements. This stipulation shall be clearly stated in the development restrictions, which shall be recorded with the development.
- O. A cul-de-sac shall provide a minimum back-to-back of curb, edge-to-edge of valley gutter, or edge-to-edge of pavement, of 100 feet in diameter and must be centered on a minimum dedicated right-of-way diameter of 120 feet. An option of constructing a center island is only available for residential road developments. Any such island shall have mountable curb or valley gutter and a minimum back-to-back of curb or edge-to-edge of valley gutter of 40 feet in diameter. Development restrictions shall dedicate the island as a highway easement with ongoing maintenance assigned to adjacent lot owners or to an owners' association. See Appendix A, Figure 3.
- P. No existing street shall be extended without the removal and reconstruction of its cul-de-sac to the existing roadway cross-section.

- Q. If the road development is not under construction within one year after the approval date of the preliminary plans, the preliminary plans must be resubmitted and re-approved.

VII. Construction Requirements

- A. Before construction can begin, four (4) sets of road and drainage construction plans shall be submitted and approved. The plans must be signed and sealed by a Professional Engineer registered in the State of Michigan. They shall be drawn on "D" sized sheets and to a scale of not more than 40' to 1" horizontal and 5' to 1" vertical. They shall include a plan view with the centerline profile directly below, a typical cross section, a permanent bench mark established at USGS datum or WGS-84 datum converted to USGS datum, and the log and location of soil borings. The plans shall note that all unsuitable subbase material must be removed to a minimum depth of two feet below the top of the subgrade or as directed by the County Engineer. Also, they must note that all work shall comply with the provisions of Part 91, Soil Erosion and Sedimentation Control Act (P.A. 451 of 1994) as administered by the Van Buren County Commission and the VBCRC. Drainage plans may be superimposed on the road plans and shall clearly indicate sizes, lengths, types, and location of all pipe (if necessary). Types of inlets shall be referenced to MDOT standards.
- B. Utilities constructed prior to the acceptance of the plans shall be shown and must comply with existing VBCRC requirements. Utilities that run parallel to the road will not be allowed within the right-of-way with the exception of water main, storm, and sanitary sewer systems. These utilities shall be placed within the road right-of-way as follows:
1. The water main shall be located 11 feet off the north or east right-of-way line.
 2. The storm sewer shall be located 17 feet west or south of the right-of-way centerline.
 3. The sanitary sewer shall be located along or within 6 feet east or north of the right-of-way centerline.
 4. All other utilities shall be placed within the 10 foot utility right-of-way easement provided by the developer.
 5. The Developer shall provide utility easements along boundary roads (i.e. County Primary or Local Roads), which are designated as 10 foot non-access easements. They are in addition to the existing R.O.W. established.

This will allow undisturbed utility placement and storage to benefit the lot owners and the VBCRC as a whole.

C. Design calculations for the storm drainage system shall be submitted with the design plans.

D. Minimum road improvements and design requirements shall be as follows:

1. Where required by the County Engineer, all road developments shall have underground storm drainage and be of valley gutter or curb and gutter construction.
2. Where required by the County Engineer, the distance from the back of or edge of valley gutter to the nearest side slope shall not be less than 10 feet. Side slopes shall be a minimum of 3:1 in fill sections and 2:1 in cut sections. See Appendix A, Figures 4 and 5.
3. ~~The minimum ditch width shall be two feet, with 1:4 fill slopes and 1:2 cut slopes. Back slopes and/or fore-slopes shall be flattened where extra width is available.~~
4. The full right-of-way shall be brought to the required cross-section grade and properly trimmed. Soil erosion and sedimentation control measures must comply with Part 91, Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, as amended and all applicable Michigan Department of Natural Resources guidelines. Disturbed areas shall be top soiled, fertilized, seeded, and mulched in conformity with current MDOT specifications. Topsoil depth shall be a minimum of three inches.
 - a. All trees, brush, stumps, shrubs and roots within the limits of the right-of-way shall be cleared and removed from the site.
 - b. Seasonal construction limitations and erosion controls may be imposed by requirements of Part 91 of 1994 P.A. 451 as amended, of the Michigan Soil Erosion and Sedimentation Control Act.
5. The maximum grade of any street shall be 6 percent. Minimum grades shall be 0.75 percent for facilities with valley gutter and 0.5 percent for facilities with curb and gutter. Cul-de-sacs shall be constructed to insure a minimum grade of 1.25 percent along the flow line of the gutter. Grade transitions shall be with vertical curves.
6. The minimum lengths of sight distance shall conform to the AASHTO Policy on Geometric Design of Highways and Streets, 1994 or most current addition.
7. The minimum radius of curve shall be 100 feet.
8. All subbase material must conform to the current MDOT specifications for Class II granular material. Soil borings shall be taken and unsuitable existing material shall be removed and backfilled with Class II material.

E. Surface and base requirements for development streets:

1. Typical cross sections

a. Industrial development street

See minimum design requirements, Appendix 4, Figure 4.

Alternative 1:

A 32' wide 8" compacted base of MDOT 22A aggregate with a 32' wide surface of 500 lbs./sy of bituminous mixture.

Alternative 2:

A 32' wide 8" compacted base of MDOT 22A aggregate with a 32' wide 6" reinforced concrete surface meeting MDOT specifications.

b. Residential development streets with curb and gutter

See minimum design requirements, Appendix A, Figure 4.

c. Residential development streets with valley gutter

See minimum design requirements, Appendix A, Figure 6.

d. Residential development streets with typical roadside ditch

See minimum design requirements, Appendix A, Figure 7.

2. Additional alternatives to those above may be permitted when approved by the County Engineer.

3. Requirements for 13A Modified and 36A bituminous mixtures shall meet VBCRC specifications supplied in Appendix A, Table I.

4. Methods and materials required shall meet MDOT Standard Construction Specifications most current edition.

F. Drainage system provisions:

1. The developer shall provide adequate means to care for surface drainage in and adjacent to his property. In all cases, an easement (minimum width of 20 feet), shall be given by the developer to provide access to drainage systems, such as ditches, tile drains, county drains, natural water courses, etc., for the purpose of maintaining an adequate drainage system. The drainage easement locations will be shown on the recorded plat and appropriately dedicated in the developer's certificate. Mulch blanket will be required in all ditch bottoms and side slopes.

2. Drainage easements across properties not within the boundary of the recorded plat will be provided as separate attachments with the final plat submitted to the County Engineer.

