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Eric J. Beck, PE - PS

Driveway Rules And Regulations



SECTION I

DRIVEWAY REGULATIONS, GENERAL

A. RESPONSIBILITY:

Within the unincorporated area of Hamilton County, no driveway intersecting a County road shall be constructed or reconstructed until a permit, on the proper form, has been issued by the Hamilton County Engineer's Permit Department. Said permit shall be subject to the following regulations, except that in specific instances and upon written request by the applicant, the Hamilton County Engineer may authorize such variance from these regulations as will not be contrary to the public interest or welfare, or where due to conditions at the site, a literal enforcement would result in unnecessary hardship.

More than one driveway may be included on a single application and permit, if all are part of the same project. Should work at the site involve other types of construction, multiple permit fees may be required.

The Hamilton County Engineer, or his representative, is charged with the administration and enforcement of these regulations and provisions and shall receive written permit applications, issue permits, examine the premises for which such permits have been requested or issued, and enforce compliance with the provisions of these regulations.

The acceptance of a permit or the performance of any work thereunder shall constitute an agreement by the party or parties to which the permit is granted to comply with all of the conditions and restrictions printed or written therein.

The permit may at any time, be revoked or annulled by the Hamilton County Engineer or his representative for nonperformance of or noncompliance with, any of the conditions, restrictions and regulations thereof.

Any person, firm, or corporation who performs work for which a permit is required by these regulations without first having secured such a permit, or fails to comply with the condition under which the permit was obtained, thereby shall be deemed in violation of these regulations and subject to the penalties provided by Sections 5589.10 and 5591.26 of the Ohio Revised Code.

These regulations shall not prevent any person or persons, firm or corporation from maintaining an installation as may be necessary for the preservation of life and/or property when the need arises during the hours the County Engineer's Office is closed; however, a permit request shall be made within one calendar day after said office opens.

B. FINANCIAL OBLIGATIONS:

Before any driveway permit is issued, the applicant shall deposit with the Hamilton County Engineer's Permit Department (for payment to the TREASURER OF HAMILTON COUNTY) a check in the amount of Twenty Dollars (\$20.00) as a non-refundable fee.

Failure to construct and/or complete the driveway in accordance with the drawings included with the permit, shall be deemed a violation of Sections 5589.10 and 5591.26 of the Ohio Revised Code.

C. ENGINEERING REQUIREMENTS:

The application for a permit for construction or reconstruction of a driveway shall be accompanied by a detailed plan in duplicate, showing all of the proposed construction that would affect traffic movement both during and after construction and shall include the following items: (Applicants prior to preparation of plans, should familiarize themselves with the provisions of Section II, Driveway Location and Section III, Driveway Construction).

- 1.) Dimensional information relative to the exact location of the property along the highway, north point, scale of drawing, and distance to nearest street intersection or section line.
- 2.) Property lines, right-of-way lines, and the dimensions thereof.
- 3.) Distance between edge of pavement and right-of-way line. (Edge of pavement is actual edge of the pavement structure.)
- 4.) The existing and the finished surface grade of the proposed installation.
- 5.) Street inlets and all public utility structures which may affect said driveway.
- 6.) Width of proposed and existing drive and the flair or radii involved.
- 7.) Dimensions and type of construction of proposed island. (If any.)
- 8.) Location and dimensions of existing and proposed buildings if within forty foot (40') of existing right-of-way.
- 9.) Location and description of existing and proposed drainage structures within highway right-of-way, including invert dimensions, pipe sizes, and pipe grades.

10.) Such other information as may be reasonably necessary to determine the exact nature and extent of the work. The accuracy of the materials submitted shall be the responsibility of the applicant. The Hamilton County Engineer's Office shall not be held responsible for damages that may occur due to any inaccurate or incomplete nature of materials submitted.

D. GENERAL REQUIREMENTS:

Upon receipt of the application (and the required monetary deposit) a field review will be conducted at the location and checks made to determine if future road improvements are planned. All applications for permits shall be dated upon receipt. The necessary review will be made as soon thereafter as practicable. If the application and proposed work is found to be acceptable, the permit will be issued. In the event that corrections or modifications are deemed necessary, the applicant will be so notified, and a copy of the plan marked as appropriate, shall be returned to the applicant. The applicant, after making the necessary changes to the original drawing, shall re-submit the same number that was required for the original submission, along with the marked copy previously returned to him/her. The Hamilton County Engineer's Permit Department will then reprocess the application and issue the permit, if the required changes were made. Revised plans, which are re-submitted shall be marked as "revised" with the date of revision noted thereon near the drawing title.

Each permit shall have stated on its face the period of time for which it is valid and said permit, or a legible copy thereof, must be on hand at the job site. The maximum period of validity shall be one (1) year. Should this time period expire prior to satisfactory completion of the driveway, the applicant shall apply for a new permit and pay another fee (\$20.00). All authorization to work within the right-of-way is withdrawn once the original permit expires unless the applicant has been issued a new permit.

It shall be the responsibility of the holder of a permit to notify the Hamilton County Engineer's Permit Department, forty eight (48) hours before commencing work within the right-of-way.

Upon completion of all work authorized in the permit, the permit holder shall notify the Hamilton County Engineer's Permit Department. No project shall be deemed completed until said notification is given and any work performed on installation made will be considered as unapproved.

These regulations shall be coordinated as necessary and appropriate with the Hamilton County Engineer's Subdivision Rules and Regulations and all other codes in effect.

All future maintenance responsibilities must be assumed by the applicant, his grantees, successors, and assignees.

SECTION II

DRIVEWAY LOCATION

A. GENERAL:

Driveways should be located so as to result in no undue interference with the free movement of normal highway traffic. In accord with this principle, driveways should be located where the highway alignment and profile are favorable; i.e. where there are no sharp curves, or steep grades, and where sight distance in conjunction with the driveway access would be adequate for safe traffic operation. The sight distance requirements are as specified in the current edition of the Ohio Department of Transportation Location and Design Manual and A Policy on Geometric Design of Highways and Streets prepared by the American Association of State Highway and Transportation Officials (AASHTO), Refer to Plate No. 31 of this manual.

If future road improvement plans exist, this information shall be applied to the degree applicable in determining the driveway location.

No driveway entrance shall interfere with facilities such as; street lights, traffic signal standards, signs, catch basins, hydrants, crosswalks, bus-loading platforms, bus stops, fire alarm supports, or other structures within the right-of-way. The party requesting the permit shall make arrangements with the proper authority, and/or public utility, for the adjustment or relocation of the facility affected if such is deemed permissible. The Hamilton County Engineer's Permit Department may request written assurance from the authority or utility that adjustment or relocation is agreed upon. In no case will it be permissible for a driveway to be located closer than five (5) feet to any pole, inlet, fire plug, etc. A driveway shall not be constructed at any angle less than forty five degrees (45°) with the line of the curb or the edge of the roadway.

B. DESCRIPTION:

The regulations as defined in Section II, Paragraph "C" through "H", except as modified by these regulations, are in accordance with the latest edition of the Ohio Department of Transportation Location and Design Manual.

These regulations shall apply to all driveways covered by these regulations unless altered or modified by other sections of these Hamilton County Driveway Regulations.

C. CORNER ISLAND (PLATE NO. 1):

- 1.) Effective* corner radius of forty feet (40') or less.
The beginning of the approach radius shall be at least twenty feet (20') from the angular bisector as measured along the face of curb or pavement edge when no sidewalks are involved. With sidewalks, the beginning of the approach radius shall not begin nearer the roadway intersection than the back edge of the sidewalk.

2.) Effective* corner radius greater than forty feet (40').

The beginning of the approach radius shall not begin closer to the roadway intersection than a distance equal to one-half of the effective* intersection radius as measured from the angular bisector along the face of curb or pavement edge, except as noted below:

- a.) When the highway intersection angle shown as $_$ on Plate No. 1 is one hundred and twenty degrees (120°) or greater, the beginning of the approach radius may begin twenty feet (20') from the angular bisector, as measured along the face of curb or pavement edge.
- b.) When the highway intersection radius is greater than eighty feet (80'), the beginning of the approach radius may begin forty feet (40') from the angular bisector.

NOTE: No part of Section II is intended to supersede the Hamilton County Regional Planning Commission regulation involving corner developments with ten (10) or more parking spaces; which requires driveway openings to be fifty feet (50') from the intersection of right-of-way lines.

*Intersection pavements are not always built on the arc of a circle. Therefore, the word "effective" is used to cover such instances.

D. APPROACHES (PLATE NO. 2, 2-A AND 2-B:

1.) General

- a.) The location and angle of an approach or flair in relation to an adjacent highway intersection shall be such that a vehicle entering or leaving the site may turn out of or into the nearest lane of traffic, moving in the desired direction and be channeled within this lane before entering the intersection or proceeding along the highway.
- b.) Where the effective radius of an approach or flare controls the turning radius of a vehicle entering the driveway by a right turn from the adjacent outside traffic lane of the roadway, the radius of that edge shall be as long as practical to provide a free and safe movement.
- c.) Approaches constructed on public property or right-of-way shall be compatible to abutting pavement.

- d.) Where curbing exists along the edge of the through pavement, the edges of the approach or flair may be delineated by a curb through the arc of the radius. Curbing along the entire approach or flair may be installed at the option of the permit applicant, however, said curb shall be installed for island work, except where there is existing sidewalk or where future sidewalk is contemplated.
- e.) To discourage improper use of intermediate island between dual approaches, the island shall be seeded or sodded except for a four foot (4') wide berm of stabilized material adjacent to the highway pavement.

2.) Design Criteria

- a.) The interior angle shown as _ on Plate No. 2 between the axes of dual approaches or flairs and the centerline of the roadway shall be no more than ninety degrees (90°) and no less than forty five degrees (45°).
- b.) The interior angle shown as _ on Plate No. 2 between the axes of a single approach or flair, designed for two-way operation, shall be no more than ninety degrees (90°) and no less than seventy degrees (70°).
- c.) The width of all approaches or flairs shall not be greater than thirty five feet (35') in the throat of the approach or flair measured at the right angles to the axis of the approach or flair as shown on Plates No. 2, 2-A and 8. Throat widths greater than thirty five feet (35') as shown on Plate No. 2-B may be permitted, in unusual situations, by the Hamilton County Engineer or his representative, upon written request. The applicant's written request must justify the need for the width variance by utilizing pertinent traffic data and related engineering information. The Hamilton County Engineer reserves the right to require the submission of a Transportation Impact Analysis prepared by a competent Traffic Engineer Registered to practice in the State of Ohio and experienced in such analysis.
- d.) Multiple driveway entrances will be permitted, but in no case shall more than sixty percent (60%) of the property frontage be used for driveway purposes. (Refer to Section H and Plate No. 3 for limits on frontage).

E. INTERMEDIATE ISLANDS:

Between all approaches there shall be an intermediate island with a minimum length "L" at the right-of-way (or easement) line, of six feet (6') for curbed islands (or islands along curbed roadways) and fifteen feet (15') for un-curbed islands.

F. SAFETY CURB:

Where sidewalks occur (existing or proposed), safety curbs of portland cement concrete or asphaltic concrete, not less than six inches (6") in height and for the length "L" as noted in "E" above, shall be provided along the right-of-way or easement line between approaches.

G. CURB RAMPS:

At locations where sidewalks occur (existing or proposed) and curbs are intended along the drive entrance, curb ramps meeting the applicable requirements of O.D.O.T. Standard Drawing BP-2.1 and the requirements of Sec. 4.7 of the Americans with Disabilities Act (A.D.A.) shall be installed as appropriate.

H. LOCATION OF APPROACHES IN RELATION TO SIDE PROPERTY LINE (PLATE NO. 3):

1.) Controls

- a.) Ninety degree (90°) control line - A line at right angles to the centerline of the highway which extends through the intersection of the side property line with the highway right-of-way line. (Usually can only be a consideration when Hamilton County owns the right-of-way in fee simple.)
- b.) Four foot (4') control - The maximum dimension, from edge of pavement, that the approach radius (flare) may extend along the ninety degree (90°) control line (when the approach radius crosses the 90° control line). This maximum dimension is subject to Section H. 1. c. below.
- c.) Extended property line control - A distance along the edge of pavement between the ninety degree (90°) control line and the extended property line. No portion of a driveway approach radius (flare) may extend beyond the limits of this distance. This control is applicable where the highway easement **is not** held in fee.

2.) Curbed Highways

The approach radius may begin at, but shall not extend across the intersection of the ninety degree (90°) control line and the pavement edge.

3.) Un-curbed Highways

The approach radius, but not the approach edge extension, may cross the ninety degree (90°) control line within the limits of the four foot (4') control. (See (1) above.)

I/J. PAVED BERMS:

In rural sections (where no curbing or paved berm exists) having a high traffic volume and maximum speed limits, the berms may be paved for a distance of one hundred and seventy five feet (175') preceding, and one hundred and seventy five feet (175') following the entering and leaving approaches respectively. This construction is subject to approval by the Hamilton County Engineer and shall be constructed by the permit applicant, but maintained by the County. This paved berm shall be not less than eight feet (8') in width and need not be more than ten feet (10') in width. The ends of these paved berms shall be tapered from one foot (1') to full width in seventy five feet (75'), this taper being included in the overall length. The transverse slope of the paved berm shall not be less than one-fourth inch (1/4") per foot, not more than three-fourths inch (3/4") per foot sloping away from the pavement edge (See Plate No. 4).

SECTION III

DRIVEWAY CONSTRUCTION

A. GENERAL:

All work and all materials incorporated into driveways constructed under provisions of permits issued by the Hamilton County Engineer's Permit Department shall be in accordance with the requirements of the Construction and Materials Specifications of ODOT (Current Edition) and supplements thereto (as modified by the requirements set forth in "The Rules and Regulations of the Office of the County Engineer Governing the Surface Improvements for Private Development Within the Unincorporated Areas of Hamilton County") and except as may be modified by this manual.

All driveways shall be adequate to support the loads to which they are to be subjected. For residential driveways constructed with portland cement concrete, the minimum thickness shall be seven inches (7") of 452 (except as may be modified in the next paragraph). Residential driveways constructed with flexible pavement shall have a minimum thickness of six inches (6") of 304 Aggregate Base and two inches (2") of 404 Asphaltic Concrete. Nonresidential driveways shall be constructed of eight inches (8") minimum thickness of 304 Aggregate Base, one and one-half inches (1-1/2") minimum thickness of 402 Asphaltic Concrete and one and one-fourth inch (1-1/4") minimum of 404 Asphaltic concrete. Equivalent designs will be considered if requested by the applicant. (Portland cement concrete shall be Class "C").

Upon agreement by the permit applicant and the Hamilton County Engineer's Permit Department, the thickness of residential portland cement concrete driveways may be five inches (5"), if it can be demonstrated that the driveways and approaches will not be subjected to heavy loads such as trucks transporting fuel oil, water and concrete.

A driveway which is to abut a concrete pavement shall be constructed of either portland cement concrete or asphaltic concrete and aggregate base. A driveway which is to abut an asphaltic concrete pavement shall be constructed of asphaltic concrete and aggregate base or portland cement concrete. If the applicant chooses to construct a portland cement concrete driveway apron along an asphalt roadway pavement, a two foot (2') wide asphaltic concrete pavement section shall be placed as a buffer between the roadway and the concrete driveway pavement. This buffer section shall be constructed of the flexible pavement materials and the thicknesses specified in the second paragraph above (see Plates No. 7-A, 8, 8-A and 12-B).

Where vertical concrete curbs exist, the curb shall be modified in accordance with details on Plate No. 5. Where rolled concrete curbs exist, and it is necessary to cut said curb for the construction of a commercial drive, the curb shall be modified in accordance with details on Plate No. 6.

Sidewalk extensions, as detailed on Plate No. 7, shall be constructed except at those locations where no sidewalks presently exist or are anticipated in the foreseeable future as determined by the Hamilton County Engineer.

B. PLAN:

Driveway entrances shall have a width not less than ten feet (10') or more than thirty five feet (35') measured at the edge of roadway (or back of curb). This measurement shall not include the length of the chord, flare or radius return on either side. (See Plates No. 2, 2-A, 7 and 8). (For possible variance see Section II. D. 2. c.).

Tooled contraction joints in the driveway apron shall not exceed a maximum spacing of fifteen feet (15') in both longitudinal or transverse directions.

Flares of different lengths may be used. At the near corner a longer flare facilitates exiting from the highway and is desirable. (See Table No. 1, Plate No. 7).

C. SECTION:

Grades of all driveways abutting roads shall be in accordance with the applicable Plate No. as noted below, for the various situations described.

1.) Frontage Subdivision Lots Abutting Roads Without Curbs Or Sidewalks

The driveway surface grade for all lots in subdivisions abutting County roads without curbs or existing sidewalks, shall be constructed to conform with the details shown on Plate No. 12-B (interior subdivision lots shall be built in conformance with the "Rules and Regulations of the Office of the County Engineer Governing the Surface Physical Improvements for Private Developments Within the Unincorporated Areas of Hamilton County").

No permanent driveway permits shall be issued until the subdivision frontage has been graded to the Hamilton County Typical Section as shown on Plate No. 12-B.

2.) Residential Lots (not part of a planned subdivision) Abutting Roads Without Curbs Or Sidewalks)

The driveway surface grade for lots abutting County roads without curbs or sidewalks shall be constructed to conform to the details shown on Plate No. 12-C.

3.) Lots Abutting On Roads With Existing Vertical Curb And Sidewalk

a.) Where sidewalk is two and one-half feet (2-1/2') or more behind the curb:

The driveway surface at the face of curb line shall be constructed one and one-half inches (1-1/2") above the gutter grade. From the face of curb line, the drive shall slope upward to existing sidewalk grade at the front face of the walk. Across the sidewalk width and for one foot (1') beyond the back of sidewalk, the drive slope shall conform to the existing sidewalk cross slope. From the point one foot (1') back of the sidewalk to the right-of-way line, the driveway slope shall (depending upon existing topography) rise at a rate no less than one fourth inches (1/4") per foot and no greater than three-fourths inches (3/4") per foot. (See Plate No. 9).

The Hamilton County Engineer or his representative may grant permission, in unusual situations, for the grade to fall at a maximum grade of three-fourths inches (3/4") per foot from a point two foot (2') back of the sidewalk to the right-of-way line. Permission for this variance must be requested in writing. The grading shall in no way obstruct the required sight distance or present conflicts for future road improvements. (See Plate No. 9).

- b.) Where sidewalk is two and one-half feet (2-1/2') or less behind curb:

In situations when there is a space between the sidewalk and back of curb, the construction shall be performed as described in a.) above.

