

5' RIGHT (IN DIRECTION OF TRAFFIC)
3' LEFT (ON ONE-WAY ROADWAYS)

SHOULDER

PAVEMENT SURFACE

PLAN GRADE

SUBGRADE

ORIGINAL GROUND

ORIGINAL GROUND

ORIGINAL GROUND

ROUND BOTTOM DITCH WIDTH, ELEVATION AND BACKSLOPE AS SPECIFIED ON PLANS.
(TO APPLY AT TOE OF FILL SLOPES WHERE CALLED FOR ON PLANS)

WIDTH

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

FILL SECTION

SHOULDER

PAVEMENT SURFACE

PLAN GRADE

SUBGRADE

ORIGINAL GROUND

ORIGINAL GROUND

ORIGINAL GROUND

PLAN GRADE ELEVATION

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

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OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

NOTE:
ADDITIONAL BORROW MAY BE OBTAINED BY MOVING THE DITCH OUT OR BY INCREASING THE DITCH WIDTH AS DIRECTED BY THE ENGINEER

ROUND BOTTOM DITCH WIDTH, ELEVATION AND BACKSLOPE AS SPECIFIED ON PLANS.

WIDTH

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

V.C.

CUT - OFF OR SIDE BORROW SECTION

SHOULDER

PAVEMENT SURFACE

PLAN GRADE

SUBGRADE

ORIGINAL GROUND

ORIGINAL GROUND

2'

6:1

PLAN GRADE ELEVATION

DEPTH AS SPECIFIED ON PLANS

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

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OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

1:6

OR AS SPECIFIED ON PLANS

NOTE:
SLOPE SHALL BE MADE FLAT ENOUGH TO PREVENT SLOUGHING OF ROCK FACE INTO DITCH.

NOTE:
SPECIAL SECTIONS ARE NECESSARY ON SUPERELEVATED CURVES AND WHERE DEEP SUBBASE IS USED.
IN ROCK CUT SECTIONS, THE NEED FOR A CONCRETE BARRIER OR OTHER TYPE OF PROTECTION SHOULD BE EVALUATED.

ROCK CUT SECTION

NOTE:

ROCK EXCAVATION WILL BE PAID FOR TO THE NEAT LINE SHOWN.