3. All required permits for bridges will be applied for and secured by the applicant prior to preliminary approval of the road plans. Applicable permits are those required by U.S. Corp of Engineers and the Department of Natural Resources.
4. Driveway culverts for each lot will be approved by the County Engineer through either a permit, or must be shown on the plans and approved prior to construction. The minimum driveway structure shall be 12 inches in diameter and 24 feet in length. End sections shall be placed on each end of the 24 foot pipe.
5. Minimum cross pipe size under roadways will be 15 inches in diameter. All cross pipes must have end sections.

The following storm sewer system requirements are established as minimums necessary to meet the concerns of the VBCRC. Meeting these requirements does not in any way substitute for the necessity for obtaining any required permit from, and meeting all requirements of, the U.S. Army Corps of Engineers and the Michigan Department of Natural Resources, and the MDEQ.

- a. The storm sewer system shall have a positive outlet. If a natural outlet is not available, and impoundment area shall be provided.
- b. The maximum surface run for storm water shall be limited to 300 feet. The run shall not be greater than 200 feet for street grades exceeding 4 percent. A relief basin must be provided at the highest end of a radius where drainage is required to cross an intersection longitudinally. Riprap will be required at all areas that may propose erosion problems.
- c. Storm sewer design shall be based on a 10 year storm and must meet the criteria of the Van Buren County Drain Commission's "Subdivision Drainage Rules and Storm Water Design Criteria." A complete engineering analysis supporting the design concept utilized will be required for all developments.
- d. Pipe selection shall meet current MDOT specifications for storm sewer. Storm sewer pipes less than 12 inches in diameter will not be permitted. Concrete pipe of appropriate class is acceptable. Where sewers 12 to 24 inches in diameter are called for with a minimum of 12 inches of cover, smooth-lined corrugated plastic pipe will also be allowed.
- e. Joints of concrete pipe shall be sealed with mastic, flexible watertight rubber gaskets or external type rubber gaskets. Plastic pipe must incorporate premium joints as specified by the manufacturer and MDOT.
- f. Leaching basins will be allowed, if approved by the County Engineer. A full justification shall be submitted with the plans if they are proposed for use. Minimum construction requirements are shown in Appendix A, Figure 9.

- g. The Developer shall include the existing drainage system along the adjacent roadway in the drainage calculations. All storm water from the development must remain within the development and shall not be directed to the existing drainage system along the road.

Drainage computations, type, size, length of pipes, and erosion control measures required shall be as approved by the County Engineer.

- h. Direct access from the lot to the primary road will not be permitted unless circumstances of the particular location show that a reasonable minimum of direct access points could be permitted utilizing safe engineering practices and as approved by the County Engineer.

On road developments adjoining a local county road, access roads are encouraged for all lots. Direct access from the lot to the local road shall be minimized; however, it may be permitted in special circumstances after review and as approved by the County Engineer.

Access points will meet the road at locations allowing braking sight distance for prima fascia or posted speed limit along the existing road.

- i. Survey requirements (i.e. monuments) shall follow the provisions set forth in the Subdivision Control Act of 1967 (P.A. 288), Section 560.125 as amended. Monuments shall be placed by a surveyor, registered in the State of Michigan, and properly recorded as per the Act. A permanent benchmark established at USGS datum or WGS-84 datum converted to USGS datum, and the location of all cross pipes with inverts labeled shall be shown on the plans.

A permanent benchmark shall be placed near the entrance to the proposed development and will be required at each additional phase. The permanent benchmark may be installed after all road development is complete and prior to acceptance from the VBCRC. If the option of placing the benchmark after the road development is complete is desired, a temporary benchmark must be established and shown on the development plans. The permanent benchmark must be shown on the "as-built" plans. All cross pipes as well as cross pipe invert elevations shall be shown on the "as-built" plans.

In the event that the proposed development will encompass an original Government Survey Corner, the subject corner will be required to be preserved at the Developer's expense.

- j. If any work is completed or materials are used without proper notification, the VBCRC has the right to reject the completed work. The VBCRC may request verification by an independent testing prior to acceptance of the roadway.

These tests may include, but not be limited to, borings of the roadway, coring, sieve analysis of aggregate materials, screening and bituminous extraction tests on materials already in place.

The Developer shall properly have the tests and repairs made or reimburse the VBCRC for any additional and all costs for testing performed by, or contracted for the VBCRC.

The VBCRC shall assign an engineering technician to inspect the progress of the work. The Developer will be billed for the actual time, equipment charges, and such other expenses that may be incurred. A schedule of costs for technicians, material testing and other expenses shall be given to the Developer at the time of the pre-construction meeting. Payment of these charges must be paid in full prior to final approval of the development by the VBCRC.

The Developer or his agent shall notify the County Engineer a minimum of 48 hours prior to the following operations:

1. Beginning of construction activity.
2. Construction of a storm sewer.
3. Upon completion of the clay cuts and prior to any Class II or aggregate backfill operation.
4. Beginning the placement of processed 22A aggregate material.
5. Prior to the application of bituminous material on the prepared aggregate surface.
6. Prior to any asphalt paving operation, an approved bituminous mix design shall be submitted for approval.

K. On all roads adjoining existing county roads, a minimum clear vision corner must be provided in each direction, a distance of 250 feet measured along the centerline of the county road and beginning at a point 30 feet from the road intersections measured along the subdivision road centerline; or a clear vision area in conformance with the local zoning ordinance, whichever provides the larger clear vision area. Similar clear vision areas will be provided on all new roads, which are constructed within an existing development.

L. MDOT or VBCRC standard plan and specification designations shall be noted on all component structures for items in the road and drainage plans.

A special plan or specification not specifically covered by MDOT's or VBCRC's standard plan and specifications must be submitted and approved by the County Engineer before construction or use of the special plan or specification is permitted.

- M. Horizontal and vertical alignment should be to as high a standard as is compatible with the topographical details and required right-of-way.
- N. The Developer shall furnish and erect street and regulatory signs at all intersections and other necessary locations within the development. In accordance with the MMUTCD, and at the Developer's expense. The Developer's engineer shall assure that all regulatory signs are posted in a timely manner and prior to completion of the roadway. A development will not be accepted without all necessary signs in place.
- O. Street lighting poles shall be no closer to the back of curb, valley gutter edge, or edge of pavement, than six feet and shall be of an MDOT approved breakaway design.
- P. All materials must conform to the requirements of the current MDOT and VBCRC specifications.
- Q. Road and drainage plan approval will be granted for a period of one year. Should the road development not be completed for acceptance within this period, construction plans must be resubmitted and re-approved.