In special cases where the above is not feasible and/or when the sidewalk abuts the back of curb, the drive slope shall be constructed such as to provide a three foot (3') minimum width of walkway area (with normal sidewalk cross slope) along the back of the sidewalk portion of the drive. Modification to the existing sidewalk may be necessary to accomplish the intent of the foregoing. In this case, the applicant is referred to Section 807 of the ODOT Location and Design Manual. (See Plate No. 10 & 11).

- 4.) Lots Abutting On Roads With Existing Rolled Curb And Sidewalks
 - a.) Residential driveways shall ramp from the top of the existing curb to the front face of the sidewalk and shall conform to the sidewalk cross slope. All other provisions of Section (2) shall apply.
 - b.) Commercial driveways shall be constructed in accordance with Plate No. 6.
- 5.) Lots Abutting On Roads With Existing Curbs (All Types), But Without Sidewalks

- a.) Residential driveways, which are part of a development, as described in Sub-Section 3 (for existing vertical curbs) or Sub-Section 4. a. (for existing roll curbs) shall be constructed with a slope upward at a rate between one-fourth inch (1/4") and three-fourths inch (3/4") per foot to a point five feet (5') from the right-of-way line. The slope shall rise at a rate approximately one-fourth inch (1/4") per foot. (See Plate No. 12-A). Modifications to existing vertical curbs shall conform to details on Plate 5.
 - b.) Residential driveways, not part of a planned development, shall follow the grade and abut the back of the existing curb as shown on Plate No. 12-A. Modifications to existing vertical curb shall conform to the details on Plate 5.
 - c.) Commercial driveways shall conform to the requirements of a.) above, except they shall abut the back of existing roll curb as detailed on Plate No. 6.
- 6.) Lots Abutting On Roads With Sidewalks, But Without Curbs

Driveway aprons abutting County roads having existing sidewalks, but no curbs, shall be constructed in accordance with the information and details shown on Plates No. 7-A and No. 12-B.

SECTION IV

BARRIERS

In cases where the private property is used for parking vehicles in a position other than parallel to the right-of-way line, barriers shall be located or constructed so as to prevent any part of the parked vehicles from extending over the right-of-way line. Details of the proposed barriers shall be shown on the permit drawings.

SECTION V

DRAINAGE

A culvert of reinforced concrete, or its equivalent (as determined by the Office of the Hamilton County Engineer) shall be installed under all driveways constructed across existing drainage ditches or at any location where the topography would indicate future need. The size of the culvert shall be based on the hydraulic requirements, but with a minimum diameter of twelve inches (12"). Whenever feasible, new driveway culverts shall be placed a minimum of ten feet (10') from the existing or proposed edge of pavement. In no case shall the culvert be placed closer to the pavement than the existing ditch (or the above noted ten feet (10'), whichever is the lesser distance) without specific authorization by the Hamilton County Engineer's Permit Department, upon request by the applicant.

The driveway pipe shall be of adequate length, so that side slopes of the driveway berms do not exceed a four to one (4:1) slope.

If the ditch line is more than ten feet (10') from the edge of pavement, the minimum size (diameter) culvert shall be used, but the ditch need not be shifted closer to the road.

Headwalls are normally prohibited along the roadway because of the hazard they present to motorists. However, they may be permitted by the Hamilton County Engineer's Permit Department if special circumstances justify installation and safety concerns are addressed.

Approval by the Hamilton County Engineer of a permit for installation of a culvert pipe of adequate size under present conditions does not relieve the permit holder/property owner from the responsibility to increase the culvert size (capacity) if necessary by later up-stream development. Such approval by the Hamilton County Engineer of a particular size or type of culvert, to be installed by permit, does not obligate him/her from costs of subsequent necessary upgrading.

For details of downspout outlets see Plate No. 27.

SECTION VI

PAVEMENT OPENINGS (Including Jacking or Tunneling)

A. RESPONSIBILITY:

Within the unincorporated area of Hamilton County, no pavement and/or right-of-way openings on a County road shall be started until a written permit on the proper form, has been issued by the Hamilton County Engineer's Permit Department. The permit shall be subject to the following regulations except that in specific instances, and upon written request by the applicant, the Hamilton County Engineer may authorize such variance from these regulations as will not be contrary to the public interest or welfare, or where due to conditions at the site, a literal enforcement would result in unnecessary hardship.

More than one pavement opening or right-of-way opening may be included on a single application and permit form, if all are part of the same project. Should work at the site involve other types of construction, multiple permit fees may be required.

The provisions of Paragraph three (3) through seven (7) of Section I-A., also apply to this Section.

B. FINANCIAL OBLIGATIONS:

Before any pavement opening permit is issued, the applicant shall deposit with the Hamilton County Engineer's Permit Department (For payment to the TREASURER OF HAMILTON COUNTY) a check in the amount as follows:

Public Utilities	\$10.00
Private Utilities	\$20.00
Contractors	\$20.00

This deposit will be retained as a permit fee. If the work is not conducted and/or completed to the satisfaction of the Hamilton County Engineer, or his representative, the applicant will be billed for the amount of funds required to repair the roadway to a satisfactory condition as determined by the Hamilton County Engineer.

C. ENGINEERING REQUIREMENTS:

- 1.) For all underground installations the applicants will be required to employ boring, jacking or tunneling methods whenever feasible for short longitudinal and all lateral installations. Permits for open cuts will be issued for such situations only after the applicant has satisfied the Hamilton County Permit Department that this method is the only feasible alternative.

- 2.) The application for a permit to make longitudinal cuts within the roadway, or within three feet (3') of the edge of the roadway, shall be accompanied by a detailed plan in triplicate showing all of the proposed construction affecting traffic movements and shall include any or all of the following items that are applicable to the project:
- a.) Dimensional information relative to the exact location of the cut along the highway, street address, north point, scale of drawing and distance to nearest street intersection or section line.
 - b.) Property lines, right-of-way lines, and the dimensions thereof.
 - c.) Distance between edge of pavement and right-of-way line (edge of pavement is actual edge of the pavement structure).
 - d.) Street inlets and all public utility structures which may affect said installation.
 - e.) Location and description of existing and proposed drainage structures within highway right-of-way, including invert elevations, pipe sizes, and pipe grades.
 - f.) For cuts deeper than four feet (4') below the surface, the applicant shall supply , as part of the application, details of bracing to be installed to protect the excavation. In those instances where cuts will be deeper than eight feet (8') calculations, prepared and sealed by a Professional Engineer, experienced in designs of this type, Registered to practice in the State of Ohio, shall accompany the drawings.

The intent of this requirement is to ensure that the permit applicant and his/her excavator (if not the same) shall make definite plans for (including having readily available to the work site all the necessary materials, equipment and labor) the protection of the pavement structure adjacent to the excavation.

It is not the intent that this requirement replace, supersede, or interfere with any of the rules, requirements or regulations of any agencies concerned with the health, safety or welfare of individuals present at the site. (It shall be the responsibility of the applicant to ascertain and abide by the requirements of the appropriate agencies having rules and regulations regarding health, safety and welfare at/on construction sites.)

- g.) Such other information as may be reasonably necessary to determine the exact nature and extent of the work.

- 3.) The application for a permit to make lateral cuts within the roadway, or jack, or tunnel under said roadway, shall require a detailed plan only upon request of the Hamilton County Engineer or his representative.

D. **GENERAL REQUIREMENTS:**

Upon receipt of the application and the required monetary deposit) a field review will be conducted at the location and checks made to determine if future road improvements are planned. All applications for permits shall be dated upon receipt. The necessary review will be made as soon thereafter as practicable. If the application and proposed work is found to be acceptable, the permit will be issued. In the event that corrections or modifications are deemed necessary, the applicant will be so notified, and a copy of the plan marked as appropriate, shall be returned to the applicant. The applicant, after making the necessary changes to the original drawing, shall re-submit the same number that was required for the original submission. The Hamilton County Engineer's Permit Department will then reprocess the application and issue the permit, if the required changes were made. Revised plans, which are re-submitted shall be marked as "revised" with the date of revision noted thereon near the drawing title.

The Hamilton County Engineer, through his representative in the Permit Department can require the permit holder to take and perform measures that will maintain stability of existing slopes, existing roadway drainage and existing erosion containment. When required, the permit shall be issued on the condition that the restoration procedures and methods specifically address these concerns. The above noted matters, when anticipated, shall be addressed on the items submitted with the application and must also be addressed when encountered at the site of the permit work.

Slope stability, roadway drainage and erosion containment methods may include, but are not limited to, any or all of the following:

- 1.) Construction of berms, ditches and/or curbs where none were present.
- 2.) Planting of shrubs, vegetative materials and installation of erosion control features.
- 3.) The obtaining of easements for slope grade reduction.

Costs of these operations shall be the responsibility of the permit holder. Restoration, necessitated by future failures, caused by the permit work, shall also be the responsibility of the permit holder.

Each permit shall have stated on its face the period of time for which it is valid and said permit must be on hand at the job site. The maximum period of validity shall be one (1) year. Should this time period expire prior to satisfactory completion of the work, the applicant shall apply for a new permit and pay another fee. It is also required that the permit holder notify the Hamilton County Engineer's Permit Department forty eight (48) hours in advance of the day on which the work will begin and the anticipated time of completion.

Whenever possible, underground facilities installed under authority of permits shall have a minimum cover of three feet (3'). It shall be the responsibility of the applicant to investigate the site and coordinate the proposed installation with previously installed items (by others).

During the progress of the work, adequate protection and passage shall be provided by the permit holder for the traveling public. All devices, including installation of same, and procedures, shall be in accordance with the ODOT Manual of Traffic Control for Construction and Maintenance Operations. Not more than one-half (1/2) of the traveled roadway shall be closed at one time and temporary or permanent pavement restoration shall be completed before the other one-half (1/2) of the roadway is closed. (For type of restoration, see Plates No. 13, 14, 15, 16, 17 and 18). This restoration can be made by plating the opening if the Contractor and Inspector are in agreement as to details. See Plate No. 30 for plate details.

All openings shall be backfilled and temporarily or permanently restored as soon as good construction practices permit. Any opening left unattended during the course of the work shall be temporarily restored as required in the preceding paragraph. However, longitudinal openings of major proportion may be left unattended provided that protection is afforded by use of barricades, lights, flashers, advance warning signs, etc. (All provided, installed and maintained in accordance with the pertinent provisions of the Ohio Manual of Traffic Control for Construction and Maintenance Operations) and the Hamilton County Engineer's Office notified prior to this procedure being put into effect at the site.

The provisions of the preceding paragraph may not apply for restricted roads. The determination of a restricted road is made on the basis of several factors including, but not limited to, traffic volume, peak traffic periods, geometrics, emergency routes, school bus routes (and schedules) and other factors considered pertinent by the Hamilton County Engineer or his representative. Time periods during which traffic lanes shall be restored to full width will be listed on the permit. Permits issued for work on restricted roads will have stamped thereon "RESTRICTED".

Trench backfill below subgrade level for all trenches in or within two feet (2') of the edge of pavement and paved berms shall consist of flowable controlled density fill. Specifications, including proportions of the fill mixture, delivery equipment and placing/curing requirements are included in this manual as Addendum "A".

Should the requirements of the preceding paragraph above become cause for a potential hazard which can be demonstrated, the Hamilton County Engineer reserves the right to make modifications. However, this will be done only upon application on writing, which application shall include sufficient information to aid in making a determination of the potential for hazard. Any permitted modifications shall be in writing (by the Hamilton County Engineer) and may include other engineering and/or construction requirements not listed in this manual.

Trench backfill for areas outside the limits described in the preceding paragraph shall consist of the materials referred to above or shall consist of compacted layers four inches (4") maximum of granular materials conforming to Ohio Department of Transportation "Construction & Materials Specifications", Section 310.02, Gradation A, if the backfill is to support driveways or sidewalks or may consist of compacted layers four inches (4") maximum of the excavated materials if the surface is unimproved. The thickness of the compacted layers noted above may be increased to twelve inches (12") when a high capacity mechanical tamper is used. (Manufacturer's specifications will be acceptable in defining a "high capacity mechanical tamper"). It shall be the responsibility of the permit applicant to protect restoration work until materials have cured sufficiently to accommodate traffic (both vehicular and pedestrian).

The Hamilton County Engineer reserves the right to require work, as he deems appropriate (including full width overlay), to correct damage to the existing pavement structure or surface, outside the pavement opening limits, which are attributable to the work covered by the permit.

Permanent restoration of all areas outside the edge of pavement shall be performed in accordance with Plates No. 19 through 26.

No materials shall be stored where it will interfere with the normal flow of traffic. In the event the highway becomes damaged because of said construction, the party or parties to whom this permit is granted shall promptly restore said highway to its former condition.

If it becomes necessary to open the trench at some future date for repairs or removal of structures, a new permit will be required.

Except as herein authorized, no excavation shall be made or obstacles placed within the limits of the highway in such manner as to interfere unnecessarily with the travel over the highway.

Except as herein provided, all materials and methods used for backfill of trenches and restorations of pavements shall meet the requirements of the current edition of the State of Ohio Department of Transportation "Construction and Materials Specifications". The permit holder should in particular be aware of the latter publication's requirements for compaction of trench backfill, granular pavement bases and pavement materials, and for maximum slumps for and vibration of portland cement concrete.

The Hamilton County Engineer reserves the right, on major projects or in critical areas or circumstances, to require testing. Such testing may include trench backfill density, subgrade compaction and concrete slump, air entrainment and strength. Testing shall be performed by an approved independent testing firm and written results shall be provided to the Hamilton County Engineer's Permit Department. Costs of any required testing shall be the responsibility of the applicant.

The granting of this permit does not in any way abridge the right of the Hamilton County Engineer in his jurisdiction over the County roads. If, in the process of any future work or for the benefit of the traveling public it becomes necessary, in the opinion of the County Engineer to order the removal, reconstruction, relocation or repair of any of the fixtures, or work performed under this permit, the removal, reconstruction, relocation or repairs shall be wholly at the expense of the owners thereof, and be made as directed by the County Engineer.

These regulations shall supersede all other governing factors for all matters concerning pavement openings within the County road right-of-way.

The right is reserved, during the time any or all of the work is being performed, to appoint an inspector over the work who shall represent the interest of the County.

All the work herein contemplated shall be done under the supervision and to the satisfaction of the Hamilton County Engineer, and the entire expense thereof, shall be borne by the party or parties to whom the permit is issued.

Failure by the applicant, or his agent, to comply with any of the above will be cause for revocation of the permit.

SECTION VII

EXCAVATION AND EMBANKMENT ON THE PUBLIC HIGHWAY

RIGHT-OF-WAY (Including all Cuts and Fills)

Within the unincorporated area of Hamilton County no excavation/embankment operations within the public right-of-way of County roads shall be started until a written permit, on the proper form, has been issued by the Hamilton County Engineer's Permit Department. The permit shall be subject to the following regulations except that in specific instances and upon written request by the applicant, the Hamilton County Engineer may authorize such variance from these regulations as will not be contrary to the public interest or welfare, or where due to conditions at the site, a literal enforcement would result in unnecessary hardship.

The provisions of Section I. A., Paragraphs three (3) through seven (7), Section I. D., Paragraphs One (1) through four (4) and Sec. VI. D., Paragraphs two (2), three (3) and four (4) shall also apply to this Section.

Before any permits are issued which cover excavations/embankments within the right-of-way, the applicant shall deposit with the Hamilton County Engineer's Permit Department (for payment to the TREASURER OF HAMILTON COUNTY) a check in the amount as follows:

Public Utilities	\$10.00
Private Utilities	\$20.00
Contractors	\$20.00

This deposit will be retained as a permit fee. If the work is not conducted and/or completed to the satisfaction of the Hamilton County Engineer, or his representative, the applicant will be billed for the amount of funds required to repair the roadway to a satisfactory condition as determined by the Hamilton County Engineer. However, in the case of proposed excavations which might jeopardize the integrity of the pavement or abutting property, the Hamilton County Engineer reserves the right to require submittal of sheeting and bracing plans, (including calculations) which are designed to protect the excavation.

For residential and/or commercial developments abutting Hamilton County roads, in addition to the driveway requirements discussed previously in this manual, the developer shall carry out and complete the work in conformance with the applicable requirements of Plates No. 12, 12-A and 12-B of this manual (excluding drive profiles).

For typical Section for Pavement Widening see Plates No. 28 and 29.

SECTION VIII

PUBLIC UTILITY WORK

- A.** In general, permits will be required, but without fee for the following:
 - 1.) Pole replacement when the poles are reset in the same location as part of a regular maintenance program. Same location in this instance is considered to include changes parallel with the pavement centerline of up to three linear feet (3 L.F.).
 - 2.) Guy wire renewals.
 - 3.) Water or gas service branch curb box replacements.
 - 4.) Any utility relocation caused by a County or other governmental agency road improvement.
- B.** In general, permits will be required and fees charged for relocations and/or rebuilding or utility facilities.
- C.** When it becomes necessary to relocate or rebuild utility facilities which are within County road right-of-way, the utility shall make every effort to locate same outside the pavement and as close to the right-of-way line as feasible.

SECTION IX

REQUIRED SIDEWALK/DRIVEWAY REPAIRS

The Office of the Hamilton County Engineer is required to inspect sidewalks and included driveway aprons along County roads on a scheduled basis or in response to a complaint. Property owners are responsible for necessary repairs which may be performed by them or their Contractor under a permit issued by the Hamilton County Engineer's Office.

Details regarding this are listed in the "Hamilton County Engineer's Sidewalk Policy".

ADDENDUM "A"

HAMILTON COUNTY ENGINEER'S PERMIT MANUAL

ITEM SPECIAL - FLOWABLE CONTROLLED DENSITY FILL:

- A.) DESCRIPTION - This work shall consist of furnishing and placing of a flowable mixture of Portland cement, fly ash and sand for backfilling trenches under various combinations of pavement within public right-of-way or other locations as shown on the plans or as specified. The materials as proportioned below shall not be used as structure backfill for aluminum or aluminum coated pipes.
- B.) MATERIALS:
- 1) Cement - - - 701.01 or 701.04 as listed in O.D.O.T. Construction & Material Specifications.
 - 2) Fly Ash - - - Shall meet A.S.T.M. C-618, Class C or Class F except that requirements for moisture and pozzolanic activity are waived for Class F fly ash and loss-on-ignition (L.O.I.) shall not exceed 12% for Class F fly ash. Fly ash shall come from a source approved by the Hamilton County Engineer.
 - 3) Fine aggregate shall be natural, recycled, or manufactured sand manufactured from stone, gravel or air cooled slag. The gradation of the sand shall meet the requirements of O.D.O.T. C. & M.S. 703.05 unless otherwise approved in writing by the Hamilton Country Engineer.
 - 4) Water used for the mixture shall be free from oil, salts, acid, strong alkalis, vegetable matter, and other impurities that would have an adverse effect on the quality of the backfill material.
 - 5) The mix design, including manufactured sand shall be evaluated as non-corrosive by ASTM-674.
 - 6) Polyethylene encasement - ASTM-674-84.
- C.) COMPATIBILITY WITH DUCTILE IRON PIPE - Should the mix design not meet the requirements of Section B-5 above, or in lieu of testing, the mix design in accordance with the requirements of Section B-5 (ASTM-674), then to ensure compatibility with ductile iron pipe, a polyethylene encasement shall be required conforming to ASTM A-674-84.