PREPARED BY
DESIGN
SUPPORT AREA

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

Brandon D. Davis
ENGINEER OF CONSTRUCTION & TECHNOLOGY

Calvin Roberts
ENGINEER OF MAINTENANCE

James D. Culp
ENGINEER OF TRAFFIC AND SAFETY

Mark A. Valachi
ENGINEER OF DESIGN SUPPORT AREA

DEPARTMENT DIRECTOR
Gloria J. Jeff

John S. Plante
ENGINEER OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

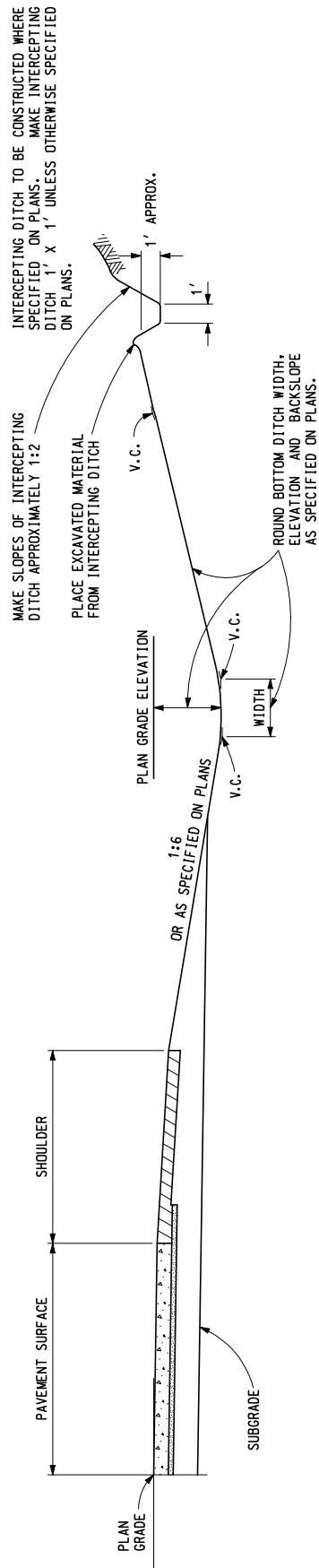
GRADING CROSS-SECTIONS

11-14-2003
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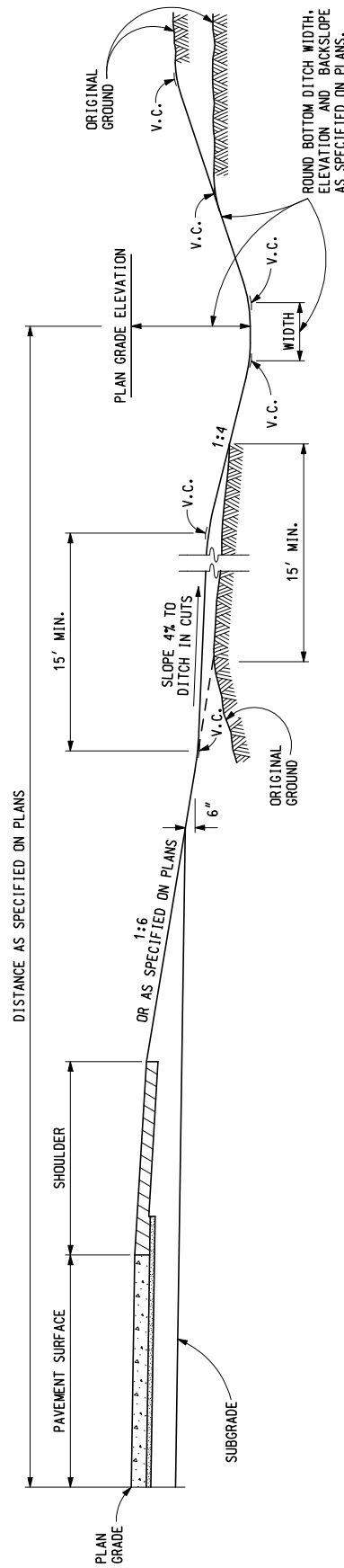
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PLAN DATE

R-105-D

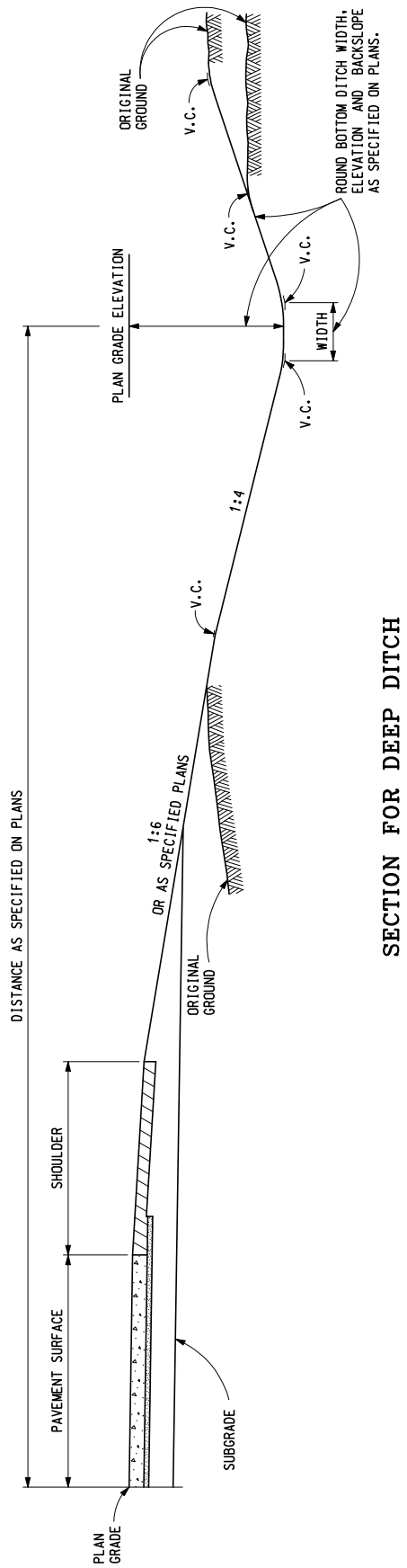
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ROUND BOTTOM DITCH SECTION