VIII. General Requirements

- A. The VBCRC reserves the right to reject any proposed road development, which does not comply with the requirements of Act 288 of the Public Acts of 1967, as amended.
- B. Approval of road and drainage plans does not relieve the Developer of the responsibility for meeting the minimum requirements of the VBCRC in force at the time of approval.
- C. No work will be permitted within any existing county road right-of-way by any contractor until the contractor has placed on file with the VBCRC proof of insurance of the following types and amounts:

Workers Compensation	As set by state statute
Personal injury liability	\$1,000,000
Property damage and public liability	\$1,000,000

In addition, the Van Buren County Road Commission shall be named additional insured.

IX. Final Road Development Acceptance

- A. The following requirements and provisions must be satisfactorily completed before the road development will be accepted.
1. All construction within the development has been completed according to the final road and drainage plans as approved, or a satisfactory escrow arrangement accepted by the VBCRC for all allowable unfinished items.
 2. A set of reproducible "as-built" plans of all improvements, including utilities constructed within the rights-of-way, must be submitted on mylar and disk and be signed and sealed by a Professional Engineer registered in the State of Michigan.
 3. Any required test reports must be submitted and approved by the County Engineer.
 4. The County Engineer may require a waiver of lien, certifying that all the Developer's indebtedness relating to the proposed plat has been satisfactorily discharged or secured.
 5. The Developer shall provide in writing, an agreement to pay for any costs accrued during the first 12 months after final acceptance of the plat. These repairs shall be inspected by the VBCRC and be to our standards for construction.
 6. All required road and street signs must be in place and to VBCRC standards.

X. Escrow Procedure

- A. It is the policy of the VBCRC to accept for final approval only those developments in which all required and proposed improvements have been completed.
- B. Escrow accounts will be established in the form of cash escrow equal to 150 percent of the approved contract cost of the remaining improvements. At minimum, the cross-section of the new development must be completed through the aggregate surface course. Topsoil, seed, mulch, and asphalt will be the only items allowed as remaining work items. Erosion controls shall also be in place if the development will sit over the winter with or without topsoil and seed in place. The cost of the remaining improvements shall be determined by the VBCRC.
- C. The VBCRC will require completion of the development to the Road Commission's standards within 180 days. If work is not completed within the allotted time frame, the VBCRC has the authority to have the remaining work completed and all expenses reimbursed out of the escrow monies.

XI. Severability Clause

A. If any part of this Road Development Policy shall be found to be invalid, such invalidity shall not affect the validity of the remaining portions of this Policy.

APPENDIX A

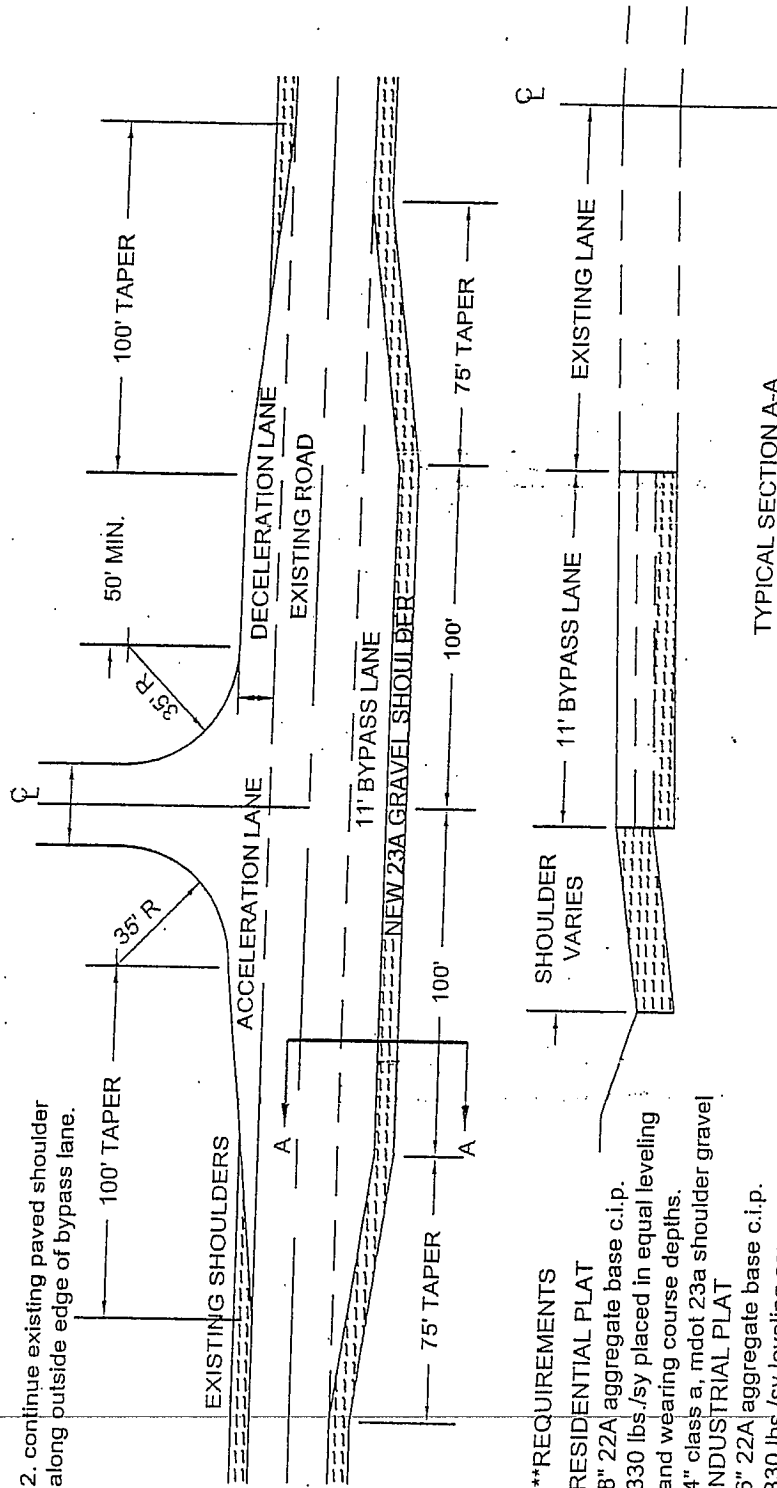
FIGURES & TABLES

BYPASS LANE & PLAT ENTERANCE

MINIMUM DESIGN REQUIREMENTS

NOTES:
 1. use industrial plat requirements for all season county road.