D.) MIX PROPORTIONING - The initial trial mixture shall consist of the following quantities of materials per cubic yard:

	Type I	Type II	Type III	Type IV	Type V
Cement	100 lbs	50 lbs	100 lbs	0 lbs	0 lbs
Fly Ash, Class F	250 lbs	250 lbs	2000 lbs	**1500 lbs	0 lbs
Fly Ash, Class C	0 lbs	0 lbs	0 lbs	500 lbs	400 lbs
Sand (SSD)*	2850 lbs	2910 lbs	0 lbs	0 lbs	2930 lbs
Air	3 oz	0	0	0	0
Water (Maximum)	500 lbs	500 lbs	725 lbs	850 lbs	430 lbs

*saturated surface dry

**or other aggregate fill, as approved by the Hamilton County Engineer

These quantities of materials are expected to yield approximately 1 cubic yard of mixture of a flowable consistency. The proportioning of materials shall be the responsibility of the Contractor. Adjustments of the proportions shall be based on maintaining the total absolute volume and proportioning shall insure that unconfined compressive strength at 90 days does not exceed 150 P.S.I. (10.8 T.S.F.). The minimum unconfined compressive strength shall not be less than 50 P.S.I. (3.6 T. S.F.). The Contractor may be required to provide test data from a laboratory or testing firm (such laboratory or firm to be approved by the Hamilton County Engineer) demonstrating that the proposed proportioning will meet the strength limitations listed above.

E.) MIX ADJUSTMENTS - To expedite consolidation of Type I or Type II mixtures as defined in Section D above, it will be necessary for bleed water to appear on the surface immediately after the mixture is "struck off". A delay in bleeding is an indication of too many fines in the mixture. In this case, the fly ash quantity shall be reduced in increments of 50 lbs. until the mixture is bleeding freely. Approximately 60 lbs. of sand shall be added to replace each 50 lbs. increment of fly ash in order to maintain yield.

To produce a flowable mix it may be necessary to produce one or more one cubic yard trial batches at different water contents. The mixture shall be considered too dry if cracks develop in the mixture as it flows into place.

- F.) FLOW TEST - A test for proper flow consists of filling a 3 inch diameter by 6 inch high open ended cylinder, placed on a smooth non-porous level surface, to the top (struck level) with flowable mixture. Within 5 seconds of filling/striking the cylinder shall be pulled straight up. The resulting spread material shall have a diameter of at least 8 inches (except for Types IV and V).
- G.) PUMPING - The mixes proportioned by Types I and II may not be pumpable. If the Contractor elects to pump the flowable mixture, fly ash may be added up to a maximum content of 750 lbs. Fine aggregates shall be reduced to maintain absolute volume of the mixture.
- H.) FCDF; FAST SETTING TYPE IV AND V - The initial mixture shall be as specified in Section D above. Fast Setting Mixture may be used elsewhere, but shall be used as directed by the Hamilton County Engineer for backfilling trenches under pavement within the public right-of-way when it is deemed that the pavement must be quickly reopened to traffic so as to minimize inconvenience to vehicular traffic or as shown on the plans. The use of FCDF Fast Setting Mixture is intended to allow for placement of an asphaltic concrete pavement within four hours after mixture placement. FCDF Fast Setting Mixture shall meet the compressive strength requirements as included in Section D above.
- I.) MIXING EQUIPMENT - Sufficient mixing capacity and delivery equipment shall be provided to permit the FCDF mixture to be placed without interruption as much as practical. FCDF mixtures may be placed in intermittent horizontal lifts as approved by the Hamilton County Engineer.

Delivery equipment shall be as follows:

- 1.) Type I and Type II mixtures shall be delivered and placed from ready mixed concrete trucks or volumetric mobile mixers. These mixtures may be pumped if modified as described in Section G above.
- 2.) Type III mixtures may be delivered and placed from dump trucks, ready mixed concrete trucks, volumetric mobile mixers, conveyor lines or pumping.
- 3.) Type IV and Type V mixtures shall be delivered and placed from volumetric mobile mixers. Volumetric mixers shall be calibrated so as to combine the mix materials in accordance with the proportions listed in Section D above and to sufficiently mix the combined materials to obtain a uniform mixture meeting the requirements of these specifications.

- J.) PLACING MIXTURES - FCDF mixtures shall be discharged from the mixing and/or delivery equipment by any reasonable means into the space to be filled. The fill material shall be brought up uniformly to the lines or limits shown on the plans or as directed by the Engineer. Placing of other materials over the low strength mortar backfill may commence as specified herein, as soon as the surface water has dissipated, or as directed by the Engineer.

For Types I, II and III mixtures, the placing of portland cement concrete pavements can be performed when all surface water has dissipated. The placing of asphaltic concrete pavements over these same three (3) type mixtures shall not occur until a minimum of 24 hours has elapsed following placing of the backfill.

For Types IV and V mixtures, the placing of portland cement concrete pavements can be performed one (1) hour after the backfill has been placed. The placing of asphaltic concrete pavement over the same mixtures shall not occur until a minimum of 4 hours has elapsed following placing of the backfill unless a pentrometer test in accordance with ASTM C-403-88 indicates average resistance strength of 400 P.S.I. in less time.

- K.) LIMITATION OF OPERATIONS

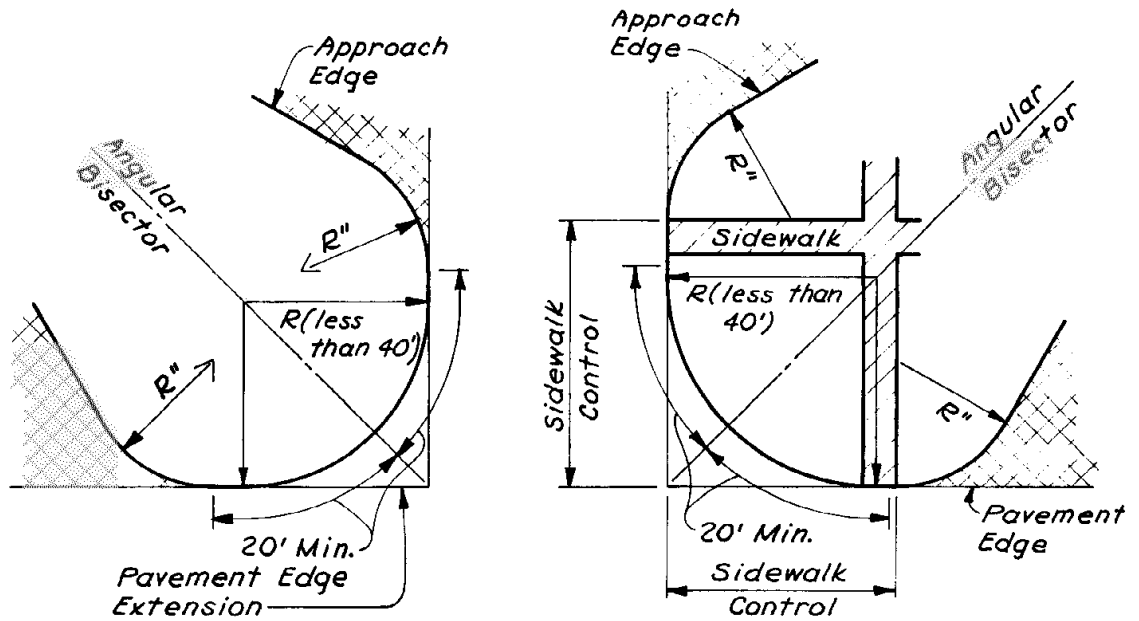
- 1.) The mixtures shall not be placed on frozen ground.
- 2.) The placed mixtures shall be protected from freezing.
- 3.) Each filling stage shall be as continuous as possible.
- 4.) Curing time of FCDF may be affected by temperature. At temperatures near freezing or below, additional time may be needed for proper cure of the material prior to any type of paving operation.

- L.) APPROVAL OF ALTERNATE MATERIALS - Manufacturers or suppliers of materials other than those approved by the Hamilton County Engineer and as indicated by these specifications may request owner's material be added as an approved equal through the Hamilton County Engineer. Any such requests shall be in writing and shall include sufficient data, results of field and laboratory tests, source of supply, quantity available, etc. to enable a reasonable consideration to be made of the request.

M.) METHOD OF MEASUREMENT - Flowable controlled density fill mixtures will be measured by the cubic yard. Quantities will be determined by calculations using dimensions shown on the plans, as described in the Contract, from field measurements, or as ordered by the hamilton County Engineer. Should disputes arise in yield values, the number of cubic yards of FCDF will be measured by conversion of the total batch(es) weight(s) or mobile meter reading. A conversion factor of 3,650 lbs. per cubic yard will be used for Types I and II, a conversion factor of 2,850 lbs. per cubic yard will be used for Types III and IV, and a conversion factor of 3,750 lbs. per cubic yard will be used for Type V.



N.) BASIS OF PAYMENT - Unless otherwise specified in the Contract or Agreement, the Contractor will be paid for the volume of mixture furnished and placed at the Contract unit price per cubic yard. This payment shall be full compensation for placing the low strength mixture and for furnishing all materials, equipment, labor and incidentals necessary to complete this item; unless included under other items in the Contract or Agreement. Payment will be made under:

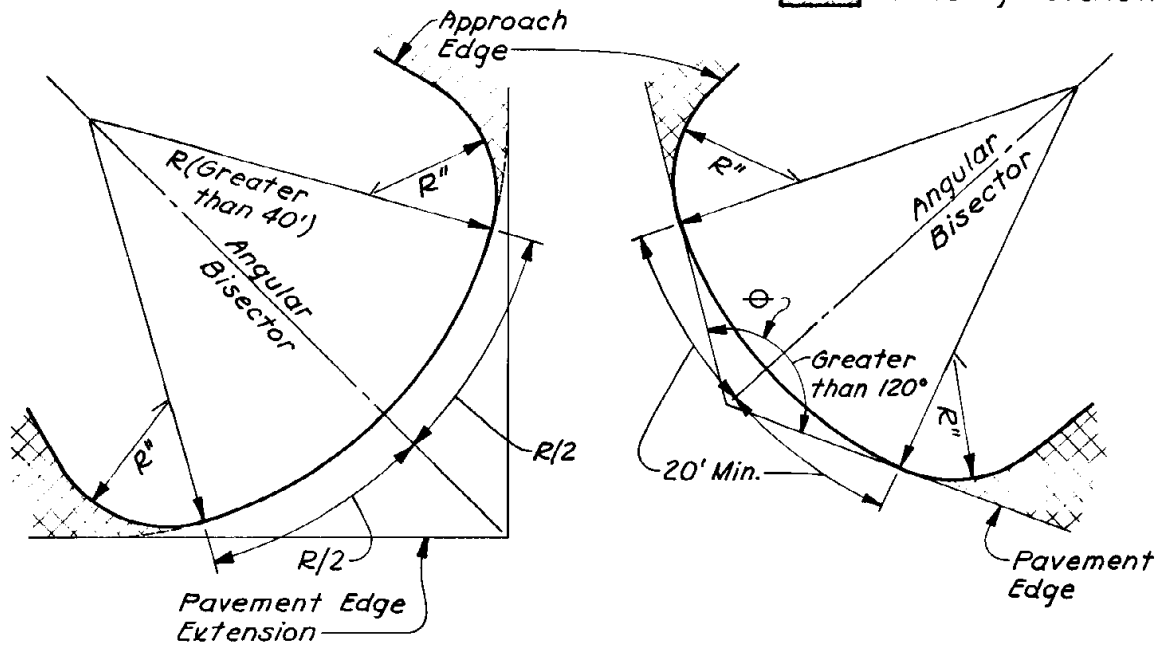
<u>ITEM</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
Spl.	Cu. Yd.	Flowable Controlled Density Fill, Type I, Type II, or Type III
Spl.	Cu. Yd.	Flowable Controlled Density Fill, Fast Setting, Type IV or Type V



INTERSECTION RADIUS LESS THAN 40 FEET

R = INTERSECTION RADIUS
 R'' = APPROACH RADIUS-TURNING
 $R/2$ = 30' MIN., MAX. NEED NOT EXCEED 40'

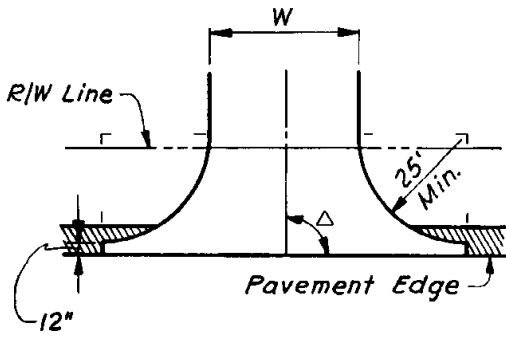
 Sidewalk Pavement
 Driveway Pavement



INTERSECTION RADIUS GREATER THAN 40 FEET

**UNCURBED APPROACHES ALONG
UNCURBED ROADWAY**

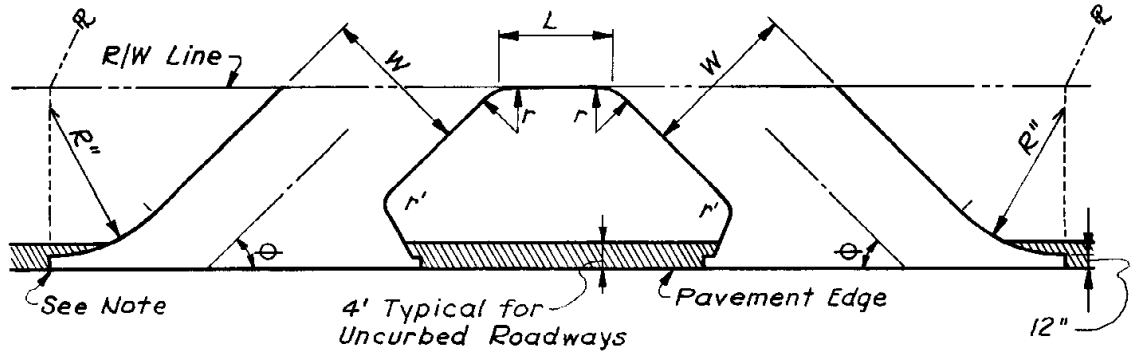
Plate No. 2



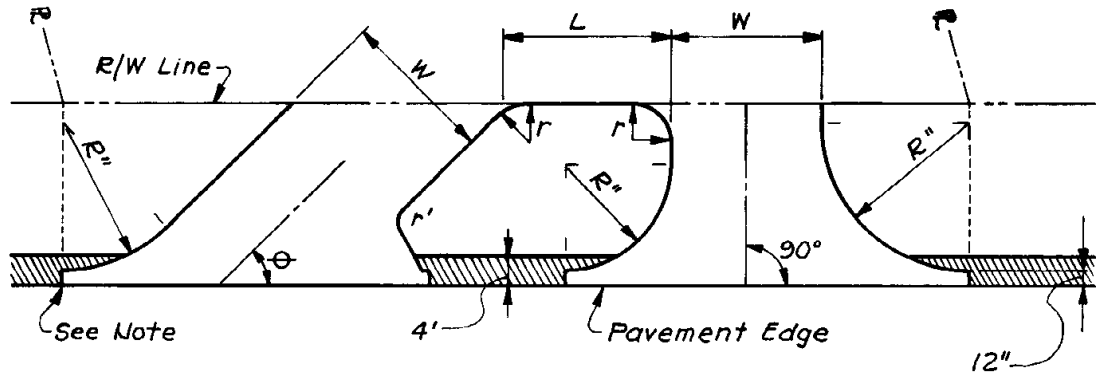
- L 6' minimum for curbed islands and 15' minimum for uncurbed islands
- W 35' maximum
- Δ 70° to 90° (for approach with two-way operation)
- \ominus 45° to 90°
- r' Non-turning radius, 5' \pm
- R'' Turning radius, 25' desirable
- r Permissible rounding, 15' maximum
- Stabilized berm

SINGLE APPROACH

NOTE: Refer to Plate No. 2A for curb restrictions

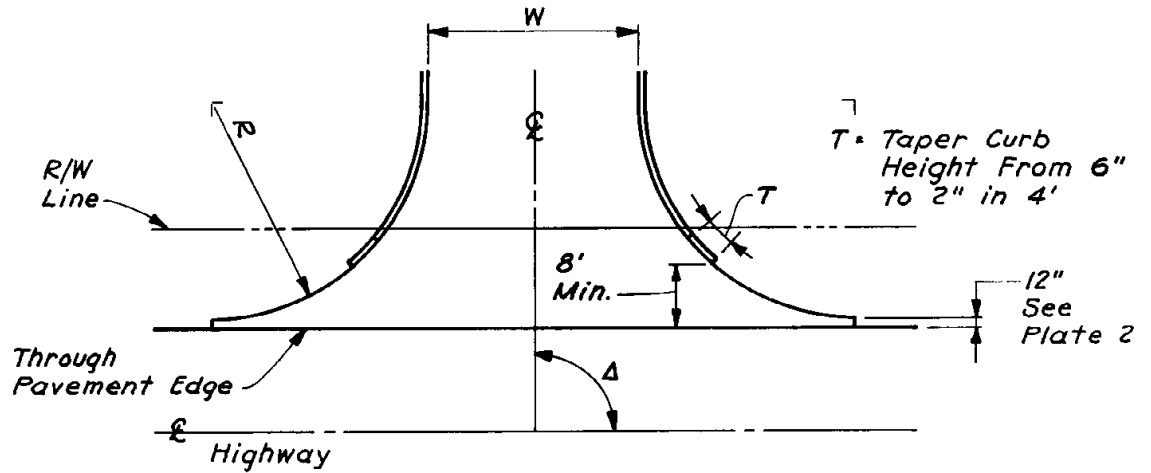


DUAL APPROACHES & INTERMEDIATE ISLAND



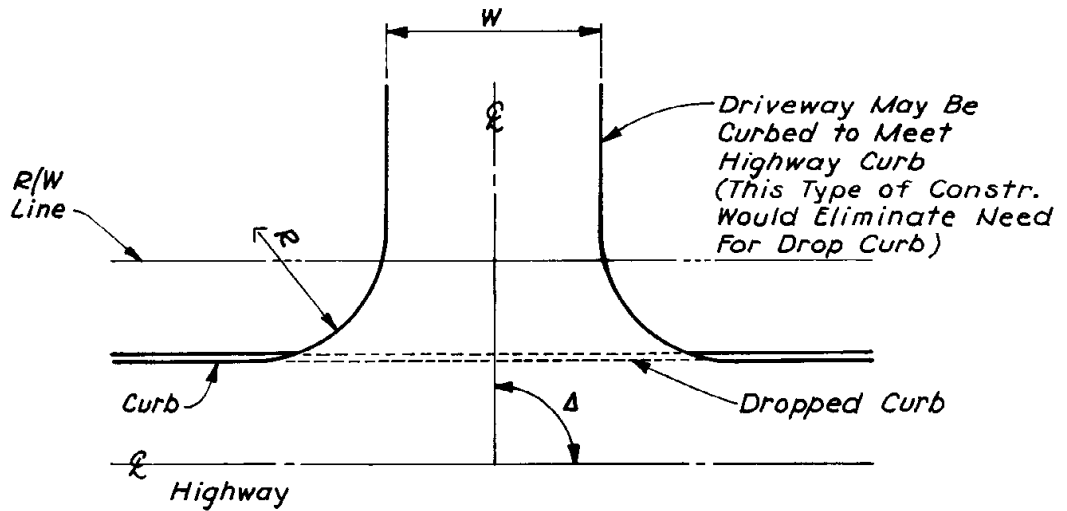
**DUAL APPROACHES WITH RETURN FLOW
& INTERMEDIATE ISLAND**

(For Use on Cross-Roads in Vicinity of Interstate Routes or Freeways)