BERM OR SWAMP DITCH SECTION



SECTION FOR DEEP DITCH

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BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

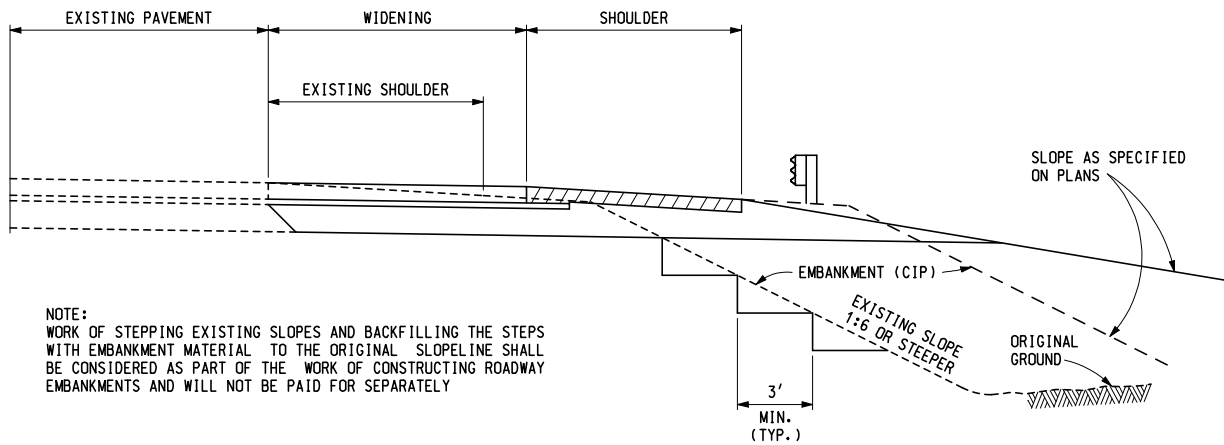
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11-14-2003
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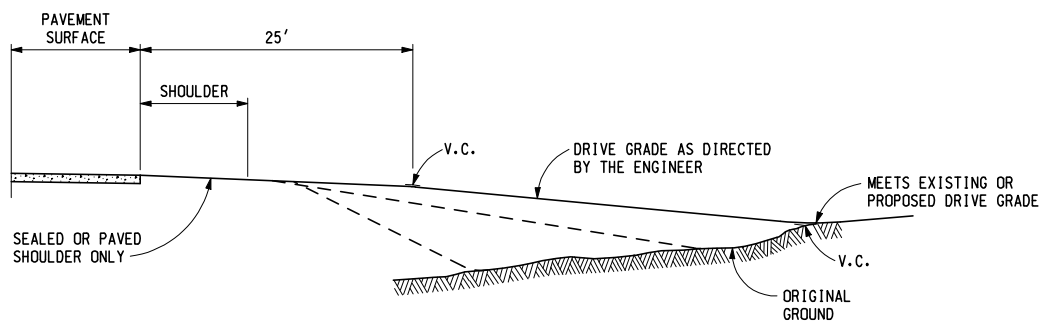
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PLAN DATE

R-105-D

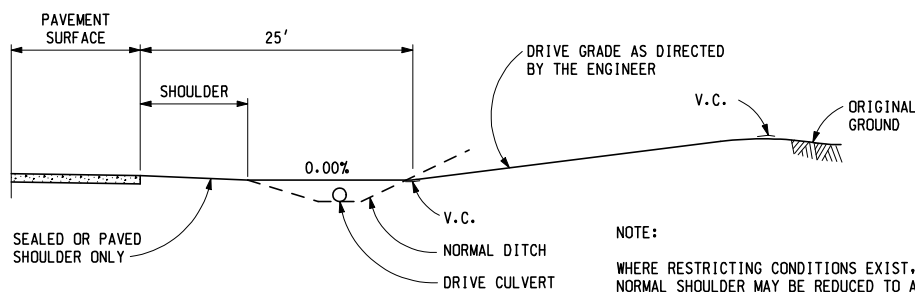
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2 OF 6