2. continue existing paved shoulder along outside edge of bypass lane.



**REQUIREMENTS

RESIDENTIAL PLAT

8" 22A aggregate base c.i.p.

330 lbs./sy placed in equal leveling and wearing course depths.

4" class a, m dot 23a shoulder gravel

INDUSTRIAL PLAT

6" 22A aggregate base c.i.p.

330 lbs./sy leveling course

270 lbs./sy wearing course

TYPICAL SECTION A-A

FIGURE 1

TYPICAL BOULEVARD ROAD APPROACH TO ROAD WITH CURB & GUTTER OR BITUMINOUS VALLEY GUTTER

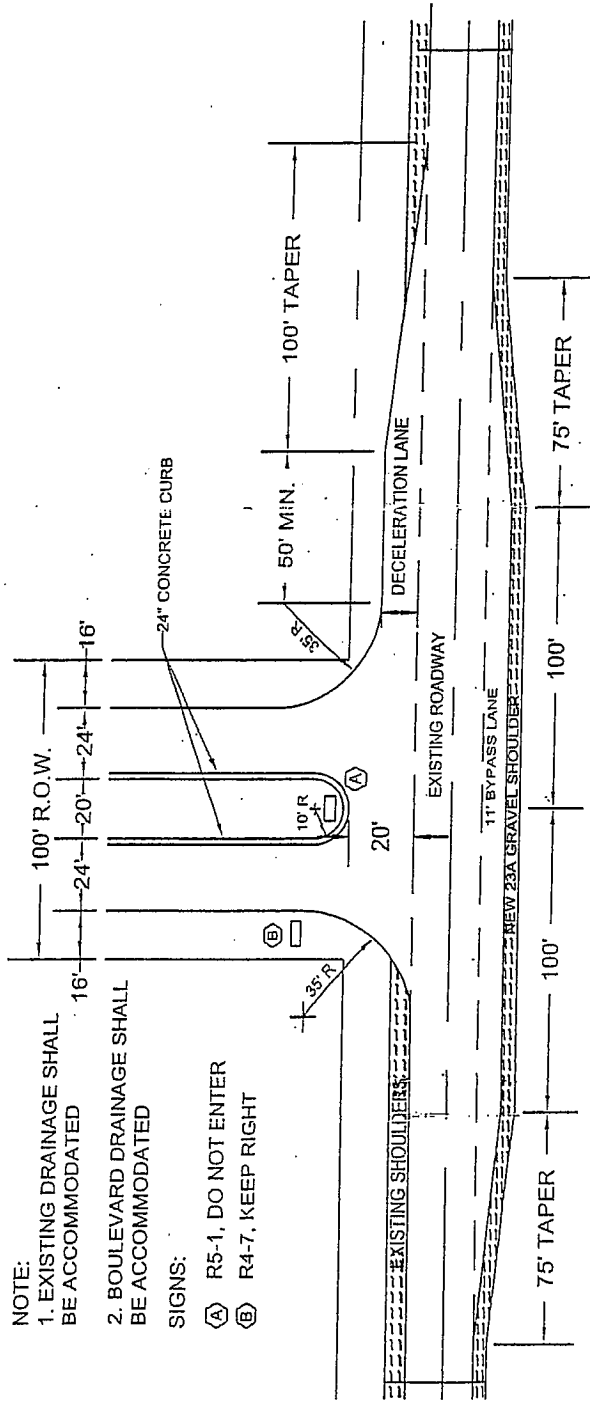
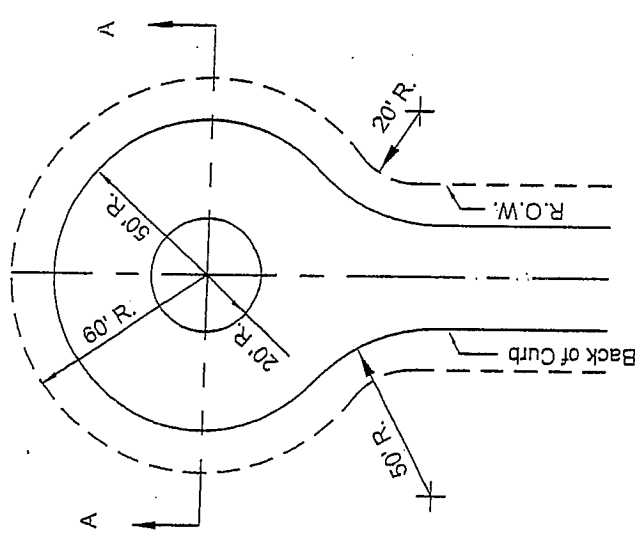