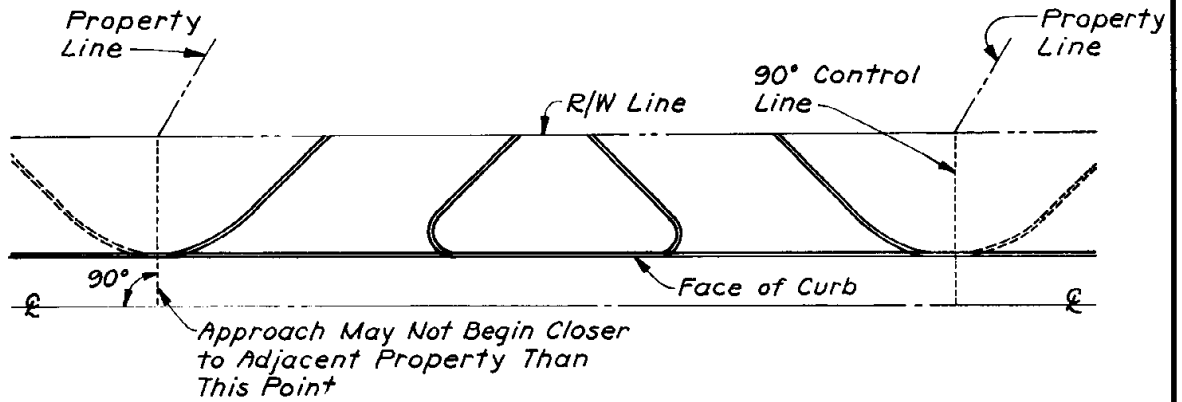
CURBED DRIVEWAY ALONG UNCURBED HIGHWAY

NOTE: This Plate is to be Coordinated With Plate No. 2

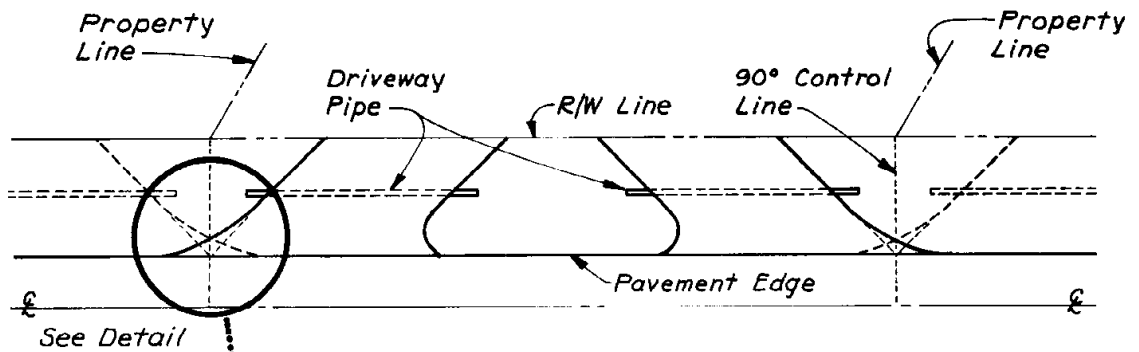


CURBED OR UNCURBED DRIVEWAYS ALONG CURBED HIGHWAY

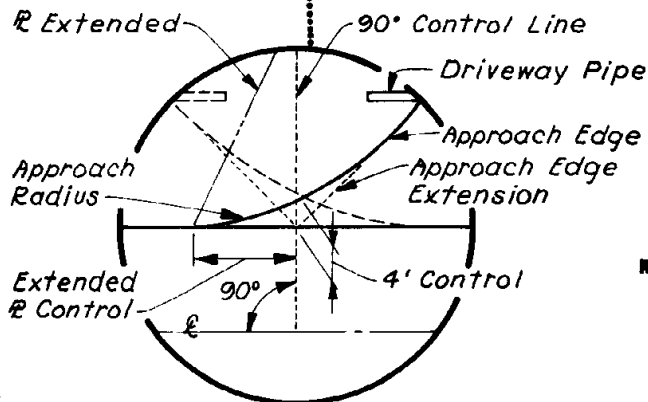
NOTE: See Dropped Curb Details Plates No. 5 and No. 6



LOCATION OF APPROACHES ALONG CURBED HIGHWAYS



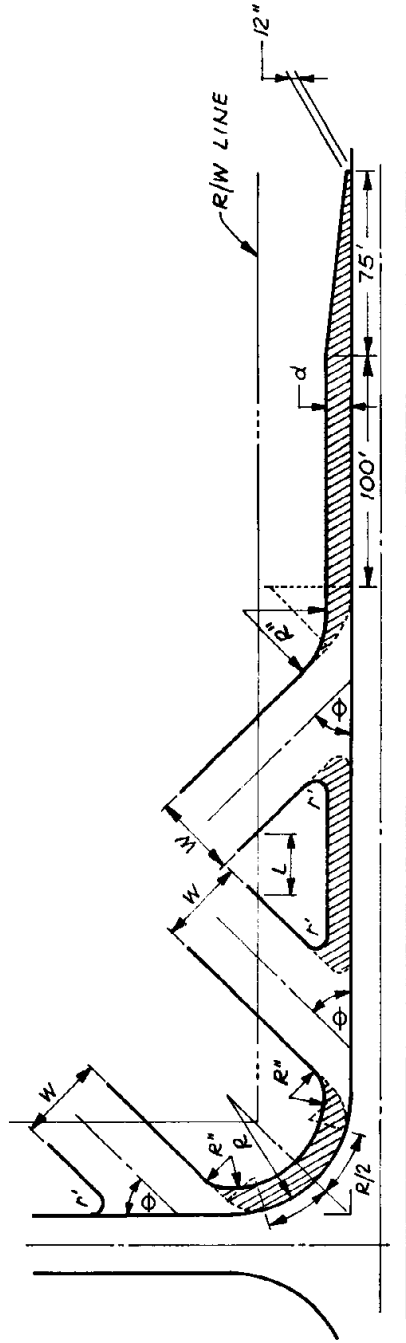
LOCATION OF APPROACHES ALONG UNCURBED HIGHWAYS




**DETAIL FOR DETERMINING
MAXIMUM UTILIZATION OF
HIGHWAY FRONTAGE**

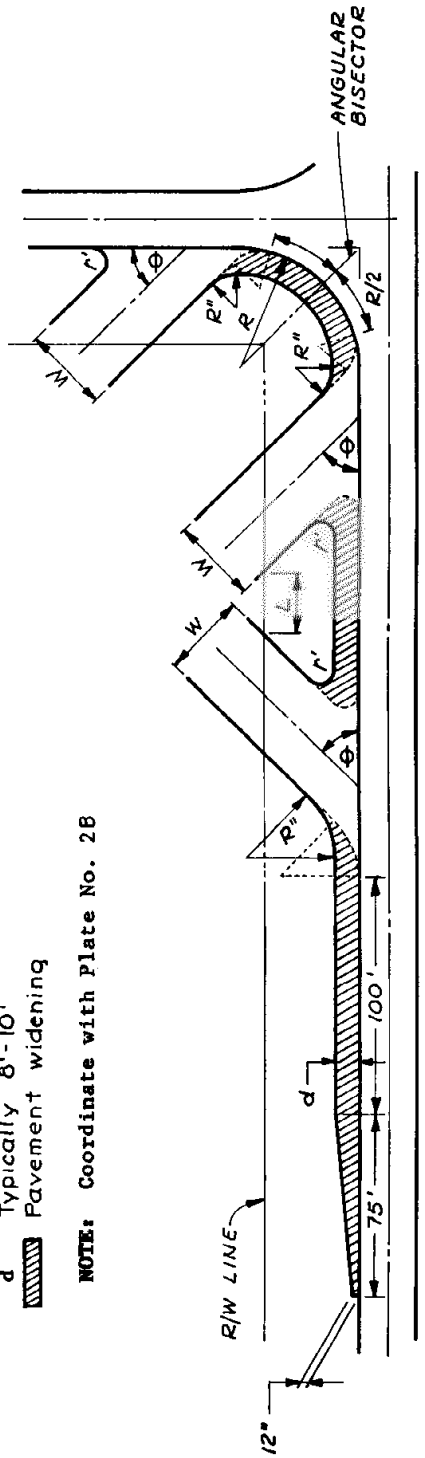
1. Approach edge extension must not cross the 90° Control line.
2. Approach radius may cross the 90° Control Line only within the limits of the 4' Control and/or the extended property line control.

NOTE: Requirements of Sec. II-G and Plate No. 3 can be enforced or permitted only if Hamilton County owns the R/W in fee. Where highway easements are in effect, no portion of any driveway approach shall be constructed beyond the side property lines. (See Sec. II-G, 1-c)



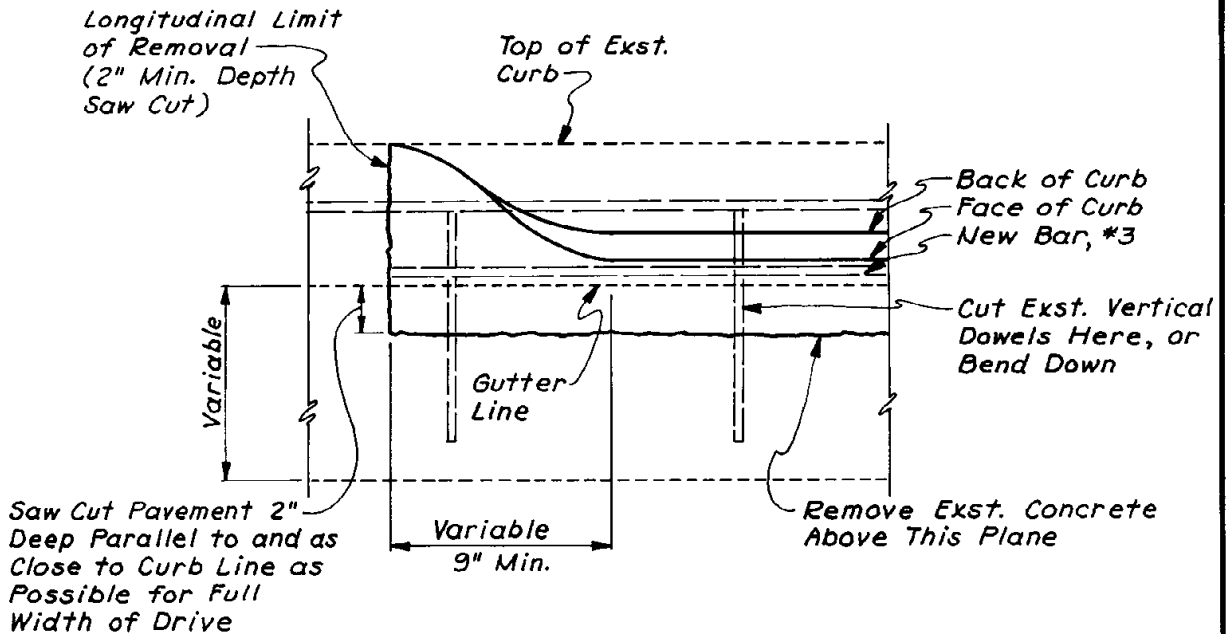
- L 6' minimum for curbed islands, 15' minimum for uncurbed islands
- W Not greater than 35 feet
- φ 45° to 90°
- R Intersection radius - use 40' minimum when existing radius is less than 40'
- r' Non-turning radius, 5' ±
- R'' Turning radius, 25', desirable
- d Typically 8'-10'
-  Pavement widening

NOTE: Coordinate with Plate No. 2B

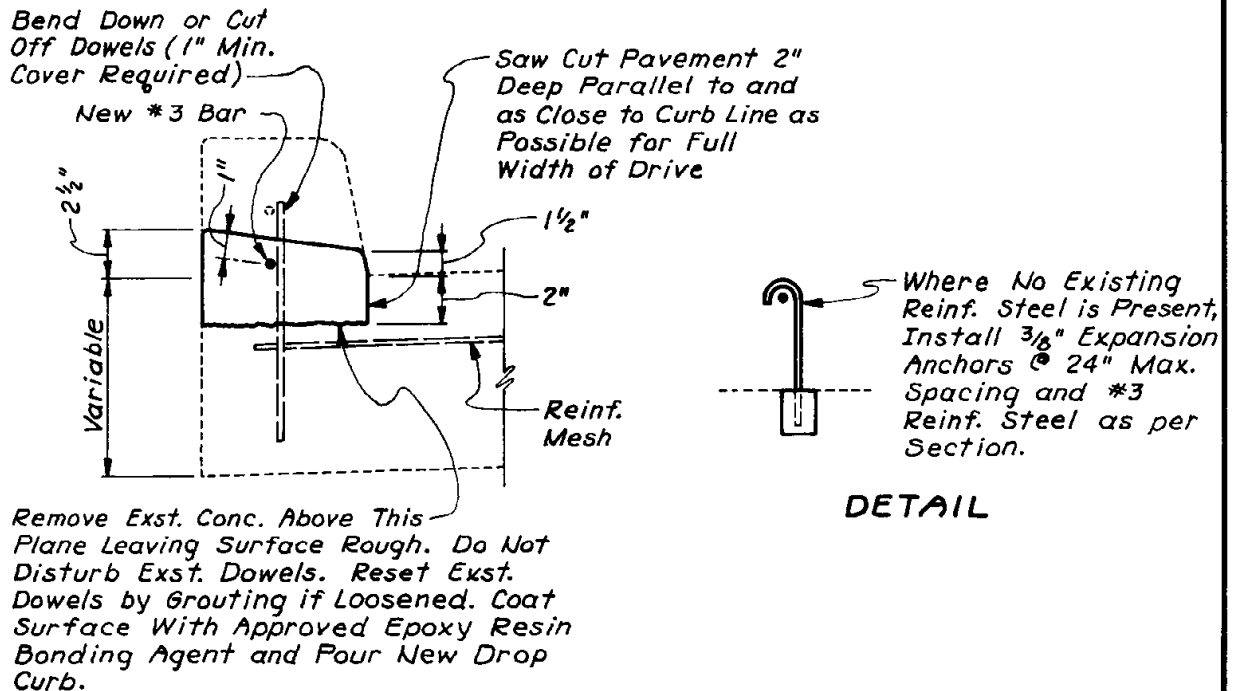


REPLACING CONCRETE CURB WITH DROP CURB AT DRIVEWAYS

Plate No. 5



FRONT ELEVATION

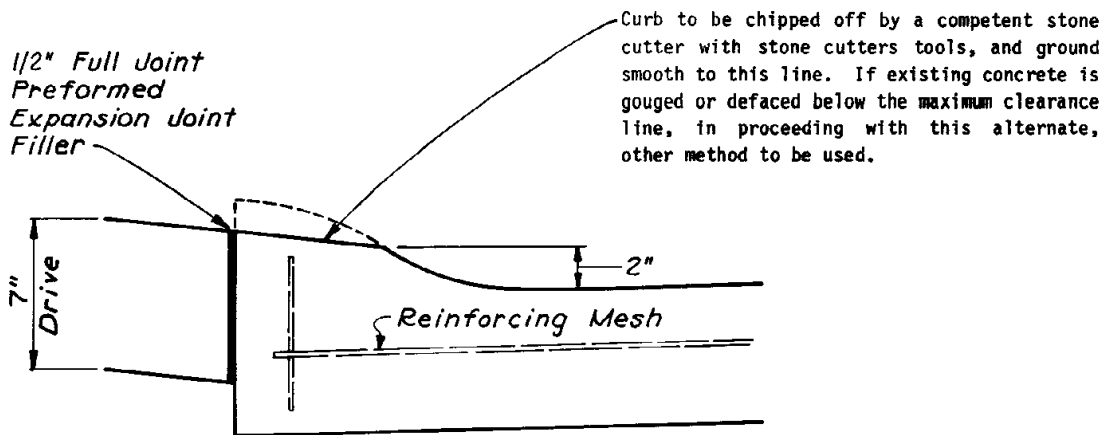
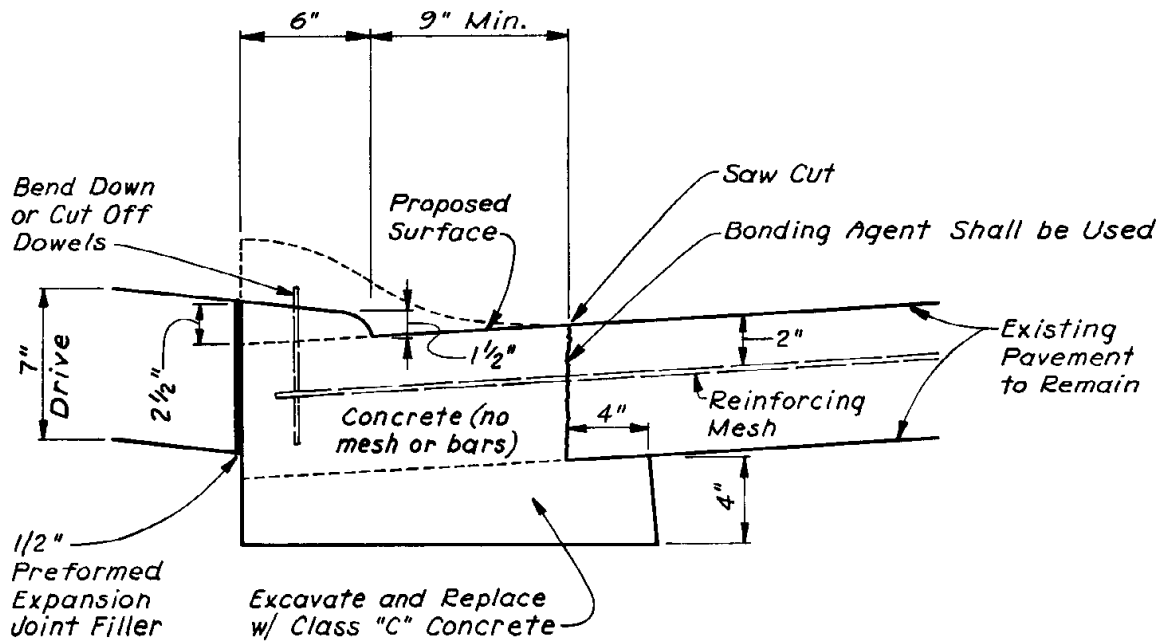