ADDING EMBANKMENT TO EXISTING SLOPES



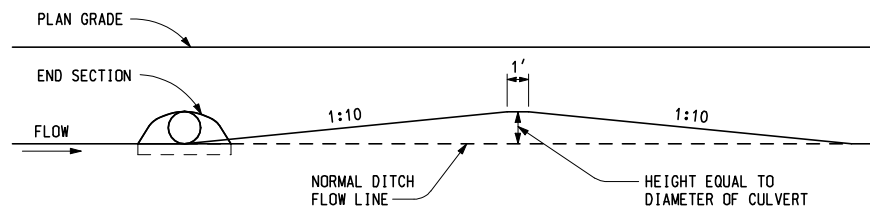
GRADING OF DRIVES IN FILL SECTIONS



NOTE:

WHERE RESTRICTING CONDITIONS EXIST, THE FLAT AREA DISTANCE OUTSIDE THE NORMAL SHOULDER MAY BE REDUCED TO A MINIMUM OF 4' VERTICAL CURVE. IN ALL CASES THE NORMAL FULL WIDTH SHOULDER SHALL BE MAINTAINED AND THE FLAT AREA SHOULD BE MAXIMIZED.

GRADING OF DRIVES IN CUT SECTIONS



DIKE IN DITCH SECTION

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BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

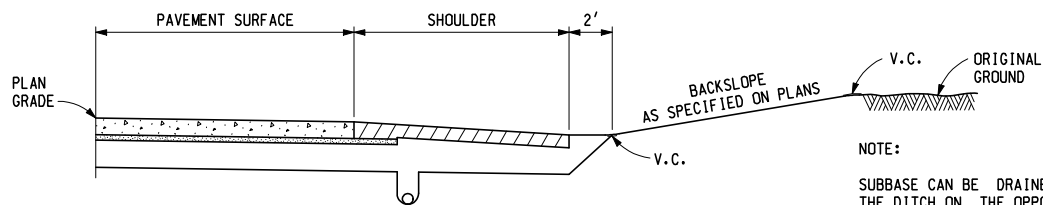
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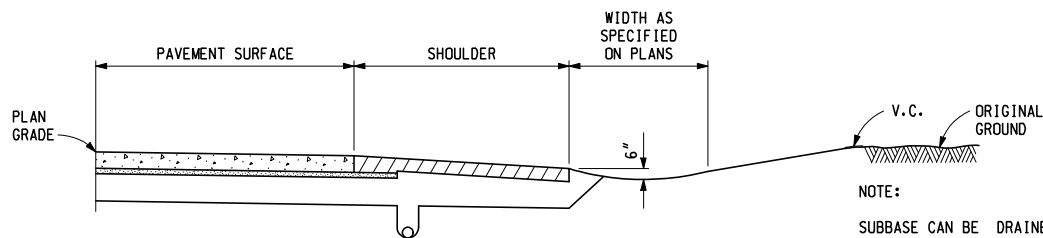
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PLAN DATE

R-105-D

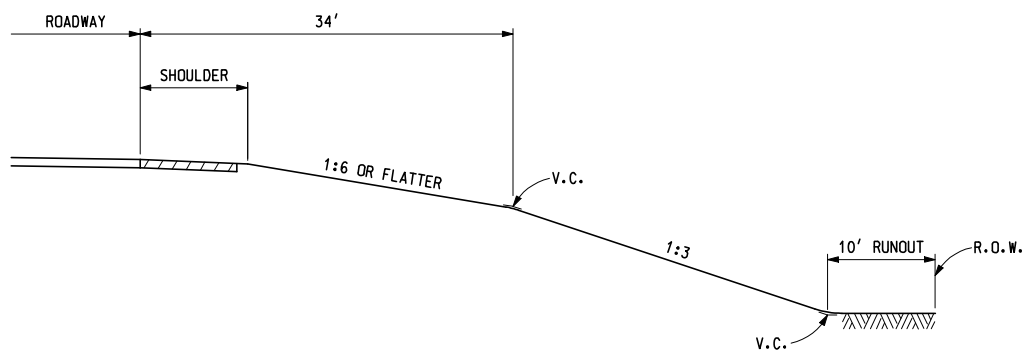
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3 OF 6