FIGURE 2

Cul - De - Sac TURNAROUND

MINIMUM DESIGN REQUIREMENTS



Plan View - Typical Cul-De-Sac

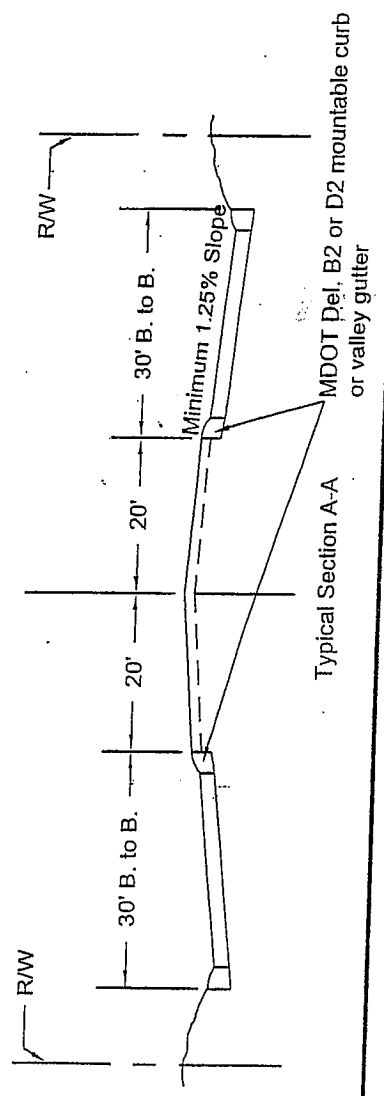


FIGURE 3

CURB & GUTTER STREET

MINIMUM DESIGN REQUIREMENTS

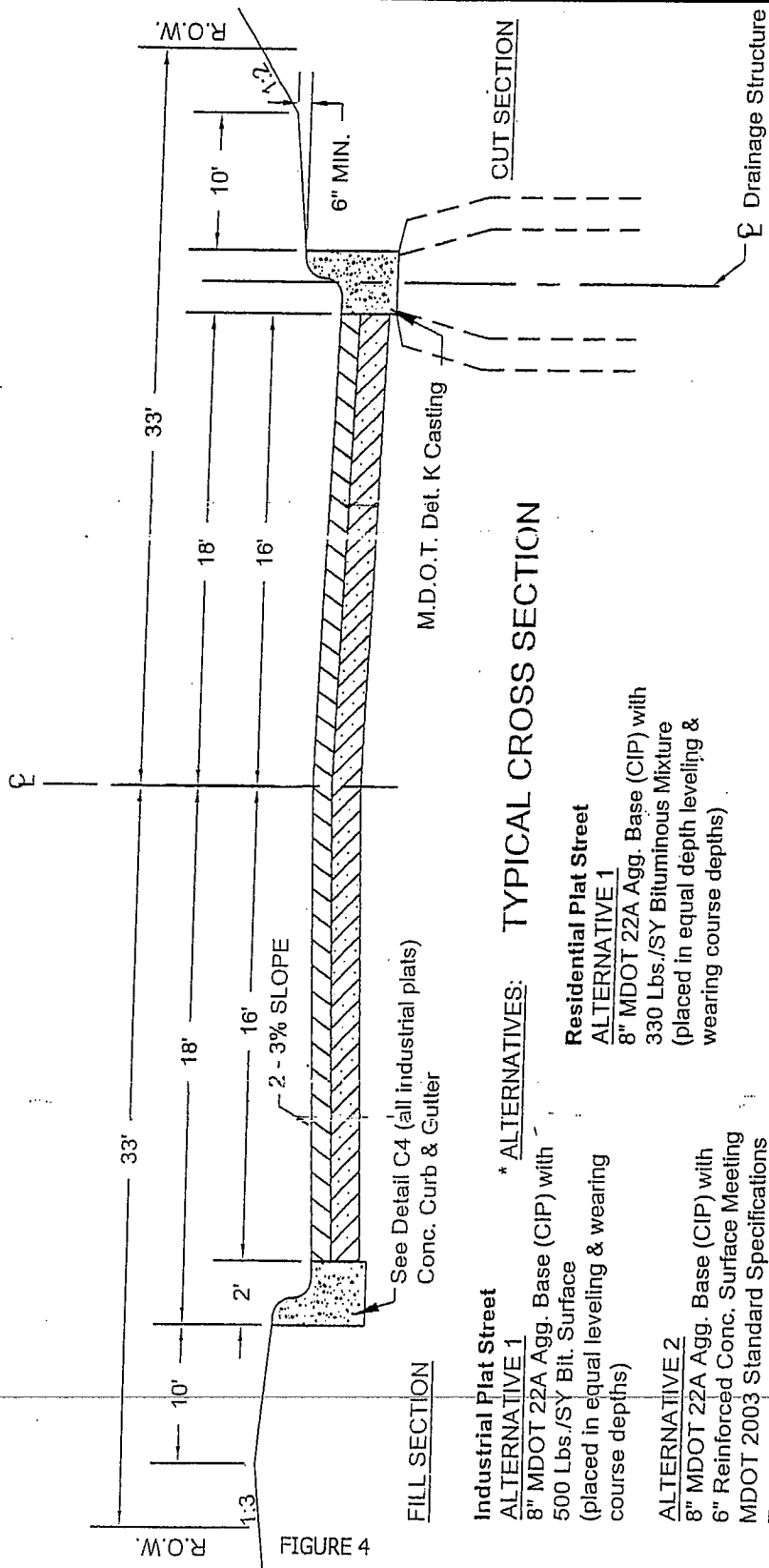


FIGURE 4

B CURB & GUTTER DETAIL

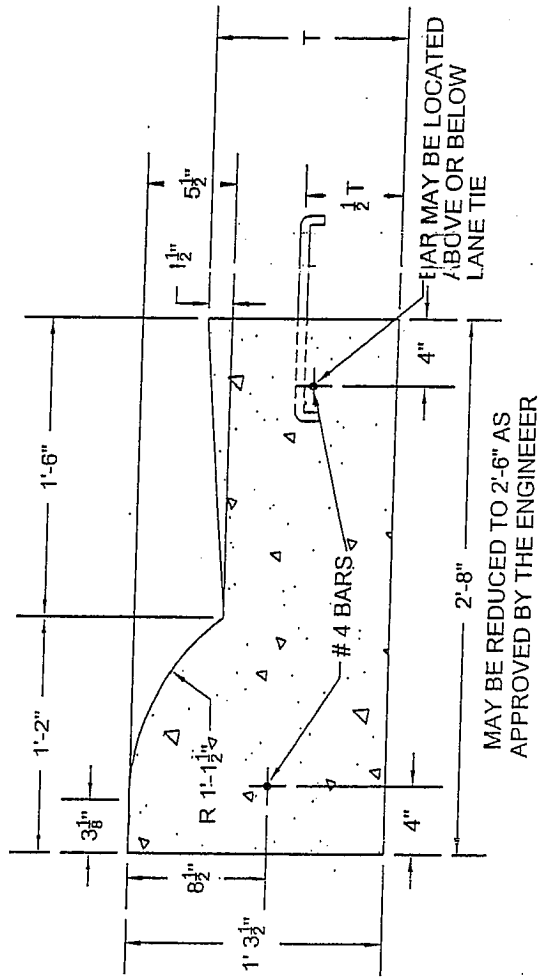
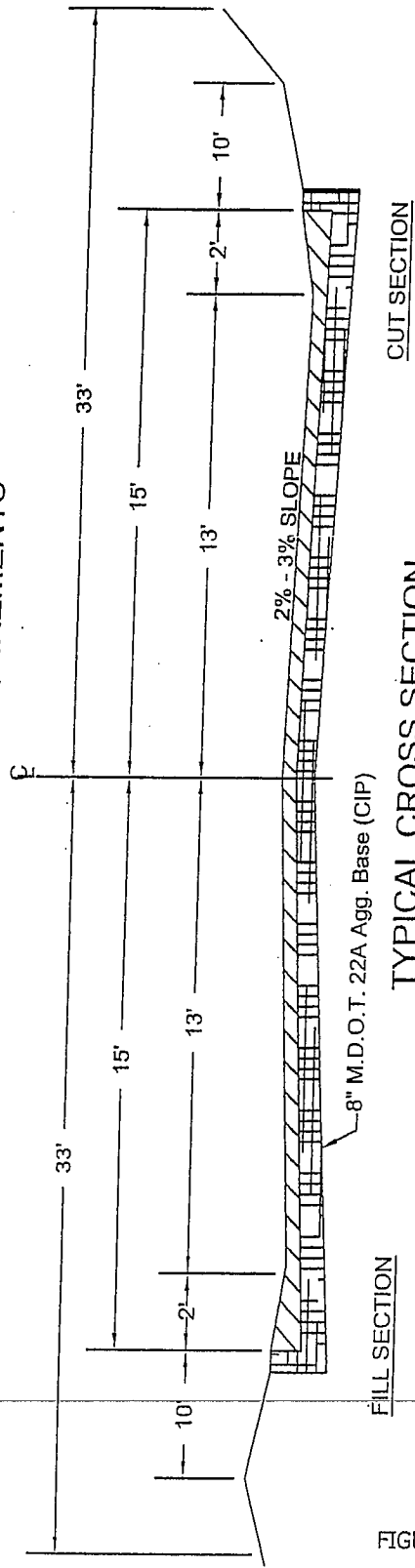