DETAIL

SECTION

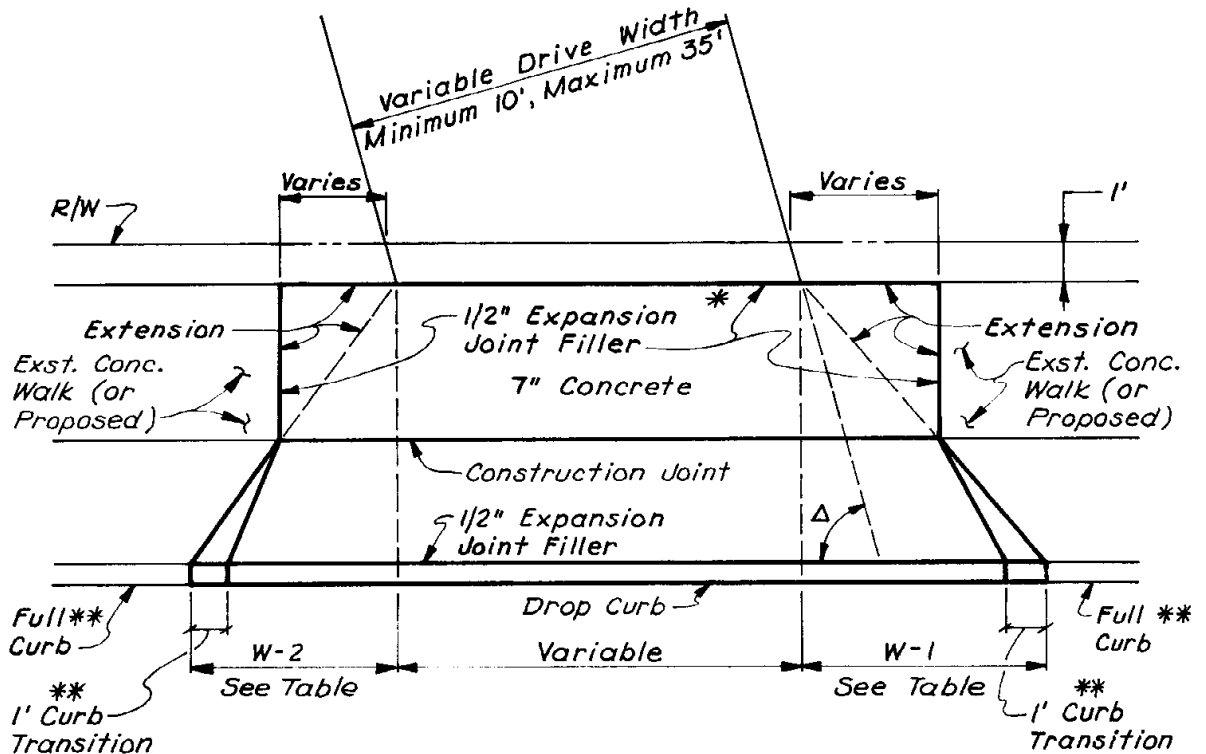
**DEPRESSED CURB
MODIFICATIONS**

Plate No. 6



DRIVEWAY APRONS WITH SIDEWALK REPLACEMENT AND CONCRETE CURB

Plate No. 7



* Expansion Joint Filler Not Required at Asphalt Driveway

TYPICAL DRIVEWAY PLAN

Δ	W-1	W-2
30° - 40°	11.0	5.0
40° - 50°	10.0	5.0
50° - 60°	9.0	5.0
60° - 70°	8.0	5.0
70° - 80°	7.0	5.0
80° - 90°	6.0	5.0
90°	5.0	5.0

RESIDENTIAL DRIVES

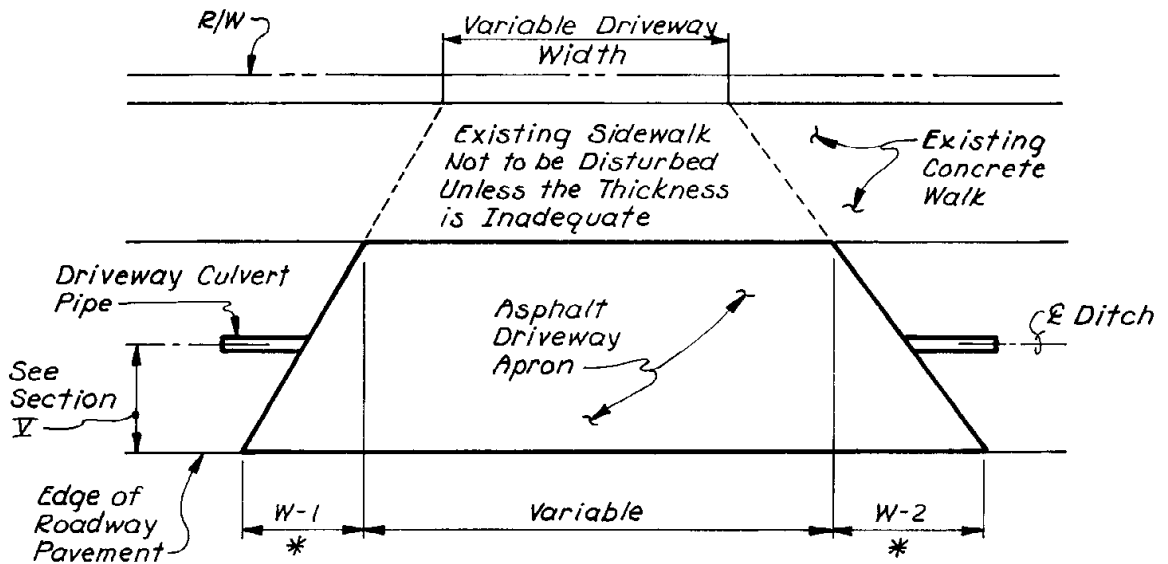
Δ	W-1	W-2
30° - 40°	11.0	5.0
40° - 50°	10.0	6.0
50° - 60°	9.5	6.5
60° - 70°	9.0	7.0
70° - 80°	8.5	7.5
80° - 90°	8.0	8.0

COMMERCIAL DRIVES

** Does Not Apply in Subdivisions With Roll Curb

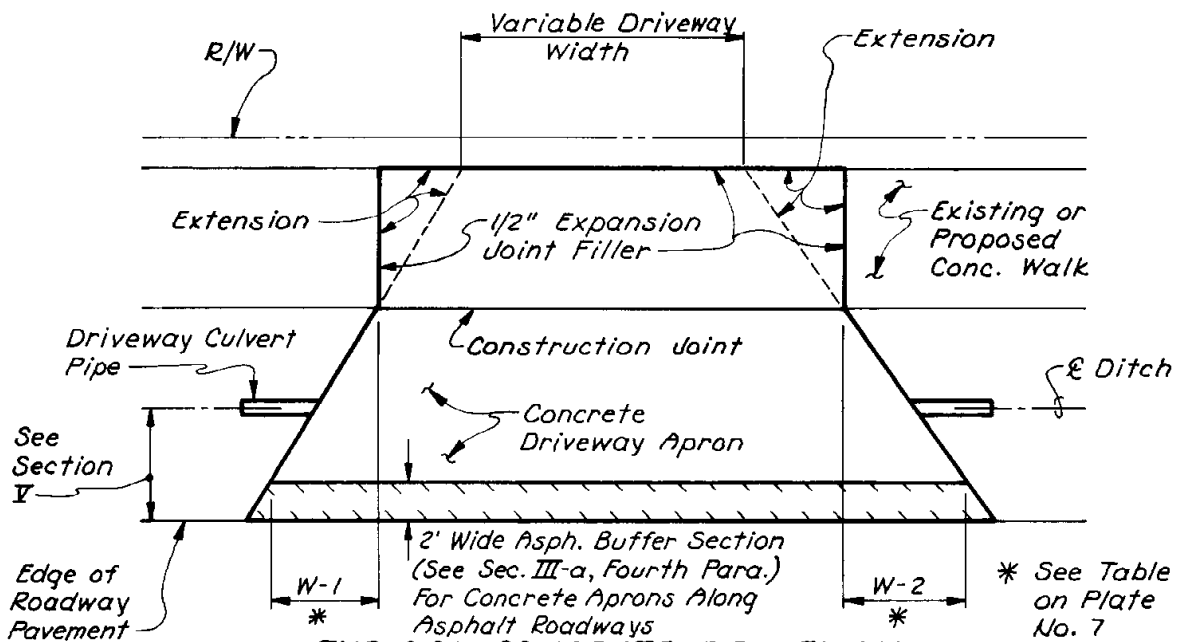
**DRIVEWAY APRON WITH SIDEWALKS
AND NO CURB**

Plate No. 7A



* See Table on Plate No. 7

**TYPICAL ASPHALT DRIVEWAY
PLAN WITH SIDEWALK AND NO CURB**

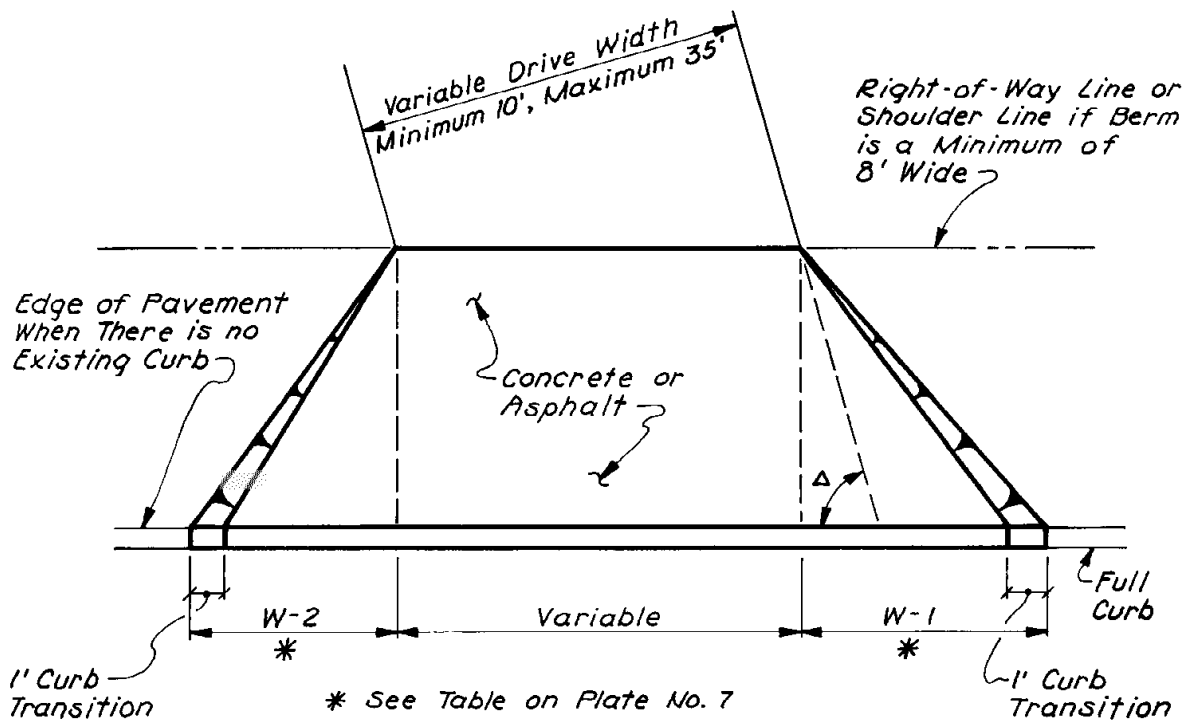


* See Table on Plate No. 7

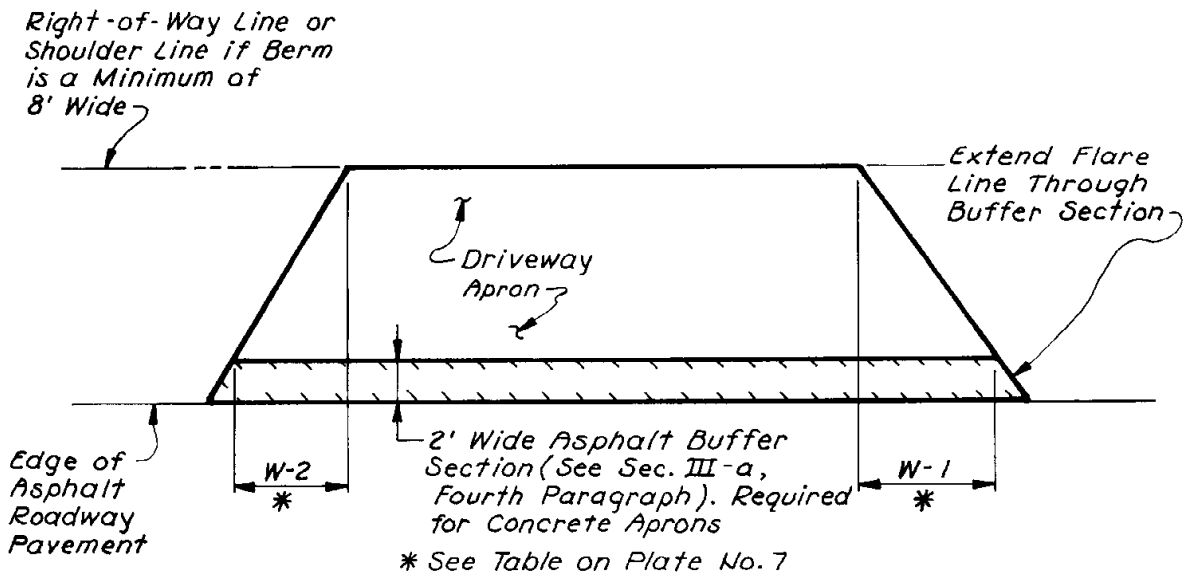
**TYPICAL CONCRETE DRIVEWAY
PLAN WITH SIDEWALK AND NO CURB**

**DRIVEWAY APRONS WITH
NO SIDEWALK**

Plate No. 8



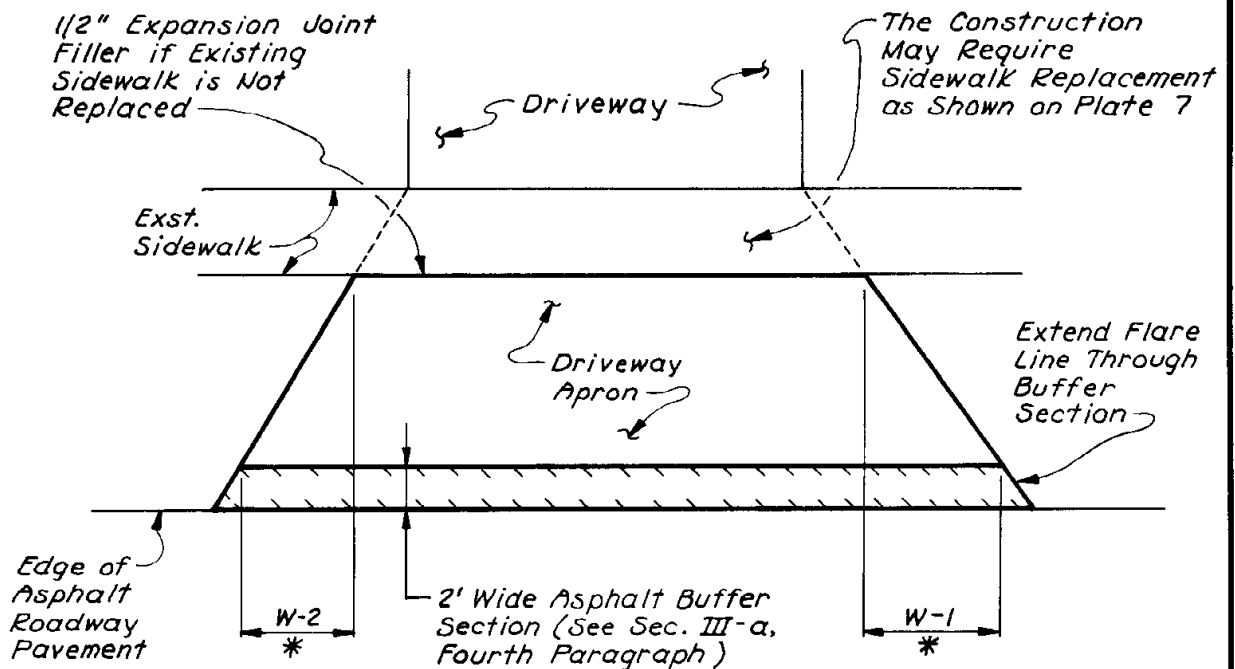
**TYPICAL DRIVEWAY PLAN WITH
CURB AND NO SIDEWALK**



**TYPICAL DRIVEWAY PLAN WITH
NO CURBS OR SIDEWALKS**

**DRIVEWAY APRONS WITH EXISTING
SIDEWALK AND NO CURB**

Plate No. 8A



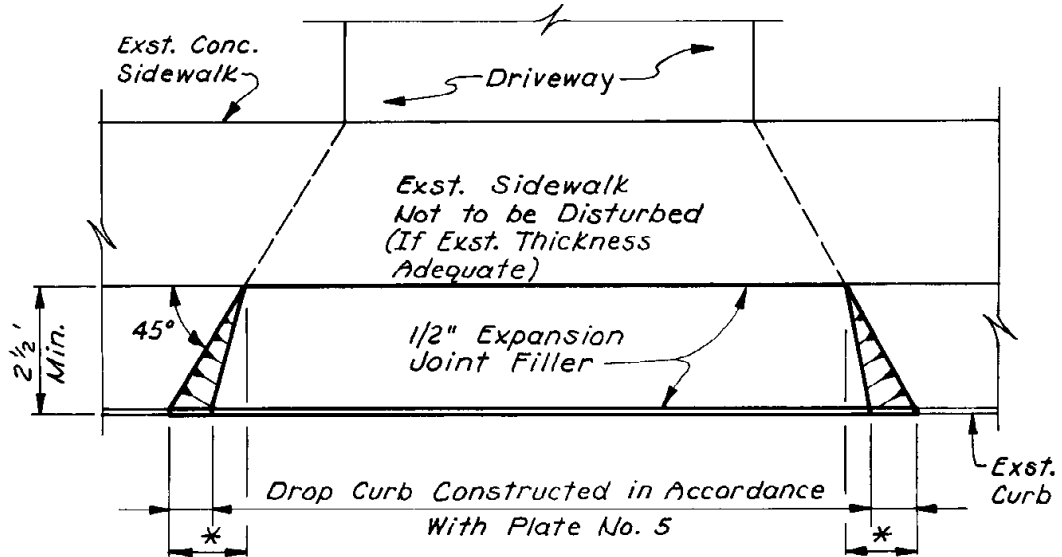
* See Table on Plate No. 7

**TYPICAL DRIVEWAY
ABUTTING AN ASPHALT ROADWAY
WITH NO CURB**

NOTE: For driveway aprons installed where sidewalks but no curbs are present, construction shall be in accordance with the details shown above and also in conformance with the requirements of Plate No. 7 (regarding sidewalk replacement) and Plate No. 12B. The two foot (2') wide buffer applies to those situations where a portland cement concrete apron is to be constructed adjacent to an asphalt concrete road.