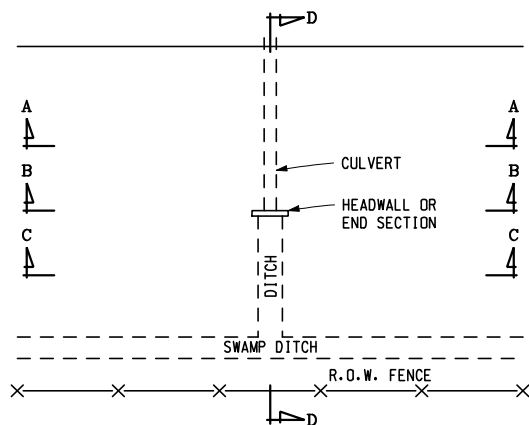
NO DITCH SECTION



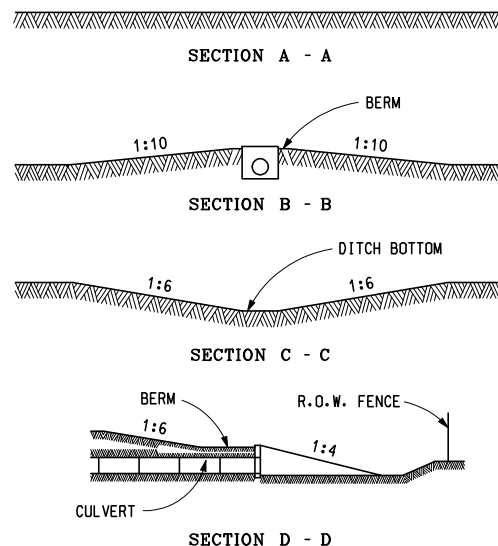
VALLEY DITCH SECTION



BARN ROOF FILL SECTION
(TO APPLY ON TANGENT SECTIONS ONLY)