FIGURE 6

VALLEY GUTTER STREET MINIMUM DESIGN REQUIREMENTS

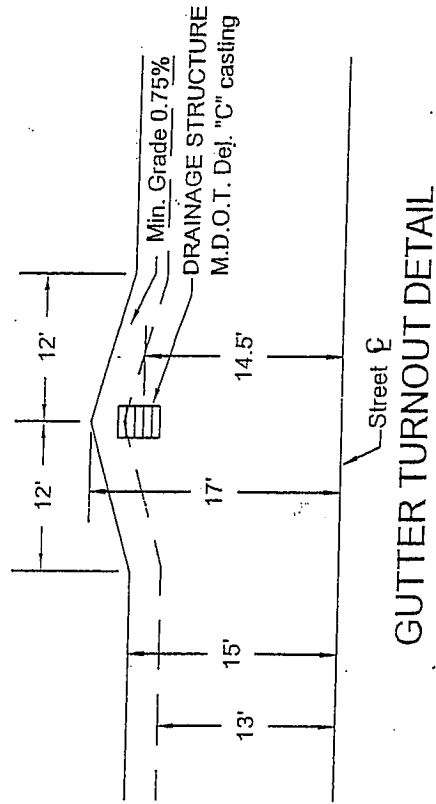


CUT SECTION

TYPICAL CROSS SECTION

FILL SECTION

*Yield shall average 354 Lbs./SY for full (30') width and a minimum of 330 Lbs./SY for traveled (26') width. Construction with leveling course permitted.

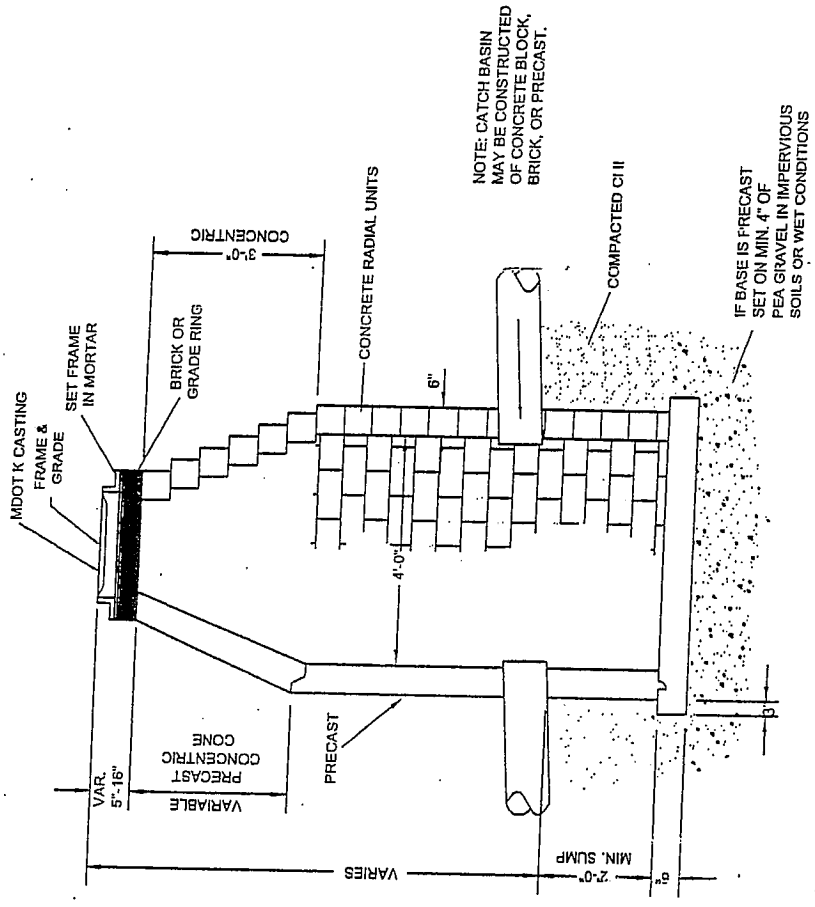


GUTTER TURNOUT DETAIL

Build Gutter Turnout at all Drainage Structures in Valley Gutter Section. Set Flow Line of Drainage Structure 0.42' below Centerline. Set E of Drainage Structure 14.5' Left or Right of Centerline.

FIGURE 7

STANDARD CATCH BASIN



NOTE: CATCH BASIN
MAY BE CONSTRUCTED
OF CONCRETE BLOCK,
BRICK, OR PRECAST.