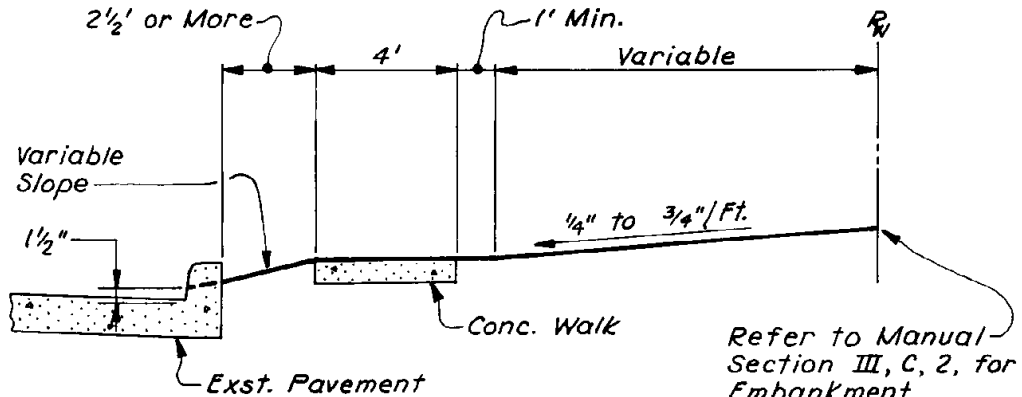
**TYPICAL HALF-SECTIONS
WITH EXISTING SIDEWALK**

Plate No. 9



* 2½' Min. Disregard 45° Angle When Flare Width Would Exceed Dimensions Shown in Table, Plate No. 7

PLAN

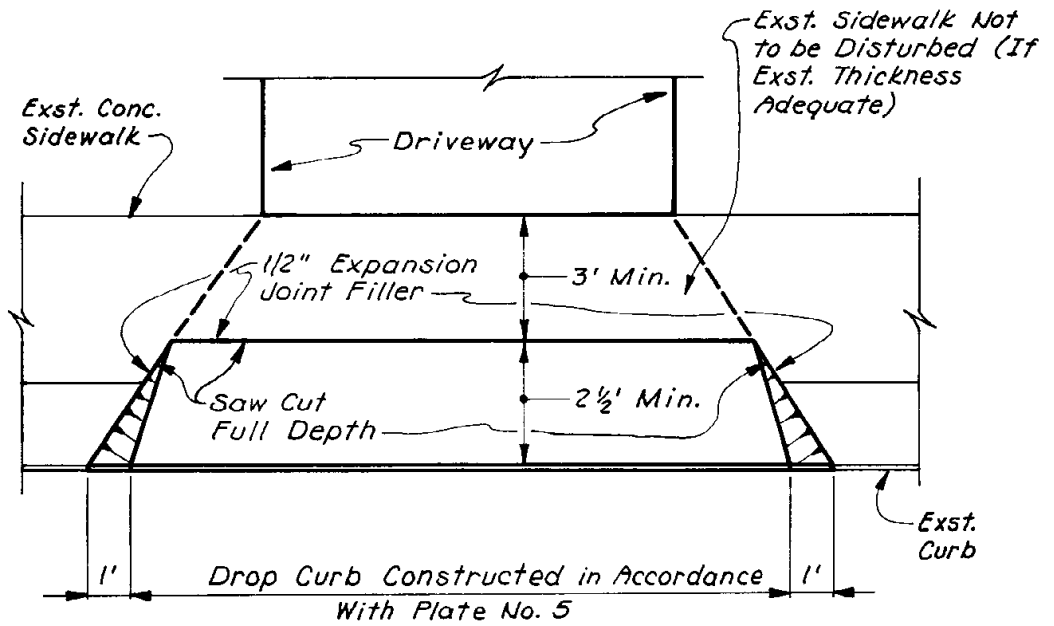


Refer to Manual Section III, C, 2, for Embankment Situations

SECTION

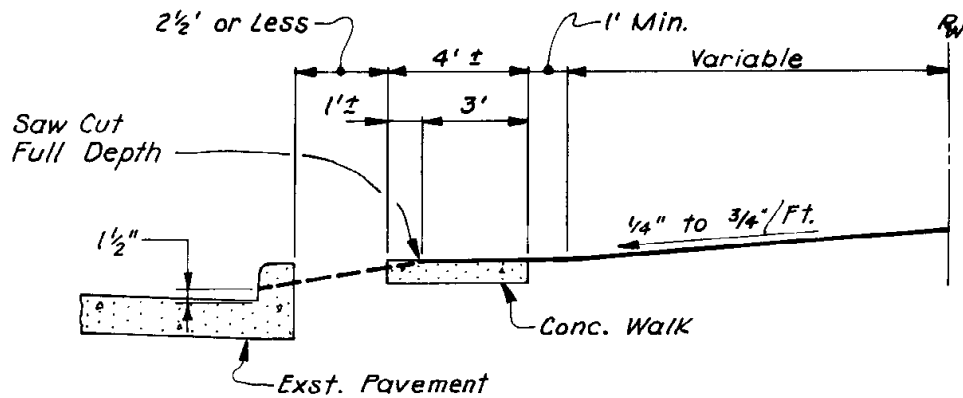
**TYPICAL HALF-SECTIONS
WITH EXISTING SIDEWALK**

Plate No. 10



PLAN

NOTE: In Some Instances Work Will Have to be Performed in Accordance With Plate No. 11



SECTION

NOTE: Driveways and Extensions Within Sidewalk Limits to be Same Thickness as Driveway Requirements.

**EXISTING SIDEWALK DETAILS
& TYPICAL SECTIONS**

Plates No. II, 12 & 12A

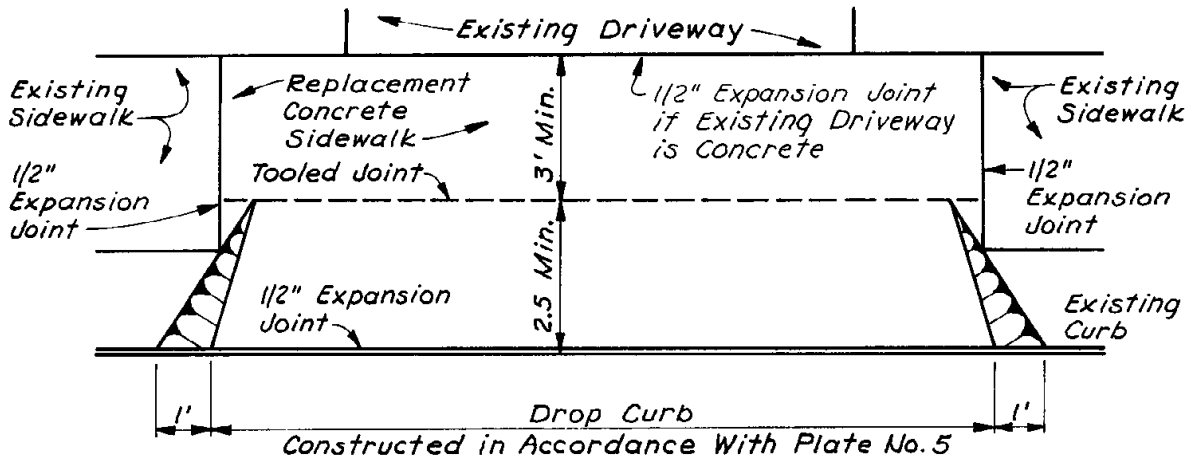


PLATE NO. II

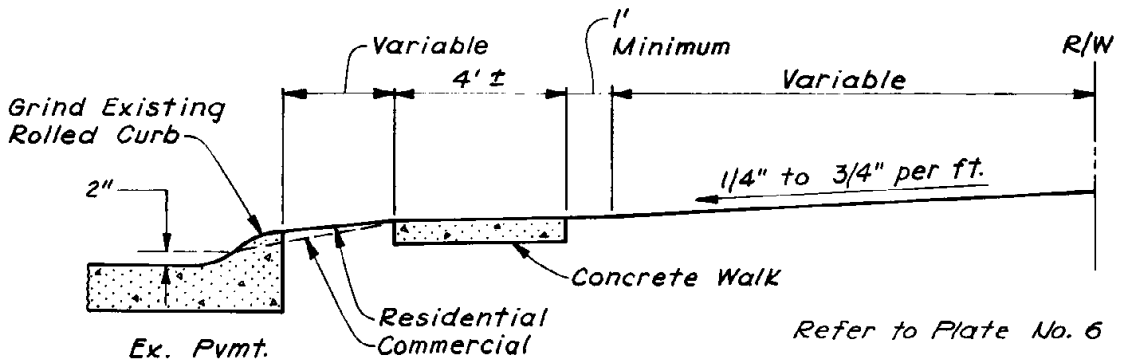


PLATE NO. 12

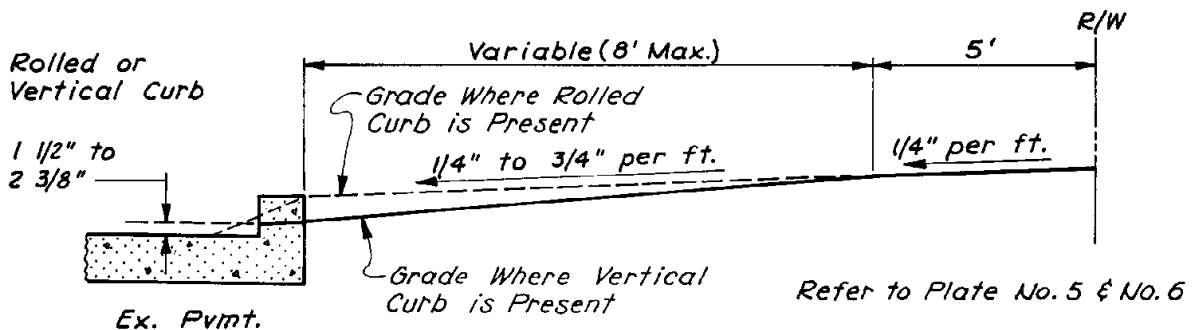
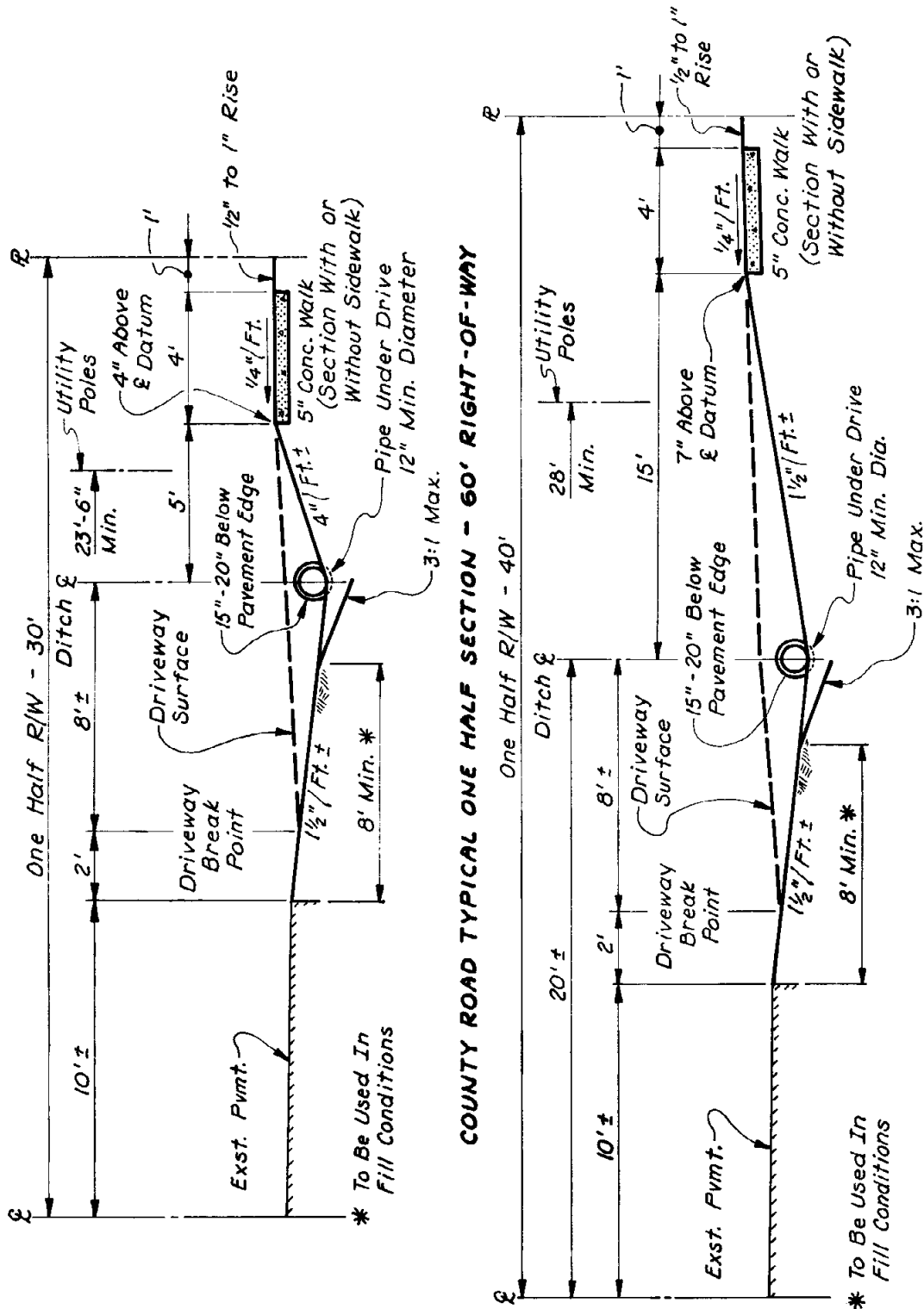


PLATE NO. 12A

TYPICAL HALF-SECTIONS FOR FRONTAGE SUBDIVISIONS

Plate No. 12B

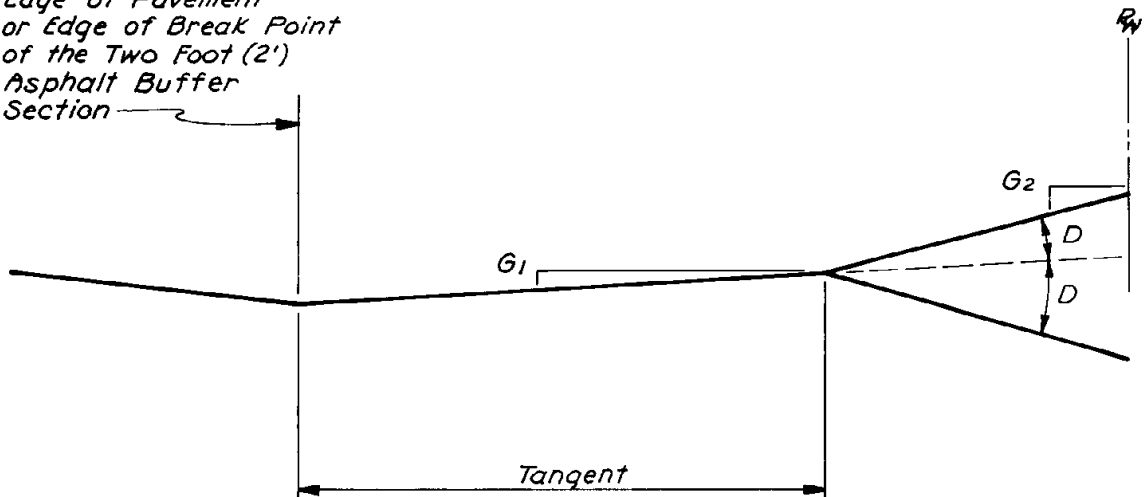


**RESIDENTIAL LOTS ABUTTING ROADS
WITHOUT CURBS OR SIDEWALKS ***

Plate No. 12C

* Not part of a planned subdivision.