OUTLET CULVERT IN BERM OR SWAMP DITCH SECTION



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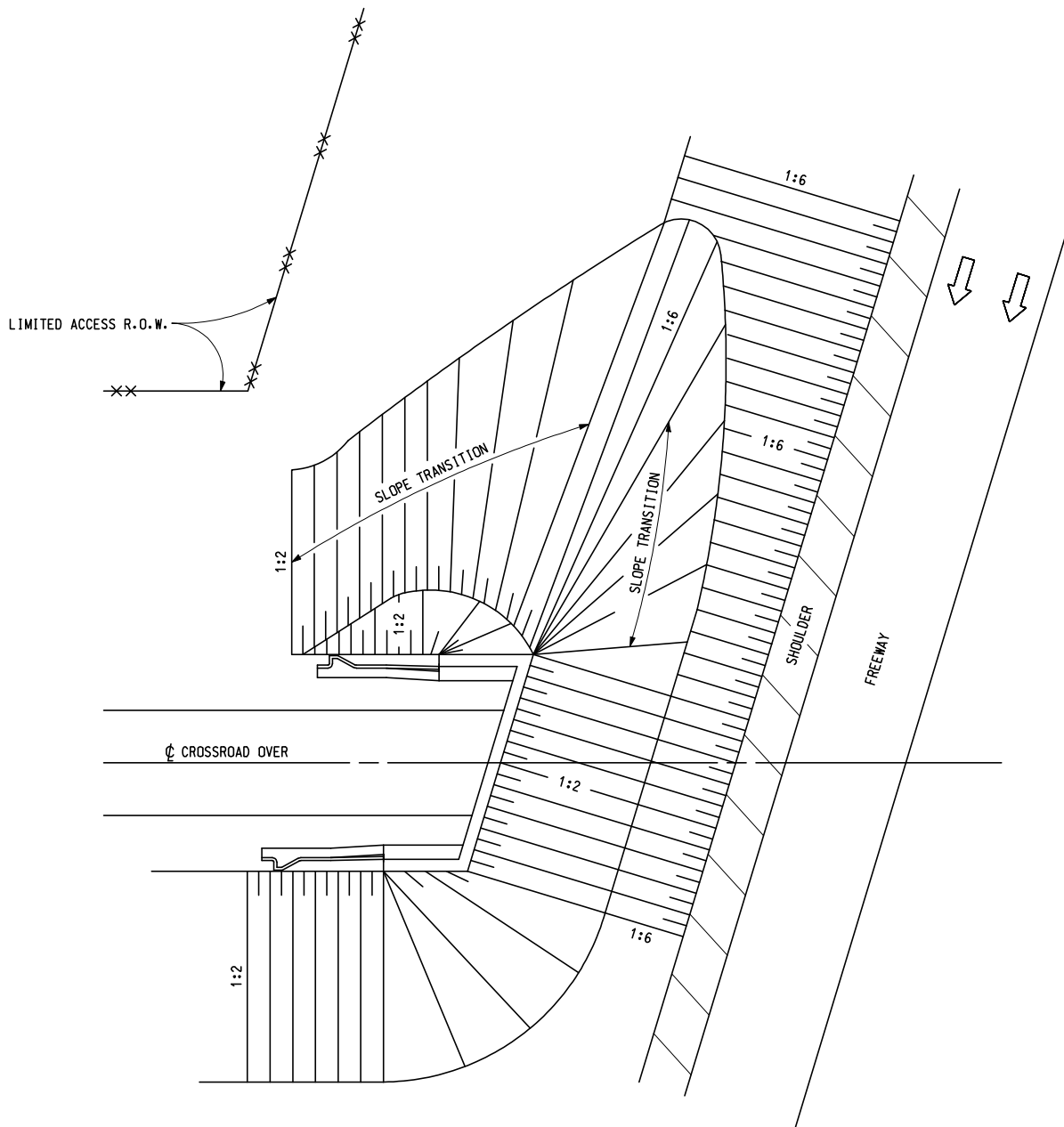
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6-19-2002
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R-105-D

SHEET
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NOTE:

THE 1:6 SLOPE FACING FREEWAY TRAFFIC SHOULD BE USED ON ALL NEW CONSTRUCTION UNLESS THE DISTANCE FROM THE EDGE OF THE NEAREST FREEWAY THROUGH LANE TO THE TOE OF THE 1:2 SLOPE UNDER THE BRIDGE EXCEEDS THE CLEAR ZONE.