FIGURE 9

FLAT TOP CATCH BASIN

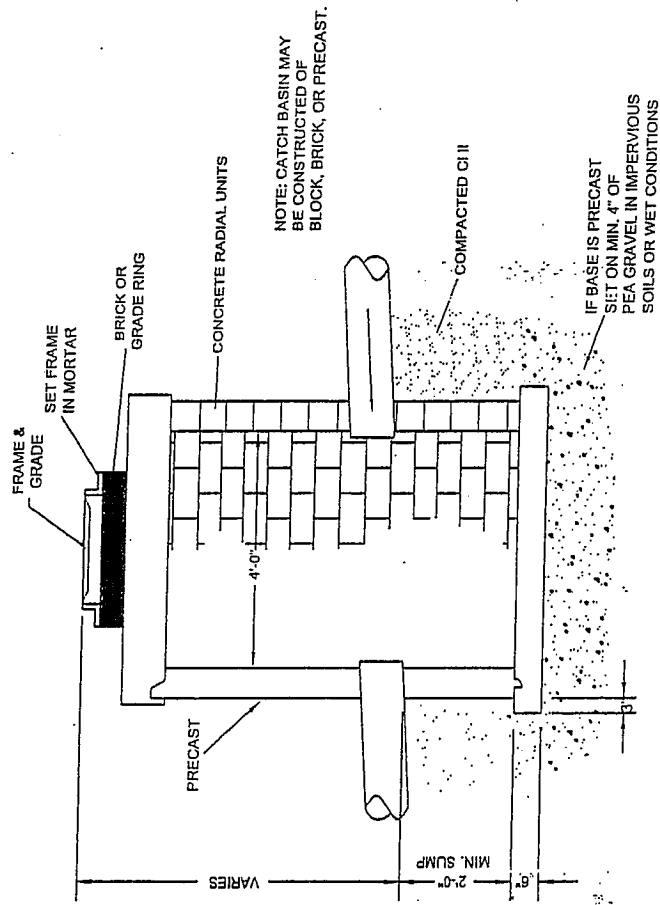
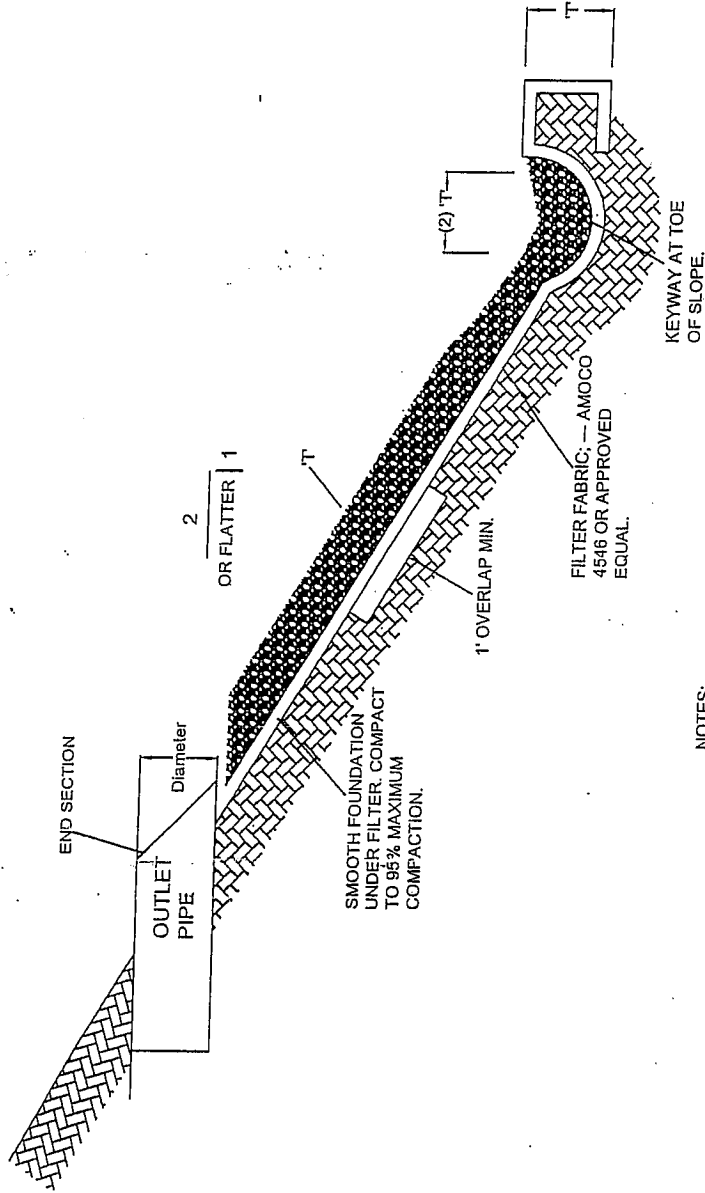


FIGURE 10

RIPRAP PROTECTION



- NOTES:**
 RIPRAP AGGREGATE SIZE: #60 OF 6"
 SIZE: 1.5 x MINIMUM
 RIPRAP WIDTH SHALL BE 4.0 x 'D' MINIMUM
 'T' = THICKNESS: MINIMUM THICKNESS SHALL BE 1.5X
 THE MAXIMUM STONE DIAMETER
 NEVER LESS THAN 6" (150mm)

FIGURE 11

TABLE I
BITUMINOUS SPECIFICATIONS

Mixture No.	13A MOD.	36A
1 1/2"		
1"		
3/4"	100	
1/2"	75-95	100
3/8"	60-90	92-100
No. 4	45-80	65-90
No. 8	30-65	55-75
No. 16	20-50	
No. 30	15-40	25-45
No. 50	10-25	
No. 100	5-15	
No. 200	3-6	3-10
Crushed Min. % (MTM 117)	80	60
Soft Particle (max) % ¹	8-12	8.0
Angularity Index (min) ²	2.5	3.0
L.A. Abrasion, % Loss (max) ³	40	40
Sand Ratio (max) ⁴	50	50

1. The sum of the Shale, Siltstone, Structurally Weak and Clay-Ironstone particles shall not exceed 8.0% for aggregates used in top course. The sum of the Shale, Siltstone, Structurally Weak and Clay-Ironstone particles shall not exceed 12.0% for aggregates used in base and leveling courses.
2. The fine aggregate angularity of blended aggregates, determined by MTM 118, must meet the minimum requirement. NAA Fine aggregate Angularity shall be reported for information only.
3. Los Angeles Abrasion Maximum loss must be met for the composite mixture, however, each individual aggregate must be less than 40.
4. Sand Ratio for 13A MOD and 36A no more than 50% of the material passing the No. 4 sieve will be allowed to pass the No. 30 sieve.

NOTE: 13A MOD HMA: percent of bitumen shall be 6 percent +/- 0.5.
Field applications of the job mix formula (JMF) will not be allowed outside of the limits shown.