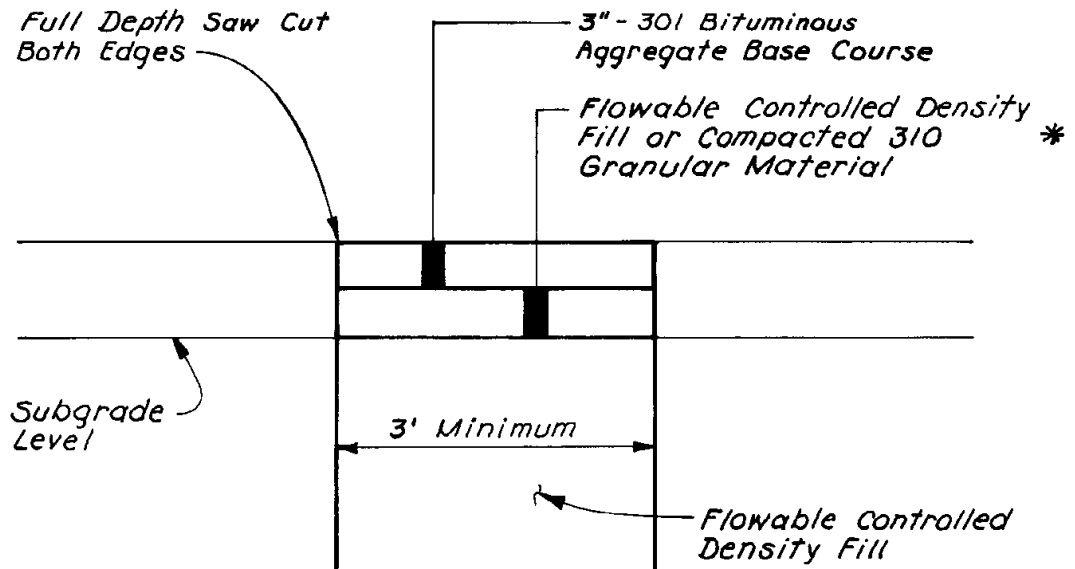
*Edge of Pavement
or Edge of Break Point
of the Two Foot (2')
Asphalt Buffer
Section* →



TYPICAL SECTION
(For a Single Resident Driveway)

NOTES:

1. The length of the Tangent should, if possible, extend to the right-of-way line. The minimum length of Tangent shall be no less than ten feet (10'), unless otherwise approved by the Hamilton County Engineer's Office. This Tangent length can include the two foot (2') asphalt buffer section.
2. The maximum positive value for G_1 shall not exceed + three-fourths inch ($3/4''$) per foot (1') (approx. 6%). The maximum negative value must provide the user with the maximum available sight distance. Negative grades may not exceed three-fourths inch ($3/4''$) per foot (1').
3. The value of G_2 is predicated by the grade change value D . The maximum D value for a single resident driveway shall be six percent (6%), which is approximately three-fourths inch ($3/4''$) per foot.



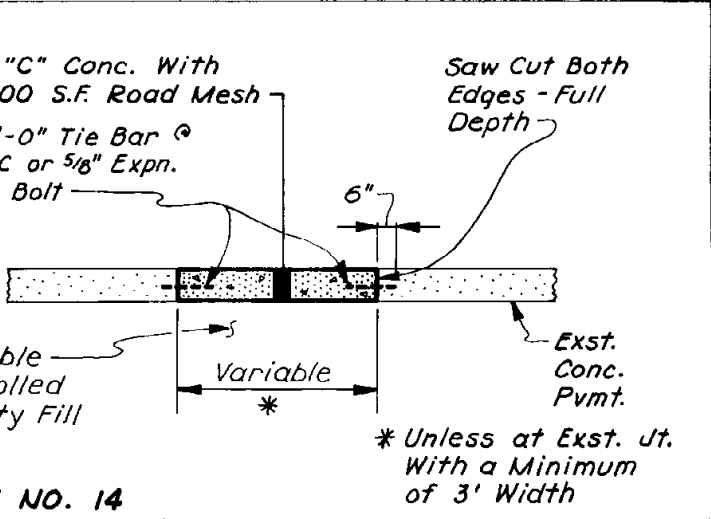
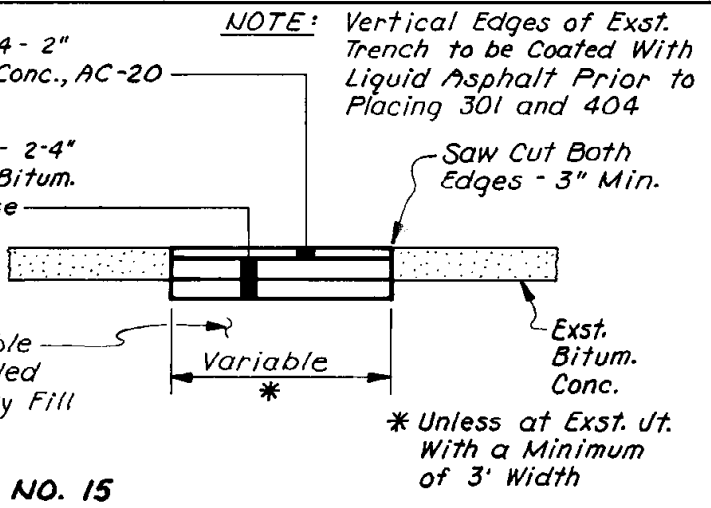
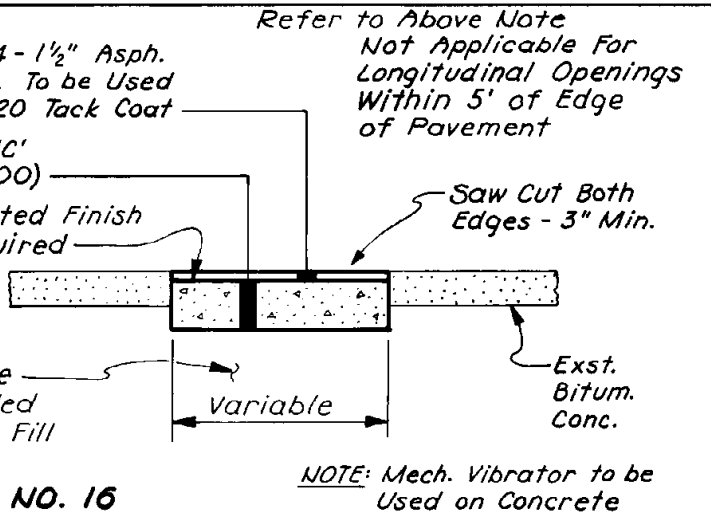
TEMPORARY PAVEMENT

* The Flowable Controlled Density Fill or 310 Granular Material Above Subgrade Level is to be Removed to Permit Proper Pavement Restoration

NOTE: Refer to Plates 14 Thru 19 for Details of Permanent Restoration

TYPICAL RESTORATION SECTIONS

Plates No. 14, 15 & 16

RESTORATION CLASS	TYPICAL RESTORATION SECTIONS	BACKFILL
<p>CONCRETE ROADWAY</p>	<p>Class "C" Conc. With 7B #/100 S.F. Road Mesh 5/8" x 1'-0" Tie Bar @ 5'-0" OC or 5/8" Expr. Anchor Bolt</p>  <p>Saw Cut Both Edges - Full Depth</p> <p>6"</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>Exst. Conc. Pvmt.</p> <p>* Unless at Exst. Jt. With a Minimum of 3' Width</p> <p>PLATE NO. 14</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>
<p>BITUMINOUS MACADAM ON STONE BASE</p>	<p>Item 404 - 2" Asphalt Conc., AC-20</p> <p>Item 301 - 2-4" Courses Bitum. Aggr. Base</p> <p><i>NOTE:</i> Vertical Edges of Exst. Trench to be Coated With Liquid Asphalt Prior to Placing 301 and 404</p>  <p>Saw Cut Both Edges - 3" Min.</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>Exst. Bitum. Conc.</p> <p>* Unless at Exst. Jt. With a Minimum of 3' Width</p> <p>PLATE NO. 15</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>
<p>BITUMINOUS MACADAM ON STONE BASE</p> <p>(Only Used W/ Written Approval of Permit Dept. Engineer)</p>	<p>Item 404 - 1 1/2" Asp. Concrete. To be Used With AC-20 Tack Coat</p> <p>8" Class 'C' Conc. (4200)</p> <p>Floated Finish Required</p> <p>Refer to Above Note Not Applicable For Longitudinal Openings Within 5' of Edge of Pavement</p>  <p>Saw Cut Both Edges - 3" Min.</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>Exst. Bitum. Conc.</p> <p><i>NOTE:</i> Mech. Vibrator to be Used on Concrete</p> <p>PLATE NO. 16</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>

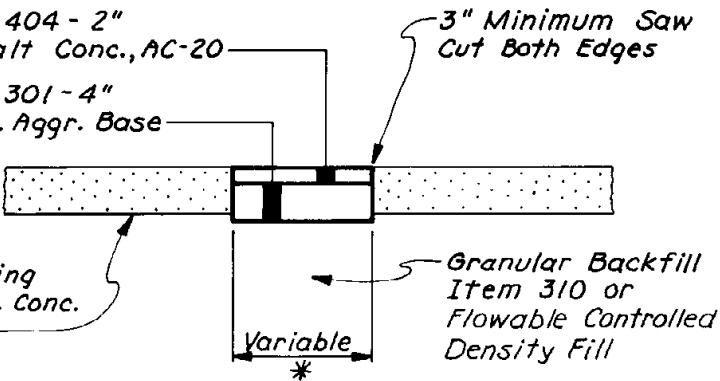
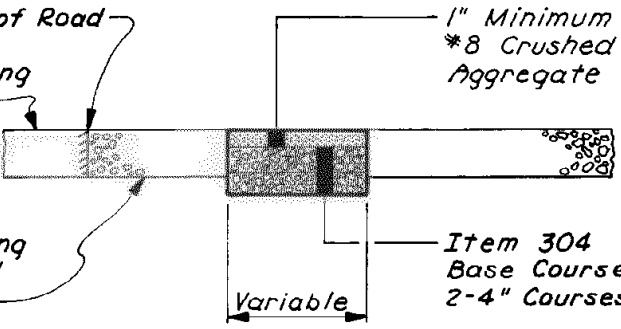
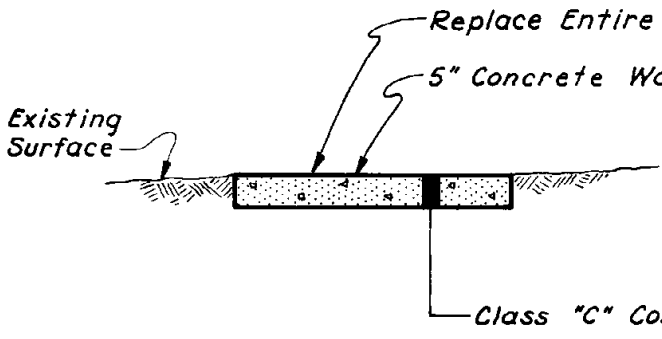
TYPICAL RESTORATION SECTIONS

Plates No. 17, 18 & 19

RESTORATION CLASS	TYPICAL RESTORATION SECTIONS	BACKFILL
<p>BRICK OR BLOCK PAVEMENT</p>	<p>See Note Plate 15</p> <p>1" Asph. Conc. Surface 1 1/2" Asph. Conc. Level Exst. Asph. Conc. Surface</p> <p>Class "C" Conc. With 78*/100 S.F. Road Mesh</p> <p>Saw Cut Both Edges - 3" Min.</p> <p>6"</p> <p>Sand Cushion</p> <p>3"</p> <p>Exst. Base</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>NOTE: If Exst. Base is Bituminous or Aggregate, Delete the 5/8" Tie Bars</p> <p>PLATE NO. 17</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>
<p>ASPHALT OR BITUMINOUS MATERIAL- CONC. BASE</p>	<p>See Note Plate 15</p> <p>Variable 404 Asphalt Concrete Surface Course Class "C" Conc. With 78*/100 S.F. Road Mesh</p> <p>Saw Cut Both Edges - Full Depth</p> <p>5/8" X 1'-0" Tie Bar @ 5'-0" O.C. or 5/8" Expn. Anchor Bolt</p> <p>Exst. Macadam</p> <p>3"</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>Exst. Conc. Base</p> <p>PLATE NO. 18</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>
<p>CONCRETE DRIVEWAY</p>	<p>Class "C" Concrete</p> <p>Saw Cut Both Edges - Full Depth</p> <p>6"</p> <p>3"</p> <p>3"</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>Exst. Conc. Pavement</p> <p>Exst. Conc. Driveway</p> <p>5/8" X 1'-0" Tie Bar @ 5'-0" O.C. or 5/8" Expn. Anchor Bolt</p> <p>PLATE NO. 19</p>	<p>GRANULAR MATERIAL</p> <hr/> <p>310 GRADATION GRADE "A" OR FLOWABLE CONTROLLED DENSITY FILL</p>

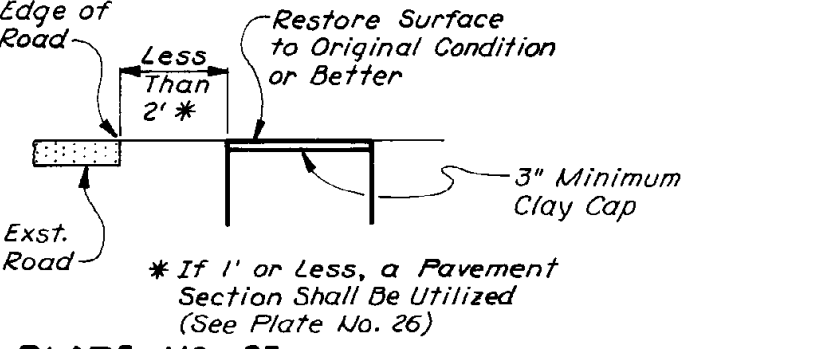
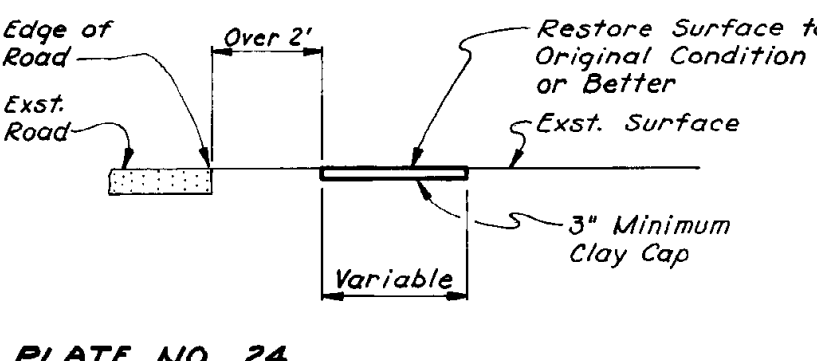
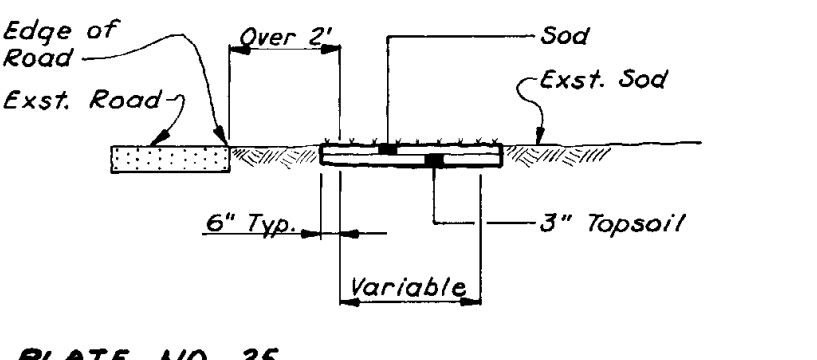
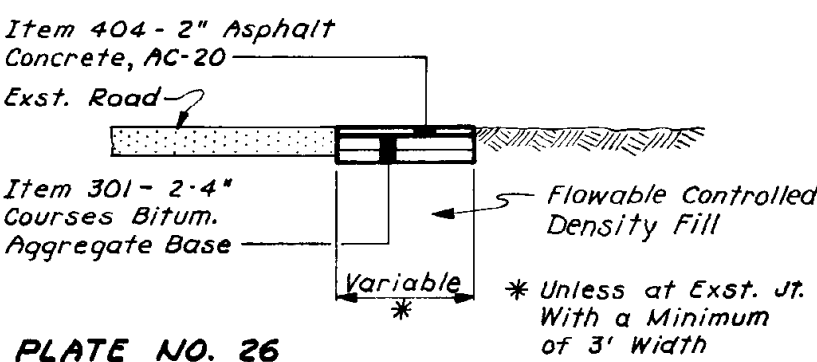
TYPICAL RESTORATION SECTIONS

Plates No. 20,21&22

RESTORATION CLASS	TYPICAL RESTORATION SECTIONS	BACKFILL
<p>MACADAM DRIVE</p>	<p>See Note Plate 15</p> <p>Item 404 - 2" Asphalt Conc., AC-20</p> <p>Item 301 - 4" Bitum. Aggr. Base</p> <p>3" Minimum Saw Cut Both Edges</p>  <p>Existing Bitum. Conc. Drive</p> <p>Granular Backfill Item 310 or Flowable Controlled Density Fill</p> <p>Variable *</p> <p>* Unless at Exst. dt. With a Minimum of 3' Width</p> <p>PLATE NO. 20</p>	<p>GRANULAR MATERIAL</p> <p>310 GRADATION GRADE "A" OR FLOWABLE CONTROLLED DENSITY FILL</p>
<p>GRAVEL SURFACE DRIVE</p>	<p>Edge of Road</p> <p>Existing Road</p> <p>Existing Gravel Drive</p> <p>1" Minimum #8 Crushed Aggregate</p> <p>Item 304 Base Course 2-4" Courses</p>  <p>Variable</p> <p>PLATE NO. 21</p>	<p>GRANULAR MATERIAL</p> <p>310 GRADATION GRADE "A" OR FLOWABLE CONTROLLED DENSITY FILL</p>
<p>SIDEWALK</p>	<p>Existing Surface</p> <p>Replace Entire Block</p> <p>5" Concrete Walk</p> <p>Class "C" Concrete</p>  <p>PLATE NO. 22</p>	<p>GRANULAR MATERIAL</p> <p>310 GRADATION GRADE "A" OR FLOWABLE CONTROLLED DENSITY FILL</p>