**GRADING DETAILS FOR FLATTENING LONG SLOPE AT
BRIDGE APPROACH FILLS FACING ONCOMING TRAFFIC**

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

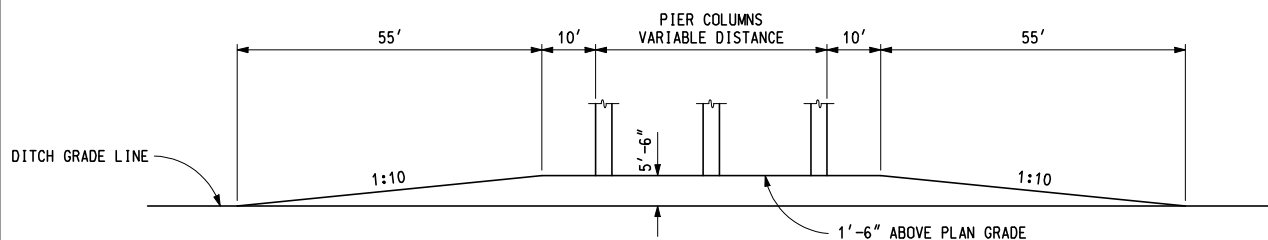
GRADING CROSS-SECTIONS

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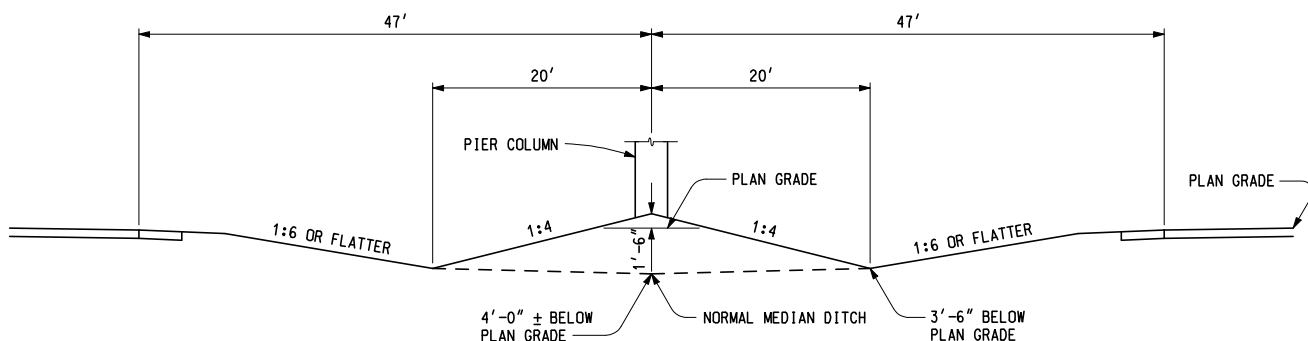
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LONGITUDINAL SECTION ALONG MEDIAN



TRANSVERSE SECTION AT STRUCTURES

TYPICAL GRADING DETAILS AROUND PIERS FOR MEDIANS 94' OR WIDER

NOTES:

THIS STANDARD APPLIES PRINCIPALLY FOR VARIOUS DITCH TYPES AND FOR THE ROUNDING OF SLOPES. THE SUBGRADE WILL BE SPECIFIED ON THE PLANS. SLOPES OTHER THAN THOSE SPECIFIED ON THIS PLAN MAY BE USED WHEN THEY ARE SPECIFIED ON THE PROJECT PLANS. IN THE EVENT OF A DISCREPANCY BETWEEN THIS PLAN AND THE PROJECT PLANS, THE PROJECT PLANS WILL GOVERN.

SEE CURRENT STANDARD PLAN R-107-SERIES FOR SUPERELEVATED SECTIONS.

DITCHES SHOULD ALWAYS BE DEEP ENOUGH TO GRAVITY DRAIN THE SUBBASE, WHERE SUBBASE IS USED.

THE SUBGRADE SHOULD BE SLOPED TO DRAIN TO THE OUTSIDE DITCH IF THE MEDIAN ON DUAL ROADWAYS IS OF INSUFFICIENT WIDTH TO ALLOW DITCHES DEEP ENOUGH TO DRAIN THE SUBBASE.

THE TOP OF BACKSLOPES AND THE BOTTOM OF FILL SLOPES SHALL BE ROUNDED WITH VERTICAL CURVES AS FOLLOWS, PROVIDED TREES OR OTHER RESTRICTIONS DO NOT INTERFERE:

1. USE 4' VERTICAL CURVE ON CUTS OR FILLS LESS THAN 4'.
2. USE 8' TO A MAXIMUM 16' VERTICAL CURVE ON CUTS OR FILLS 4' TO 16'.
3. USE A MAXIMUM 16' VERTICAL CURVE ON CUTS OR FILLS GREATER THAN 16'.

ALL TRANSITIONS IN LENGTH OF VERTICAL CURVES SHALL BE GRADUAL AND GRADED TO PRESENT A UNIFORM AND ATTRACTIVE APPEARANCE.

WHEN 1:6 OR FLATTER SLOPES CANNOT BE CONSTRUCTED WITHIN THE EXISTING R.O.W., THE BARN ROOF FILL SECTION MAY BE USED TO ELIMINATE THE NEED FOR ADDITIONAL R.O.W.. THEY WILL BE USED ONLY WHERE SPECIFIED ON THE PLANS.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

GRADING CROSS-SECTIONS

11-14-2003
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6-19-2002
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R-105-D

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