APPENDIX B

CHECKLIST OF REQUIREMENTS AND SPECIFICATIONS
FOR PROPOSED ROAD DEVELOPMENTS

A. Preliminary Requirements

1. Submit Pre-Road Development Plans _____
2. Submit Preliminary Plans:
 - a. Four copies on "D" sized sheets _____
 - b. CD containing plans in AutoCad format _____
 - c. Signed and sealed by Registered Michigan Professional Engineer _____
 - d. Scale not less than 1" = 200' _____
 - e. Include situation sketch showing proposed development in relation to existing road system, section and quarter section lines _____
 - f. Show street layout, street names, and R.O.W. dimensions _____
 - g. Street layout provides a continuous circuit _____
 - h. Street layout compatible with existing street system _____
 - i. Show layout of entire parcel from which proposed development is taken _____
 - j. Include adjoining features such as streams, streets, etc. _____
 - k. Relief to be shown as USGS datum or WGS-84 datum converted to USGS datum with not more than 2 foot contour intervals _____
 - l. Centerline profile an intersecting county road shown for a distance of at least 600 feet on each side of the proposed development street _____
3. Submitted copy of Letter of Approval for proposed street names _____
4. Section and quarter section line roads centered on section and quarter section lines _____

- 5. Minimum R.O.W. width met:
 - a. Road development 66 feet _____
 - b. Local roads 100 feet _____
 - c. Primary roads 120 feet _____
- 6. Ten-foot wide private easement for public utilities provided outside and contiguous to road R.O.W. _____
- 7. Intersection legs have 100 feet straightaway and meet 90° _____
- 8. All intersected primary and local roads provided with bypass and acceleration/deceleration lanes and turn radii _____
- 9. No lot access onto primary roads _____
- 10. No or minimal lot access onto local roads _____
- 11. Cul-de-sacs centered in at least 120 feet diameter R.O.W. and provide at least 100 feet diameter back to back of curb, edge-to-edge of valley gutter or edge-to-edge of pavement _____
- 12. No existing street extended without removal and reconstruction of its cul-de-sac to the existing road cross section _____

B. Construction Requirements

- 1. Construction Plans
 - a. Four copies on "D" sized sheets _____
 - b. Signed and sealed by Registered Michigan Professional Engineer _____
 - c. Scale not more than 40 feet to 1 inch horizontal, 5 feet to 1 inch vertical _____
 - d. Show plan view and centerline profile _____
 - e. Show typical cross section and bench mark established at USGS datum or WGS-84 datum converted to USGS datum _____
 - f. Show soil borings and include note that all unsuitable material must be removed to a minimum depth of 2 feet below top of subgrade or as directed by County Engineer _____

- g. Provide note that work will comply with the provisions of Part 91, Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act 1994 PA 451, as amended _____
- h. Show drainage structures and manholes _____
- i. Show lengths and size of pipes and types of inlets and pipes, as well as invert elevations _____
- j. Provide MDOT specifications designations on structures _____
- 2. Location of utilities meets VBCRC requirements, except for water main, storm sewer, and sanitary sewer, placement of utilities that run parallel to the road is beyond the road R.O.W. _____
- 3. Design calculations for storm drainage system submitted within plans _____
- 4. Minimum road improvements and design requirements:
 - a. Storm drainage underground, when required _____
 - b. At least 10 feet from back of curb or valley gutter edge to side slope, when required _____
 - c. Full R.O.W. brought to required grade and properly trimmed _____
 - d. Soil erosion and sedimentation-control measures comply with Part 91 PA 451 1994 _____
 - e. Maximum street grade no more than 6 percent _____
 - f. Minimum street grade 0.75 percent for valley gutter section or 0.5 percent if curb and gutter section, when required _____
 - g. Minimum grade of 1.25 percent at gutter flowline of turnaround _____
 - h. Soil borings and designation of unsuitable material _____
 - i. Road base of compacted 22A aggregate _____
 - j. Curb and gutter section 36 feet back-to-back of curb; valley gutter section 30 feet edge-to-edge, when required _____
 - k. Road surface of concrete or bituminous mixture _____

- 5. Drainage system provisions (as required by County Engineer)
 - a. Maximum surface run for storm water not greater than 300 feet; run not greater than 200 feet if street grade exceeds 4 percent _____
 - b. Relief basin at highest end of radius where drainage is required to cross intersection longitudinally _____
 - c. Storm sewer design based on a 10-year storm and must meet the criteria of the Van Buren County Drain Commission _____
 - d. Storm sewer pipe conforms to MDOT specifications _____
 - e. Storm sewer pipe not less than 12 inches in diameter _____
- 6. If an existing county road abuts a proposed road development:
 - a. No lot access is permitted or provided _____

Or

 - b. Lot access is permitted or provided and road is subject to improvements _____
- 7. While meeting minimum requirements, horizontal and vertical alignment is to as high a standard as is appropriate _____
- 8. Street lighting poles no closer to back of curb, valley gutter edge, or edge-to-edge of pavement than 6 feet and of an MDOT approved breakaway design _____
- 9. All materials conform to current MDOT & VBCRC specifications _____
- 10. Variations from minimum design standards and specifications approved by the VBCRC _____

C. General Requirements

- 1. Certification of liability insurance placed on file at the VBCRC office:
 - a. \$1,000,000 provided for personal injury and \$1,000,000 provided for property damage _____
 - b. The VBCRC named as an additional insured with a very specific paragraph of information on the certificate of liability (please contact the VBCRC for the proper wording) _____

D. Final Development Acceptance

1. Development construction:

a. Completed _____

Or

b. Satisfactory escrow arrangement accepted by the VBCRC _____

c. Infrastructure reporting form turned in to the VBCRC _____

2. "As Built" Plans:

a. One set on a "D" sized sheet _____

b. One "D" sized Mylar or similar stable reproducible material _____

c. Signed and sealed by Registered Michigan Professional Engineer _____

d. All improvements including utilities shown _____

e. All cross-pipe invert elevations labeled, as well as the permanent bench mark _____

f. Final copy on CD in AutoCad format _____

3. Financial obligations satisfied _____

E. Escrow Procedure

1. 150 percent of contract escrow _____

2. Exceptions approved by the VBCRC _____

APPENDIX C

INFRASTRUCTURE REPORTING FORM

Infrastructure Reporting Form

Van Buren County Road Commission requires that you complete and return the following Infrastructure Report. The Road Commission is required to keep track of these costs due to the GASB 34 infrastructure reporting requirements effective January 1, 2003.

Land Cost	
Survey Cost	
Dirt Work Cost	
Gravel Cost	
Asphalt Cost	
Total Cost	

Please list any assumptions that you may make so that the Road Commission can be as accurate as possible in reporting the required information to the State of Michigan.

Please contact the Van Buren County Road Commission for any clarification or questions that you may have.