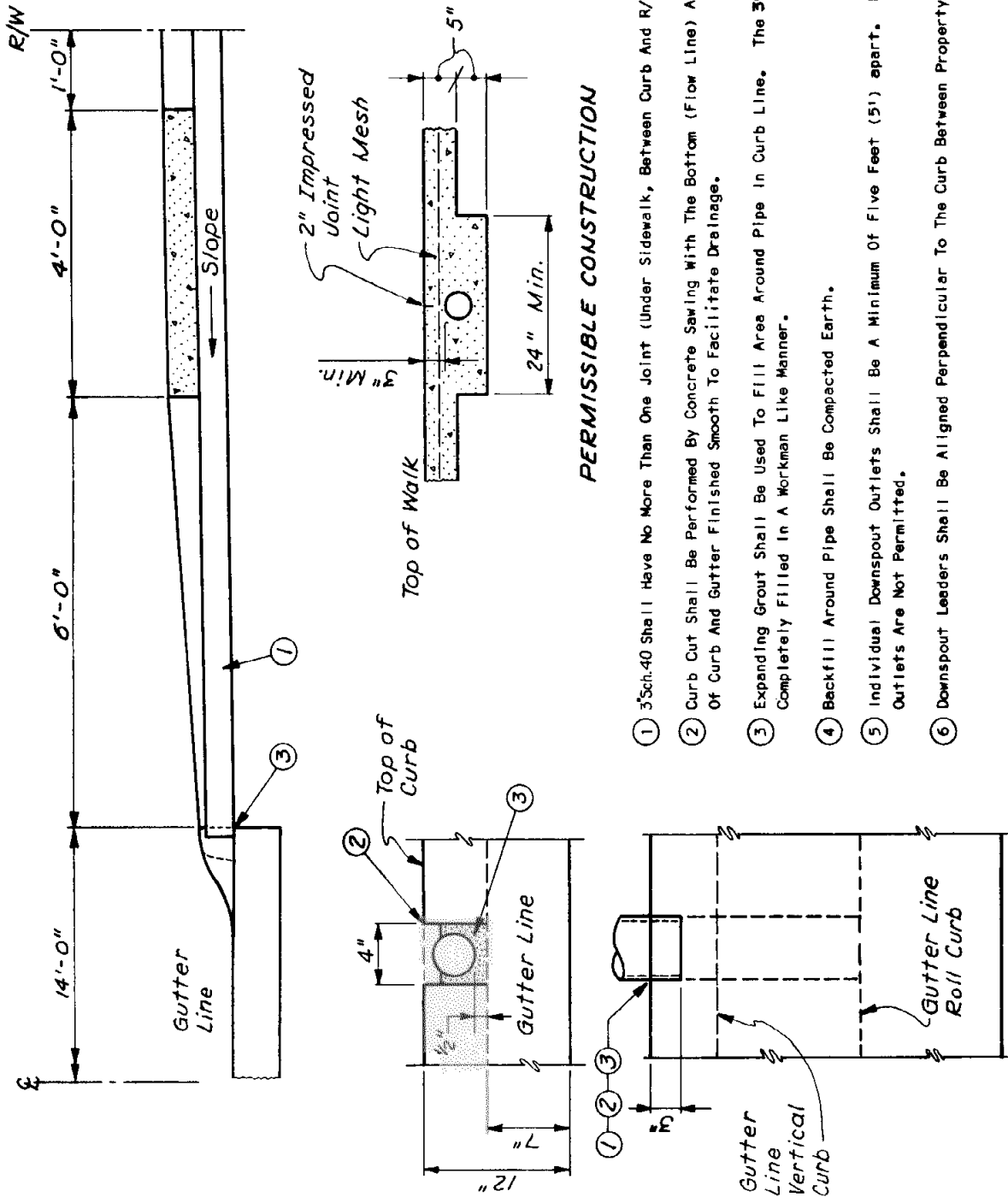
TYPICAL RESTORATION SECTIONS

Plates No. 23,24,25 & 26

RESTORATION CLASS	TYPICAL RESTORATION SECTIONS	BACKFILL
<p>TRENCH LESS THAN 2' BUT NOT ADJ. TO EDGE OF PAVEMENT</p> <p>ALSO ROAD UNDER CONSTRUCTION OR PROPOSED CONSTRUCTION</p>	 <p>Edge of Road</p> <p>Less Than 2' *</p> <p>Restore Surface to Original Condition or Better</p> <p>3" Minimum Clay Cap</p> <p>Exst. Road</p> <p>* If 1' or Less, a Pavement Section Shall Be Utilized (See Plate No. 26)</p> <p>PLATE NO. 23</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>
<p>UNIMPROVED AREA</p>	 <p>Edge of Road</p> <p>Over 2'</p> <p>Restore Surface to Original Condition or Better</p> <p>3" Minimum Clay Cap</p> <p>Exst. Road</p> <p>Exst. Surface</p> <p>Variable</p> <p>PLATE NO. 24</p>	<p>EXCAVATED MATERIAL</p>
<p>SODDED AREA</p>	 <p>Edge of Road</p> <p>Over 2'</p> <p>Sod</p> <p>Restore Surface to Original Condition or Better</p> <p>3" Topsoil</p> <p>Exst. Road</p> <p>Exst. Sod</p> <p>6" Typ.</p> <p>Variable</p> <p>PLATE NO. 25</p>	<p>EXCAVATED MATERIAL</p>
<p>TRENCH ADJACENT TO EDGE OF PAVEMENT</p>	 <p>Item 404 - 2" Asphalt Concrete, AC-20</p> <p>Exst. Road</p> <p>Item 301 - 2-4" Courses Bitum. Aggregate Base</p> <p>Flowable Controlled Density Fill</p> <p>Variable *</p> <p>* Unless at Exst. Jt. With a Minimum of 3' Width</p> <p>PLATE NO. 26</p>	<p>FLOWABLE CONTROLLED DENSITY FILL</p>

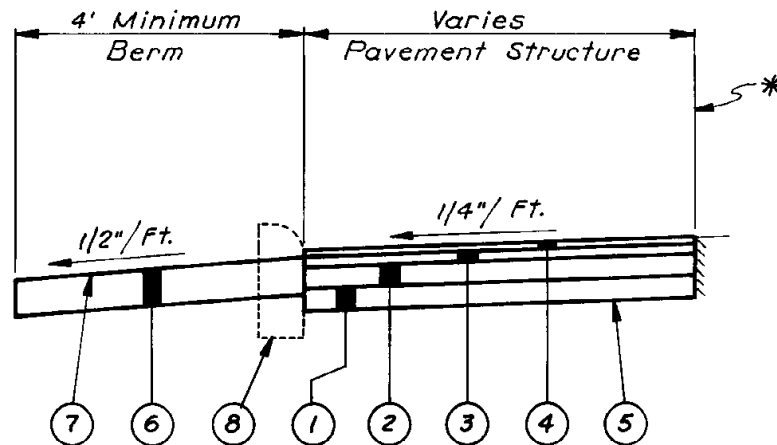
DOWNSPOUT OULET DETAILS FOR CURBED ROADWAYS

Plate No. 27



PERMISSIBLE CONSTRUCTION

- ① 3" Sch. 40 Shall Have No More Than One Joint (Under Sidewalk, Between Curb And R/W).
- ② Curb Cut Shall Be Performed By Concrete Sawing With The Bottom (Flow Line) Area Between Back Of Curb And Gutter Finished Smooth To Facilitate Drainage.
- ③ Expanding Grout Shall Be Used To Fill Area Around Pipe In Curb Line. The 3" Width Shall Be Completely Filled In A Workman Like Manner.
- ④ Backfill Around Pipe Shall Be Compacted Earth.
- ⑤ Individual Downspout Outlets Shall Be A Minimum Of Five Feet (5') apart. Double Downspout Outlets Are Not Permitted.
- ⑥ Downspout Leaders Shall Be Aligned Perpendicular To The Curb Between Property Line And Curb.

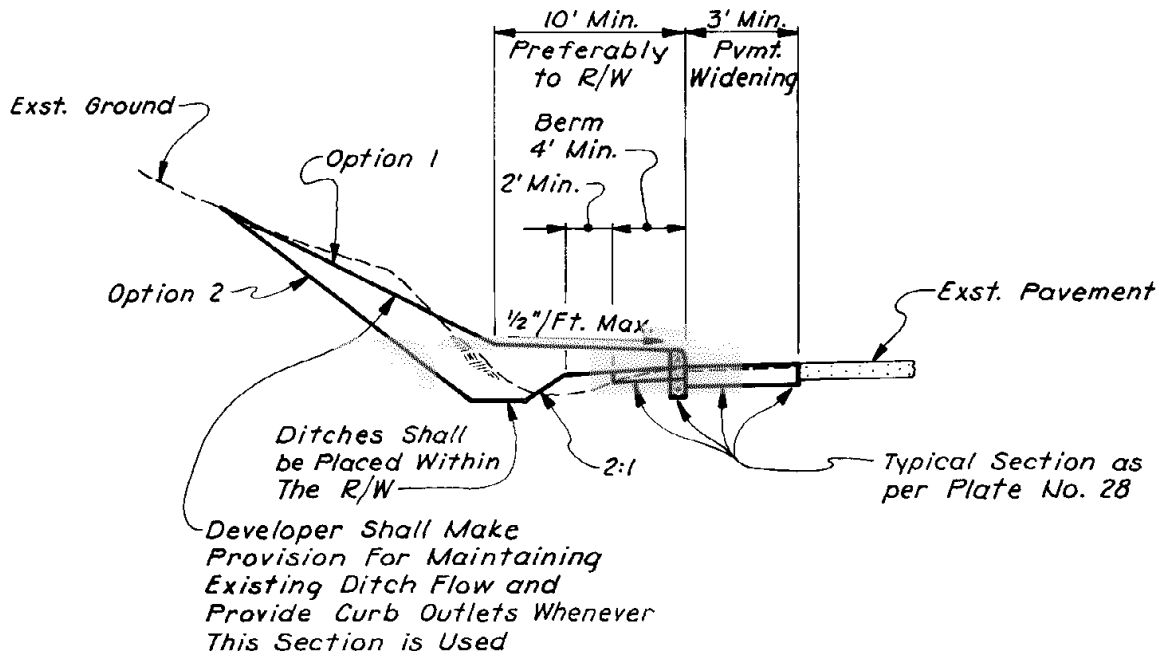


FLEXIBLE PAVEMENT

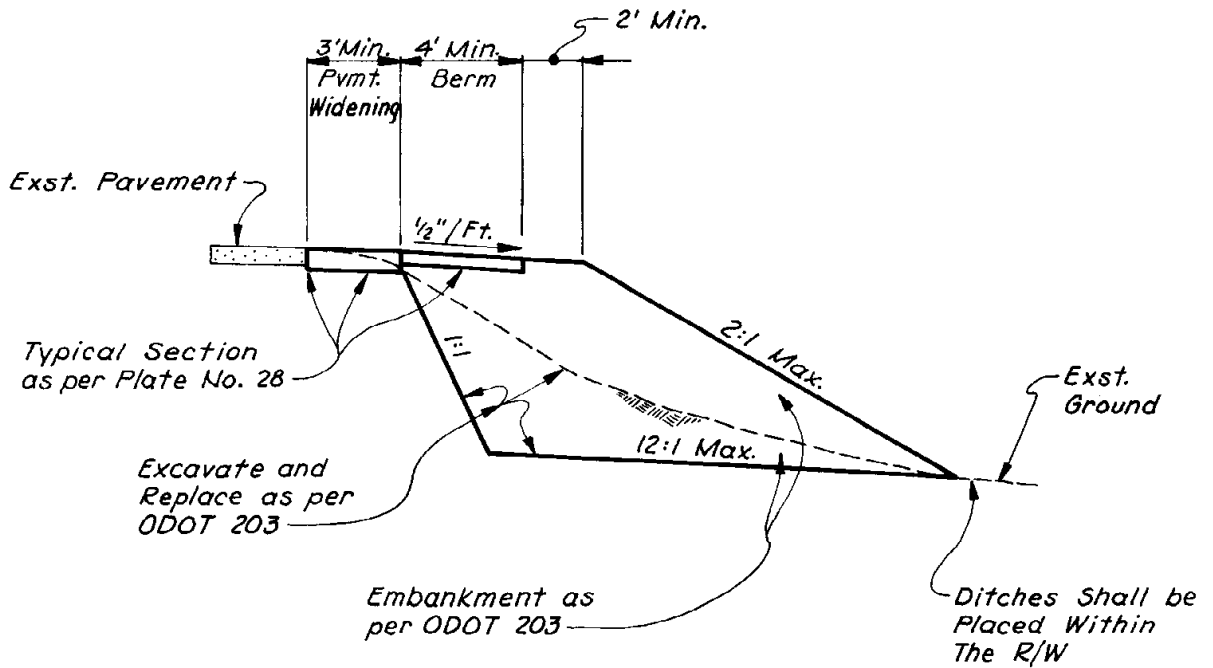
* Edge of existing pavement (if existing pavement is deteriorated, developer shall remove and replace up to two feet width as part of widening operation).

- ① Item 301 - 4 1/2" Base Course
- ② Item 301 - 4 1/2" Base Course
- ③ Item 402 - 1 1/2" Intermediate Course
- ④ Item 404 - 1" Wearing Course
- ⑤ Item 203 - Subgrade Compaction
- ⑥ Item 304 - 6" Aggregate Base
- ⑦ Item 408 - Seal Coat Using 0.3 Gal./S.Y. MC-3000 and 12 Lbs./S.Y. No. 9 Aggregate or Coarse Sand
- ⑧ Item 609 - Type 6 Curb (Required in cut sections, optional in fill sections)

NOTE: Rigid pavement must be compatible with existing pavement. Applicant must discuss with Hamilton County Engineer Permit Department.



TYPICAL HALF SECTIONS IN 'CUT'

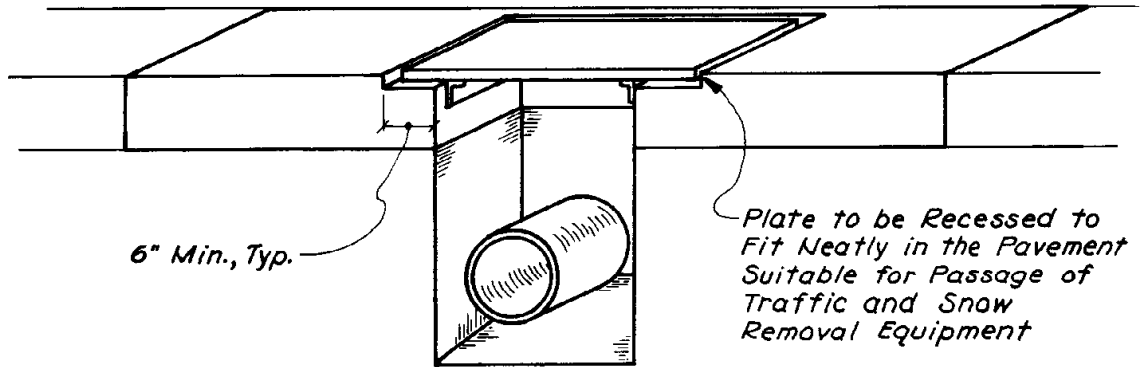


TYPICAL HALF SECTIONS IN 'FILL'

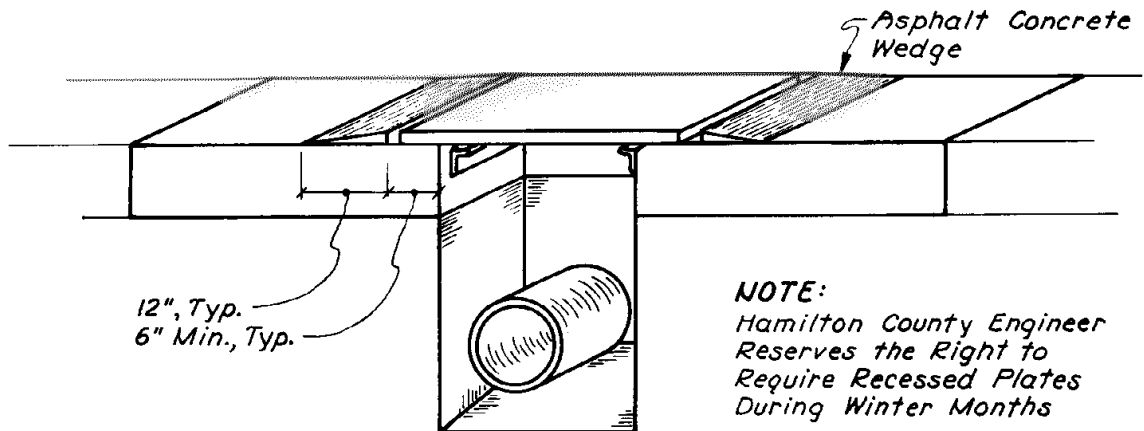
**TRENCH PLATE DETAILS FOR
MAJOR AND MINOR ROADS**

Plate No. 30

For trenches excavated within county roads, trenches shall be plated in accordance with the details shown below. The intent of this detail is to provide the availability of all traffic lanes especially during peak traffic periods as well as non-working hours.



HIGHER SPEED/VOLUME APPLICATION



LOWER SPEED/VOLUME APPLICATION

TYPICAL INTERSECTION SIGHT DISTANCE CONDITIONS**

** For approaches to a two lane through roadway

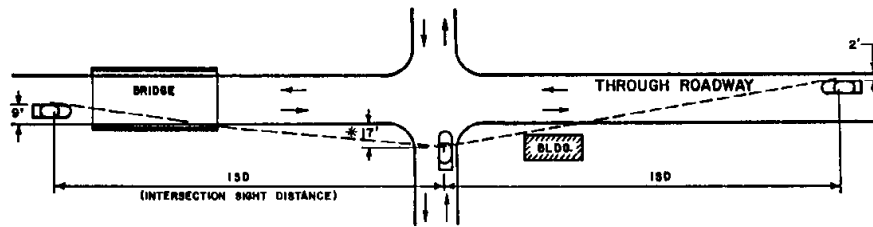


DIAGRAM A - HORIZONTAL COMPONENTS

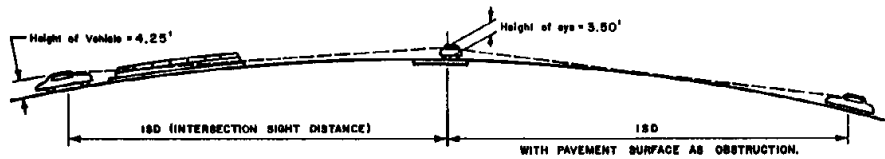


DIAGRAM B - VERTICAL COMPONENTS

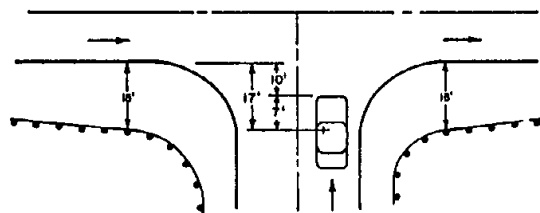


DIAGRAM C - WAITING VEHICLE

INTERSECTION SIGHT DISTANCE (ISD)
FOR APPROACHES TO A TWO LANE
THROUGH ROADWAY

Design Speed M.P.H.	ISD Ft.
55	755
50	690
45	625
40	560
35	495
30	430

NOTE:

Sight distances listed in this table may be modified if necessary, in specific instances, to meet special conditions. However, this will be approved only after the submission of an analysis prepared by the applicants experienced registered engineer. The analysis shall demonstrate that the modification meets AASHTO standards.

*** For Restricted Conditions
15' Minimum May Be Used*